Radio Test Report

FCC ID: PPQ-WN4616R

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

Issued Date	:	Oct. 12, 2012
Project No.	:	1210063
Equipment	:	802.11b/g/n 2T2R Wireless Lan USB Module
Model Name	:	WN4616R
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. 02, 2012
Date of Test: Oct. 02, 2012 ~ Oct. 11, 2012

Testing Engineer : Rush Kao
(Rush Kao)

Technical Manager : Jeff Yang
(Jeff Yang)

Authorized Signatory : Andy Chiu
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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.**

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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.

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REPORT ISSUED HISTORY

Revised Version No.	Description	Issued Date
-	Initial Issue.	Oct. 12, 2012

1 CERTIFICATION

Equipment	:	802.11b/g/n 2T2R Wireless Lan USB Module
Brand Name	:	LITEON
Model Name	:	WN4616R
Applicant	:	LITE-ON TECHNOLOGY CORP.
Date of Test	:	Oct. 02, 2012 ~ Oct. 11, 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-1-1210063) 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)	6 dB 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>WN4616R</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: 19.99 dBm
IEEE 802.11g: 24.30 dBm
Antenna01:
IEEE 802.11n (20 MHz): 23.67 dBm
IEEE 802.11n (40 MHz): 21.87 dBm
Antenna02:
IEEE 802.11n (20 MHz): 23.66 dBm
IEEE 802.11n (40 MHz): 21.57 dBm
Antenna Total:
IEEE 802.11n (20 MHz): 26.68 dBm
IEEE 802.11n (40 MHz): 24.73 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	TE	2173487-1	PIFA	I-PEX	5.00
2	TE	2173487-2	PIFA	I-PEX	5.00

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.

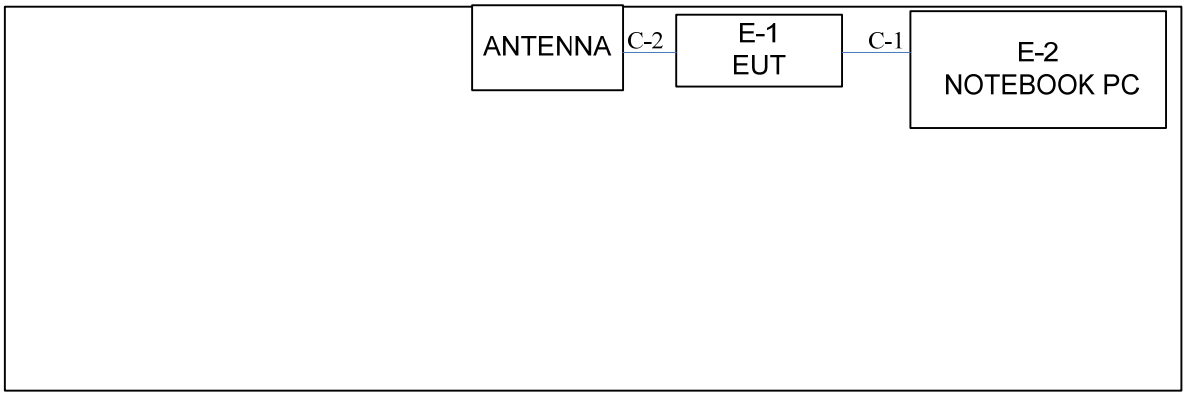
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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	DRTU			DRTU		
Frequency	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
Parameter	13	15	14	18	18	0D

IEEE	802.11n (20 MHz)			802.11n (40 MHz)		
Test software Version	DRTU			DRTU		
Frequency	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
Parameter	1E/20	17/1A	19/1B	11/12	16/1B	0C/0E

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	WN4616R	PPQ-WN4616R	N/A	EUT
E-2	Notebook PC	ACER	ZH2	DOC	LXTCY0503560BDB52500	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	N/A	0.1M	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.

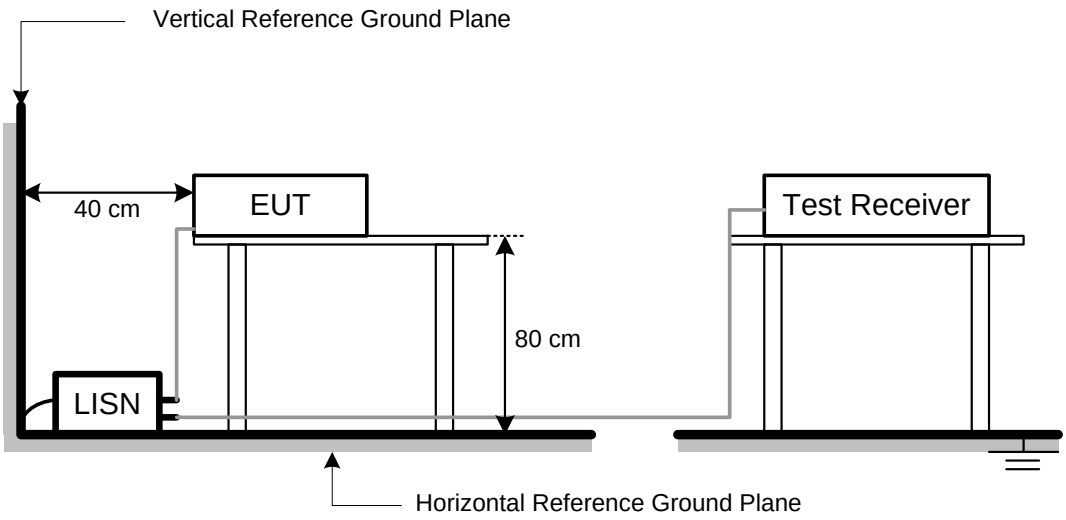
4.3 TEST PROCEDURES

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

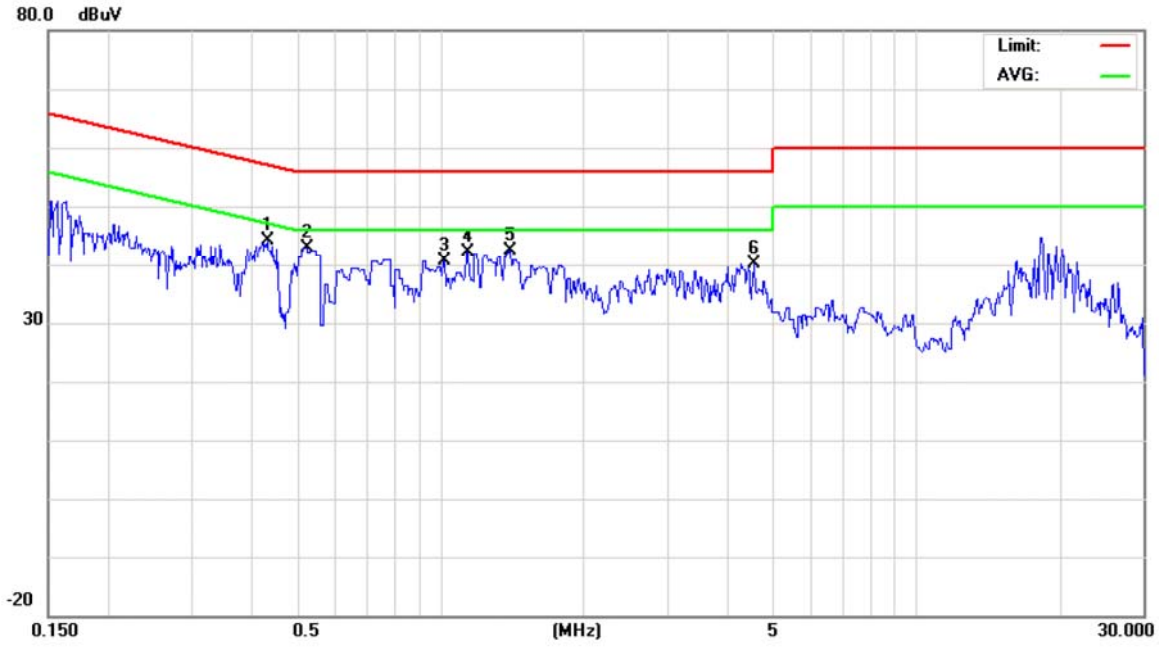
4.6 EUT OPERATING CONDITIONS

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	WN4616R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

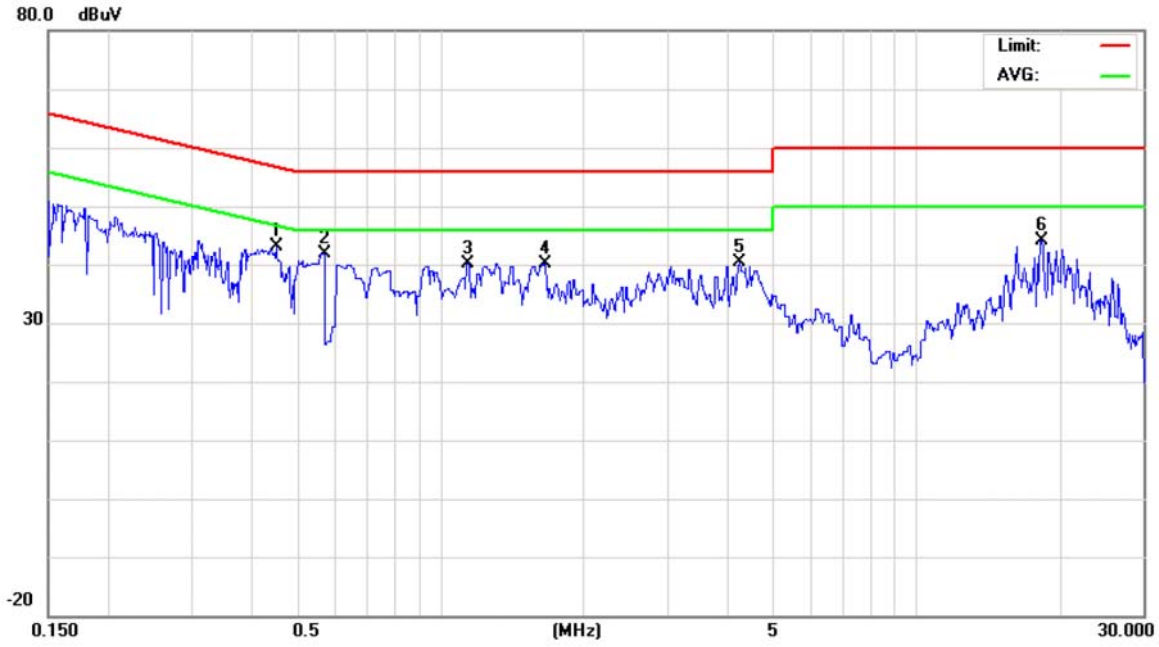
Phase: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4317	34.30	9.71	44.01	57.22	-13.21	peak	
2	*	0.5225	33.20	9.70	42.90	56.00	-13.10	peak	
3		1.0175	30.98	9.71	40.69	56.00	-15.31	peak	
4		1.1413	32.41	9.71	42.12	56.00	-13.88	peak	
5		1.4000	32.76	9.70	42.46	56.00	-13.54	peak	
6		4.5725	30.42	9.79	40.21	56.00	-15.79	peak	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	*	0.4510	33.49	9.70	43.19	56.86	-13.67	peak	
2		0.5675	32.10	9.69	41.79	56.00	-14.21	peak	
3		1.1413	30.35	9.70	40.05	56.00	-15.95	peak	
4		1.6588	30.41	9.68	40.09	56.00	-15.91	peak	
5		4.2463	30.62	9.76	40.38	56.00	-15.62	peak	
6		18.2500	34.38	9.87	44.25	60.00	-15.75	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

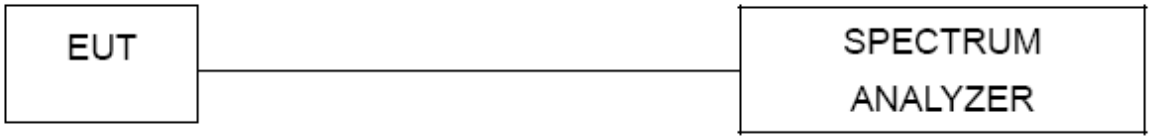
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

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

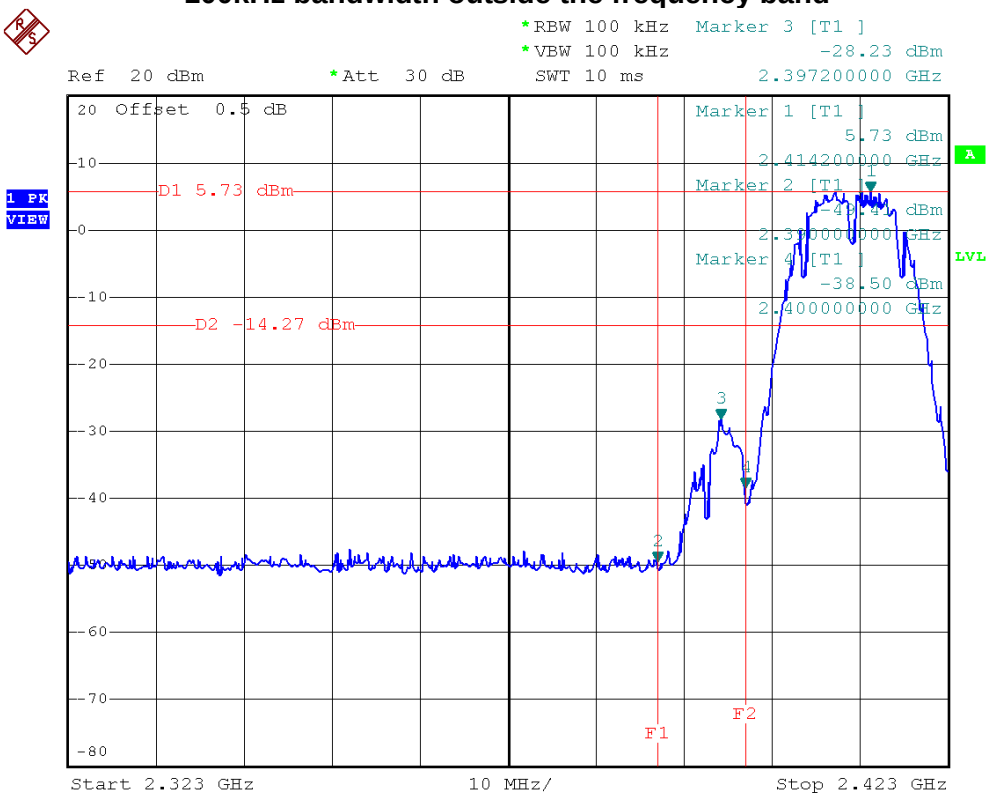
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

5.7 TEST RESULTS

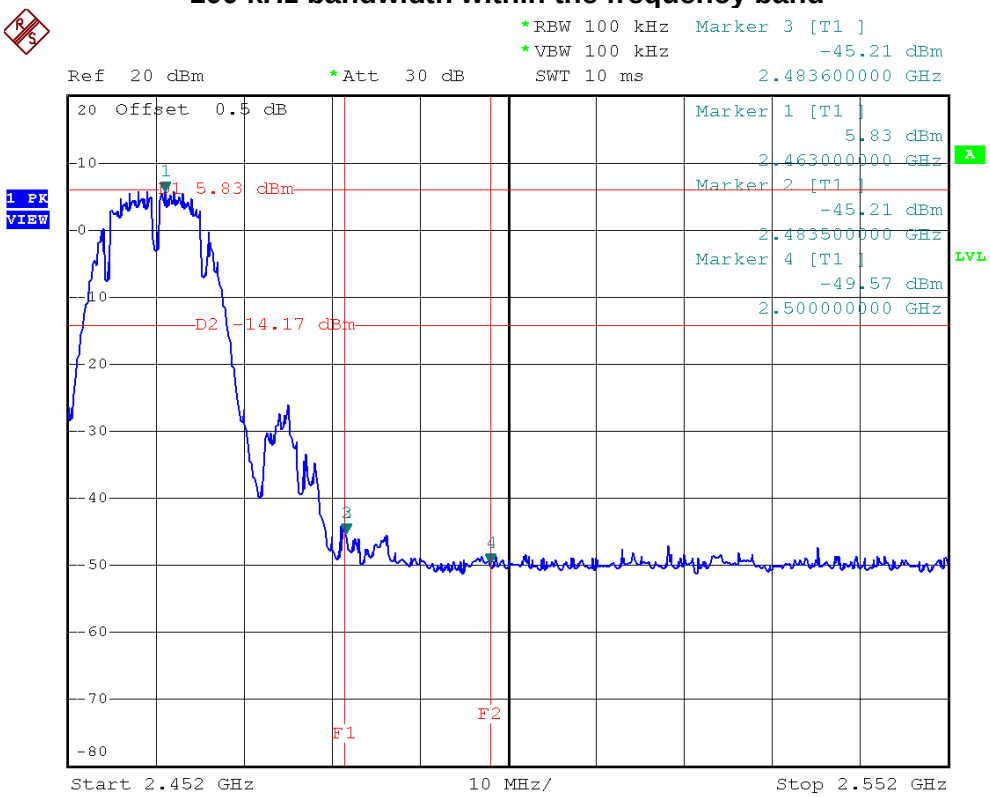
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b		

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	-28.23	2483.60	-45.21
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.			

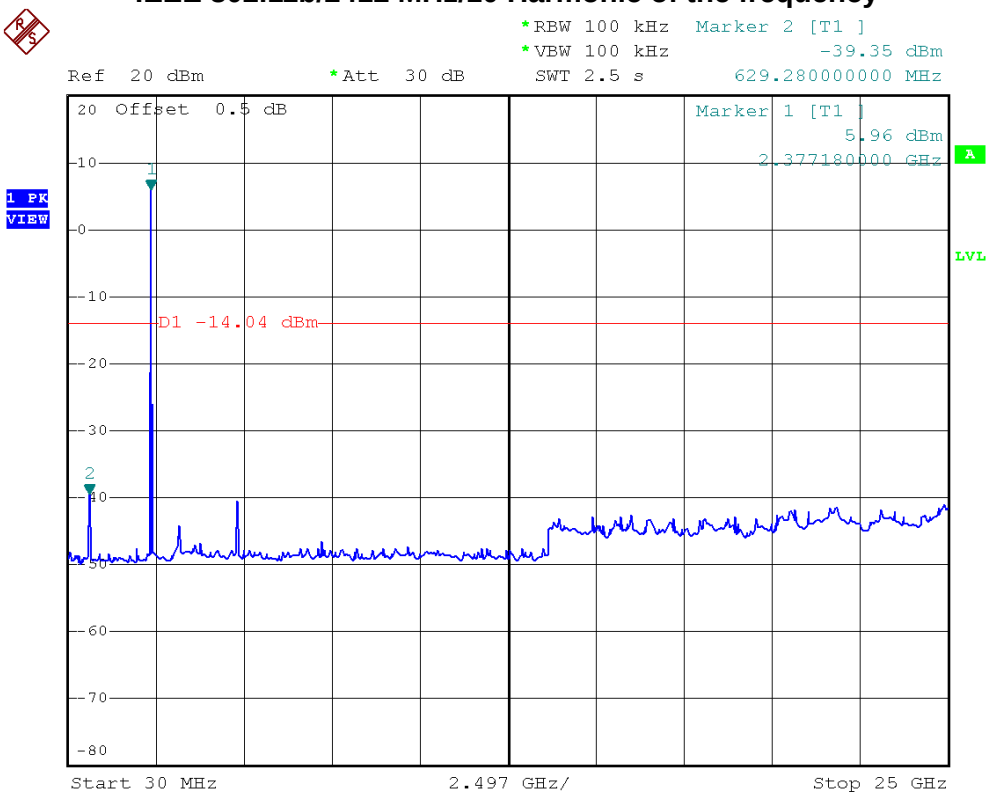
IEEE 802.11b/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



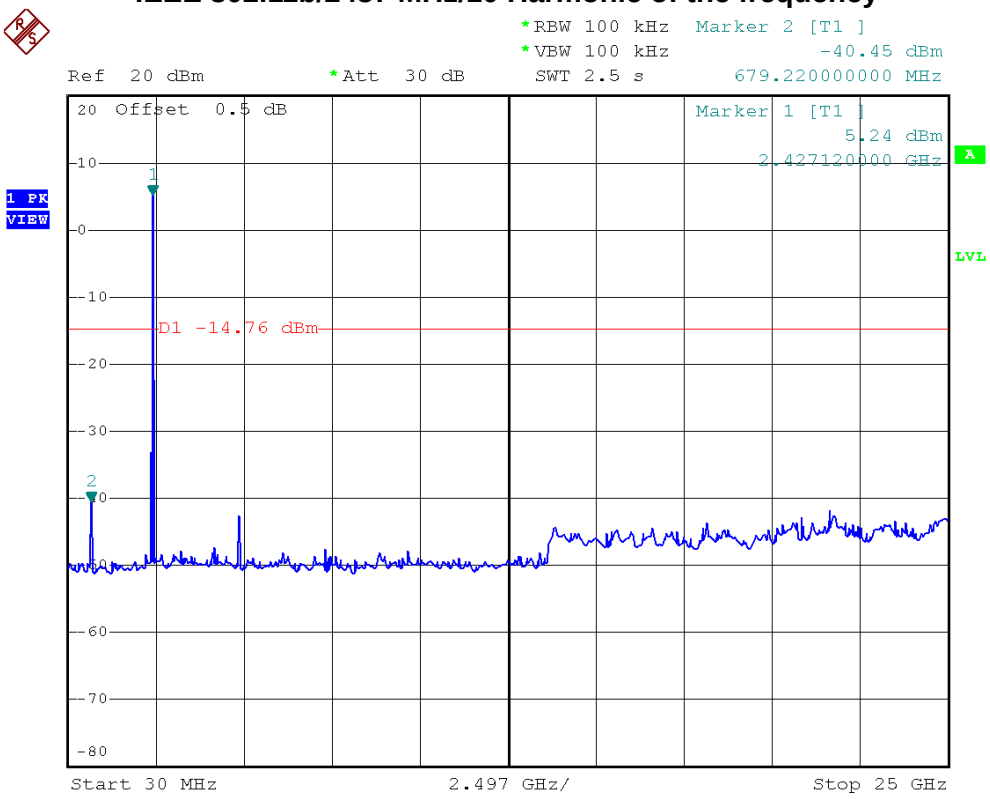
IEEE 802.11b/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



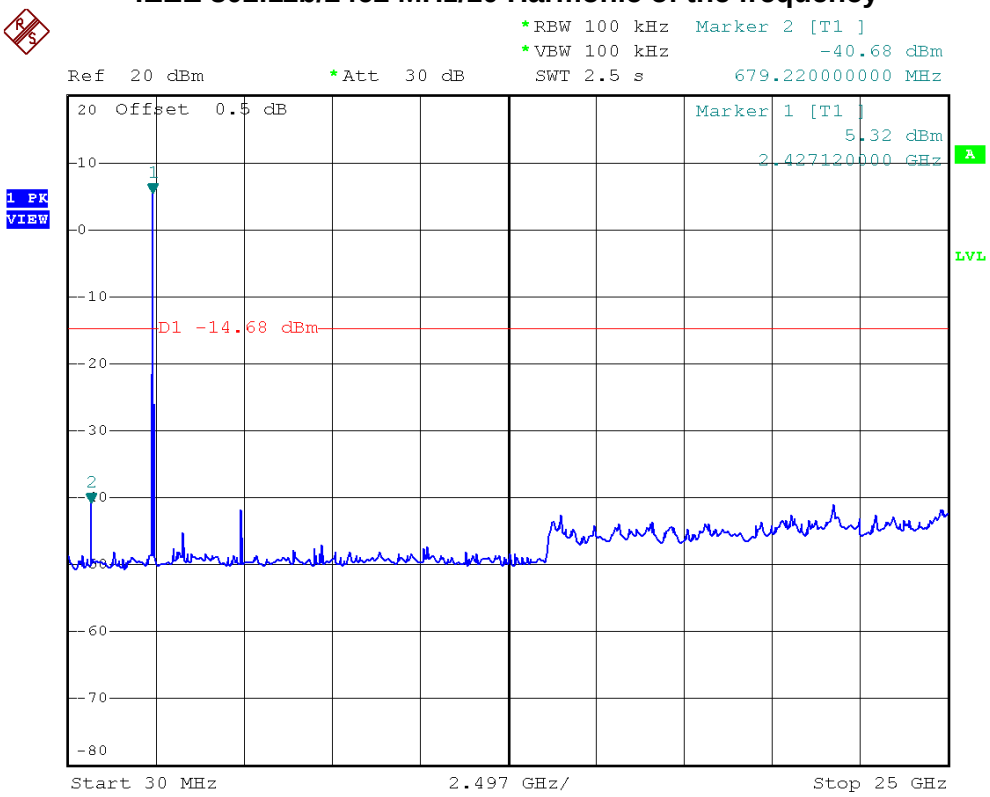
IEEE 802.11b/2412 MHz/10 Harmonic of the frequency



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



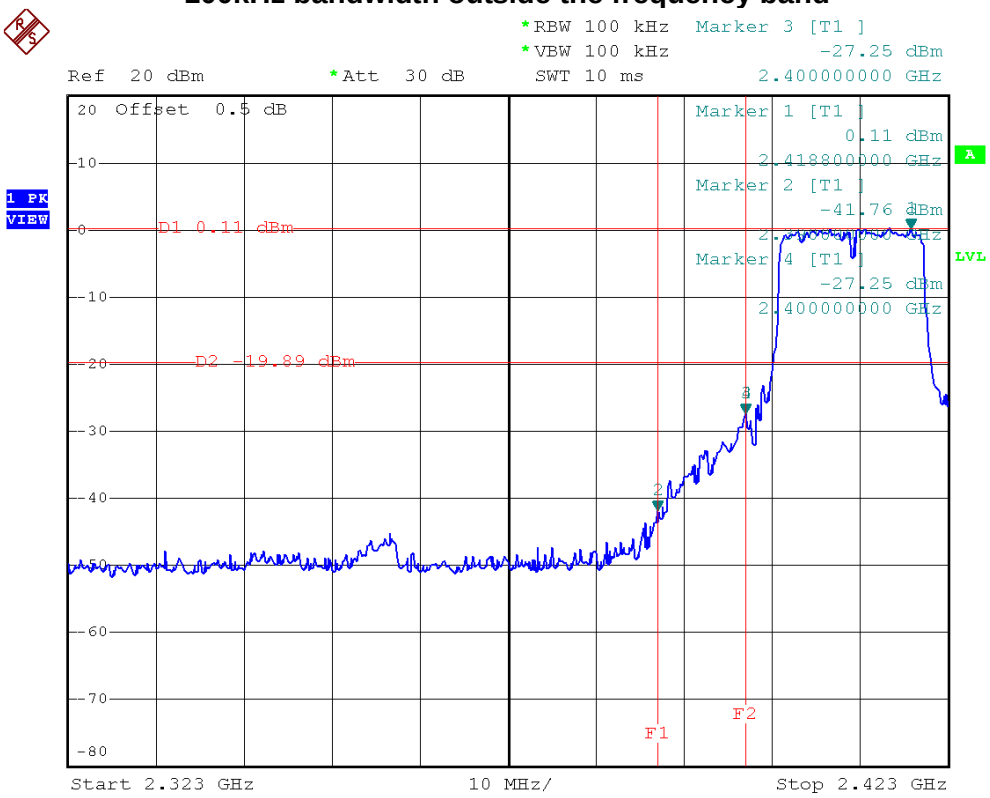
IEEE 802.11b/2462 MHz/10 Harmonic of the frequency



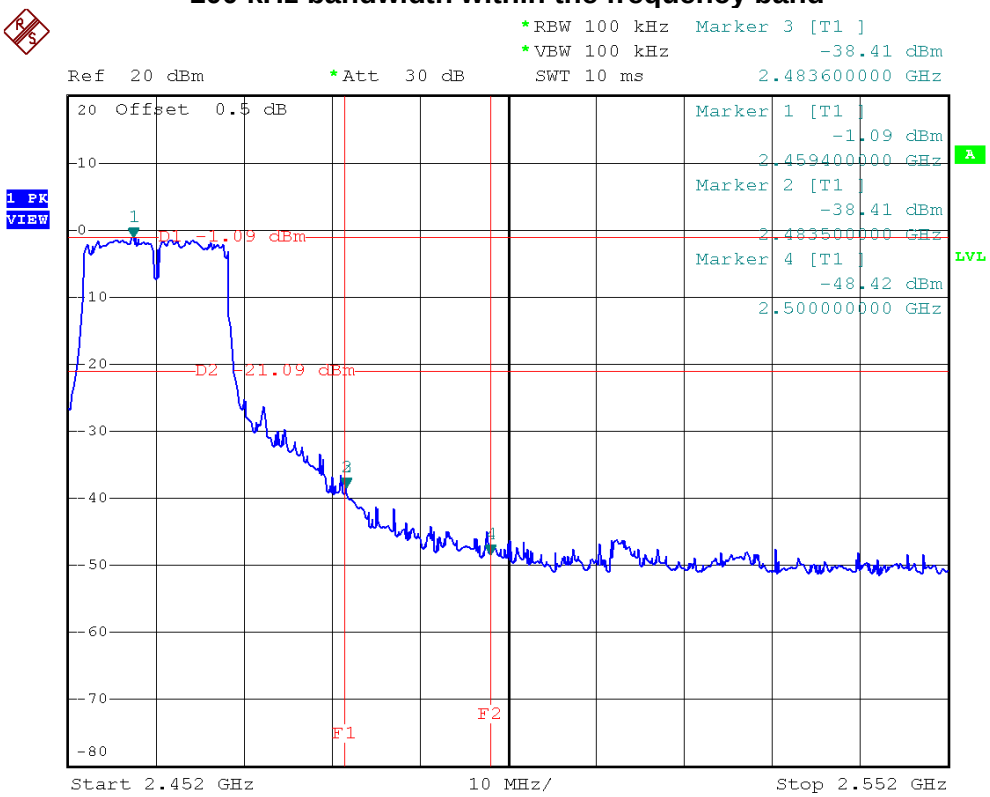
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g		

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	-27.25	2483.60	-38.41
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.			

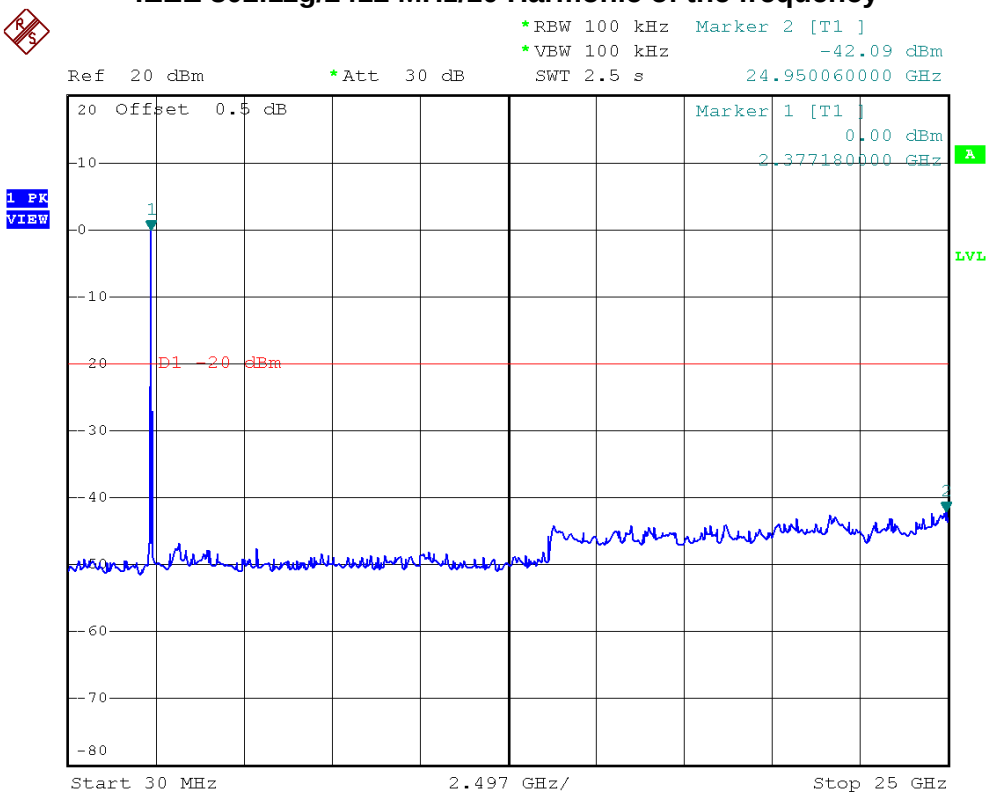
IEEE 802.11g/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



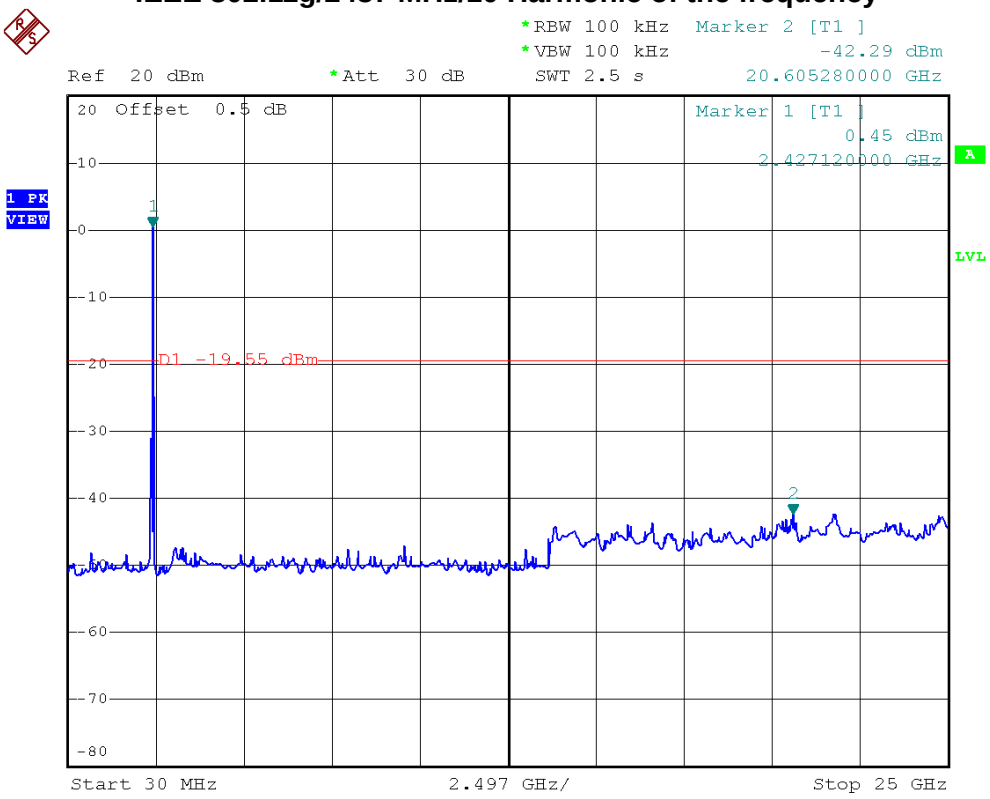
IEEE 802.11g/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



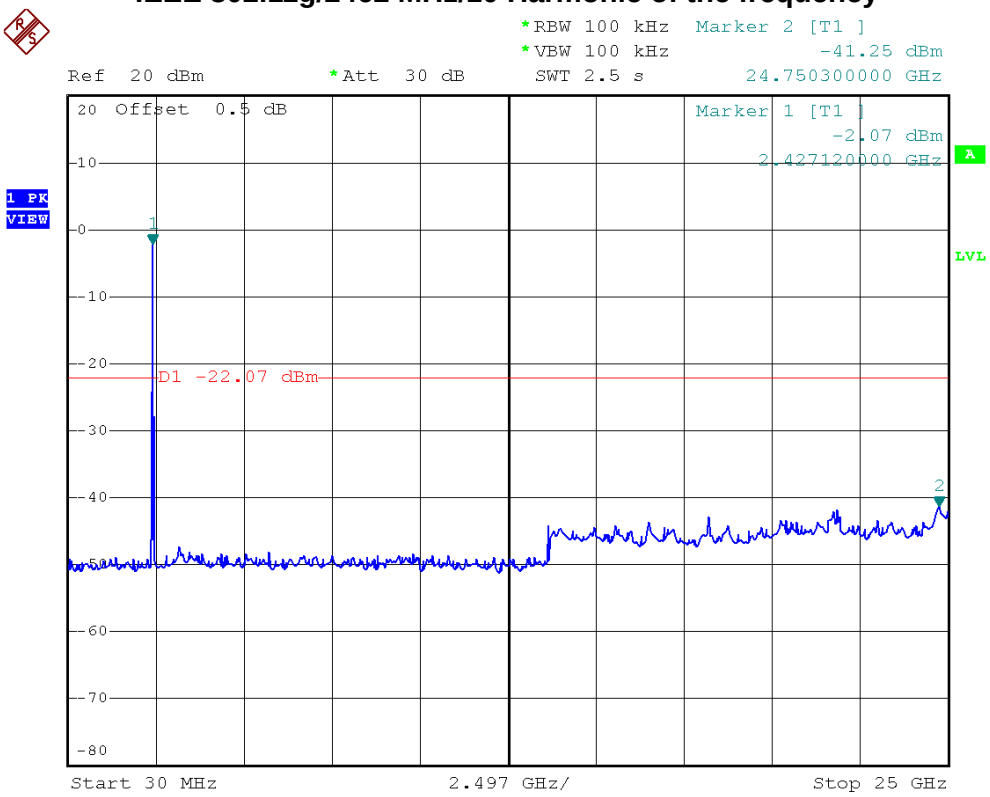
IEEE 802.11g/2412 MHz/10 Harmonic of the frequency



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



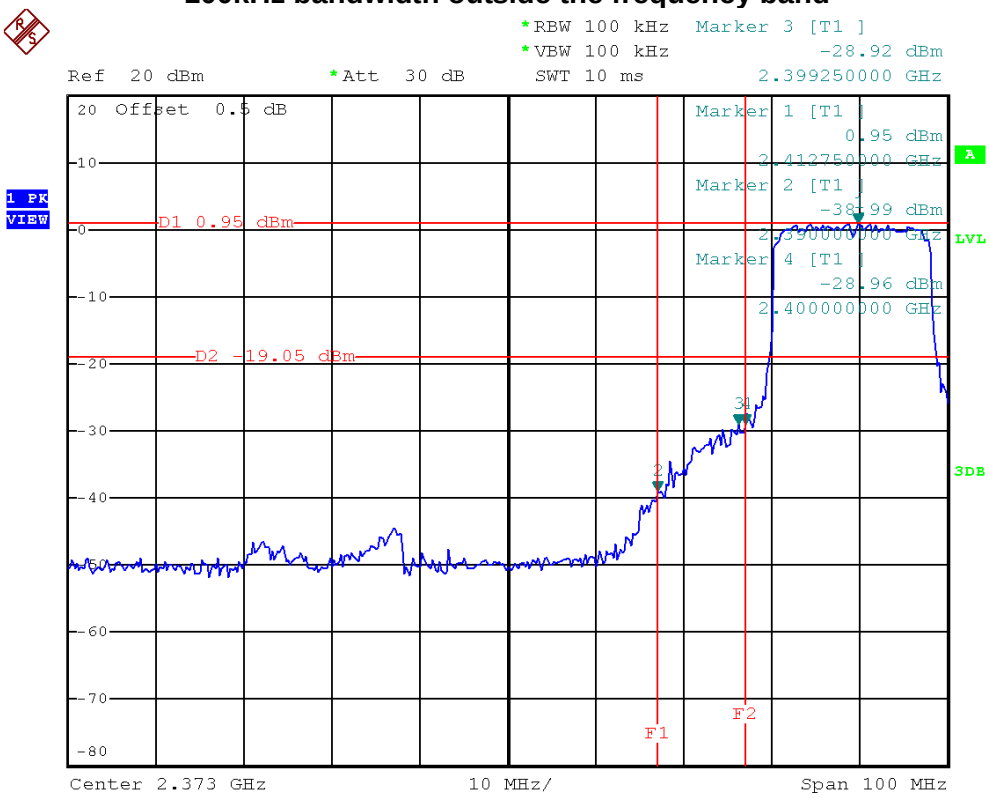
IEEE 802.11g/2462 MHz/10 Harmonic of the frequency



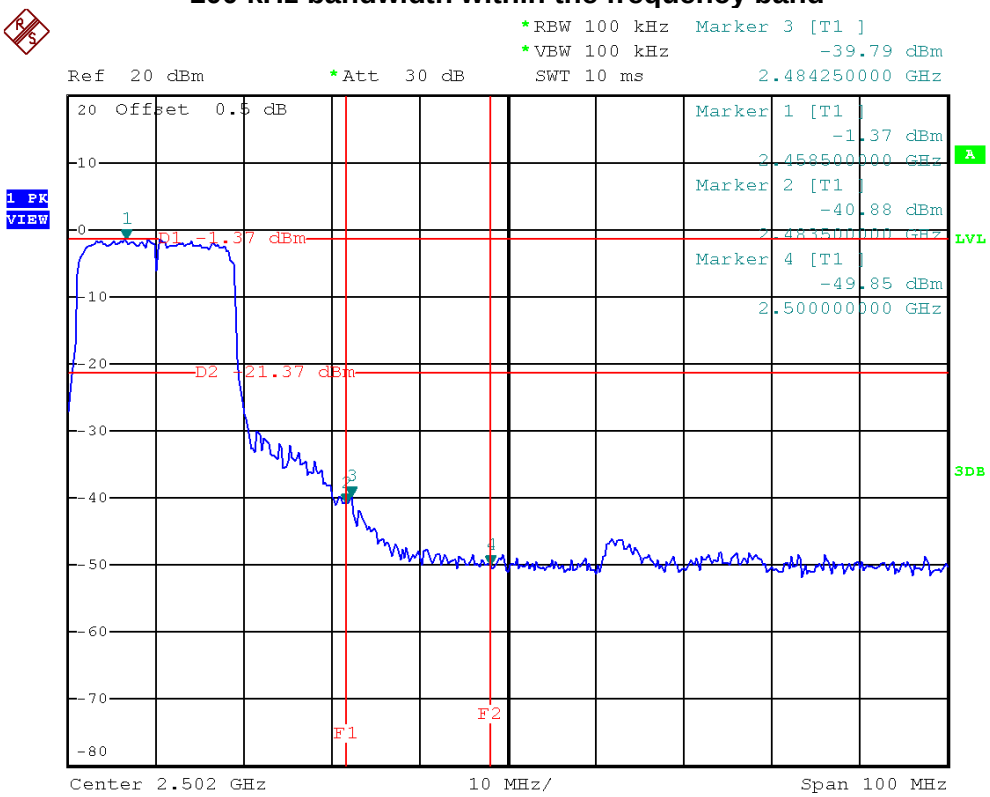
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1		

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)
2399.25	-28.92	2484.25	-39.79
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.			

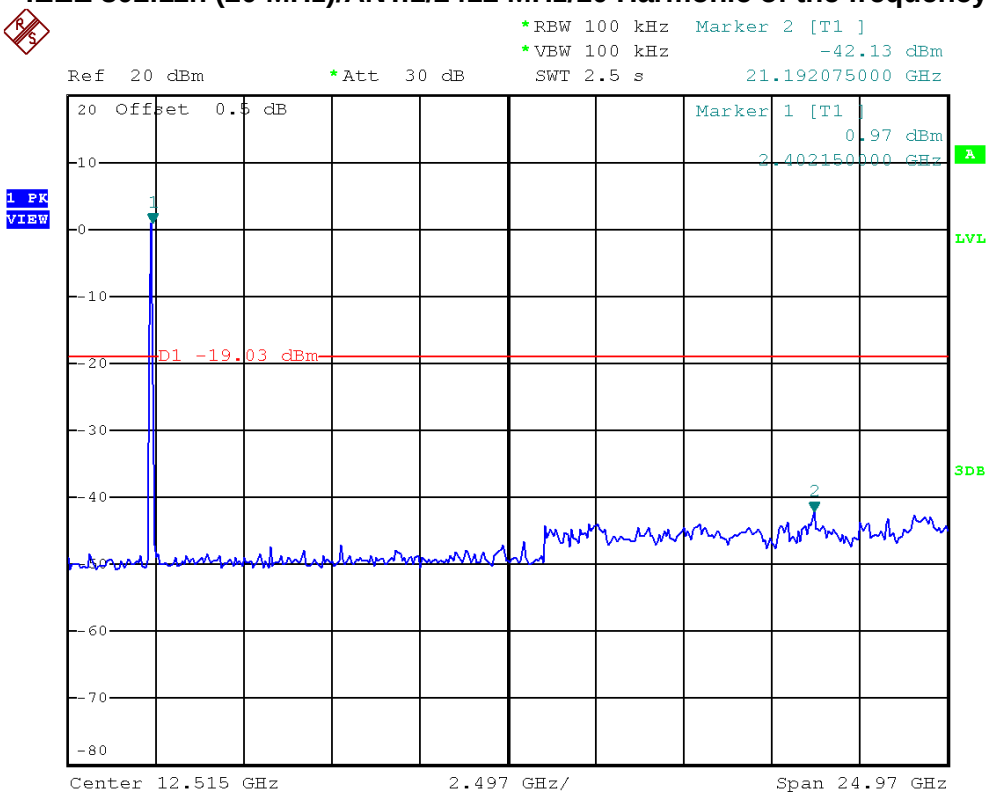
IEEE 802.11n (20 MHz)/ANT.1/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



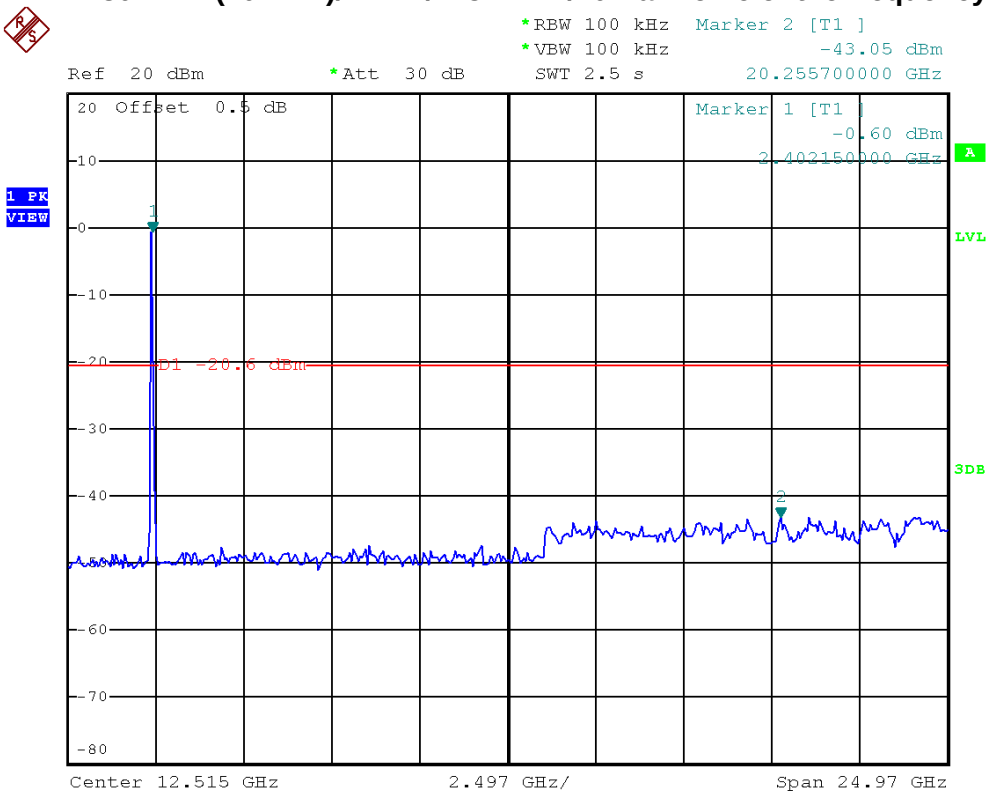
IEEE 802.11n (20 MHz)/ANT.1/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



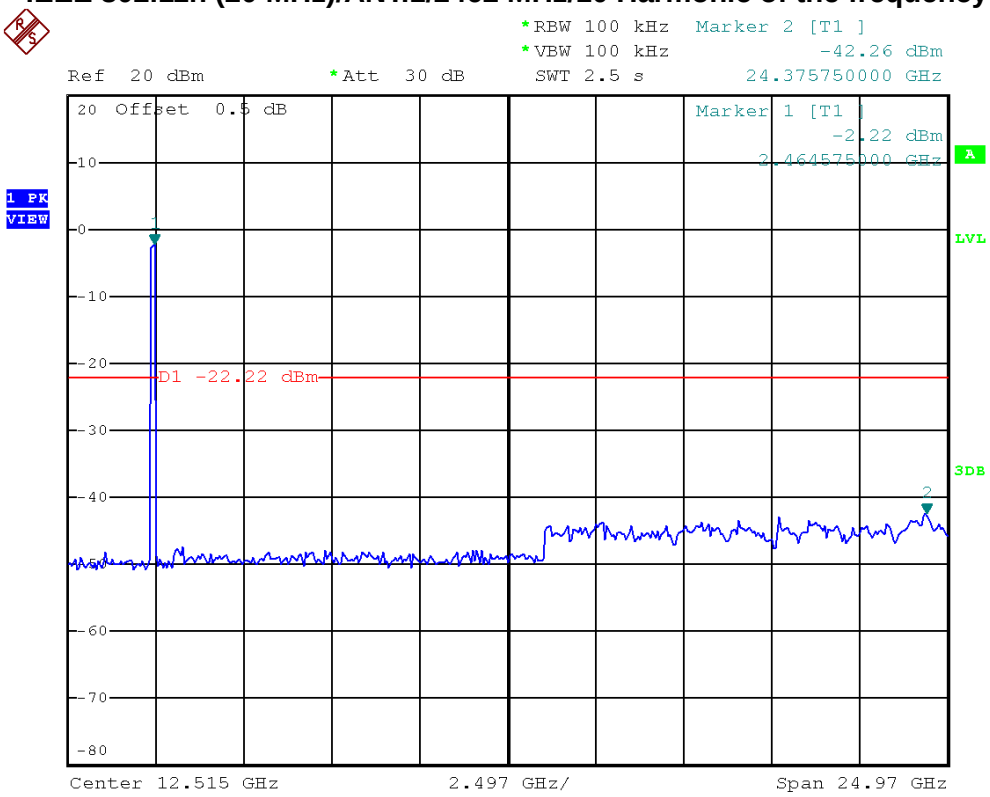
IEEE 802.11n (20 MHz)/ANT.1/2412 MHz/10 Harmonic of the frequency



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



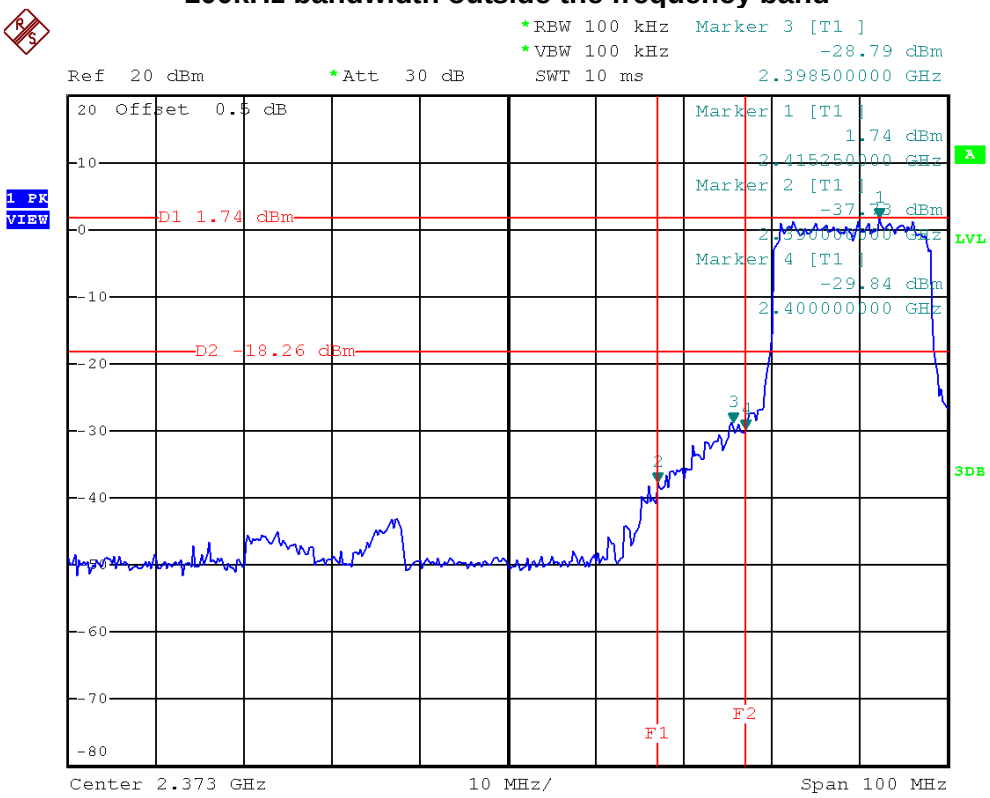
IEEE 802.11n (20 MHz)/ANT.1/2462 MHz/10 Harmonic of the frequency



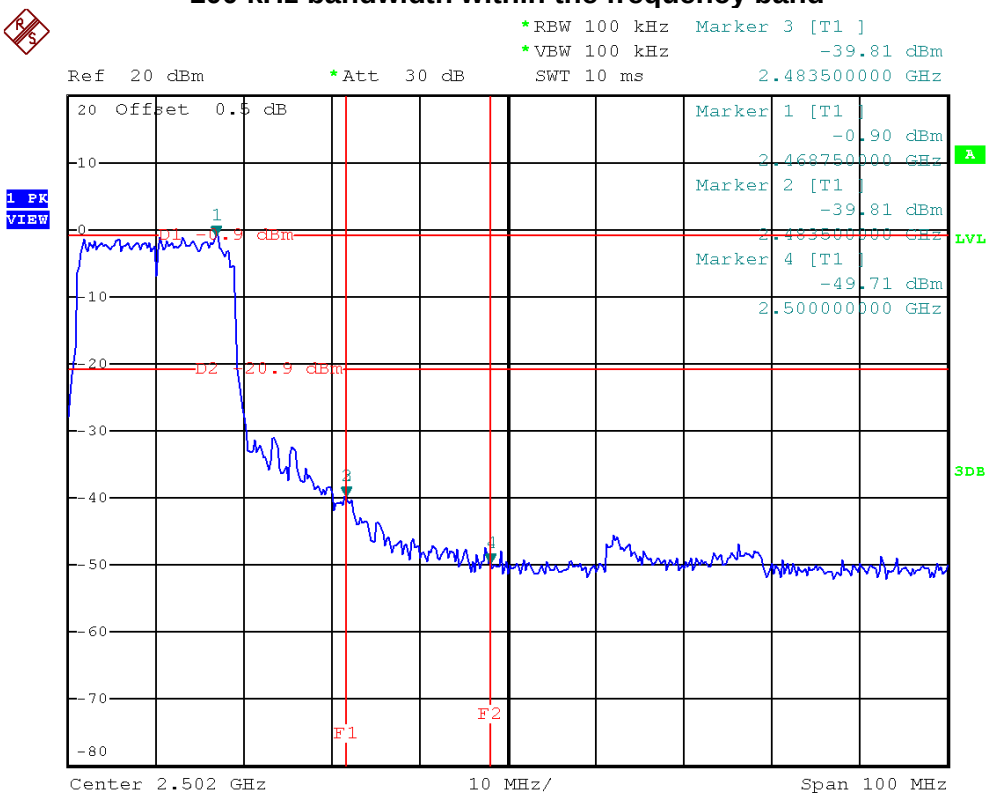
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2		

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)
2398.50	-28.79	2483.50	-39.81
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.			

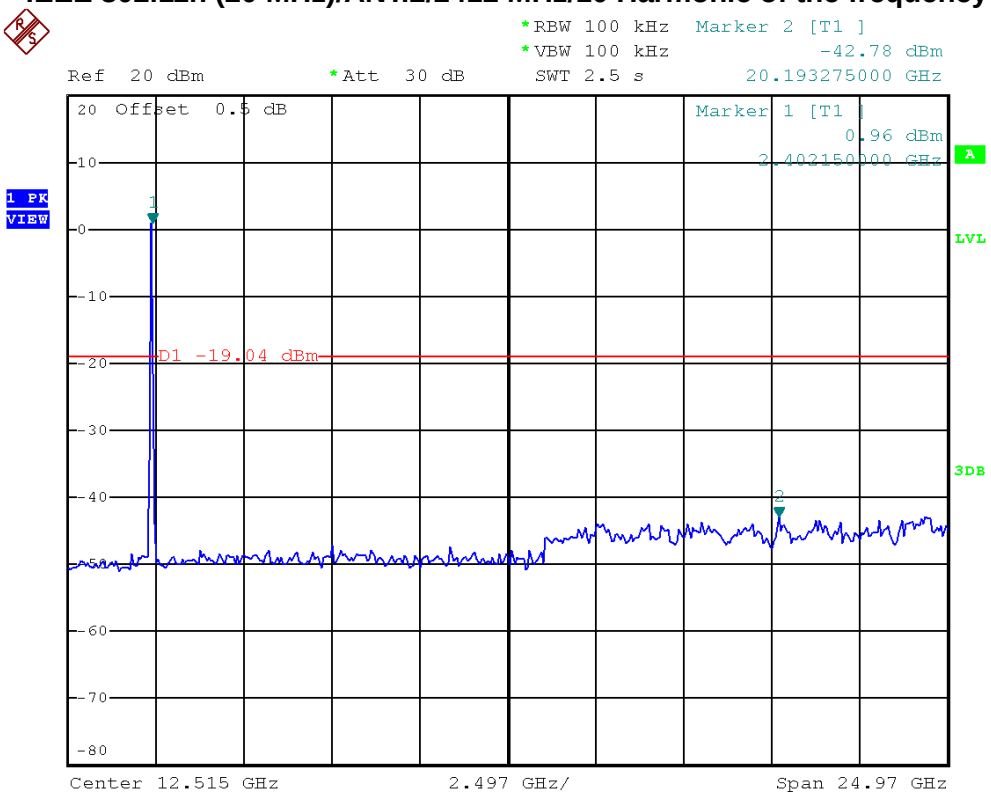
IEEE 802.11n (20 MHz)/ANT.2/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



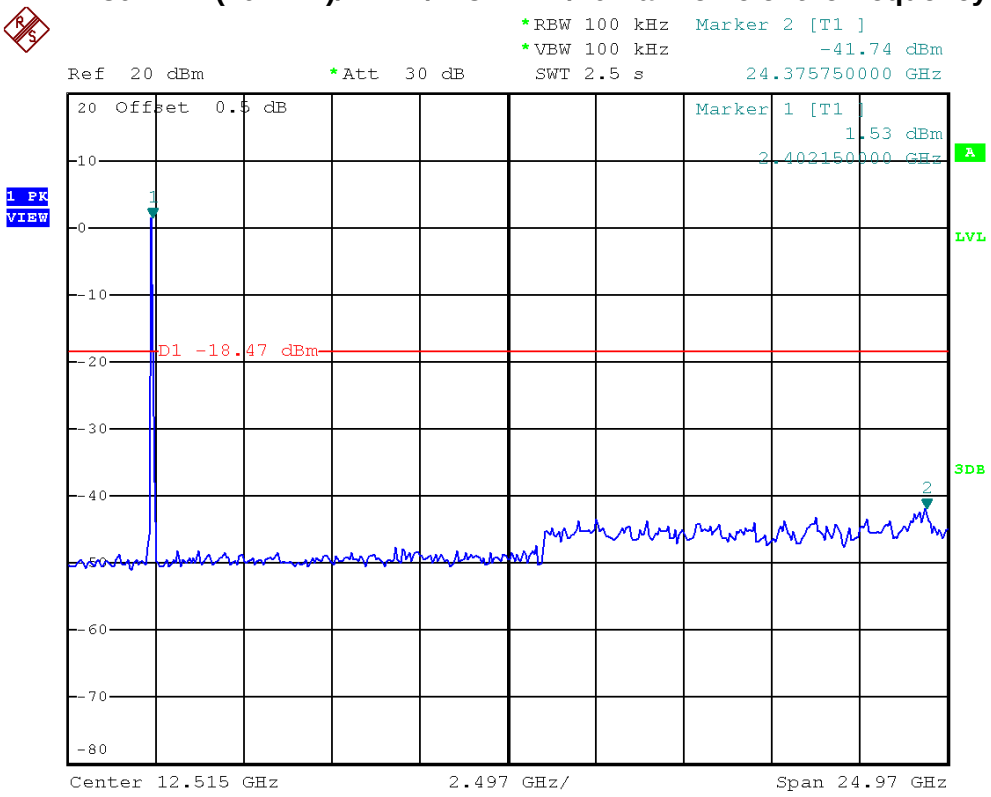
IEEE 802.11n (20 MHz)/ANT.2/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



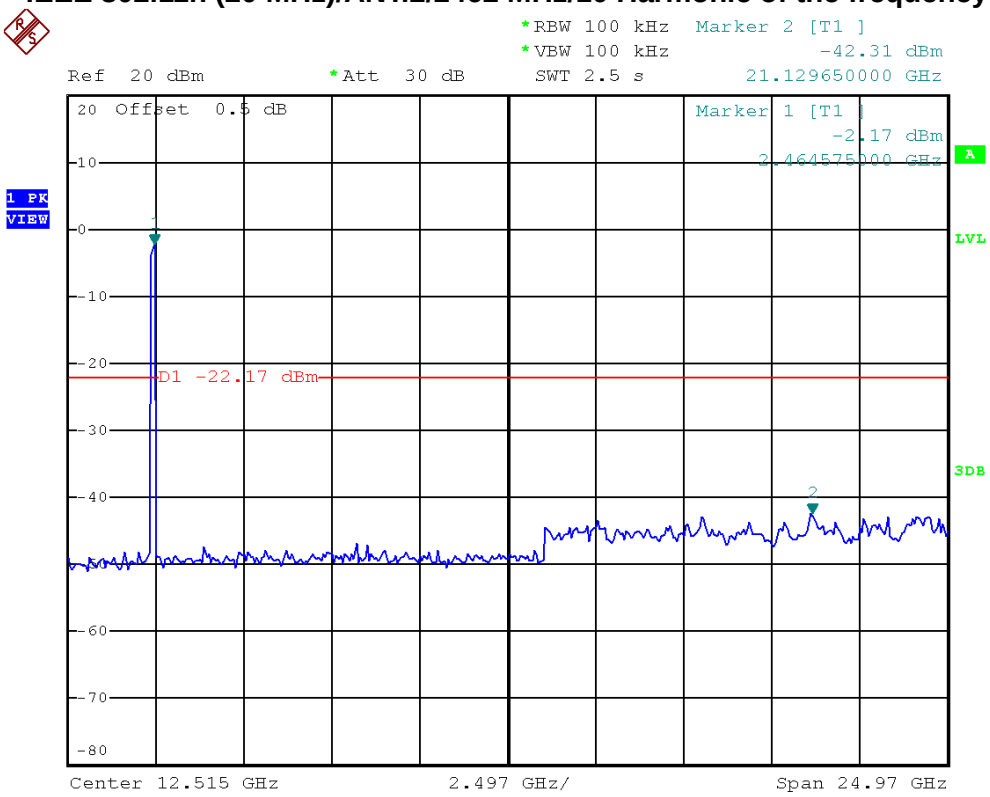
IEEE 802.11n (20 MHz)/ANT.2/2412 MHz/10 Harmonic of the frequency



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



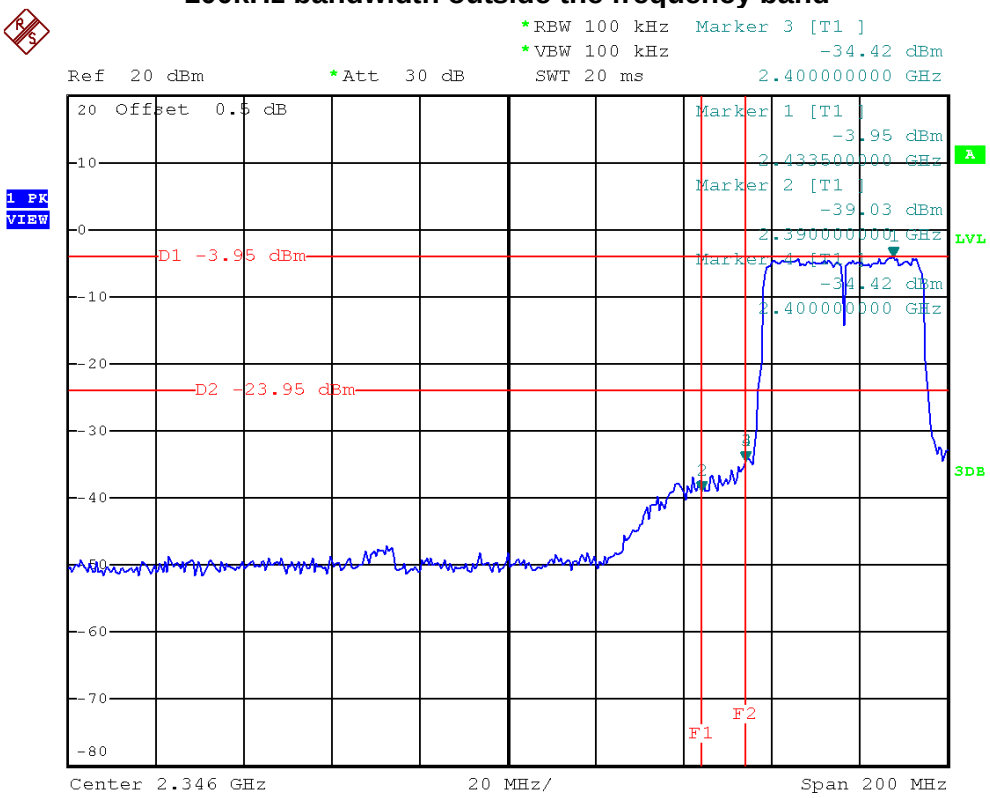
IEEE 802.11n (20 MHz)/ANT.2/2462 MHz/10 Harmonic of the frequency



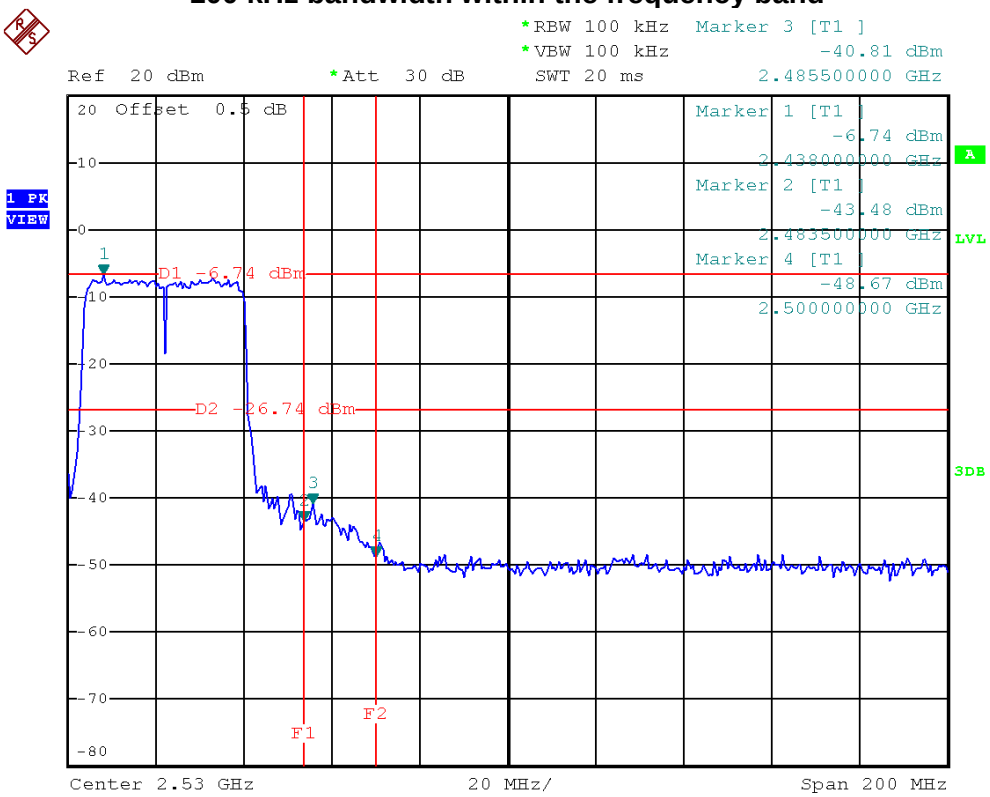
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1		

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)
2400.00	-34.42	2485.50	-40.81
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.			

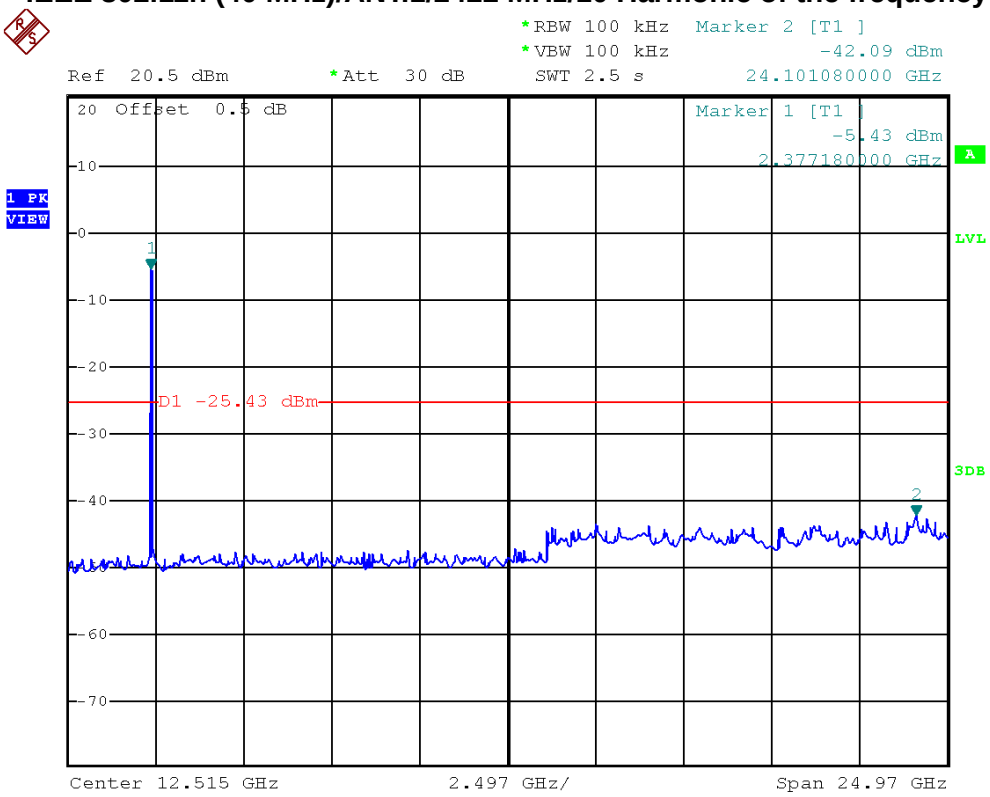
IEEE 802.11n (40 MHz)/ANT.1/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



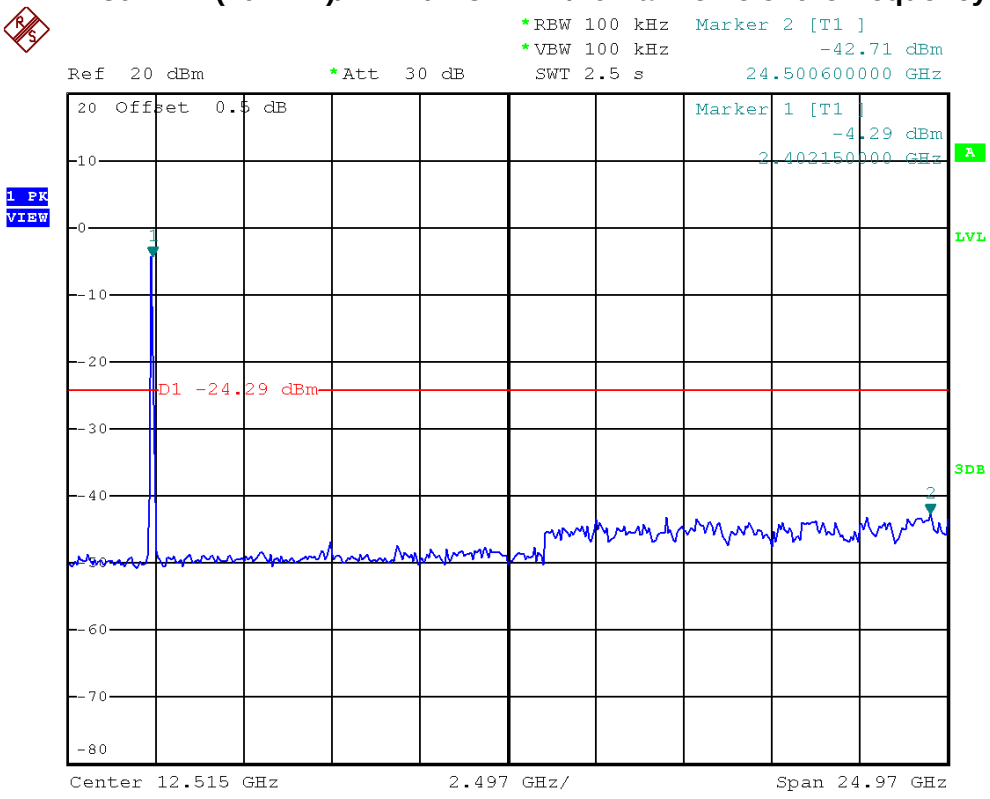
IEEE 802.11n (40 MHz)/ANT.1/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



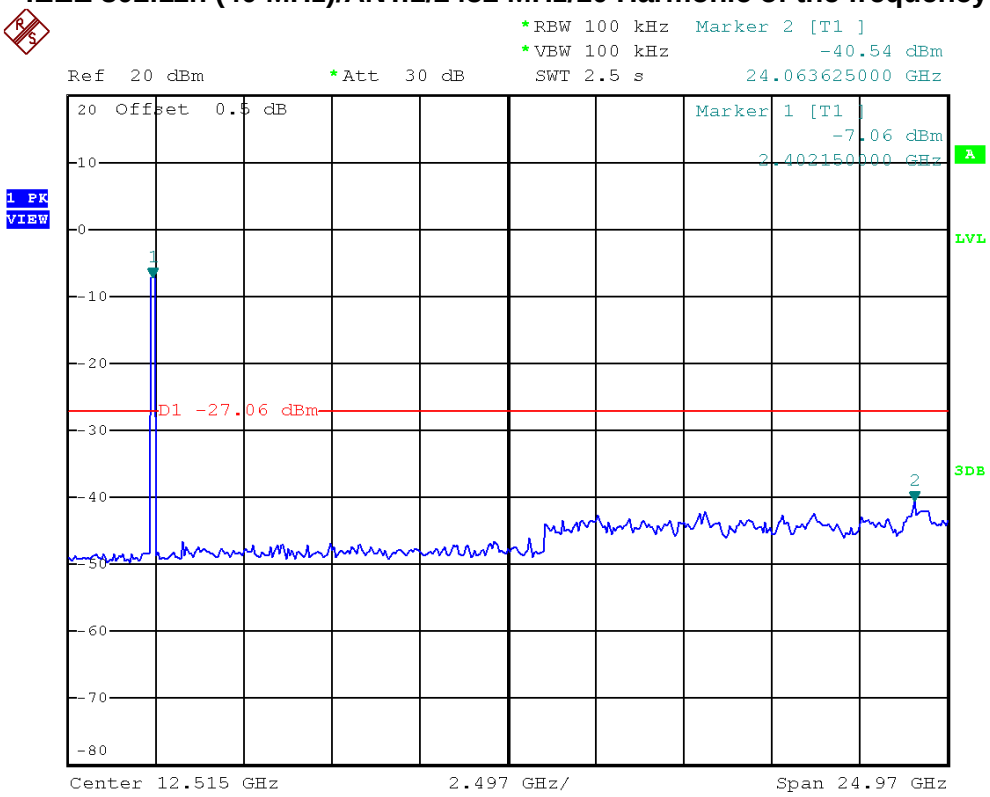
IEEE 802.11n (40 MHz)/ANT.1/2422 MHz/10 Harmonic of the frequency



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



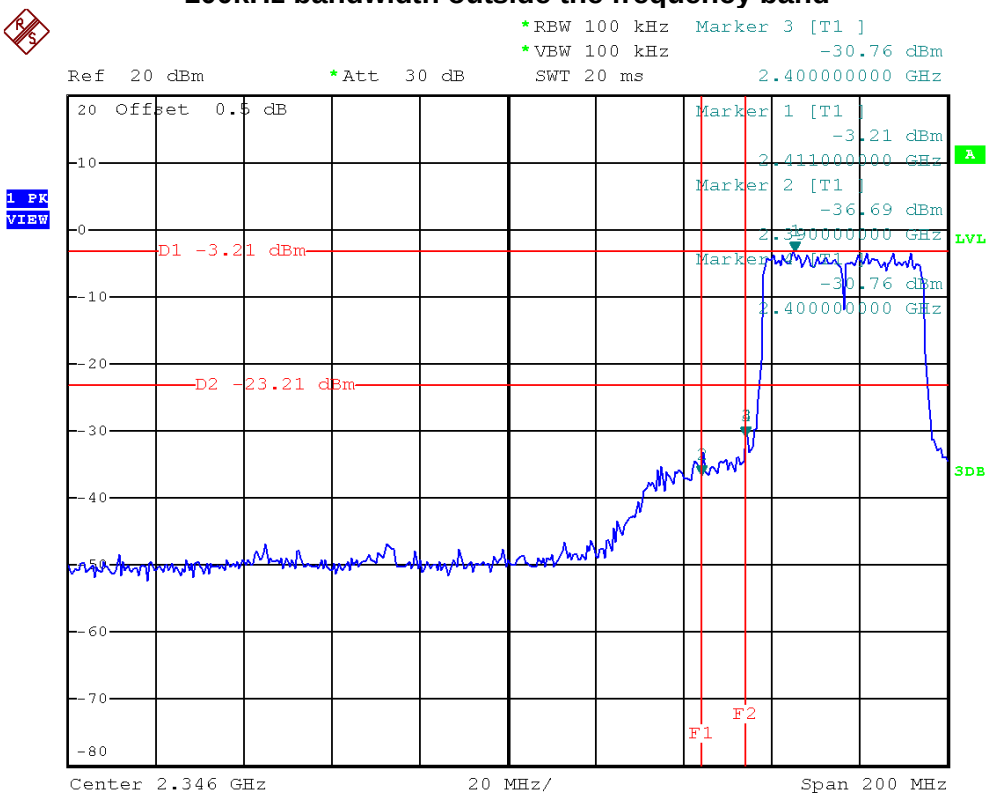
IEEE 802.11n (40 MHz)/ANT.1/2452 MHz/10 Harmonic of the frequency



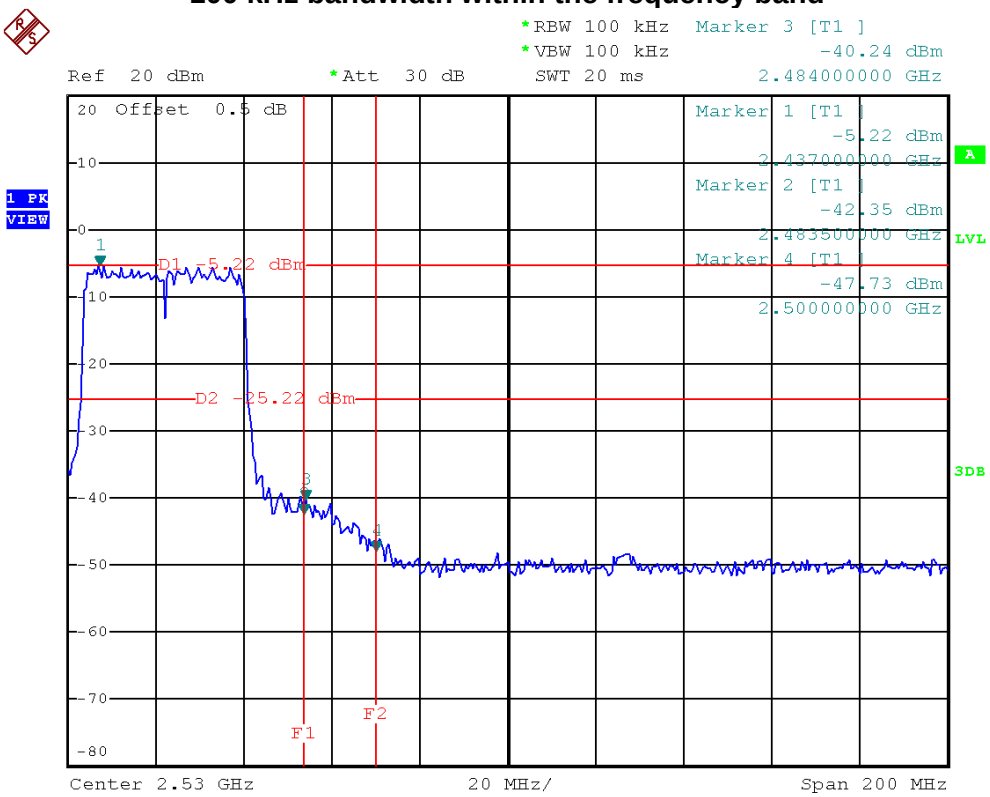
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2		

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)
2400.00	-30.76	2484.00	-40.24
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.			

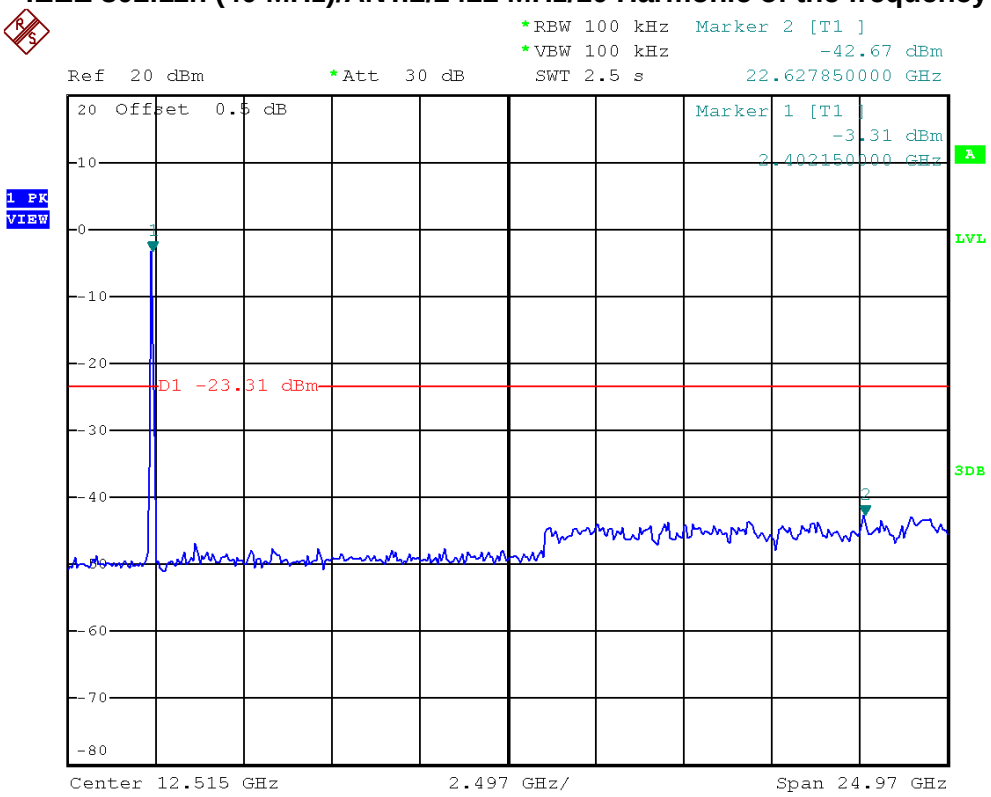
IEEE 802.11n (40 MHz)/ANT.2/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



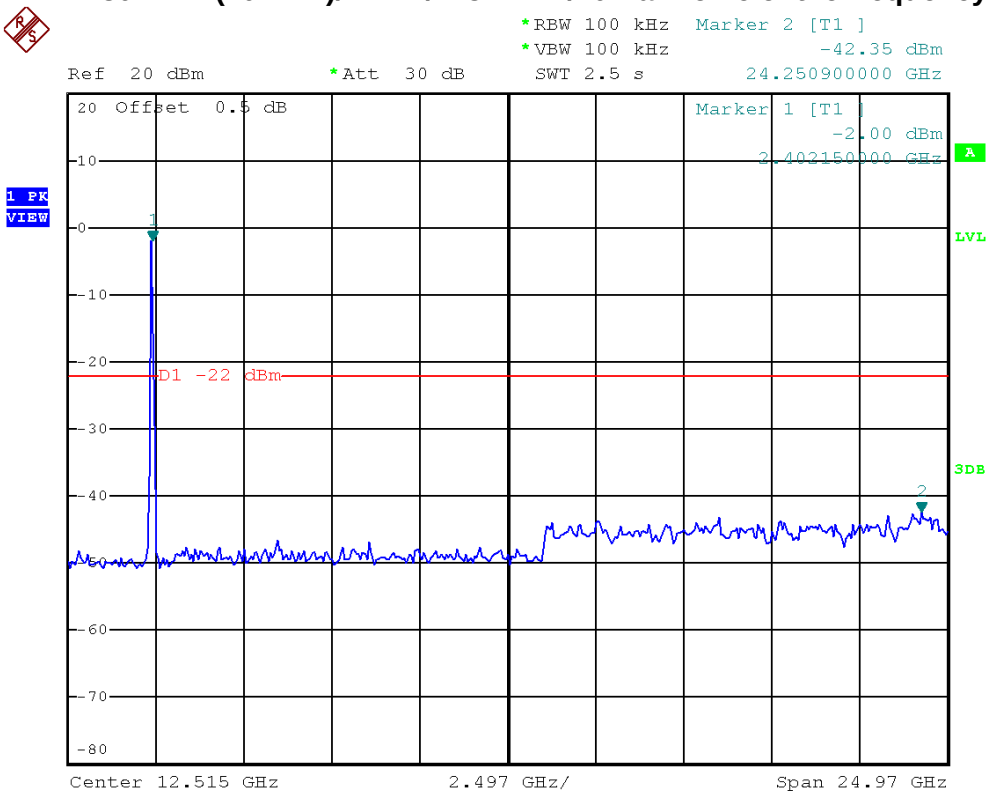
IEEE 802.11n (40 MHz)/ANT.2/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



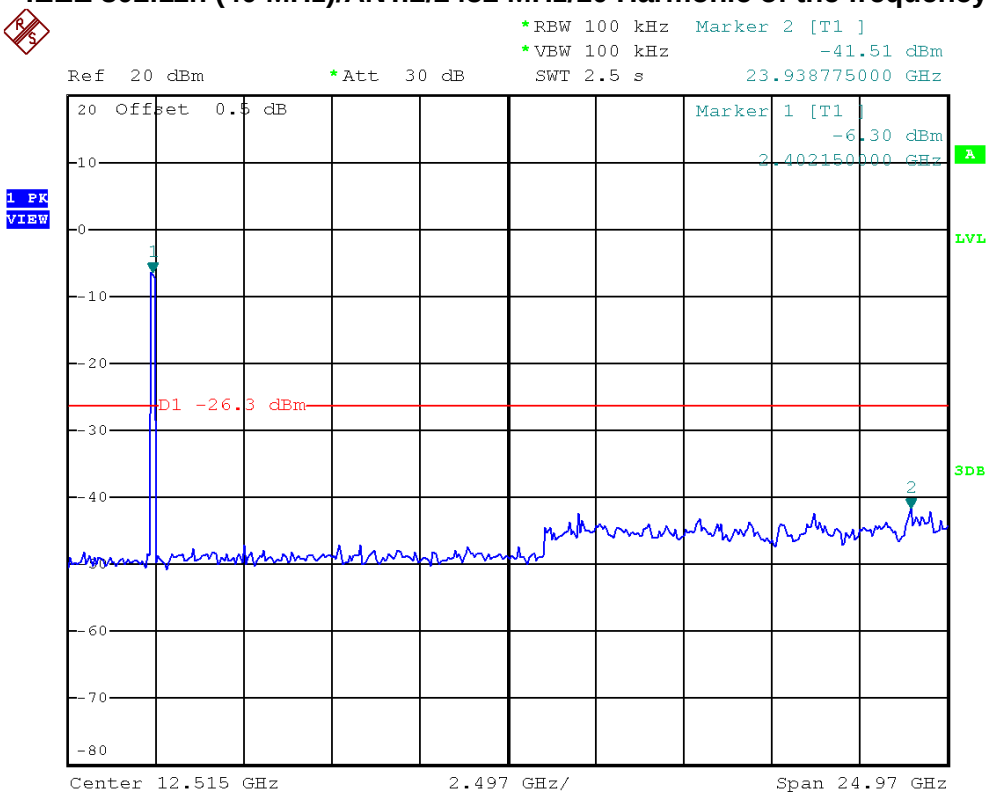
IEEE 802.11n (40 MHz)/ANT.2/2422 MHz/10 Harmonic of the frequency



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

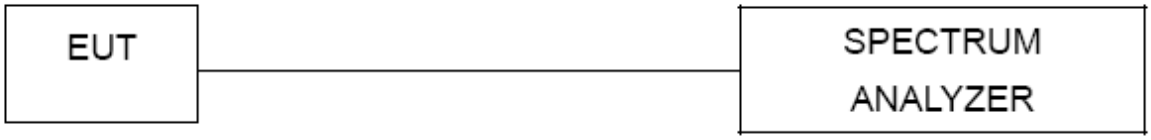
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

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

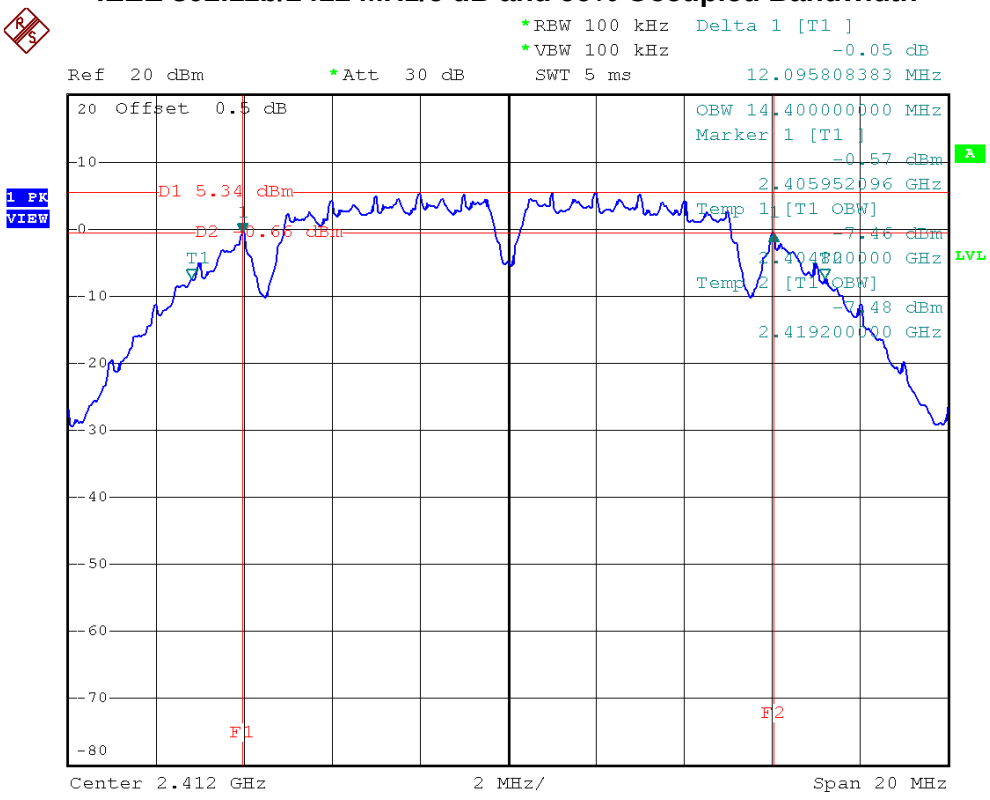
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

6.7 TEST RESULTS

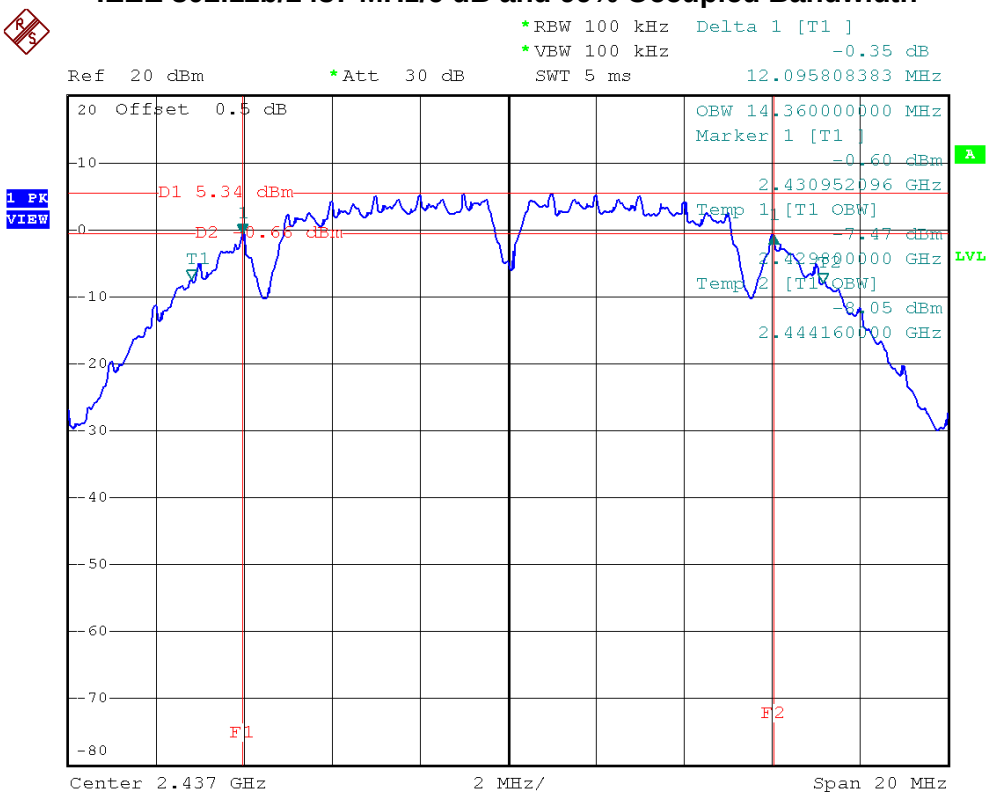
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	12.10	14.40	>=500 kHz	PASS
2437 MHz	12.10	14.36	>=500 kHz	PASS
2462 MHz	12.10	14.36	>=500 kHz	PASS

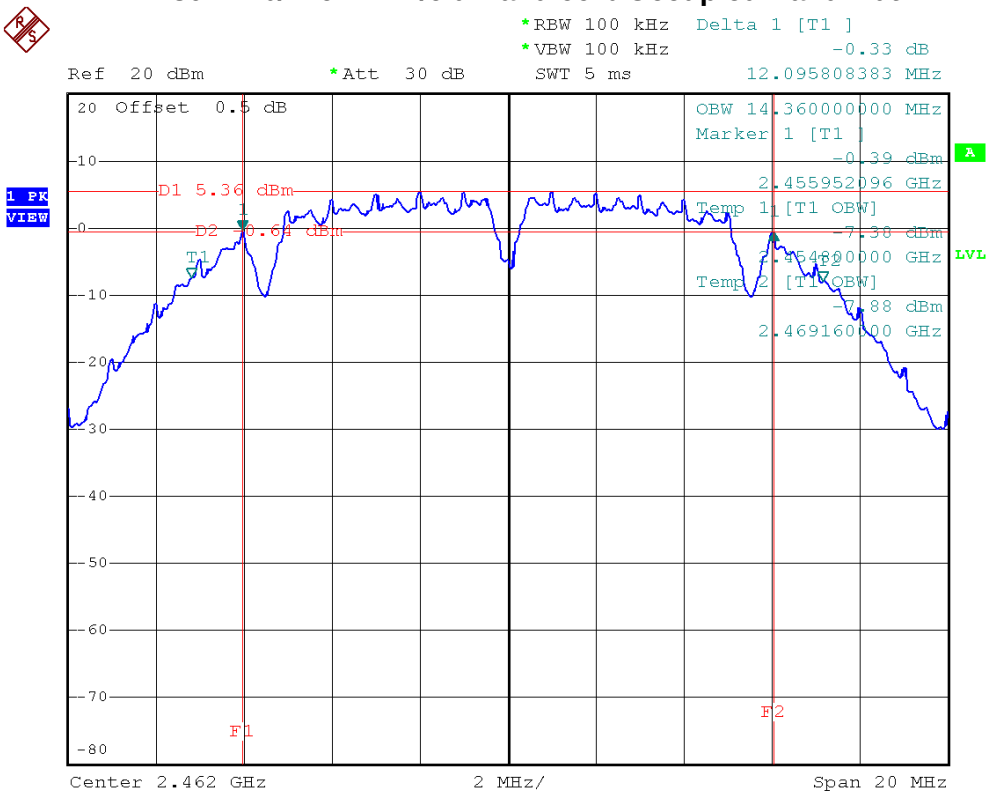
IEEE 802.11b/2412 MHz/6 dB and 99% Occupied Bandwidth



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



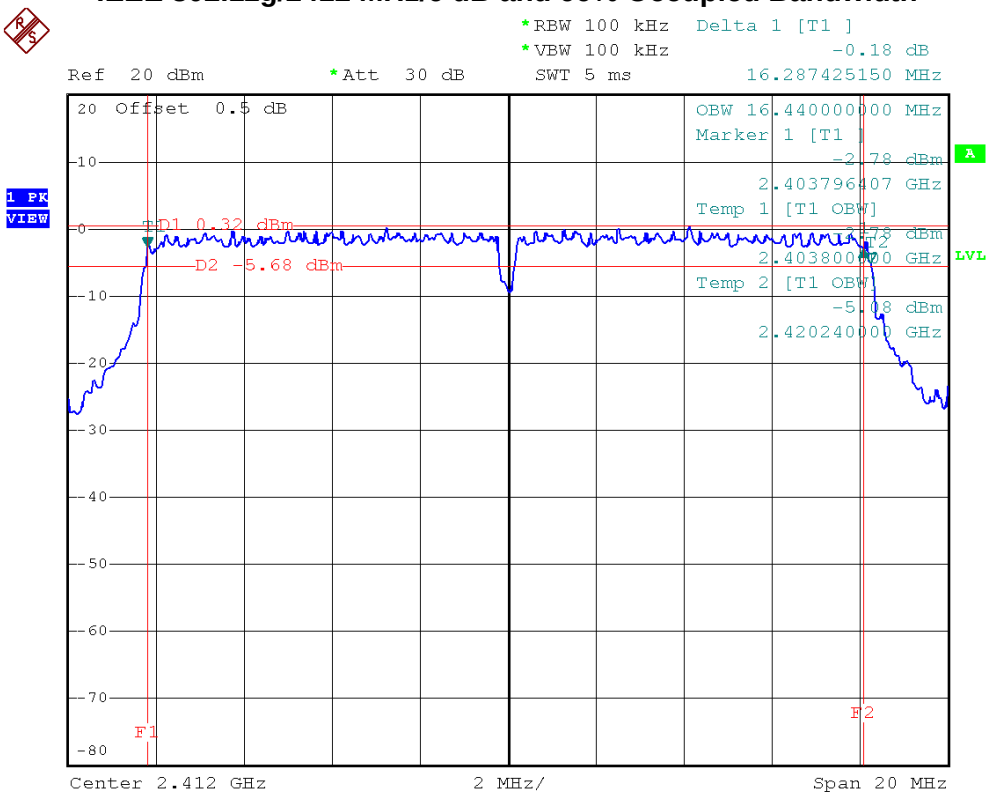
IEEE 802.11b/2462 MHz/6 dB and 99% Occupied Bandwidth



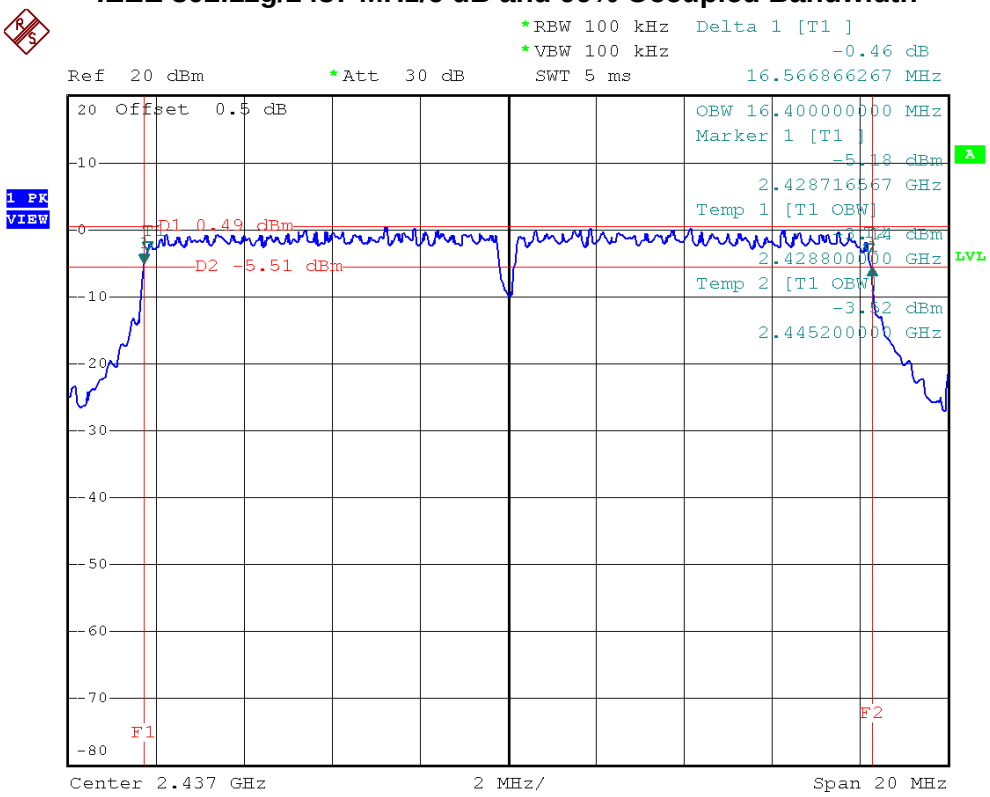
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	16.29	16.44	>=500 kHz	PASS
2437 MHz	16.57	16.40	>=500 kHz	PASS
2462 MHz	16.53	16.44	>=500 kHz	PASS

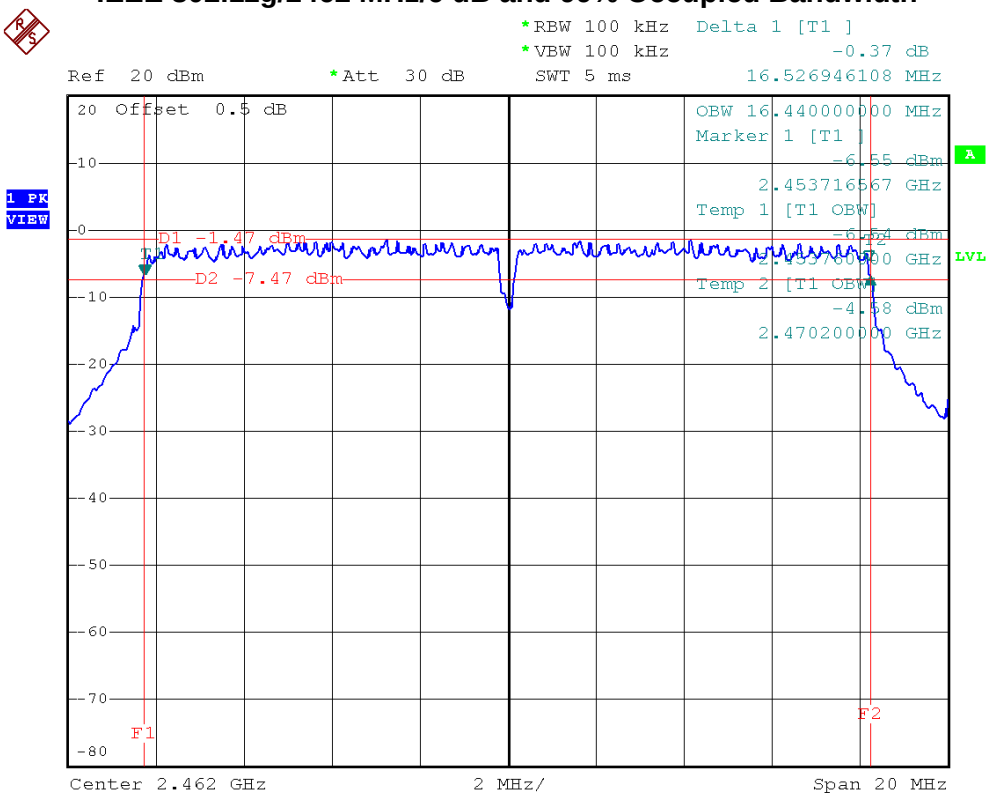
IEEE 802.11g/2412 MHz/6 dB and 99% Occupied Bandwidth



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



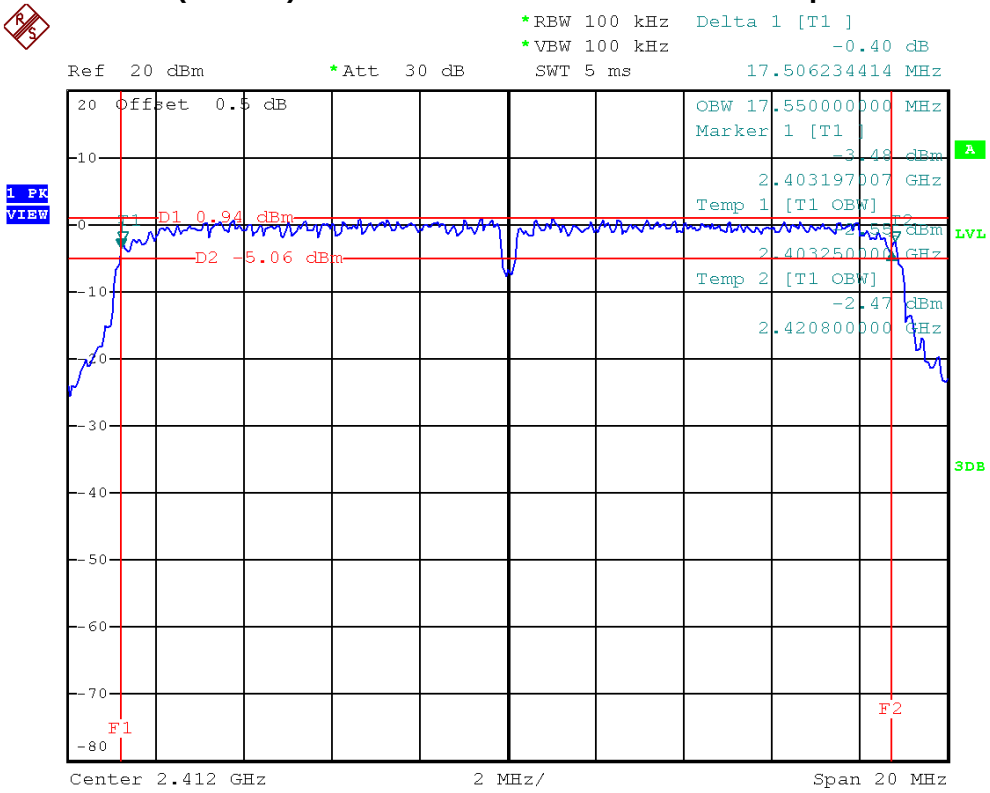
IEEE 802.11g/2462 MHz/6 dB and 99% Occupied Bandwidth



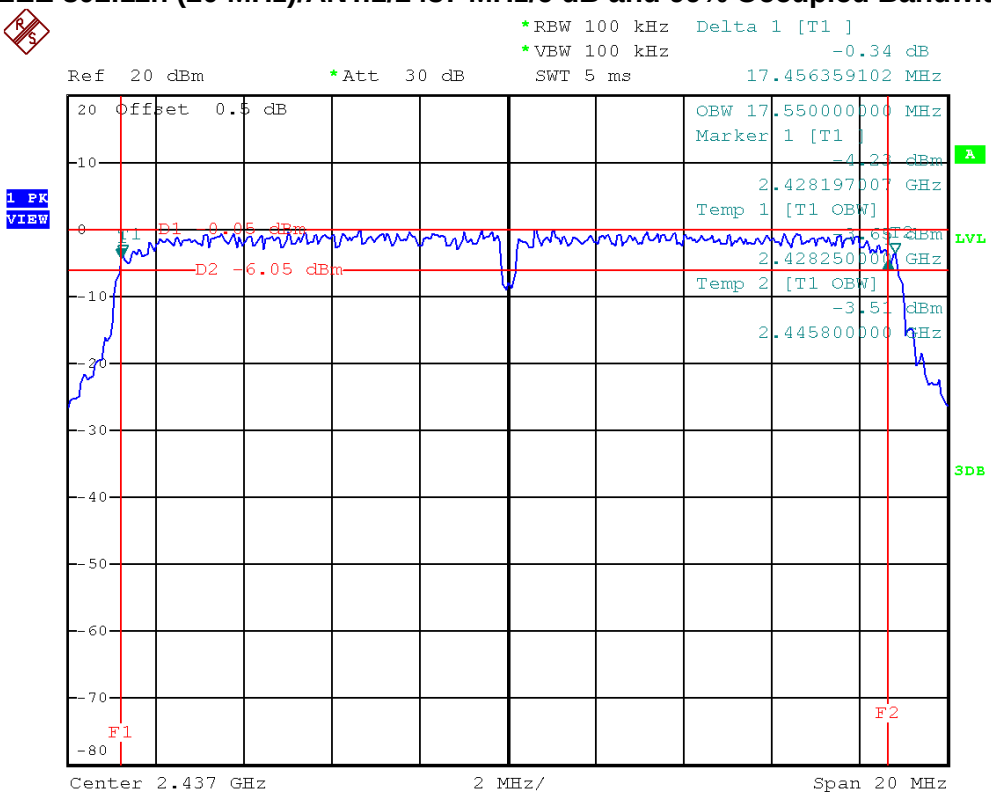
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	17.51	17.55	>=500 kHz	PASS
2437 MHz	17.46	17.55	>=500 kHz	PASS
2462 MHz	17.61	17.55	>=500 kHz	PASS

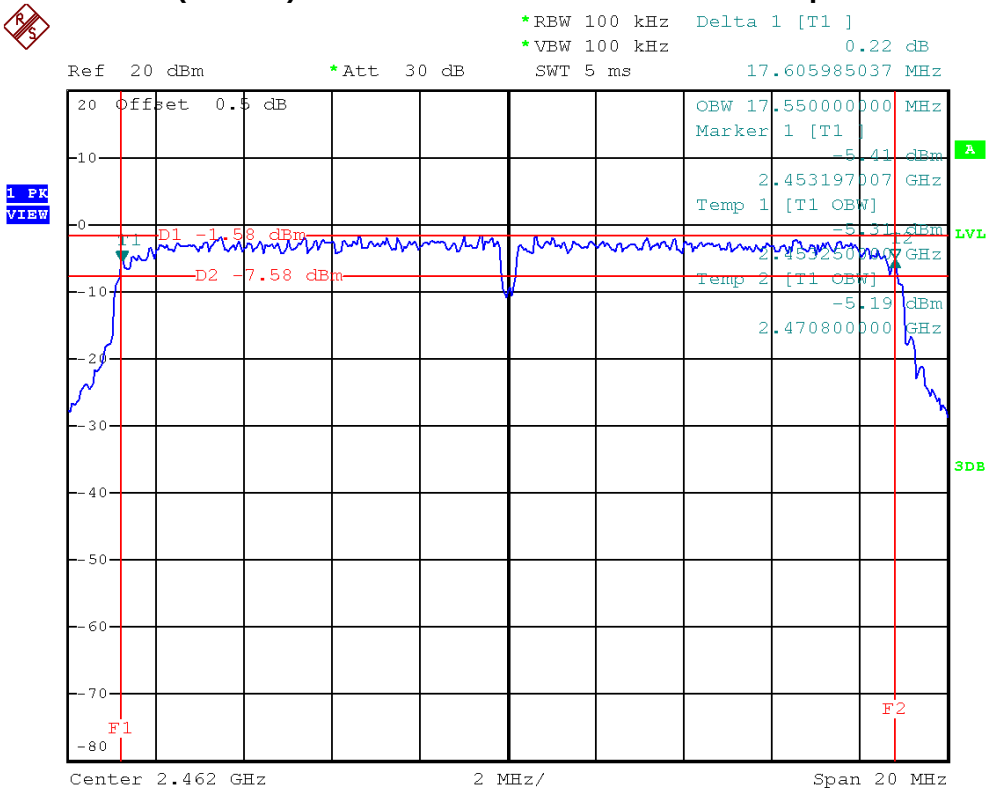
IEEE 802.11n (20 MHz)/ANT.1/2412 MHz/6 dB and 99% Occupied Bandwidth



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



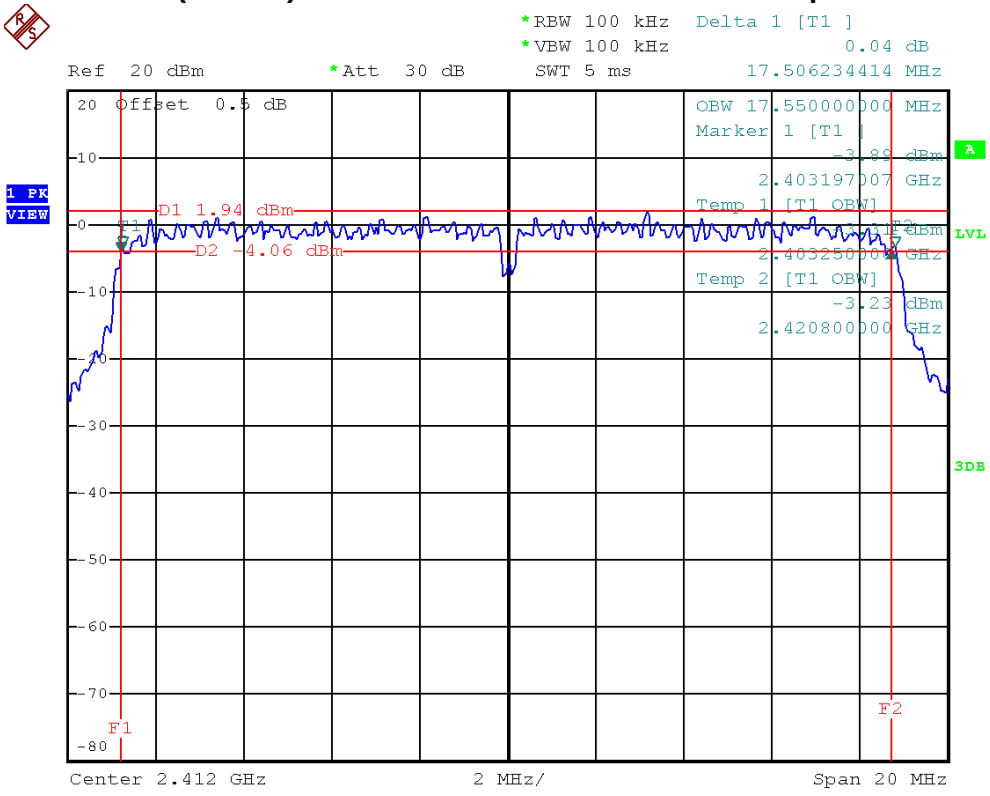
IEEE 802.11n (20 MHz)/ANT.1/2462 MHz/6 dB and 99% Occupied Bandwidth



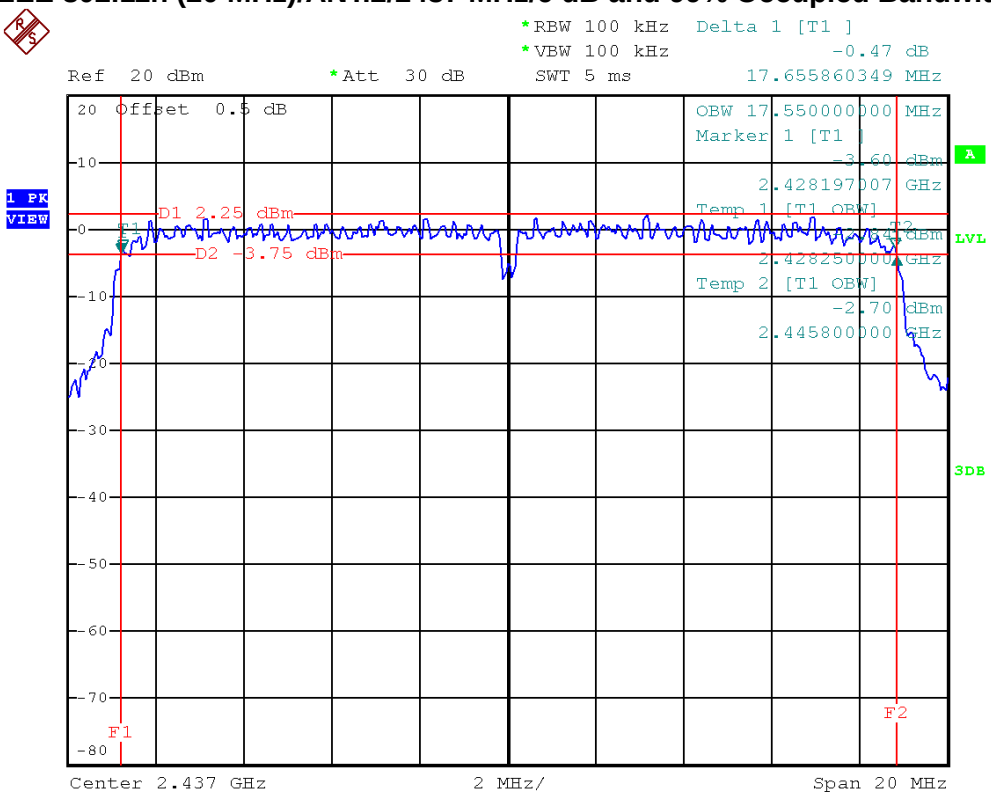
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	17.51	17.55	>=500 kHz	PASS
2437 MHz	17.66	17.55	>=500 kHz	PASS
2462 MHz	17.61	17.55	>=500 kHz	PASS

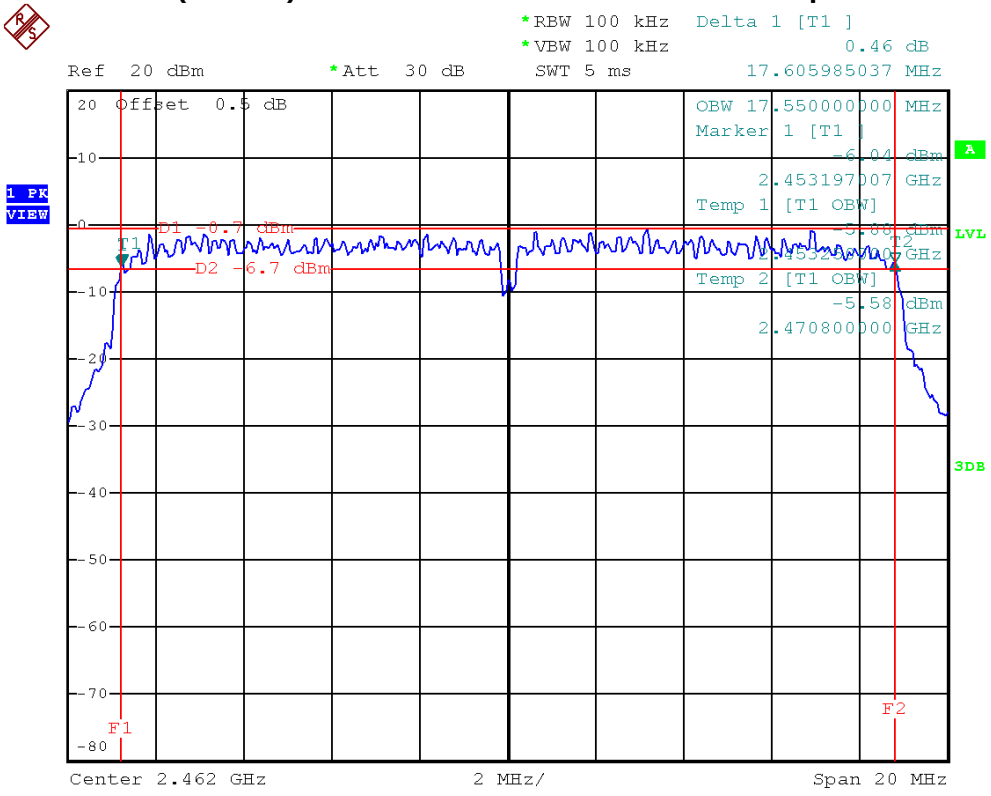
IEEE 802.11n (20 MHz)/ANT.2/2412 MHz/6 dB and 99% Occupied Bandwidth



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



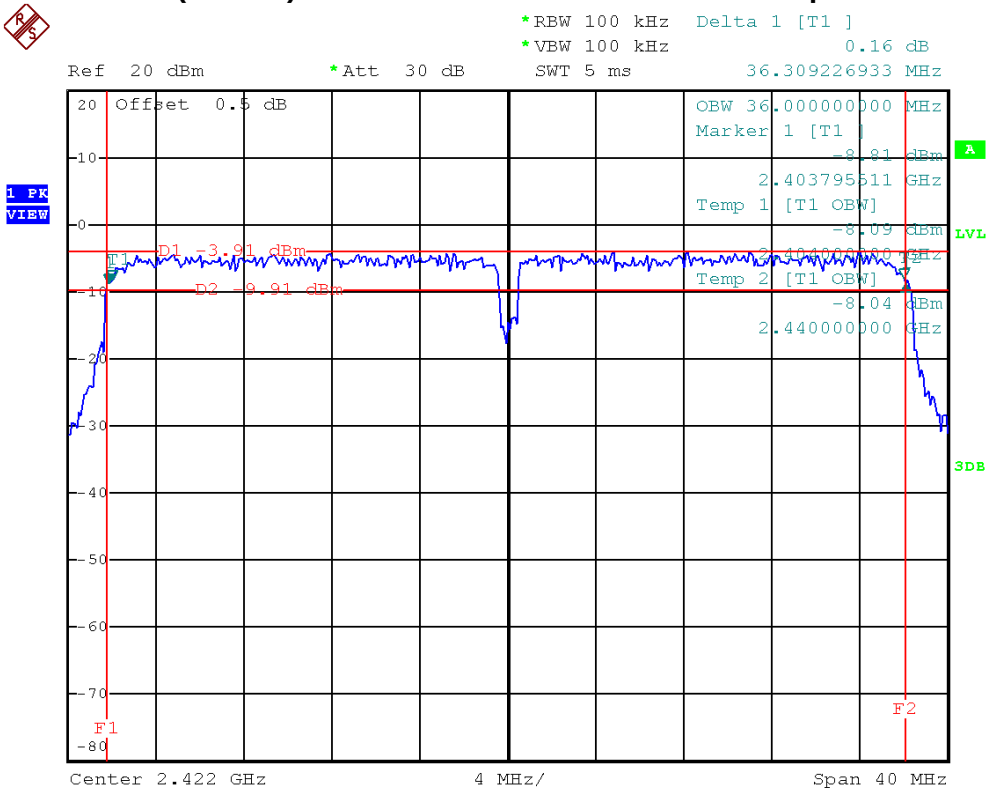
IEEE 802.11n (20 MHz)/ANT.2/2462 MHz/6 dB and 99% Occupied Bandwidth



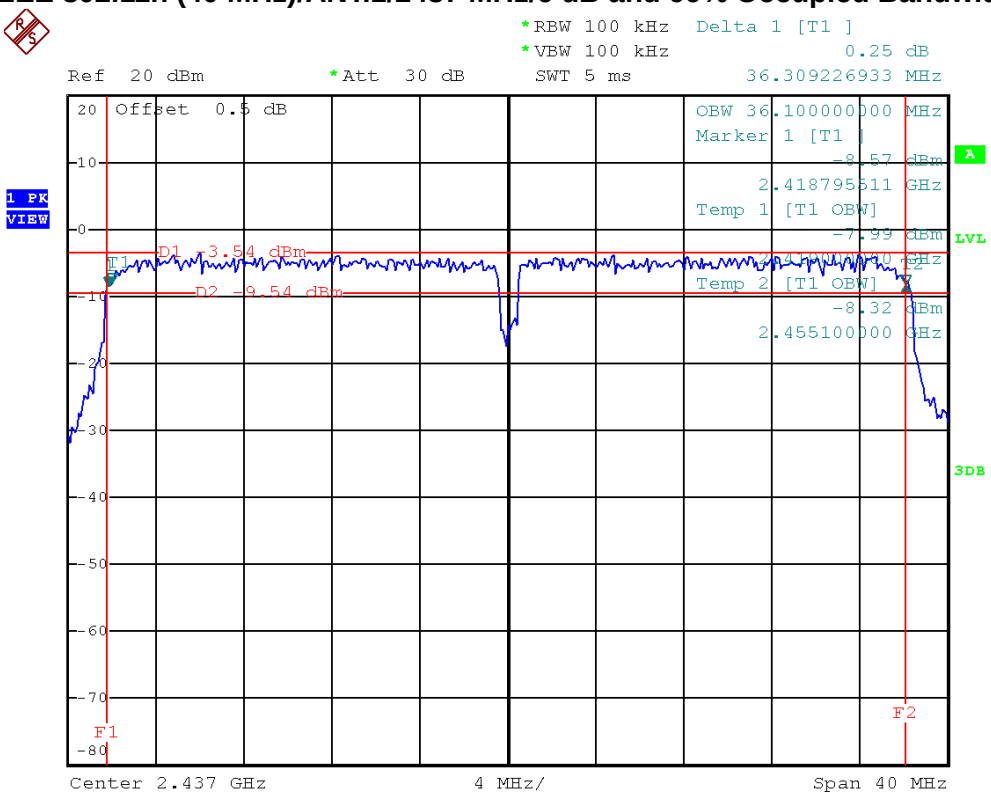
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2422 MHz	36.31	36.00	>=500 kHz	PASS
2437 MHz	36.31	36.10	>=500 kHz	PASS
2452 MHz	36.41	36.10	>=500 kHz	PASS

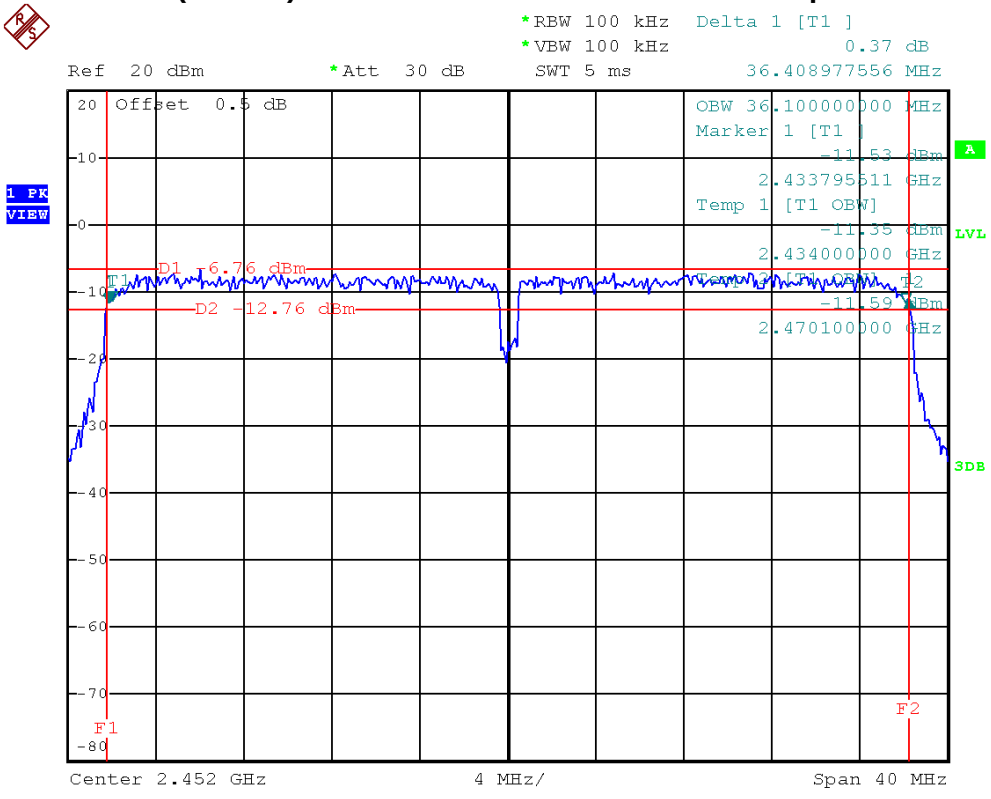
IEEE 802.11n (40 MHz)/ANT.1/2422 MHz/6 dB and 99% Occupied Bandwidth



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



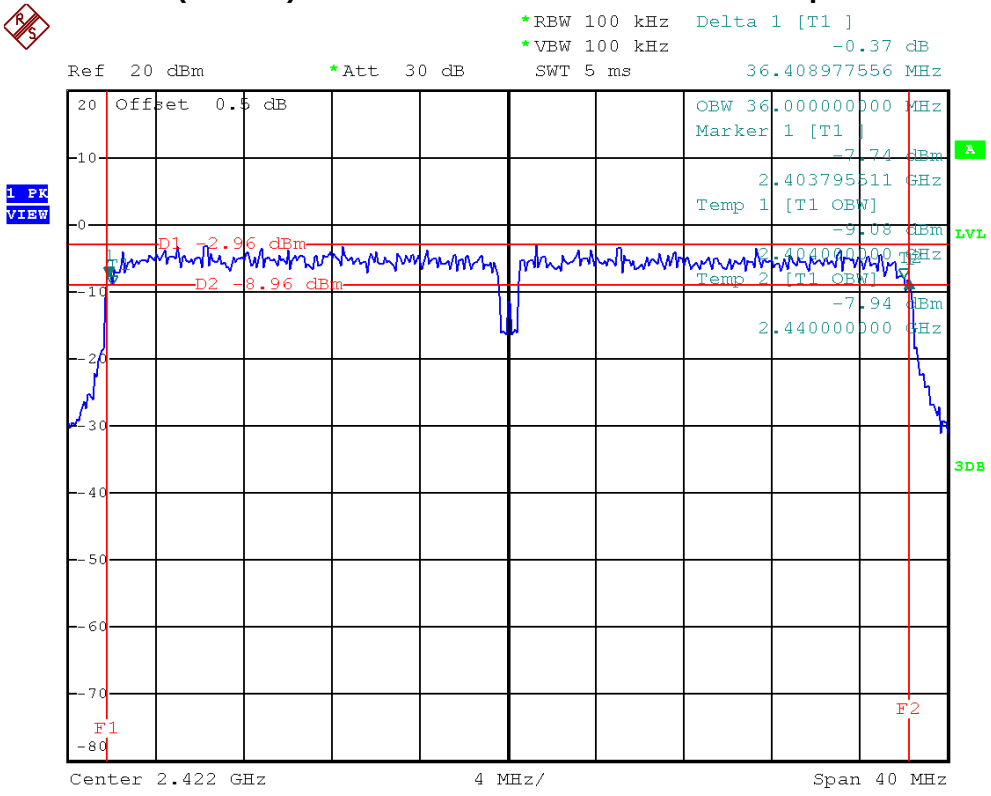
IEEE 802.11n (40 MHz)/ANT.1/2452 MHz/6 dB and 99% Occupied Bandwidth



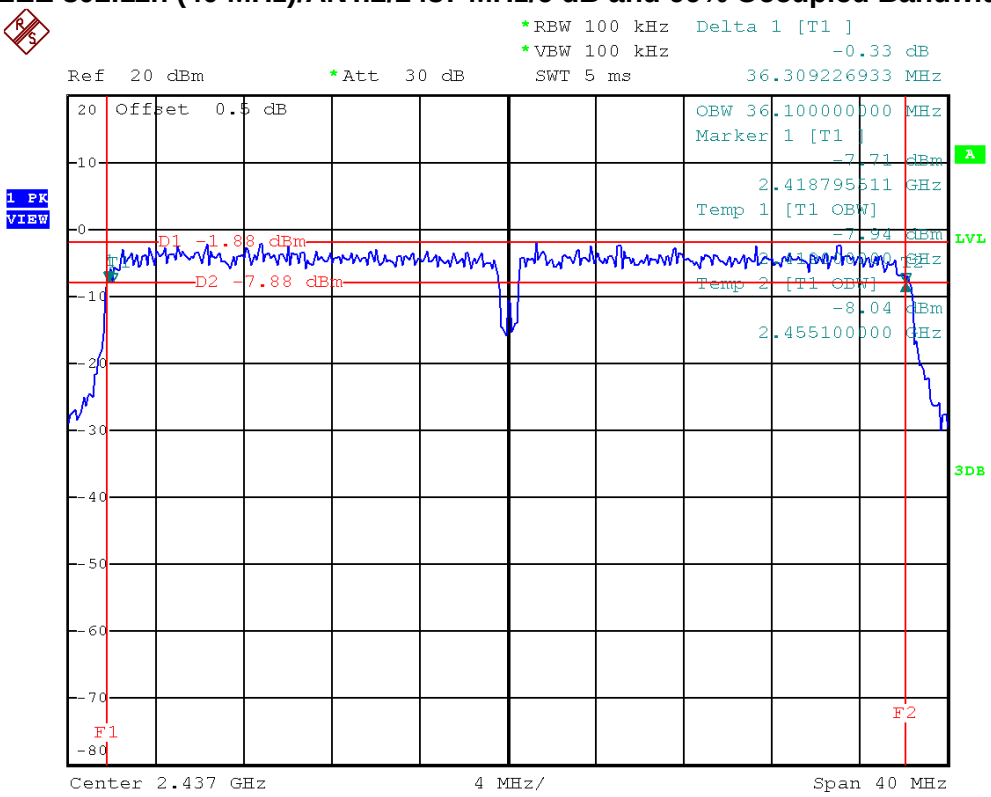
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2422 MHz	36.41	36.00	>=500 kHz	PASS
2437 MHz	36.31	36.10	>=500 kHz	PASS
2452 MHz	36.11	36.10	>=500 kHz	PASS

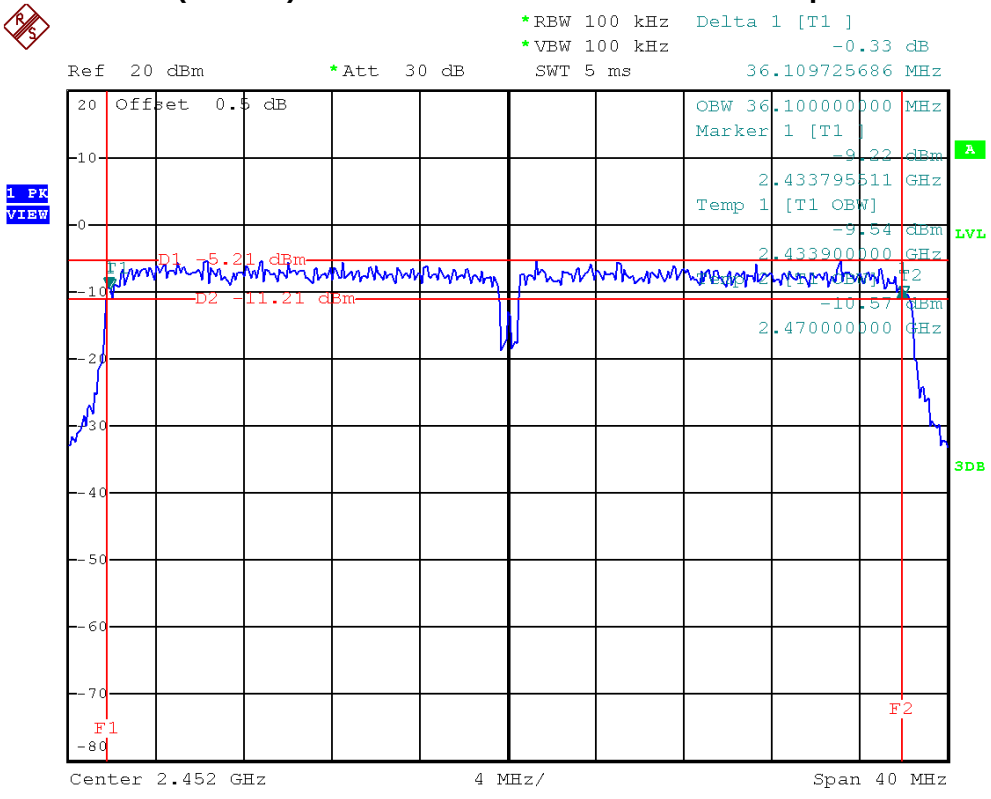
IEEE 802.11n (40 MHz)/ANT.2/2422 MHz/6 dB and 99% Occupied Bandwidth



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

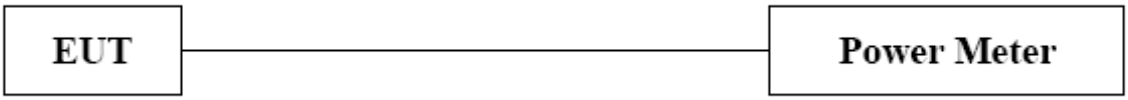
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Feb,20,2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Feb,20,2013

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	WN4616R
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	19.71	30	PASS
2437 MHz	19.75	30	PASS
2462 MHz	19.99	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	24.3	30	PASS
2437 MHz	23.45	30	PASS
2462 MHz	21.7	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	23.67	30	PASS
2437 MHz	22.82	30	PASS
2462 MHz	21.83	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	23.66	30	PASS
2437 MHz	22.87	30	PASS
2462 MHz	21.32	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	26.68	30	PASS
2437 MHz	25.86	30	PASS
2462 MHz	24.59	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.

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	21.4	30	PASS
2437 MHz	21.87	30	PASS
2452 MHz	19.2	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	20.99	30	PASS
2437 MHz	21.57	30	PASS
2452 MHz	19	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	24.21	30	PASS
2437 MHz	24.73	30	PASS
2452 MHz	22.11	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.

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.

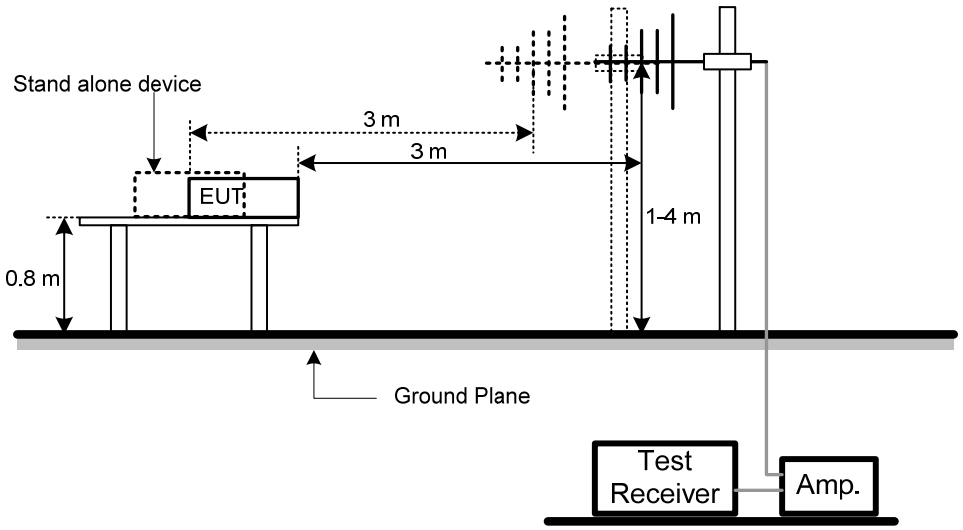
NOTE:

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



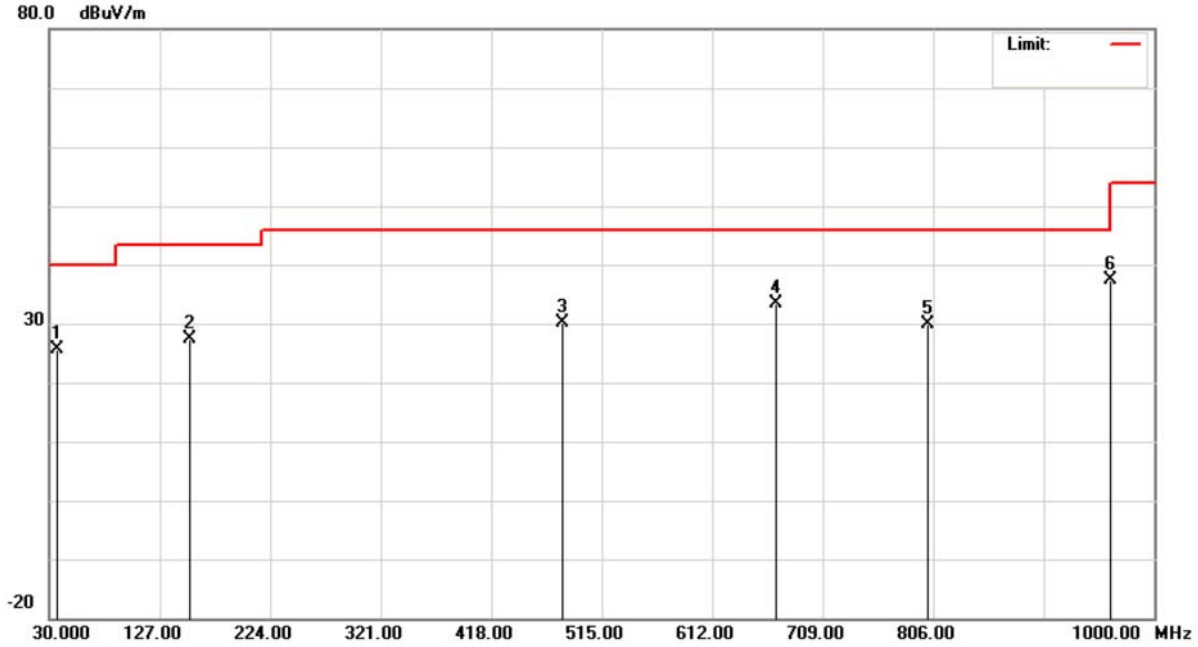
8.7 EUT OPERATING CONDITIONS

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	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

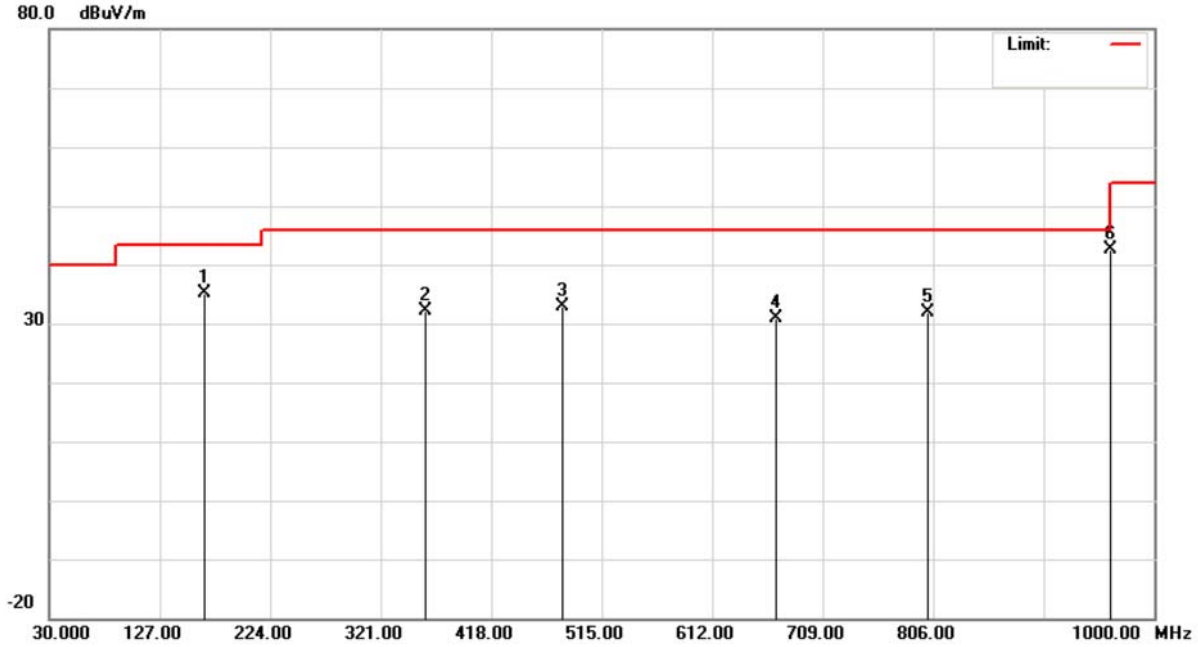
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		37.2750	44.79	-19.05	25.74	40.00	-14.26	peak	
2		153.6750	46.32	-18.93	27.39	43.50	-16.11	peak	
3		481.0499	43.76	-13.63	30.13	46.00	-15.87	peak	
4	*	667.7750	43.48	-10.03	33.45	46.00	-12.55	peak	
5		801.1500	38.01	-8.03	29.98	46.00	-16.02	peak	
6		961.2000	42.88	-5.40	37.48	54.00	-16.52	peak	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	*	165.8000	54.37	-19.34	35.03	43.50	-8.47	peak	
2		359.8000	48.83	-16.73	32.10	46.00	-13.90	peak	
3		481.0500	46.40	-13.63	32.77	46.00	-13.23	peak	
4		667.7750	40.91	-10.03	30.88	46.00	-15.12	peak	
5		801.1500	40.02	-8.03	31.99	46.00	-14.01	peak	
6		961.2000	48.07	-5.40	42.67	54.00	-11.33	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.

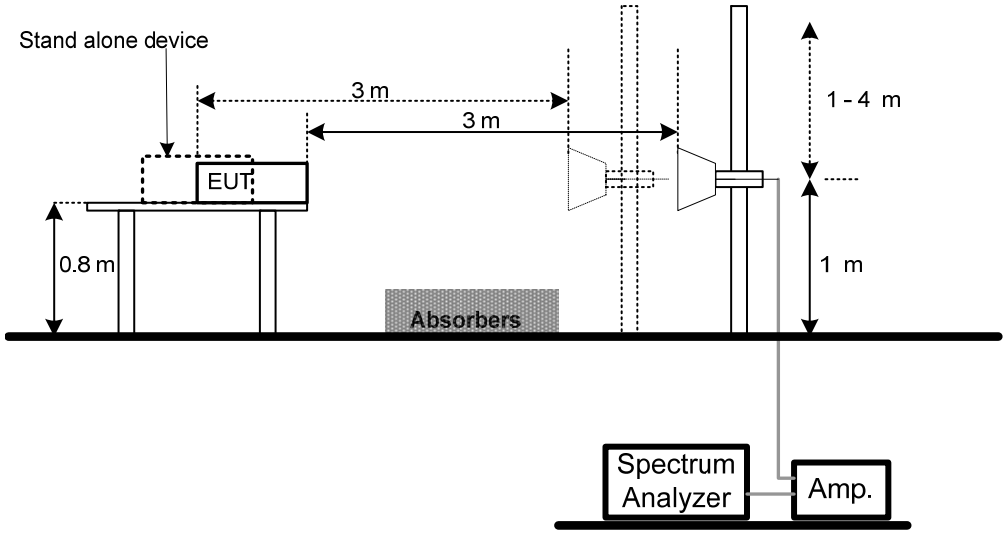
NOTE:

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



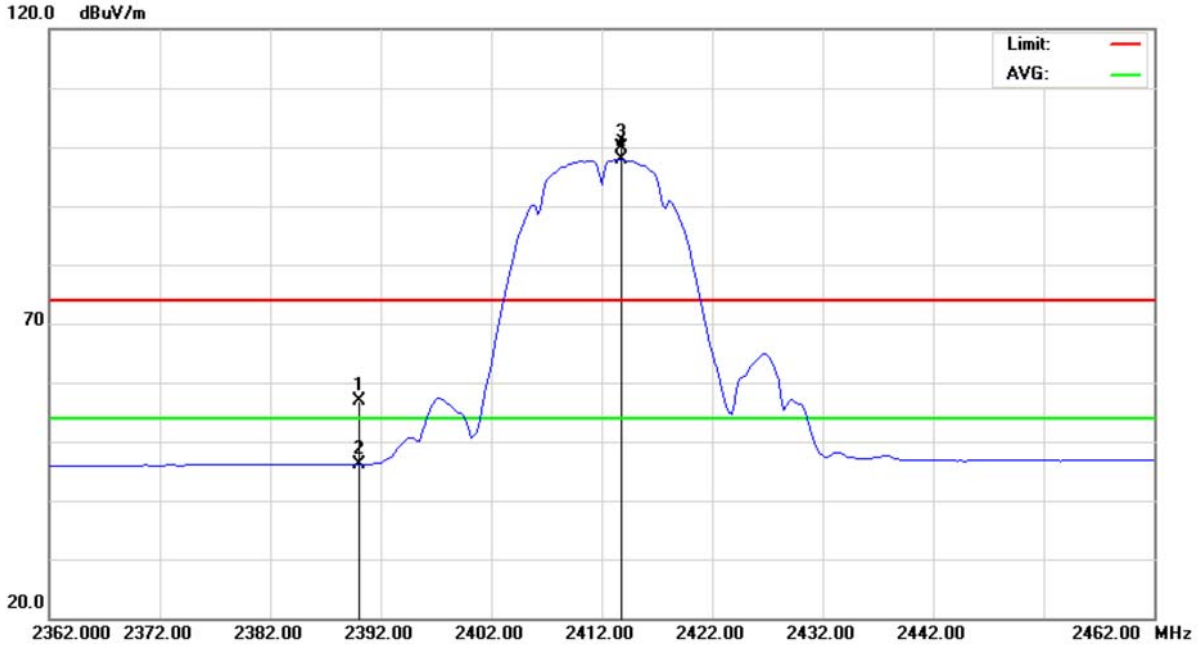
9.7 EUT OPERATING CONDITIONS

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	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

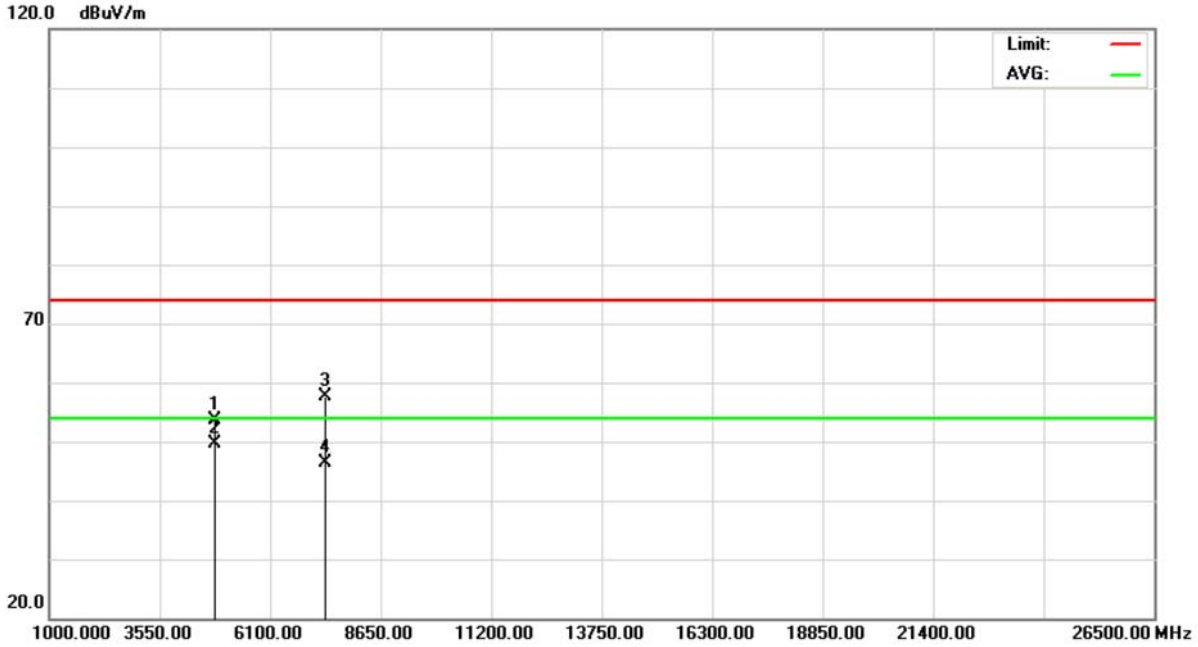
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.87	32.99	56.86	74.00	-17.14	peak	
2		2390.000	13.21	32.99	46.20	54.00	-7.80	AVG	
3	X	2413.750	66.70	33.12	99.82	74.00	25.82	peak	
4	*	2413.750	64.74	33.12	97.86	54.00	43.86	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

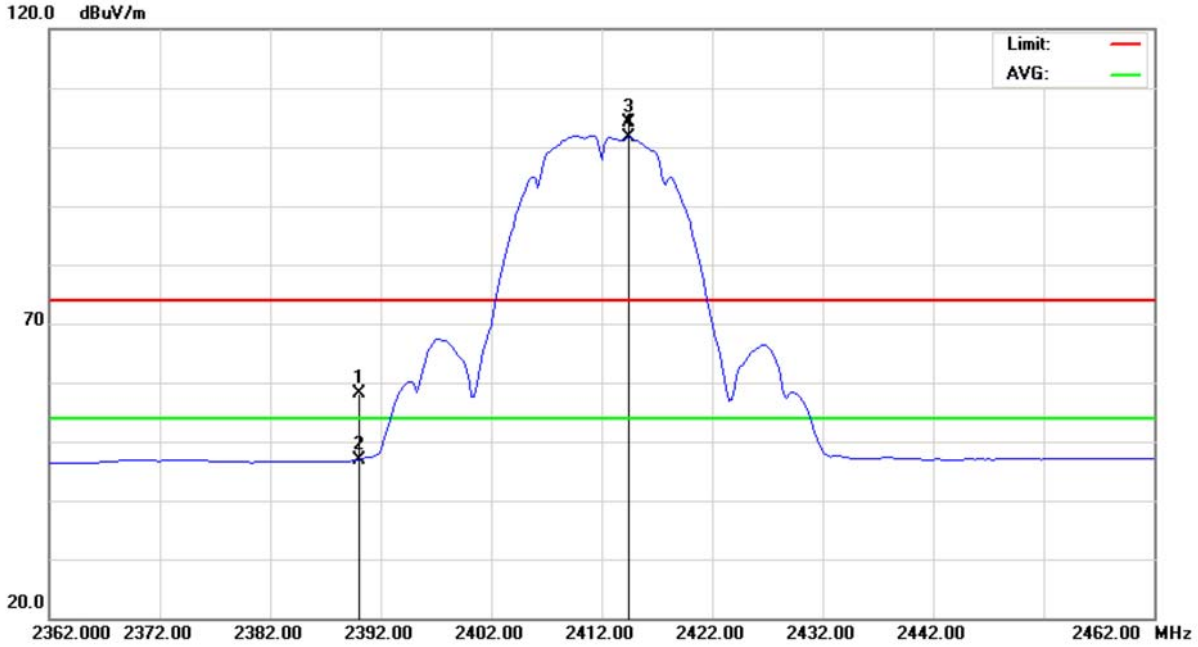
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4824.000	46.18	7.49	53.67	74.00	-20.33	peak	
2	*	4824.000	42.03	7.49	49.52	54.00	-4.48	AVG	
3		7326.000	42.52	15.10	57.62	74.00	-16.38	peak	
4		7326.000	31.30	15.10	46.40	54.00	-7.60	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

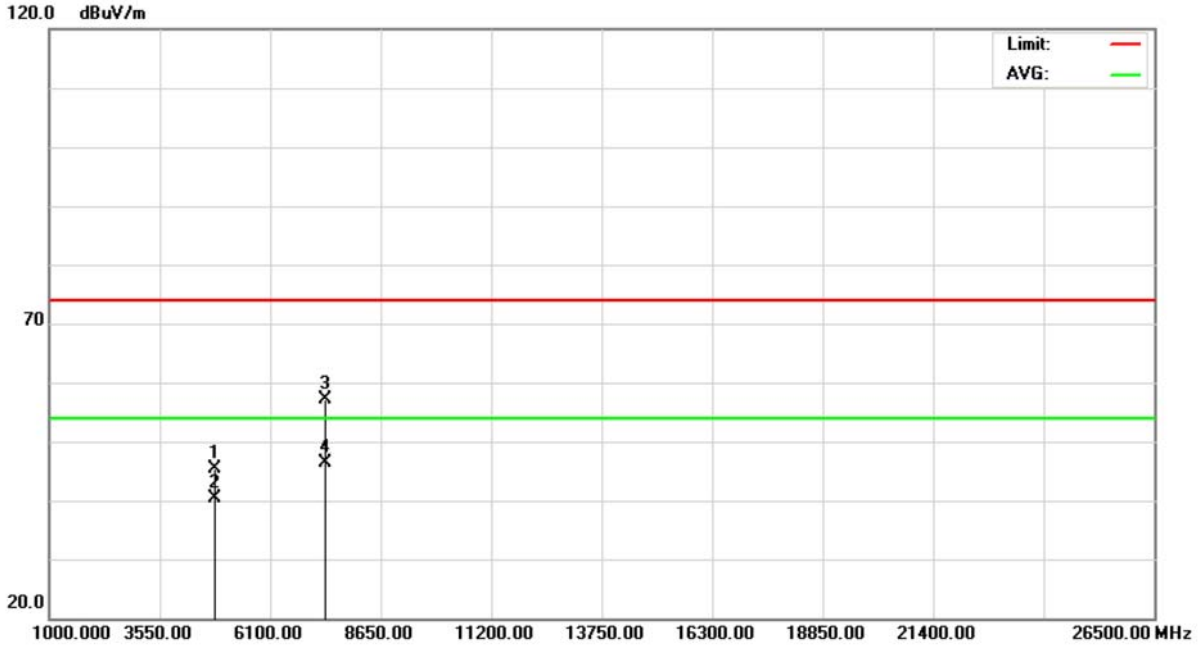
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	25.21	32.99	58.20	74.00	-15.80	peak	
2		2390.000	13.96	32.99	46.95	54.00	-7.05	AVG	
3	X	2414.500	70.90	33.12	104.02	74.00	30.02	peak	
4	*	2414.500	68.41	33.12	101.53	54.00	47.53	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

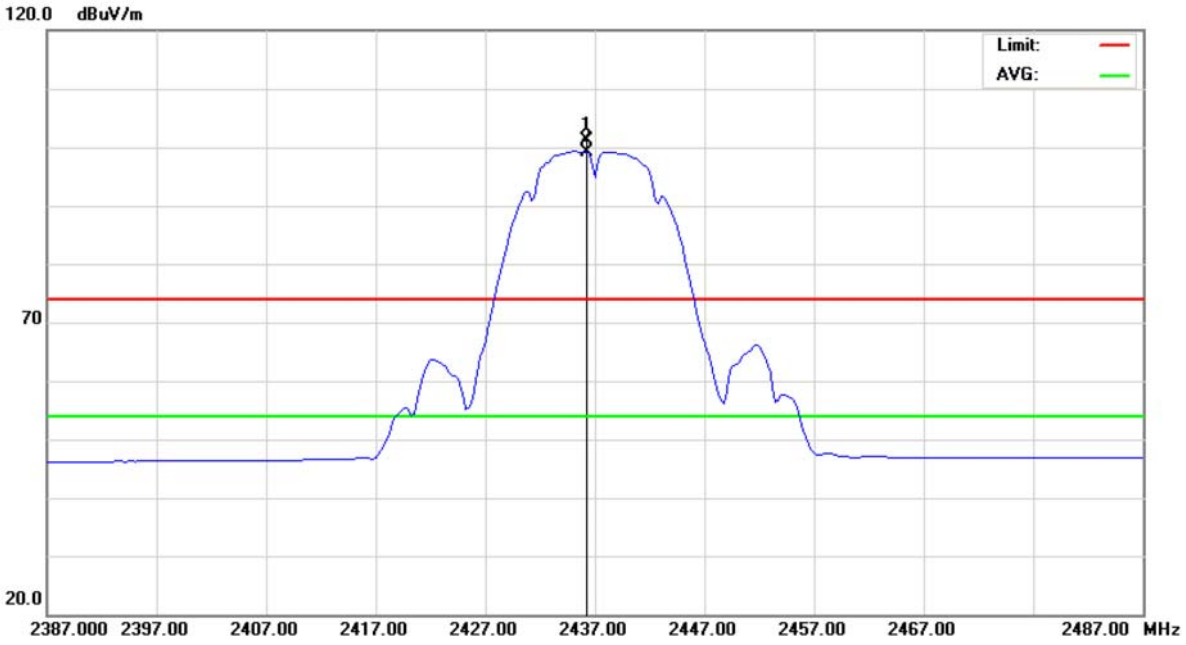
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4824.000	37.88	7.49	45.37	74.00	-28.63	peak	
2		4824.000	32.87	7.49	40.36	54.00	-13.64	AVG	
3		7326.000	42.06	15.10	57.16	74.00	-16.84	peak	
4	*	7326.000	31.37	15.10	46.47	54.00	-7.53	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

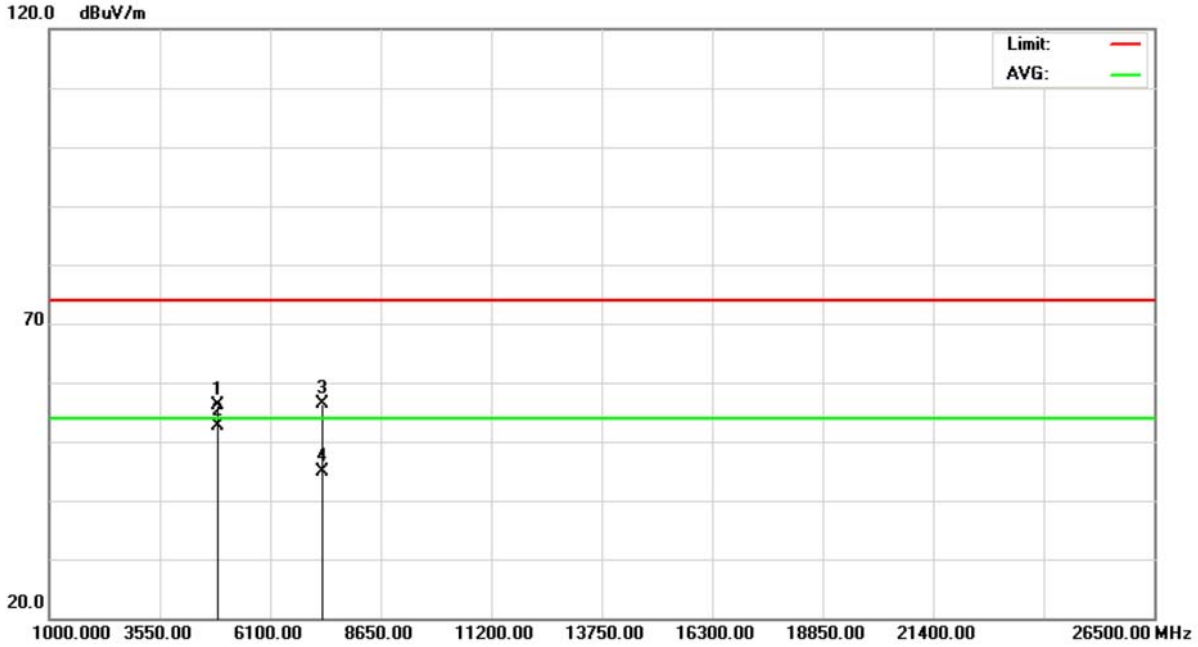
Polarization: Vertical



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	67.95	33.24	101.19	74.00	27.19	peak	
2	*	2436.250	65.97	33.24	99.21	54.00	45.21	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

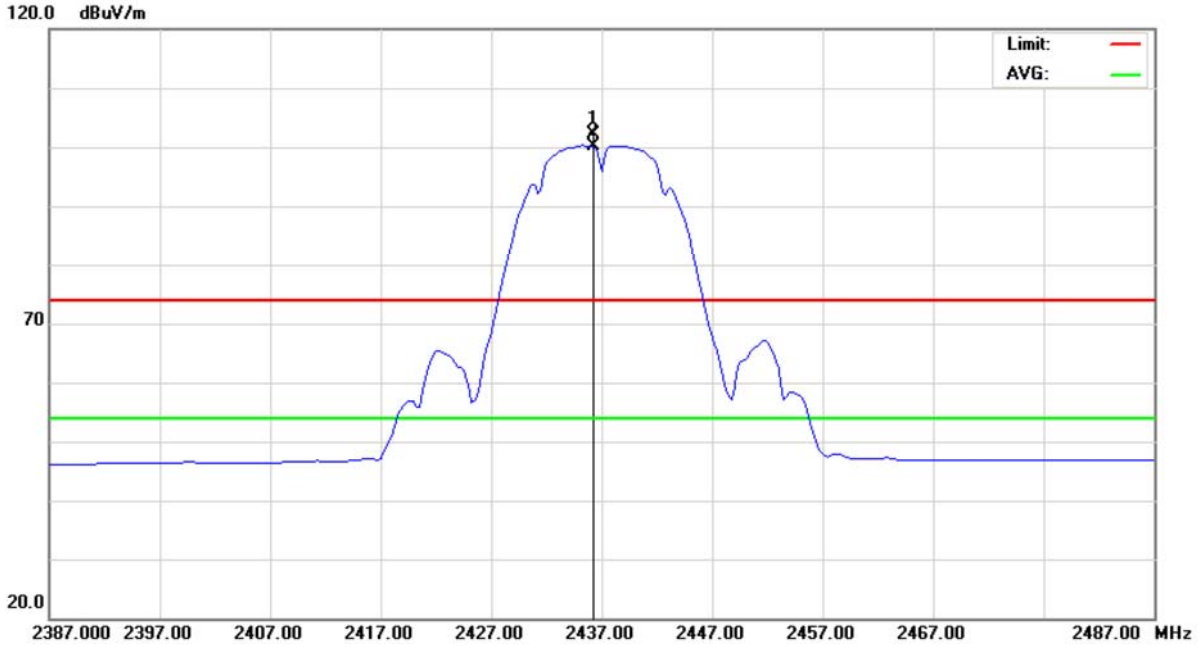
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4874.013	48.47	7.67	56.14	74.00	-17.86	peak	
2	*	4874.013	44.92	7.67	52.59	54.00	-1.41	AVG	
3		7311.000	41.20	15.06	56.26	74.00	-17.74	peak	
4		7311.000	29.74	15.06	44.80	54.00	-9.20	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

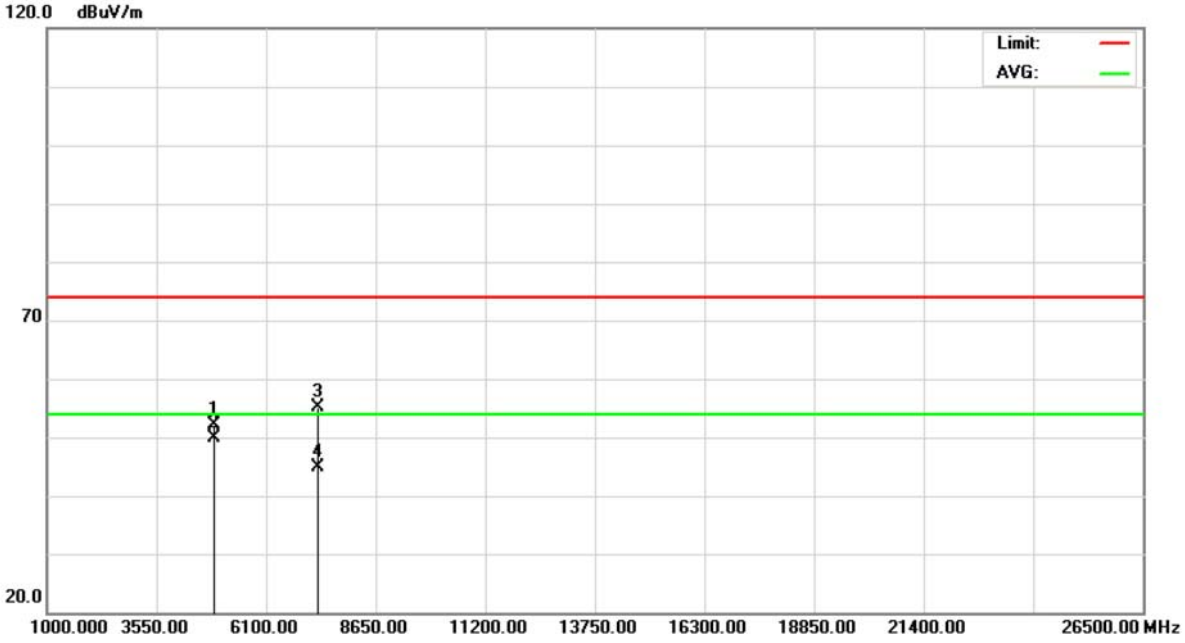
Polarization: Horizontal



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	68.87	33.24	102.11	74.00	28.11	peak	
2	*	2436.250	66.94	33.24	100.18	54.00	46.18	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

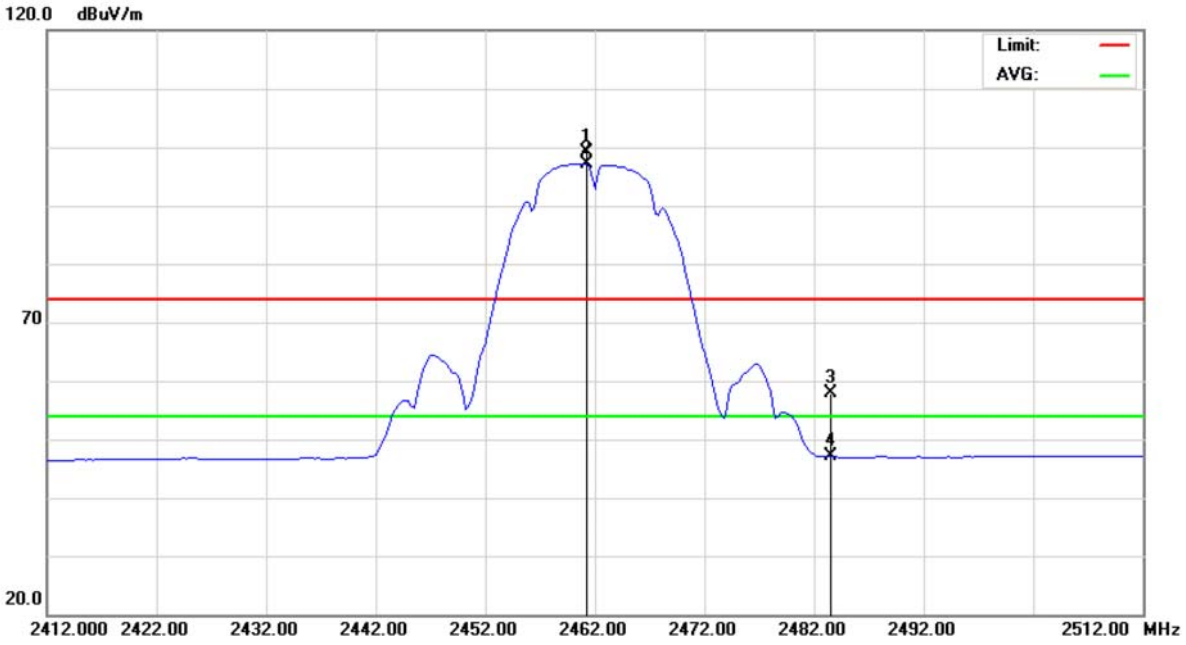
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4873.825	44.36	7.67	52.03	74.00	-21.97	peak	
2	*	4873.825	42.27	7.67	49.94	54.00	-4.06	AVG	
3		7311.000	40.04	15.06	55.10	74.00	-18.90	peak	
4		7311.000	29.89	15.06	44.95	54.00	-9.05	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

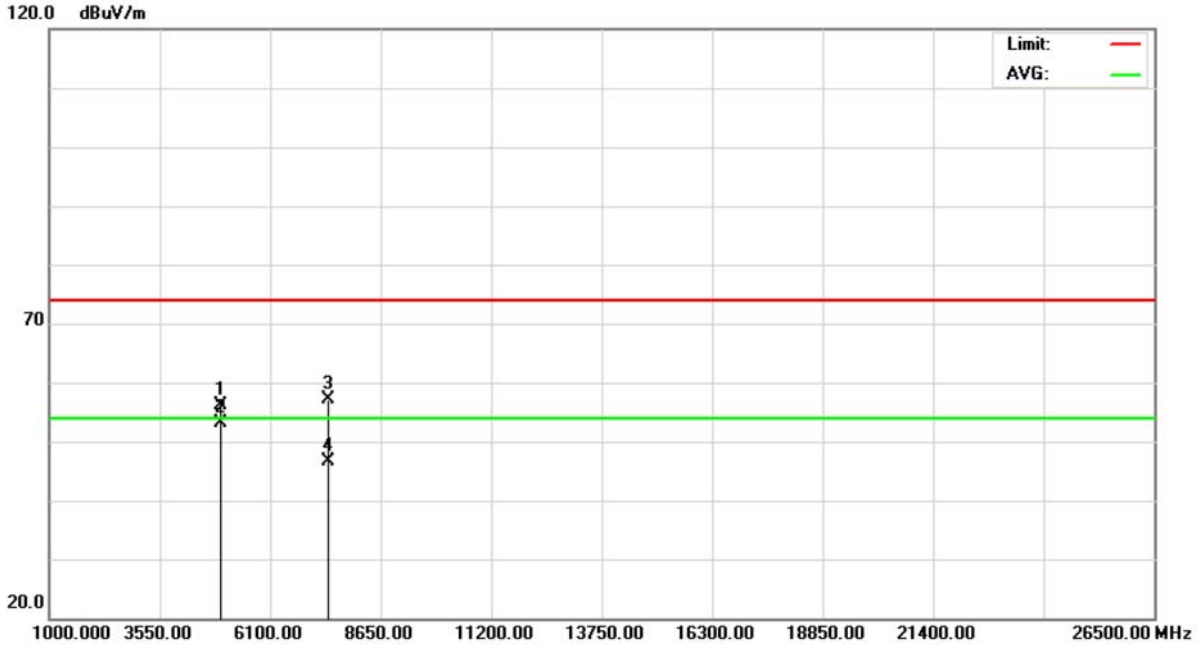
Polarization: Vertical



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	65.78	33.38	99.16	74.00	25.16	peak	
2	*	2461.250	63.75	33.38	97.13	54.00	43.13	AVG	
3		2483.500	24.30	33.50	57.80	74.00	-16.20	peak	
4		2483.500	13.58	33.50	47.08	54.00	-6.92	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

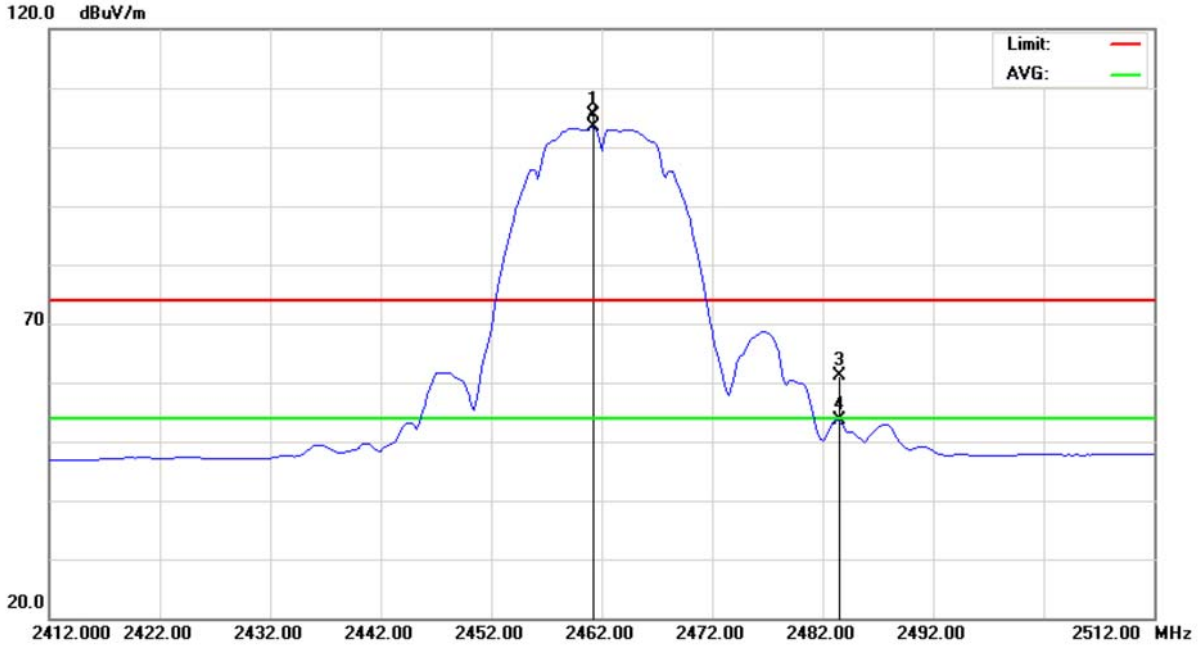
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4923.987	48.33	7.85	56.18	74.00	-17.82	peak	
2	*	4923.987	45.31	7.85	53.16	54.00	-0.84	AVG	
3		7386.000	41.82	15.26	57.08	74.00	-16.92	peak	
4		7386.000	31.30	15.26	46.56	54.00	-7.44	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

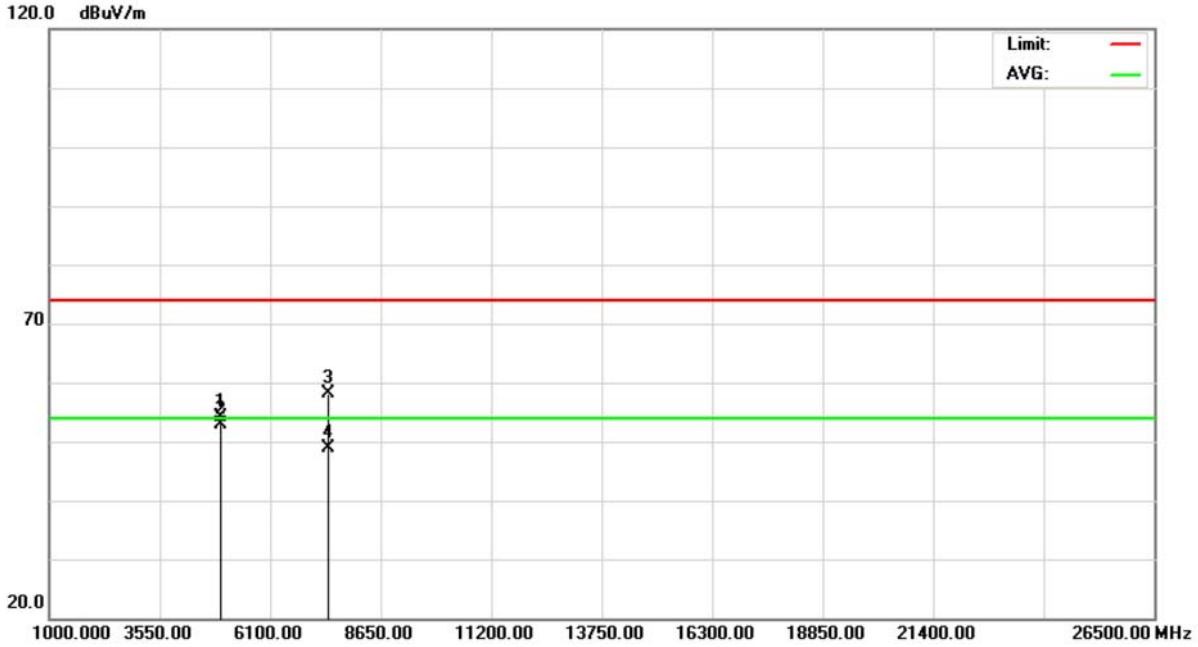
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2461.250	71.90	33.38	105.28	74.00	31.28	peak	
2	*	2461.250	69.91	33.38	103.29	54.00	49.29	AVG	
3		2483.500	27.73	33.50	61.23	74.00	-12.77	peak	
4		2483.500	20.03	33.50	53.53	54.00	-0.47	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

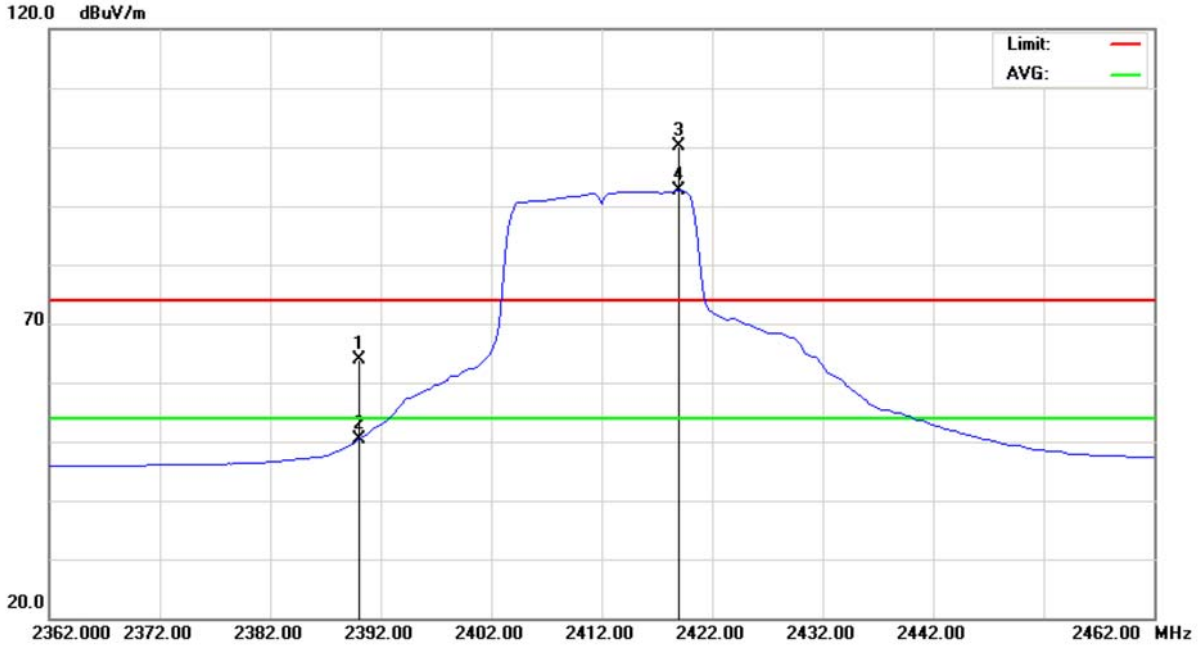
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4923.900	46.17	7.85	54.02	74.00	-19.98	peak	
2	*	4923.975	44.92	7.85	52.77	54.00	-1.23	AVG	
3		7386.000	42.99	15.26	58.25	74.00	-15.75	peak	
4		7386.000	33.57	15.26	48.83	54.00	-5.17	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

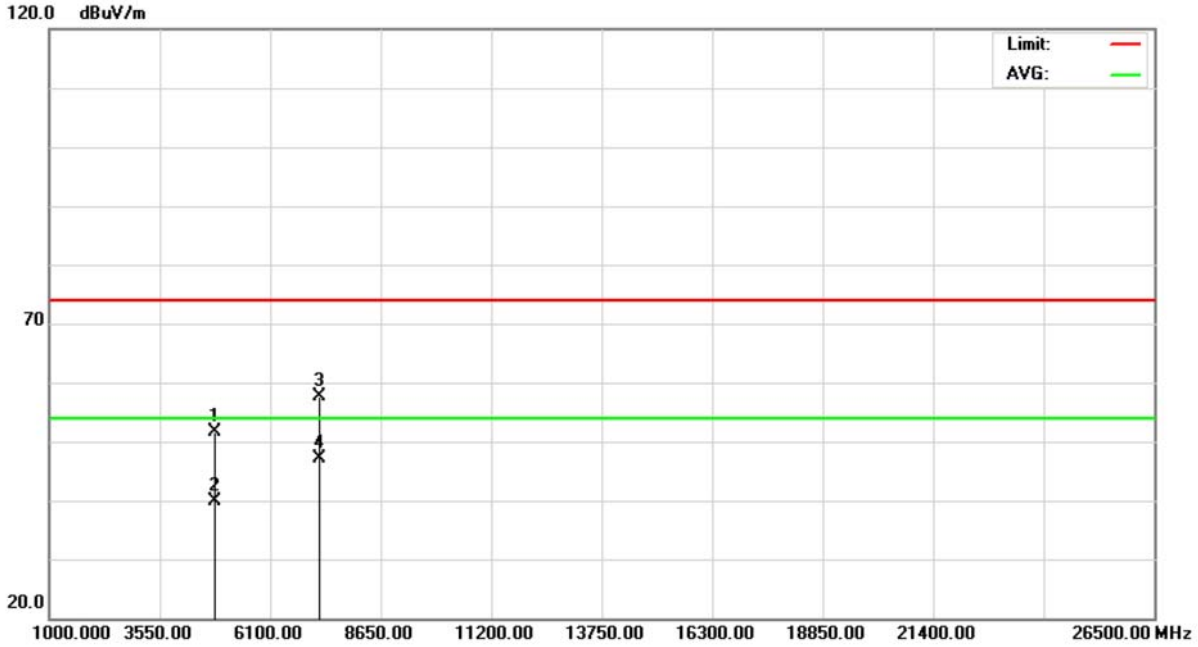
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	30.82	32.99	63.81	74.00	-10.19	peak	
2		2390.000	17.40	32.99	50.39	54.00	-3.61	AVG	
3	X	2419.000	67.01	33.15	100.16	74.00	26.16	peak	
4	*	2419.000	59.42	33.15	92.57	54.00	38.57	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

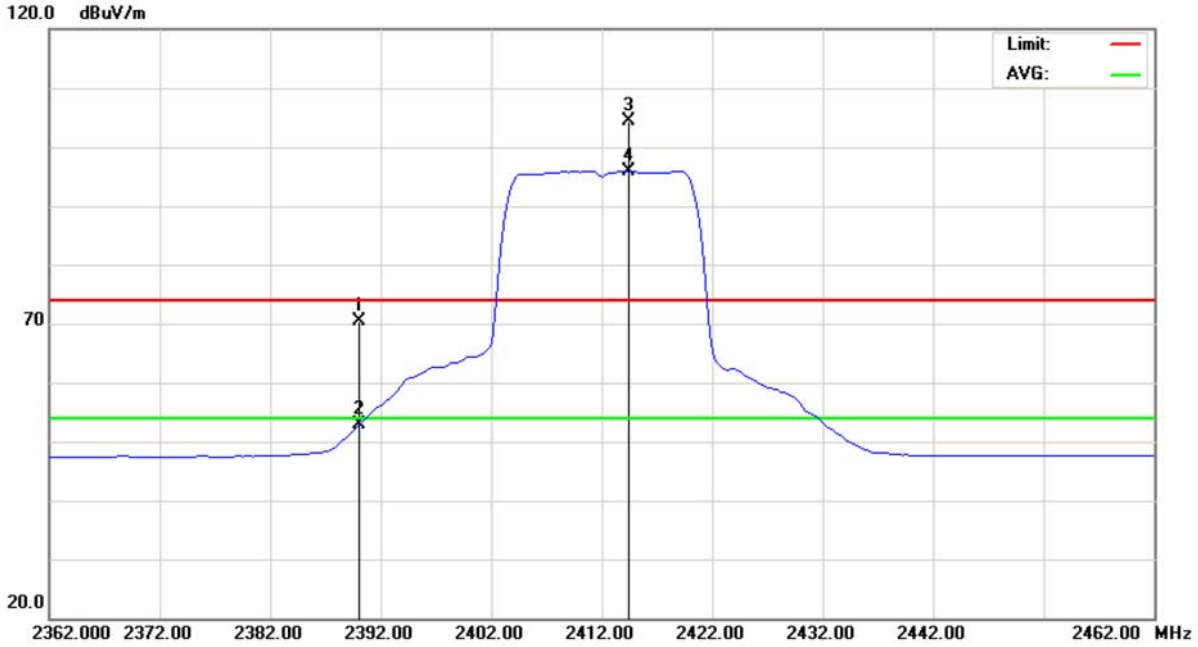
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4824.000	44.11	7.49	51.60	74.00	-22.40	peak	
2		4824.000	32.47	7.49	39.96	54.00	-14.04	AVG	
3		7237.000	42.80	14.87	57.67	74.00	-16.33	peak	
4	*	7237.000	32.18	14.87	47.05	54.00	-6.95	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

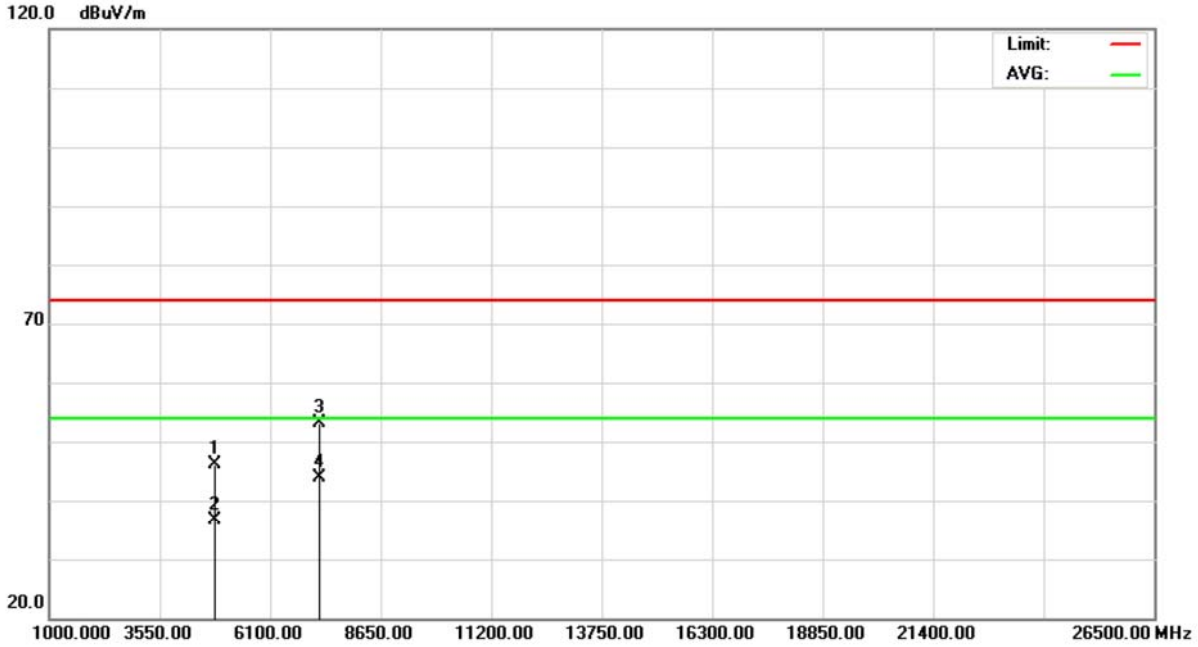
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	37.47	32.99	70.46	74.00	-3.54	peak	
2		2390.000	19.87	32.99	52.86	54.00	-1.14	AVG	
3	X	2414.500	71.37	33.12	104.49	74.00	30.49	peak	
4	*	2414.500	62.87	33.12	95.99	54.00	41.99	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

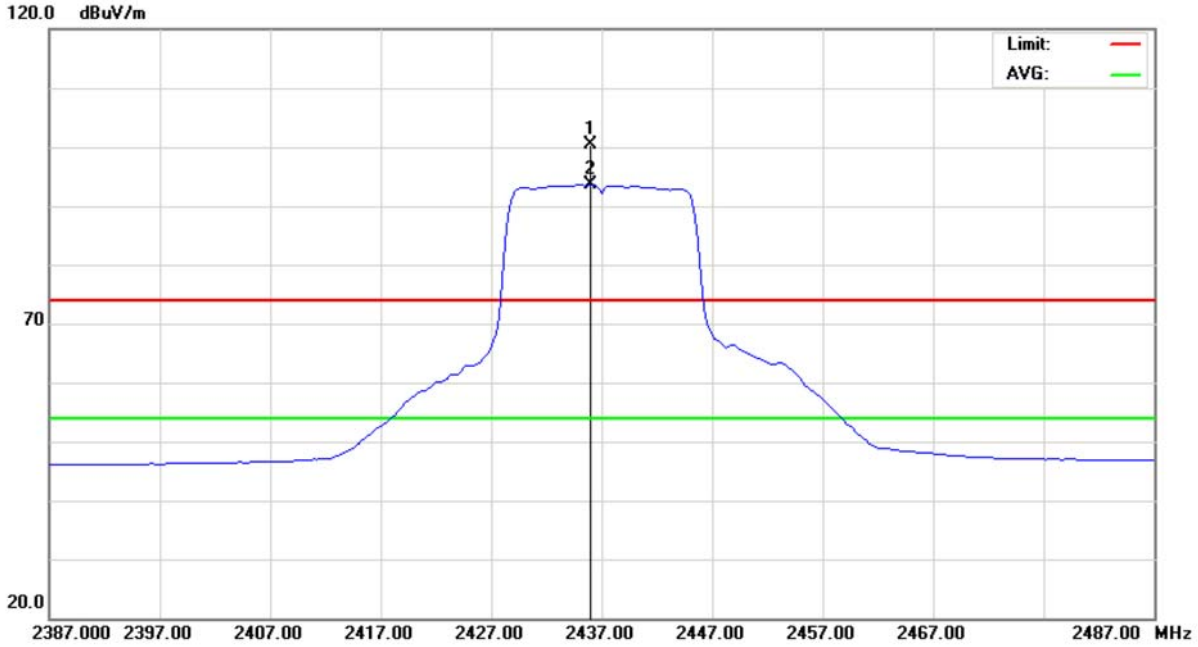
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4823.600	39.61	6.64	46.25	74.00	-27.75	peak	
2		4823.600	30.00	6.64	36.64	54.00	-17.36	AVG	
3		7236.000	39.55	13.66	53.21	74.00	-20.79	peak	
4	*	7236.000	30.16	13.66	43.82	54.00	-10.18	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

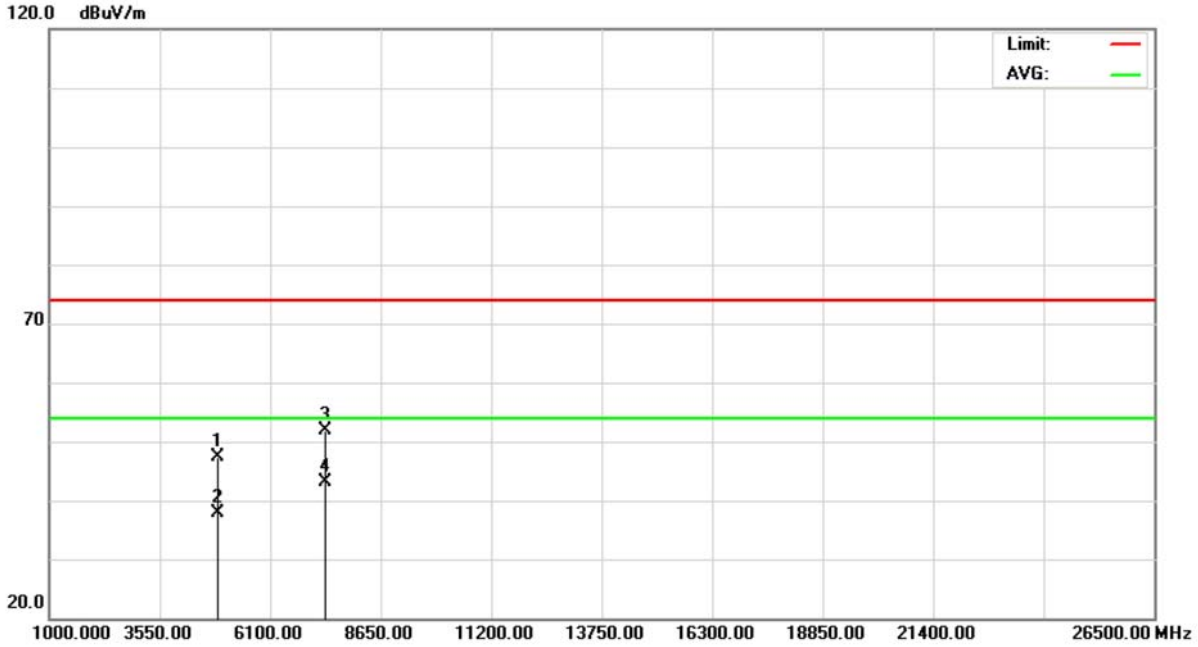
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2436.000	67.19	33.24	100.43	74.00	26.43	peak	
2	*	2436.000	60.30	33.24	93.54	54.00	39.54	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

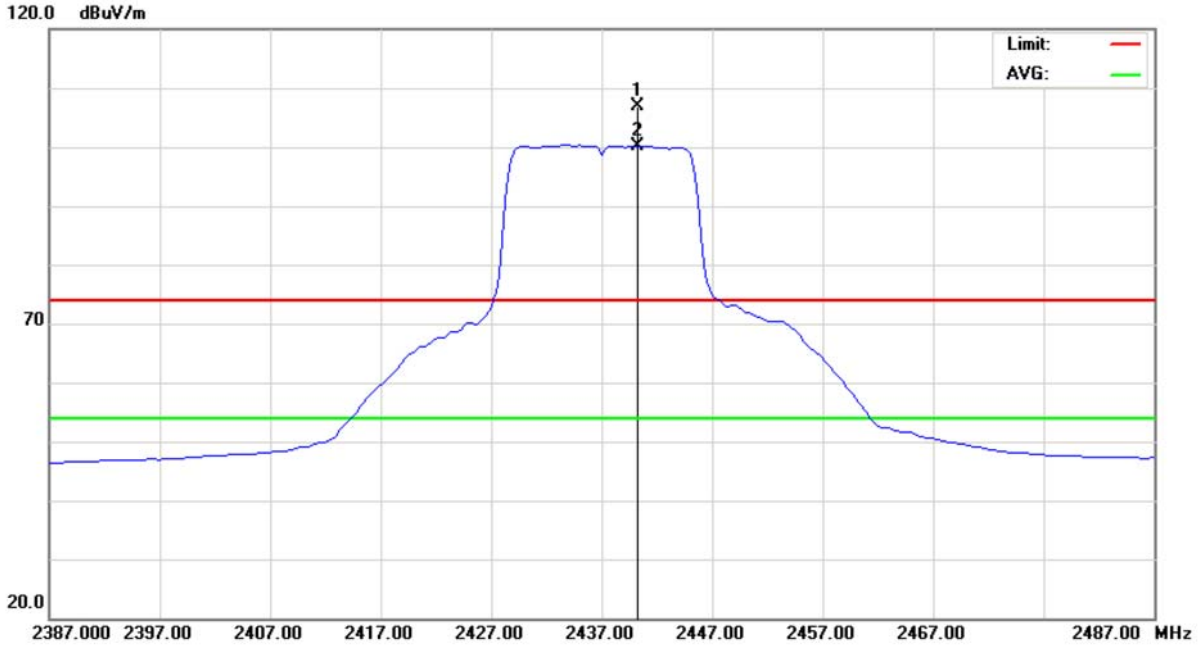
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4876.000	40.63	6.84	47.47	74.00	-26.53	peak	
2		4876.000	31.04	6.84	37.88	54.00	-16.12	AVG	
3		7311.750	38.17	13.81	51.98	74.00	-22.02	peak	
4	*	7311.750	29.37	13.81	43.18	54.00	-10.82	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

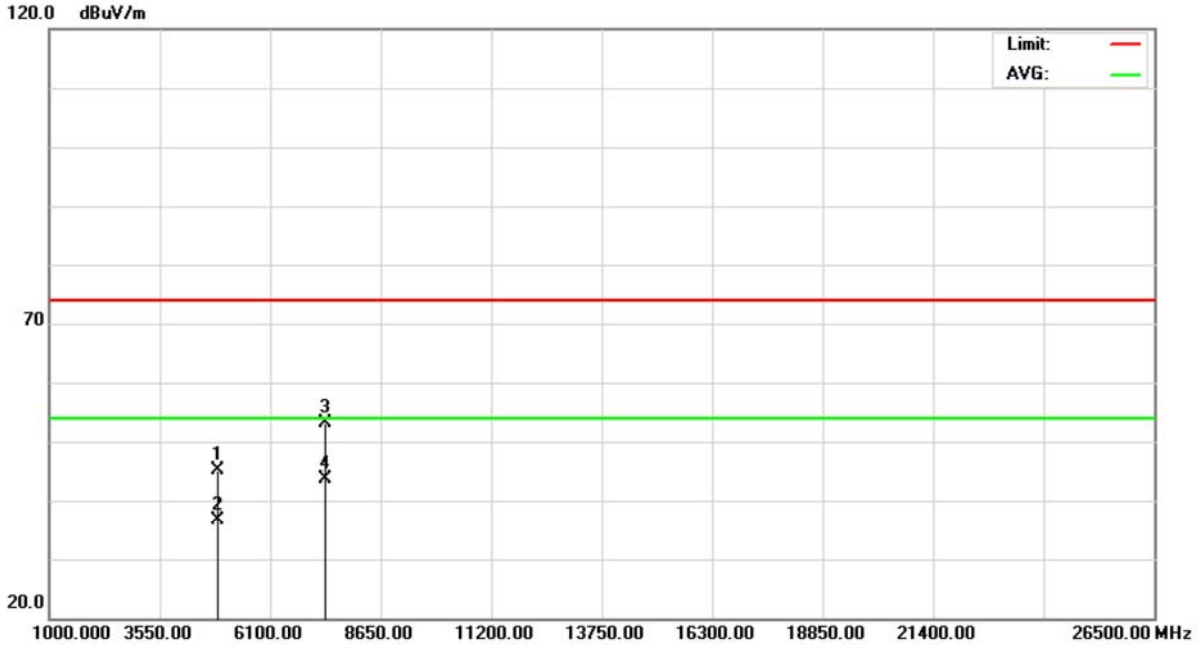
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2440.250	73.72	33.26	106.98	74.00	32.98	peak	
2	*	2440.250	66.87	33.26	100.13	54.00	46.13	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

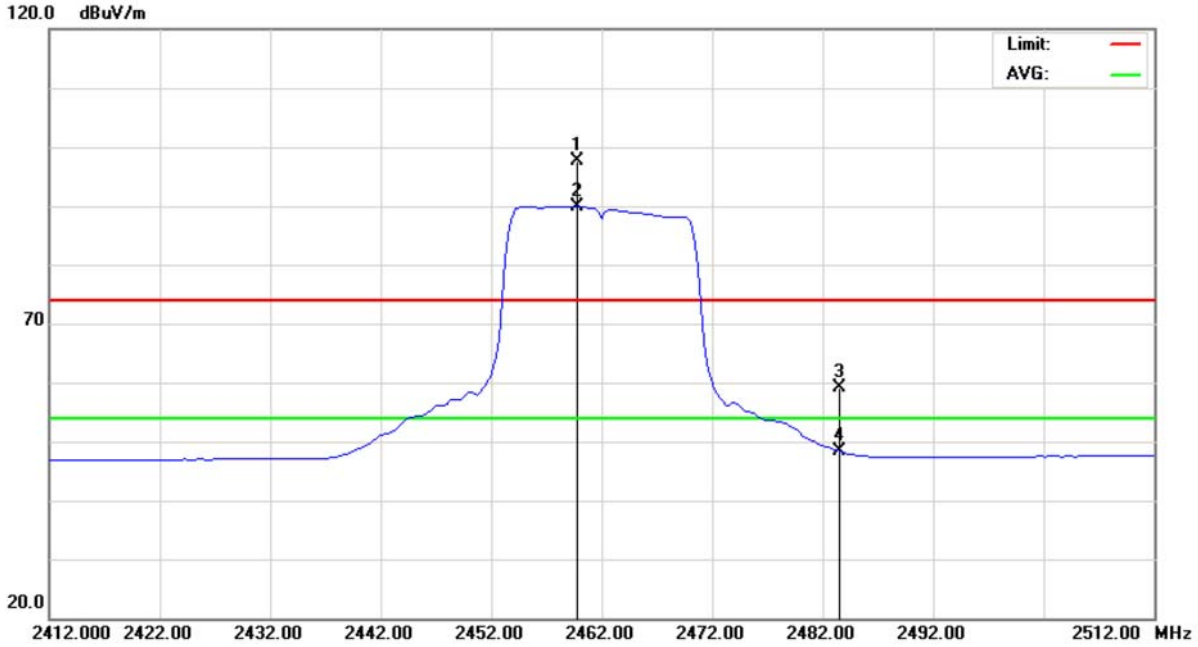
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4875.750	37.39	7.67	45.06	74.00	-28.94	peak	
2		4875.750	28.97	7.67	36.64	54.00	-17.36	AVG	
3		7311.750	37.95	15.07	53.02	74.00	-20.98	peak	
4	*	7311.750	28.64	15.07	43.71	54.00	-10.29	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

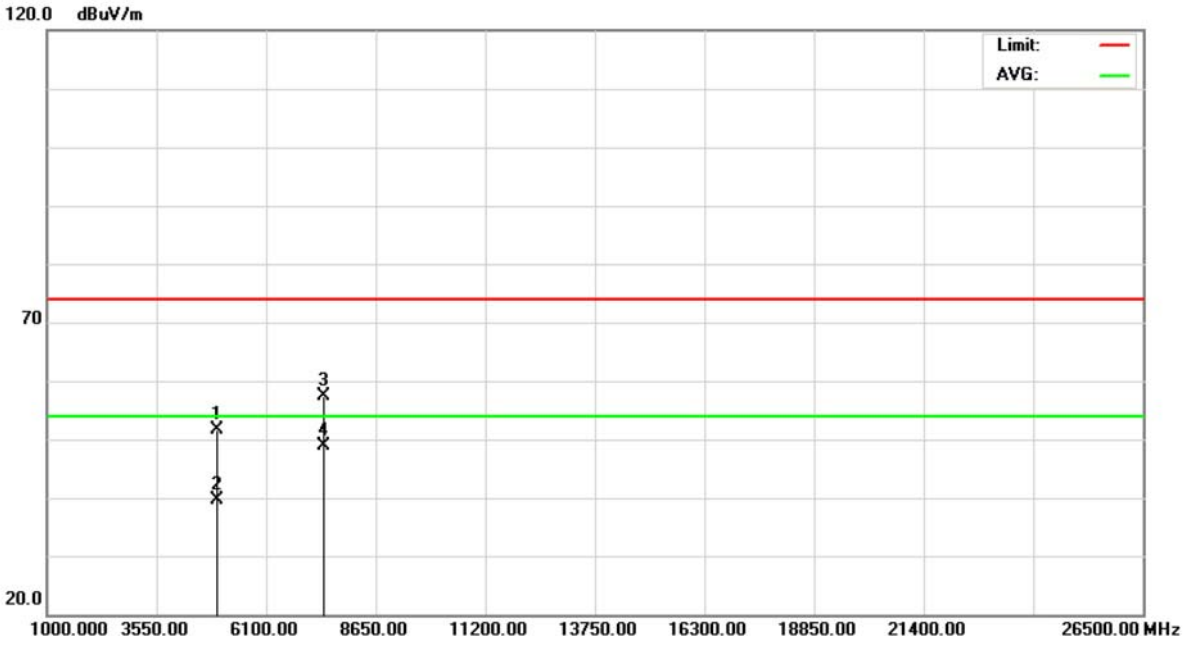
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2459.750	63.81	33.79	97.60	74.00	23.60	peak	
2	*	2459.750	56.13	33.79	89.92	54.00	35.92	AVG	
3		2483.500	25.22	33.92	59.14	74.00	-14.86	peak	
4		2483.500	14.45	33.92	48.37	54.00	-5.63	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

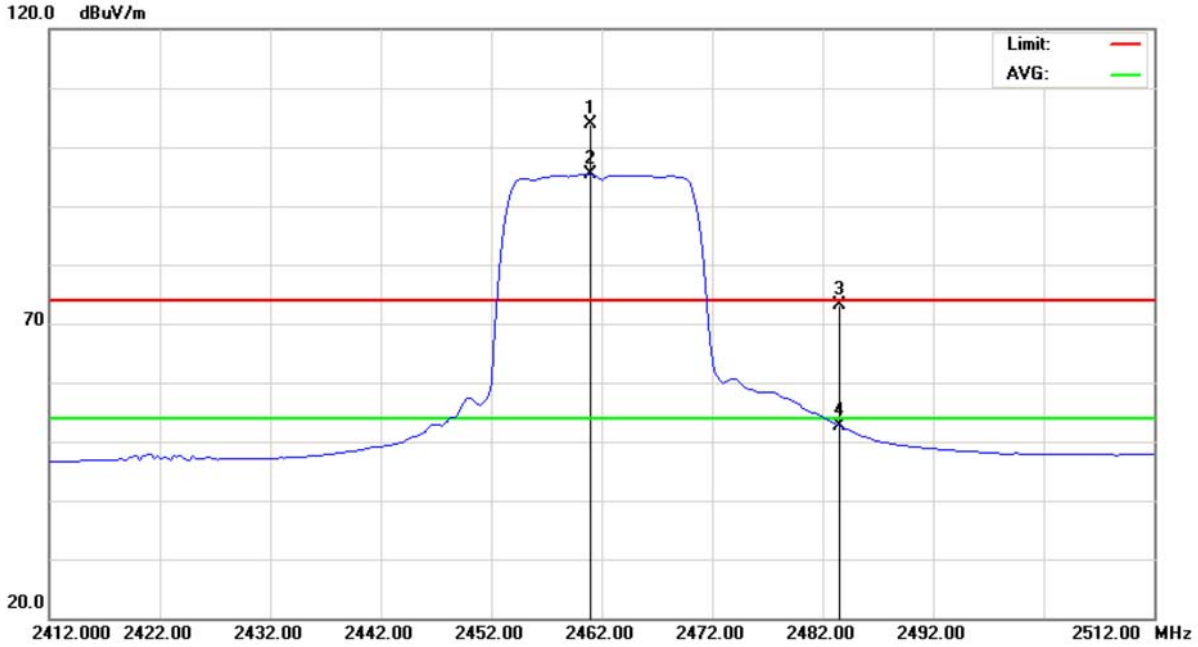
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.250	43.80	7.85	51.65	74.00	-22.35	peak	
2		4924.250	31.87	7.85	39.72	54.00	-14.28	AVG	
3		7384.000	42.13	15.26	57.39	74.00	-16.61	peak	
4	*	7384.000	33.56	15.26	48.82	54.00	-5.18	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

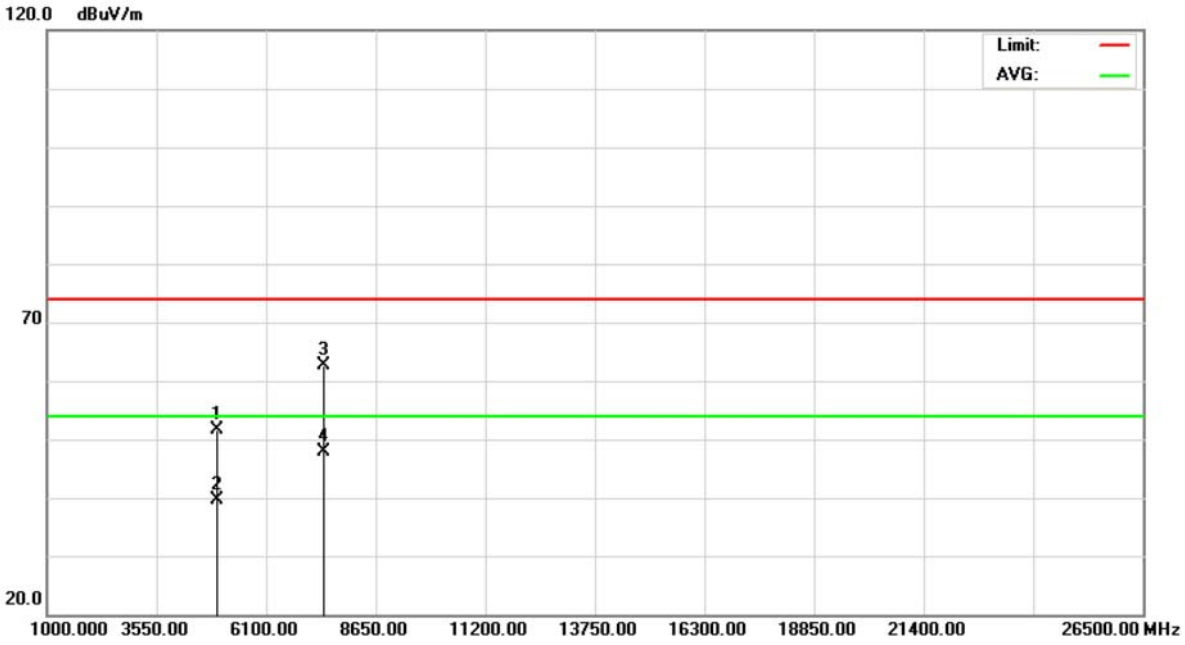
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2461.000	70.41	33.38	103.79	74.00	29.79	peak	
2	*	2461.000	61.92	33.38	95.30	54.00	41.30	AVG	
3		2483.500	39.70	33.50	73.20	74.00	-0.80	peak	
4		2483.500	19.14	33.50	52.64	54.00	-1.36	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

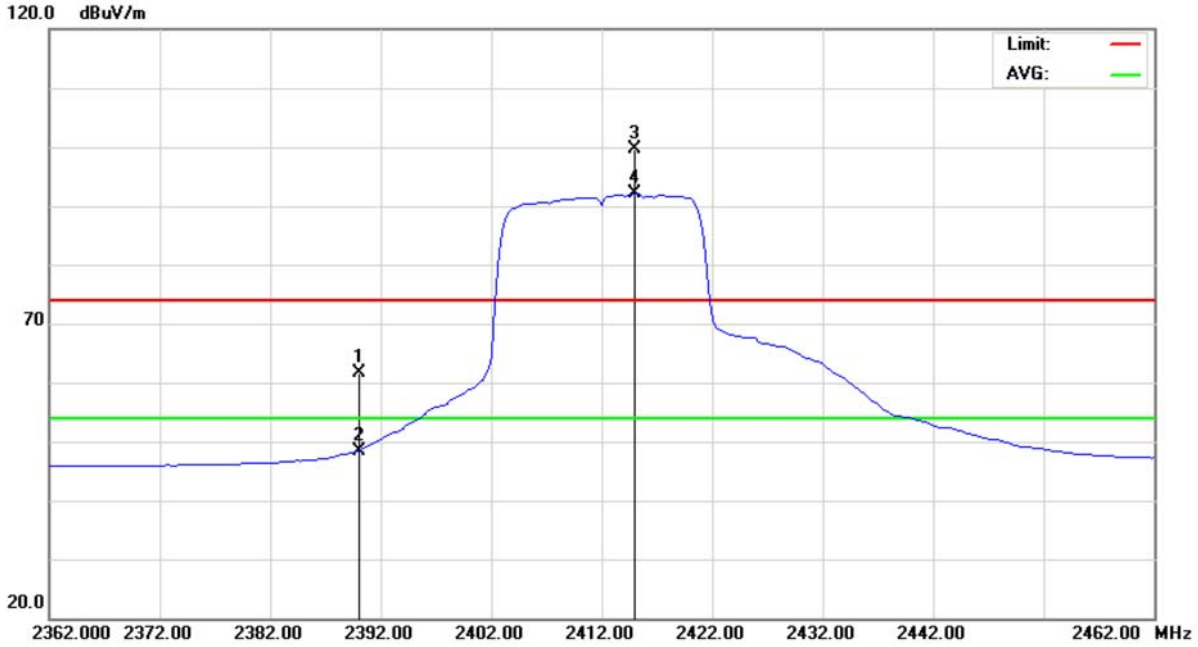
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.250	43.80	7.85	51.65	74.00	-22.35	peak	
2		4924.250	31.87	7.85	39.72	54.00	-14.28	AVG	
3		7384.000	47.27	15.26	62.53	74.00	-11.47	peak	
4	*	7384.000	32.64	15.26	47.90	54.00	-6.10	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

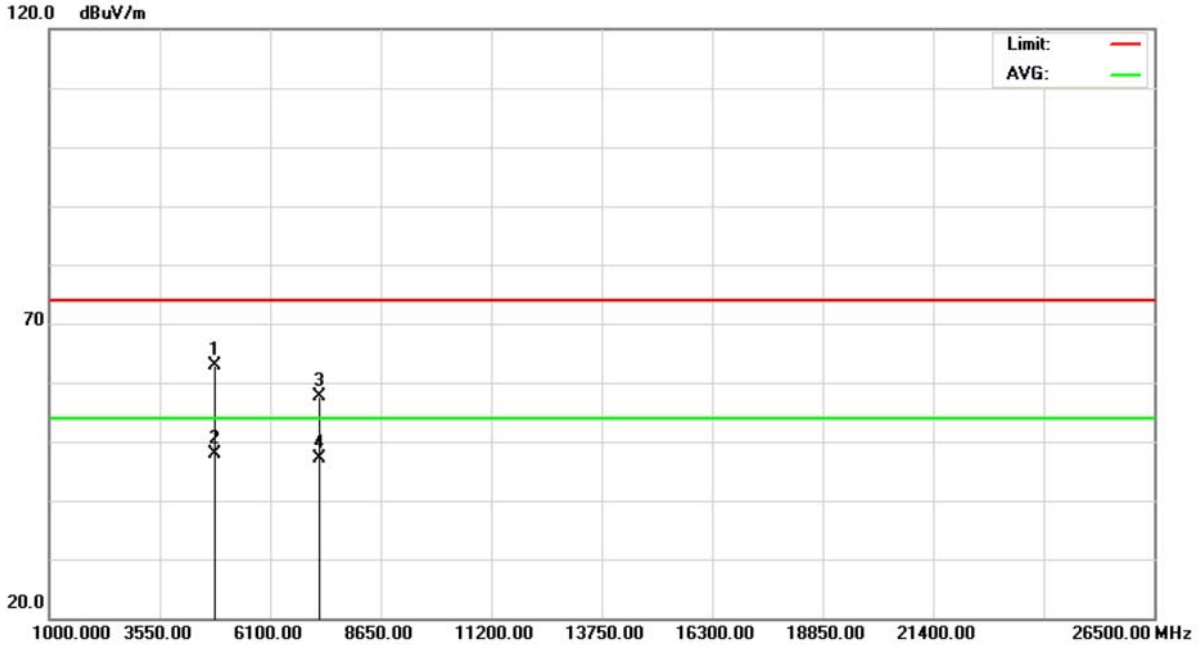
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	28.53	32.99	61.52	74.00	-12.48	peak	
2		2390.000	15.48	32.99	48.47	54.00	-5.53	AVG	
3	X	2415.000	66.43	33.13	99.56	74.00	25.56	peak	
4	*	2415.000	58.89	33.13	92.02	54.00	38.02	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

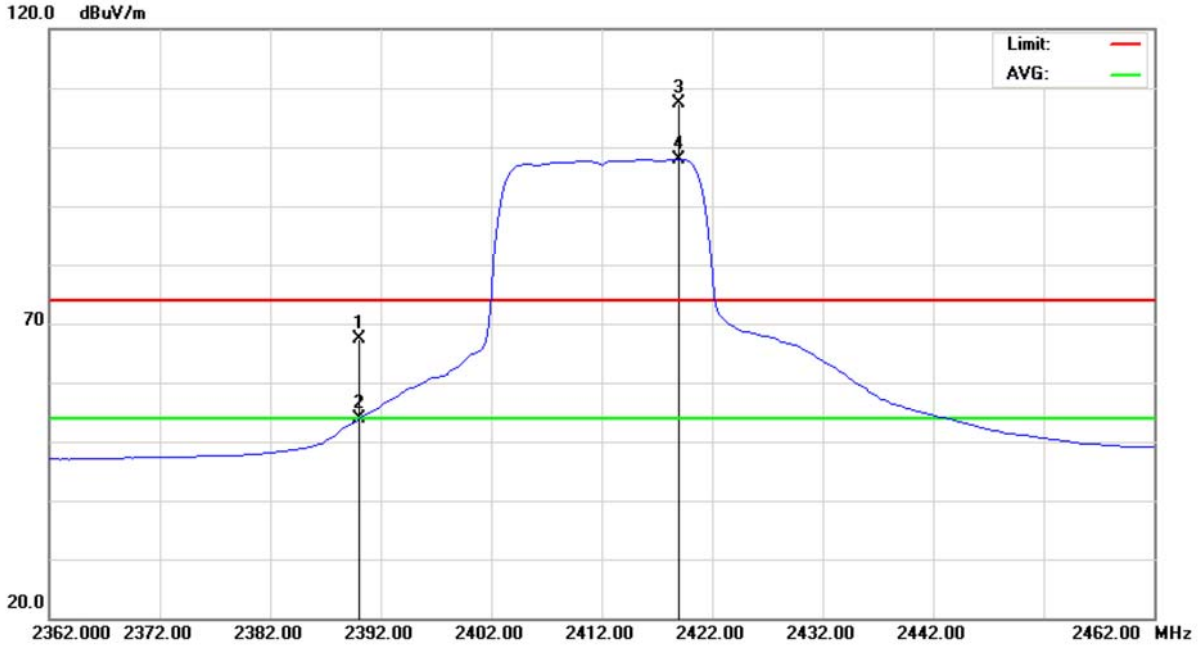
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4823.875	55.33	7.49	62.82	74.00	-11.18	peak	
2	*	4823.875	40.50	7.49	47.99	54.00	-6.01	AVG	
3		7237.000	42.80	14.87	57.67	74.00	-16.33	peak	
4		7237.000	32.18	14.87	47.05	54.00	-6.95	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

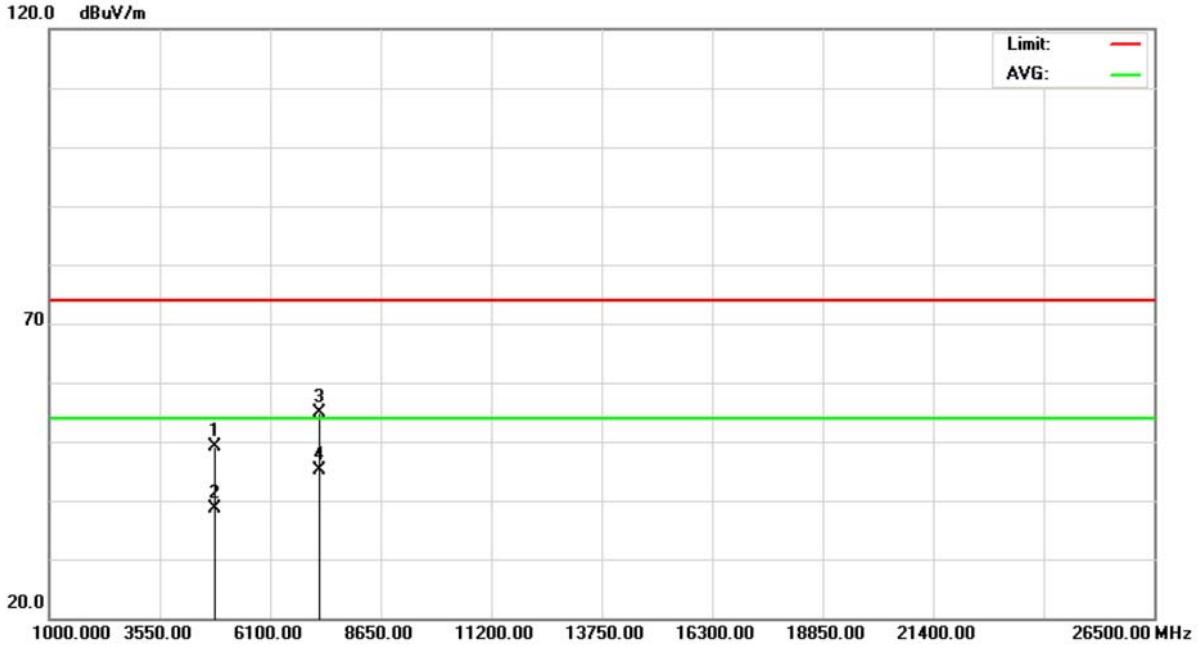
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	34.36	32.99	67.35	74.00	-6.65	peak	
2		2390.000	20.80	32.99	53.79	54.00	-0.21	AVG	
3	X	2419.000	74.19	33.15	107.34	74.00	33.34	peak	
4	*	2419.000	64.83	33.15	97.98	54.00	43.98	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

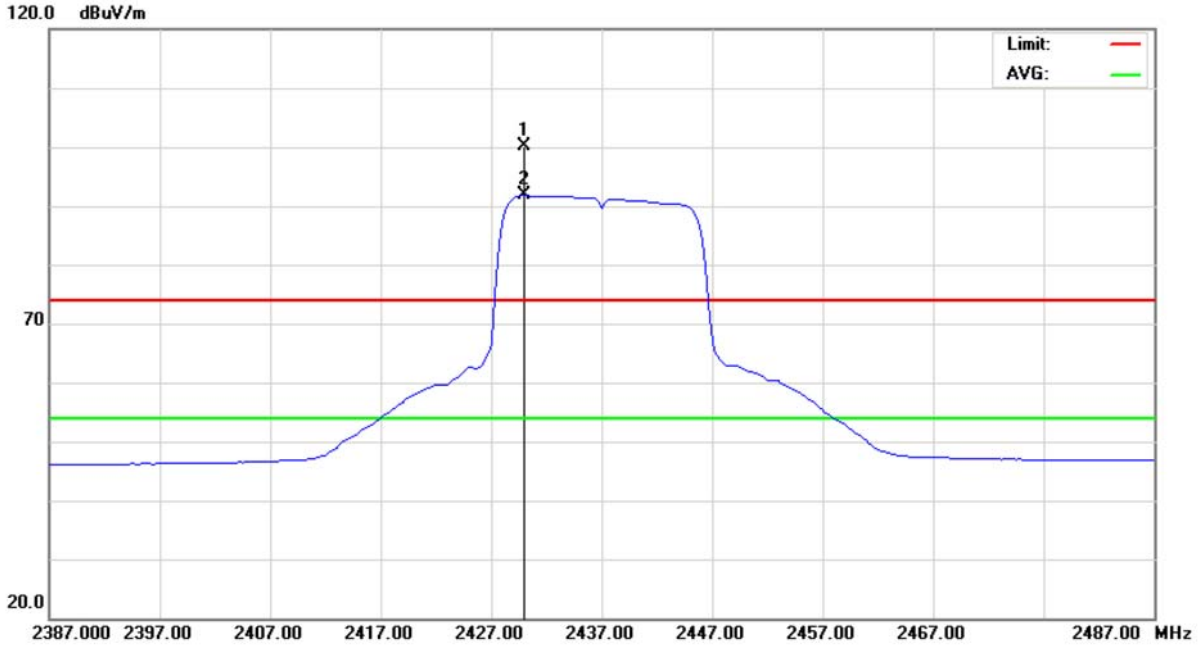
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4824.000	41.65	7.49	49.14	74.00	-24.86	peak	
2		4824.000	31.21	7.49	38.70	54.00	-15.30	AVG	
3		7237.250	40.11	14.87	54.98	74.00	-19.02	peak	
4	*	7237.250	30.20	14.87	45.07	54.00	-8.93	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

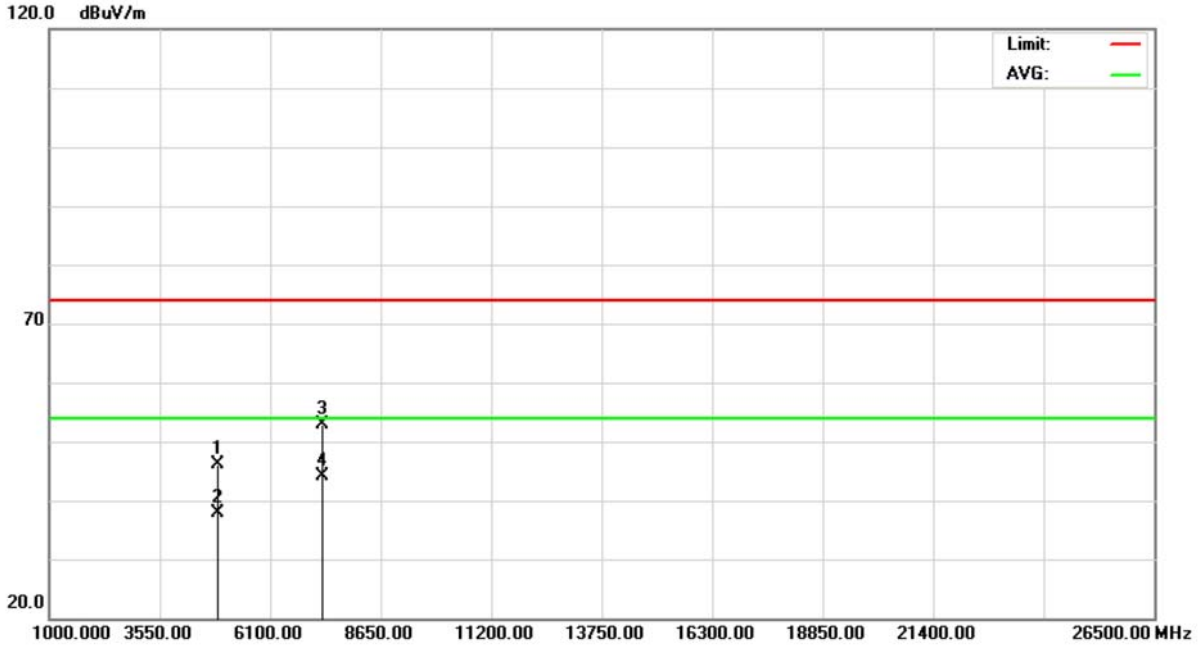
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2430.000	66.81	33.21	100.02	74.00	26.02	peak	
2	*	2430.000	58.57	33.21	91.78	54.00	37.78	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

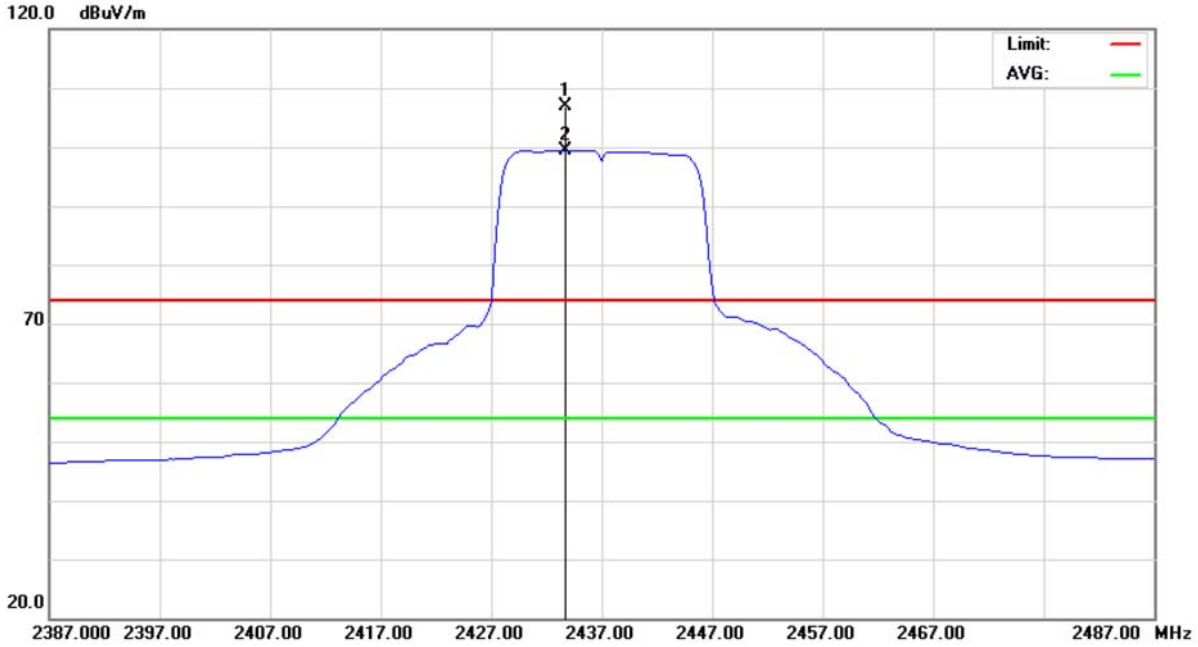
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4874.750	38.51	7.67	46.18	74.00	-27.82	peak	
2		4874.750	30.22	7.67	37.89	54.00	-16.11	AVG	
3		7311.250	37.83	15.07	52.90	74.00	-21.10	peak	
4	*	7311.250	28.98	15.07	44.05	54.00	-9.95	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

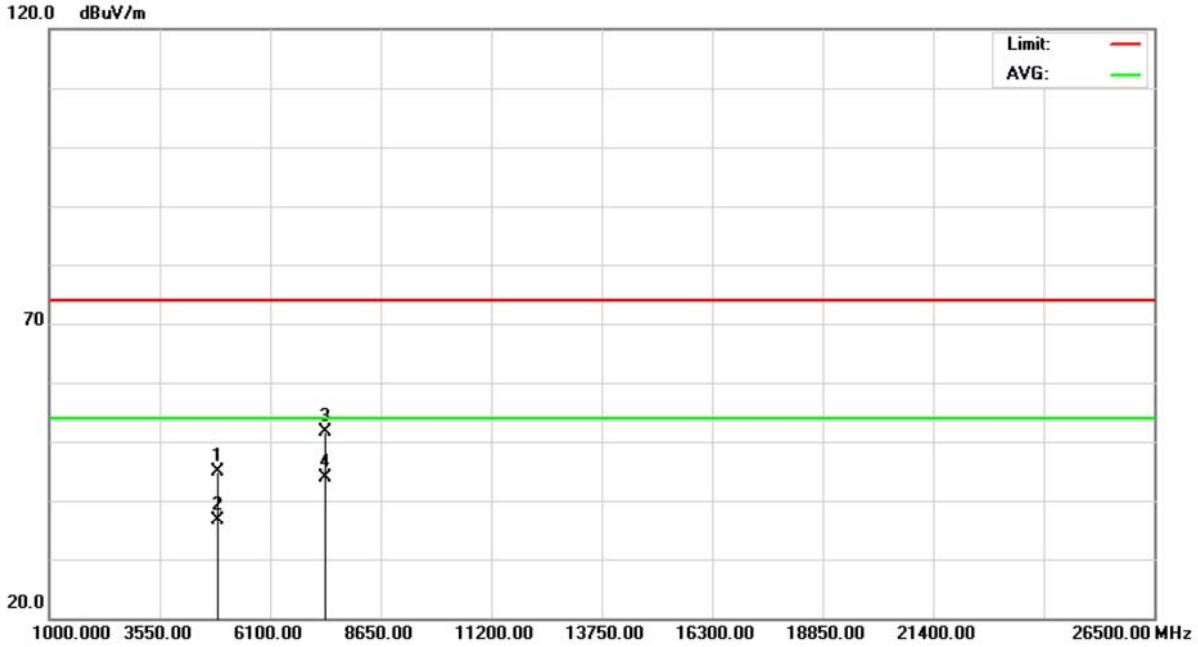
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2433.750	73.53	33.23	106.76	74.00	32.76	peak	
2	*	2433.750	66.22	33.23	99.45	54.00	45.45	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

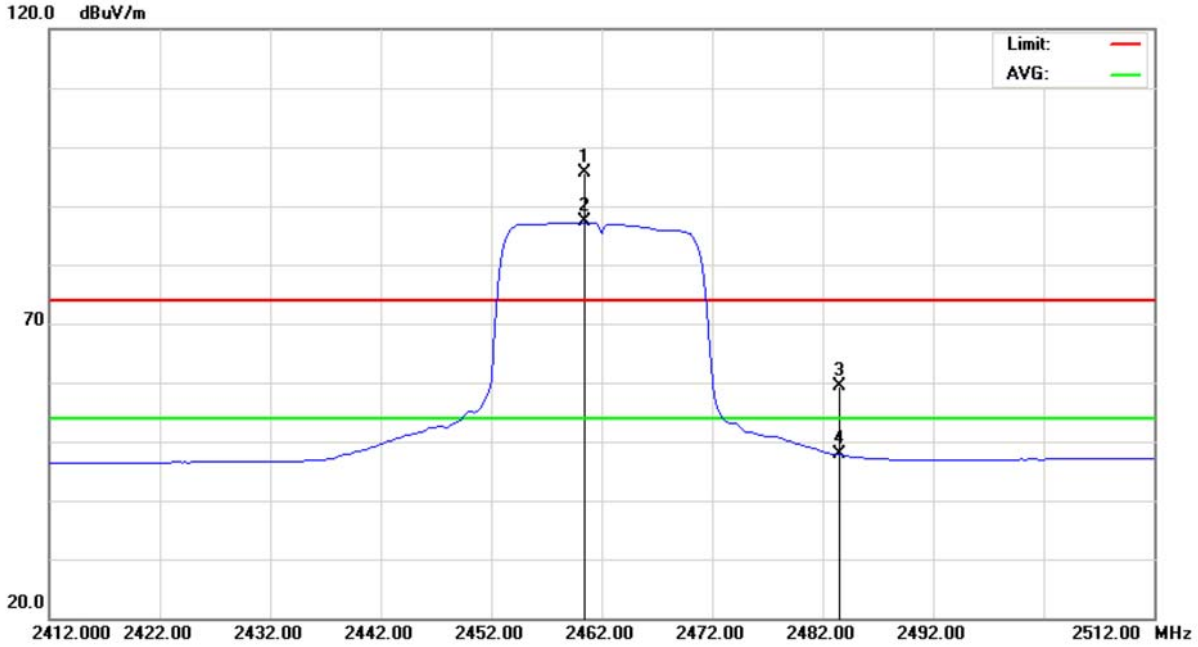
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4874.000	37.33	7.67	45.00	74.00	-29.00	peak	
2		4874.000	29.01	7.67	36.68	54.00	-17.32	AVG	
3		7312.250	36.48	15.07	51.55	74.00	-22.45	peak	
4	*	7312.250	28.88	15.07	43.95	54.00	-10.05	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

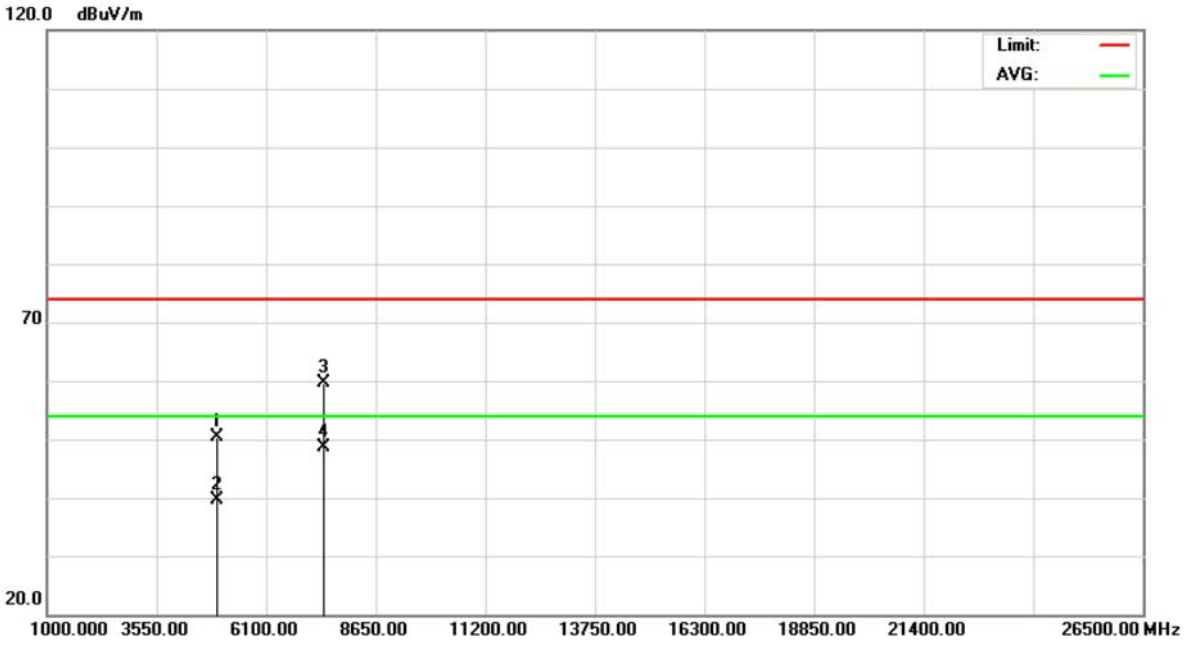
Polarization: Vertical



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	62.17	33.38	95.55	74.00	21.55	peak	
2	*	2460.500	53.88	33.38	87.26	54.00	33.26	AVG	
3		2483.500	25.91	33.50	59.41	74.00	-14.59	peak	
4		2483.500	14.26	33.50	47.76	54.00	-6.24	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

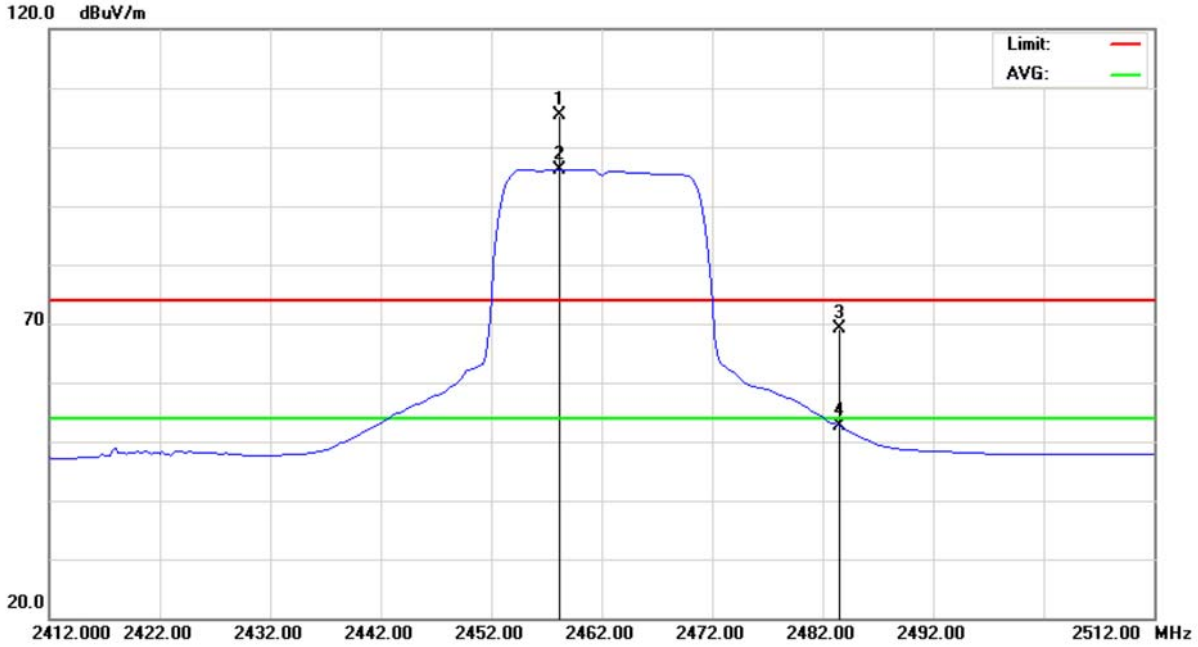
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4923.250	42.63	7.84	50.47	74.00	-23.53	peak	
2		4923.250	31.72	7.84	39.56	54.00	-14.44	AVG	
3		7384.000	44.27	15.26	59.53	74.00	-14.47	peak	
4	*	7384.000	33.31	15.26	48.57	54.00	-5.43	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

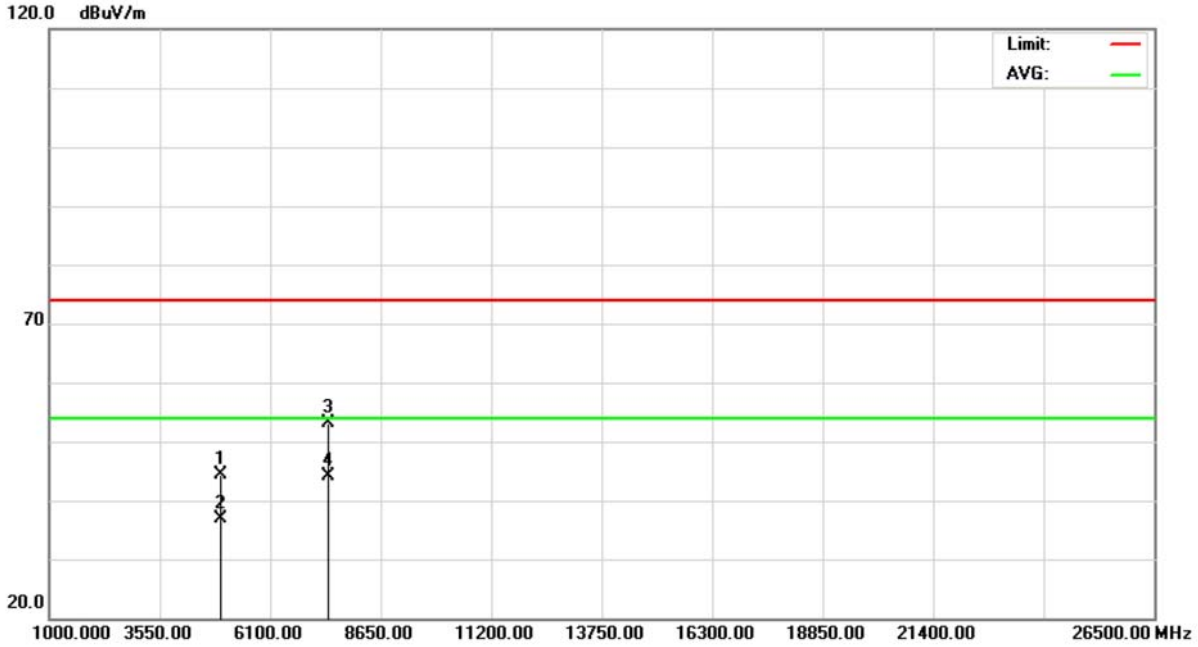
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2458.250	71.92	33.36	105.28	74.00	31.28	peak	
2	*	2458.250	62.83	33.36	96.19	54.00	42.19	AVG	
3		2483.500	35.63	33.50	69.13	74.00	-4.87	peak	
4		2483.500	19.08	33.50	52.58	54.00	-1.42	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

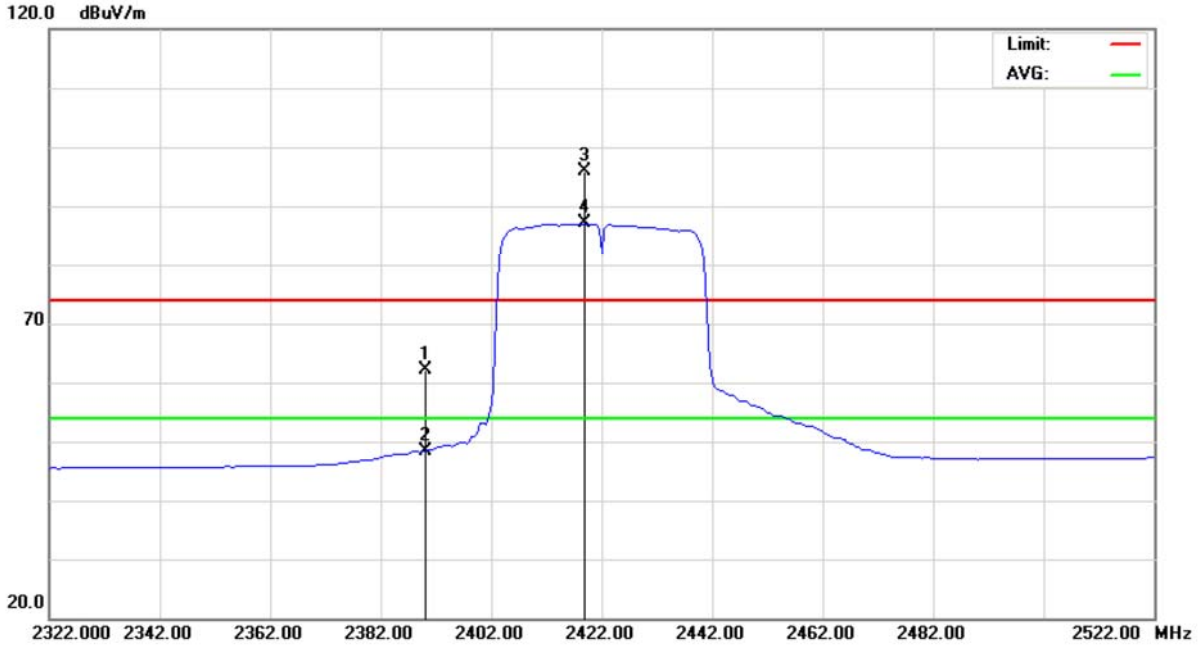
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.250	36.60	7.85	44.45	74.00	-29.55	peak	
2		4924.250	29.05	7.85	36.90	54.00	-17.10	AVG	
3		7386.250	37.98	15.26	53.24	74.00	-20.76	peak	
4	*	7386.250	28.92	15.26	44.18	54.00	-9.82	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

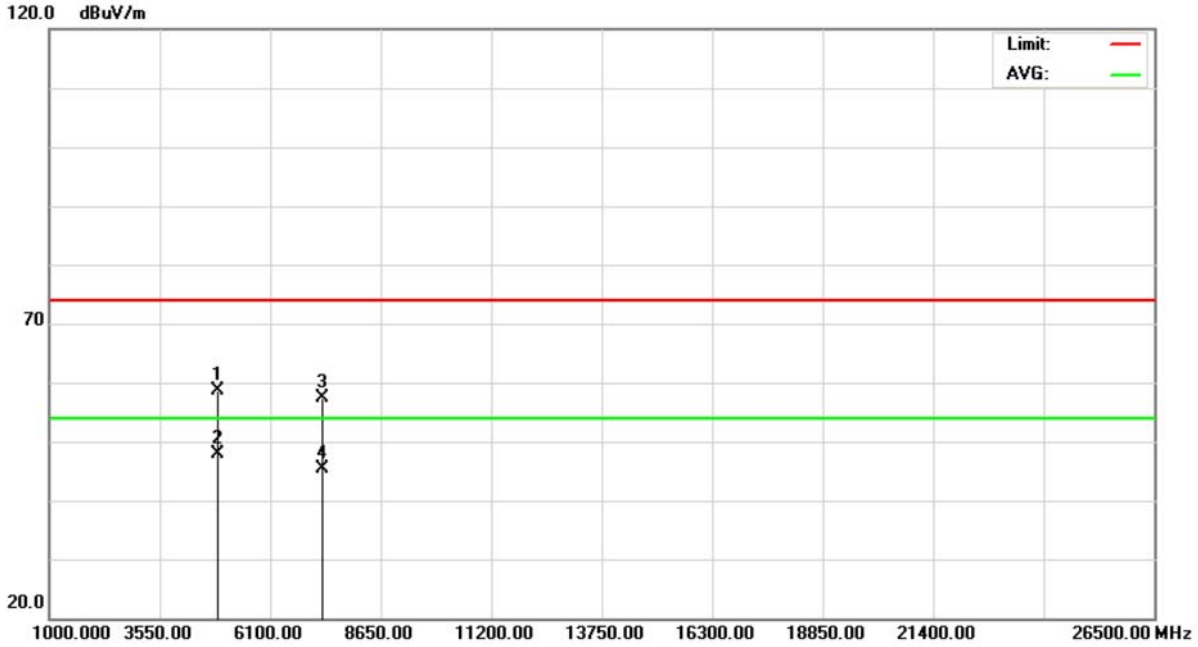
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	29.11	32.99	62.10	74.00	-11.90	peak	
2		2390.000	15.46	32.99	48.45	54.00	-5.55	AVG	
3	X	2419.000	62.70	33.15	95.85	74.00	21.85	peak	
4	*	2419.000	53.86	33.15	87.01	54.00	33.01	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

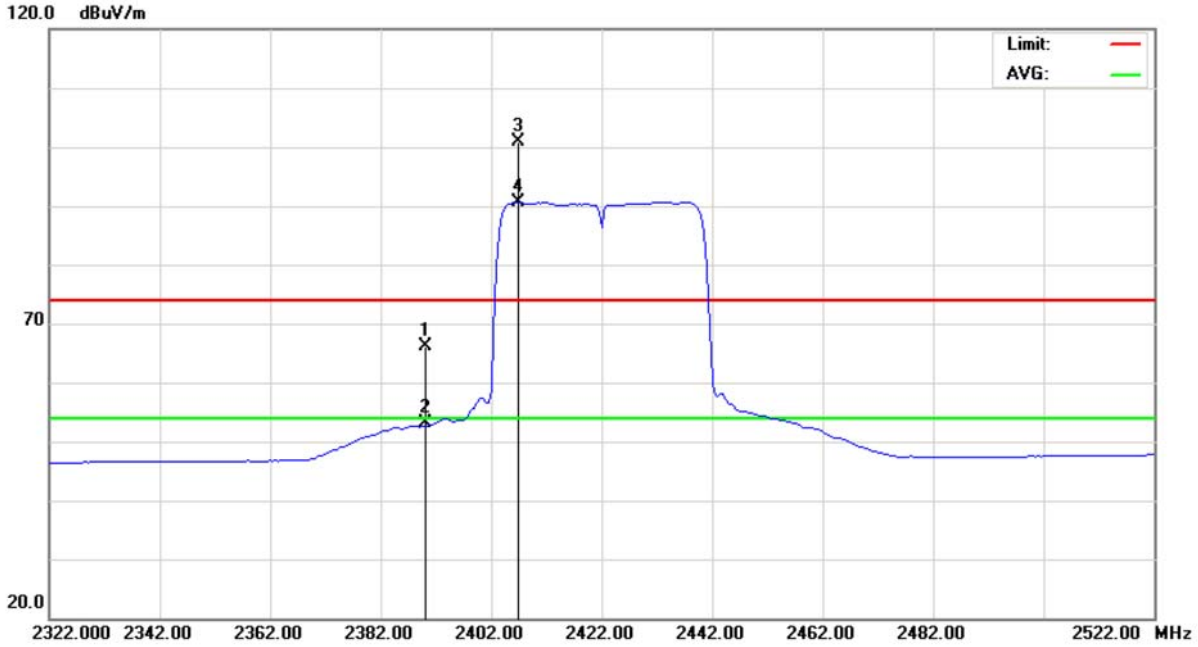
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4848.500	51.03	7.57	58.60	74.00	-15.40	peak	
2	*	4848.500	40.20	7.57	47.77	54.00	-6.23	AVG	
3		7266.000	42.33	14.95	57.28	74.00	-16.72	peak	
4		7266.000	30.52	14.95	45.47	54.00	-8.53	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

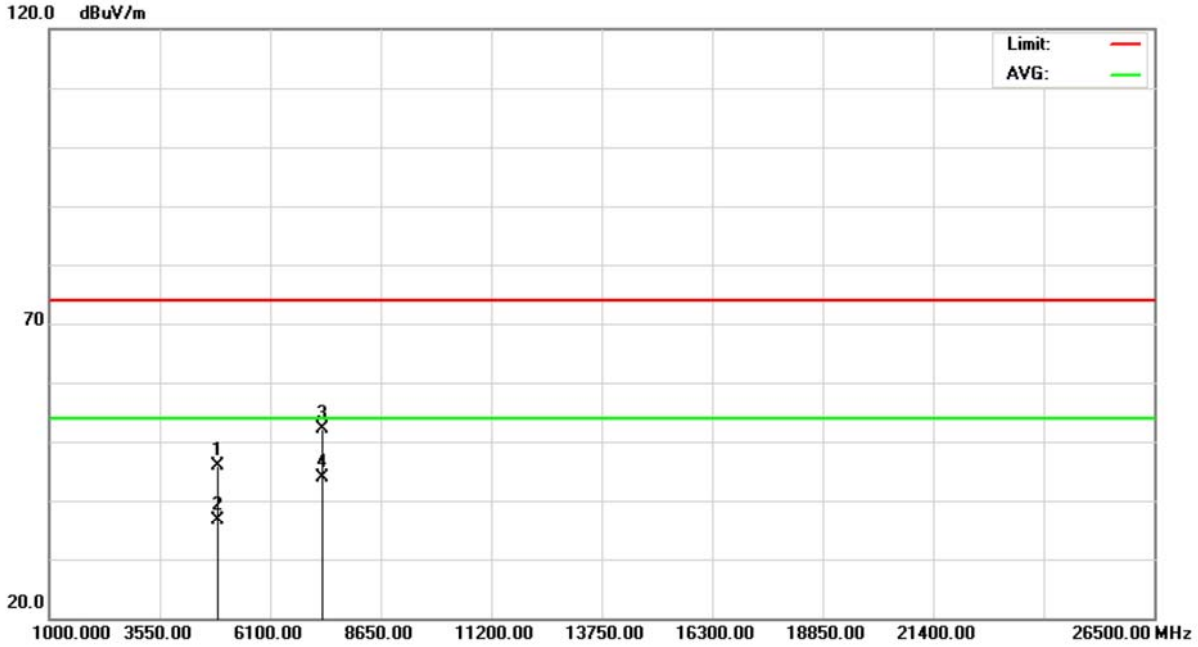
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	33.25	32.99	66.24	74.00	-7.76	peak	
2		2390.000	20.03	32.99	53.02	54.00	-0.98	AVG	
3	X	2407.000	67.85	33.08	100.93	74.00	26.93	peak	
4	*	2407.000	57.57	33.08	90.65	54.00	36.65	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

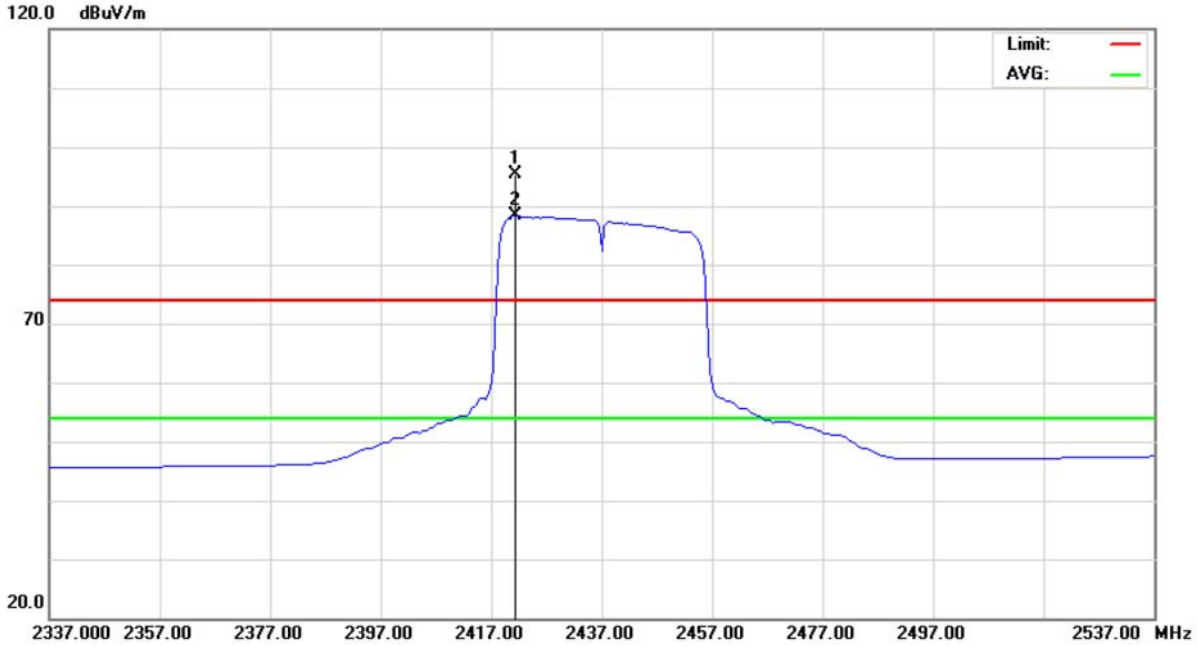
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4845.500	38.38	7.56	45.94	74.00	-28.06	peak	
2		4845.500	28.95	7.56	36.51	54.00	-17.49	AVG	
3		7268.500	37.21	14.95	52.16	74.00	-21.84	peak	
4	*	7268.500	28.84	14.95	43.79	54.00	-10.21	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

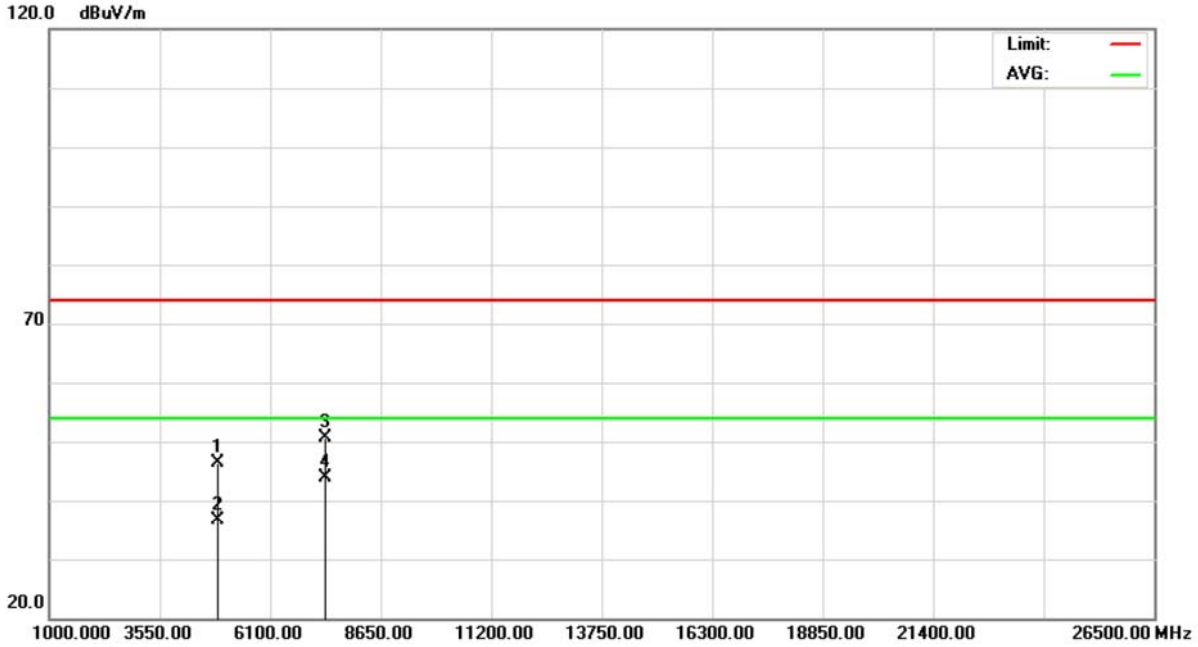
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2421.500	62.20	33.16	95.36	74.00	21.36	peak	
2	*	2421.500	55.25	33.16	88.41	54.00	34.41	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

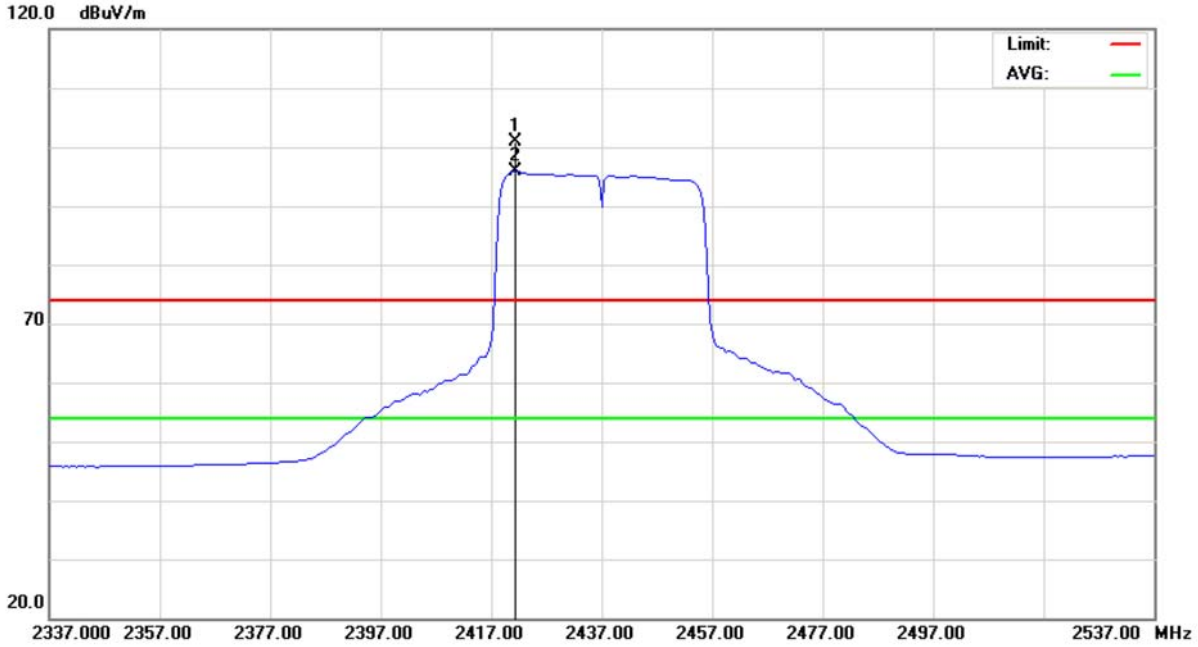
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4872.500	38.67	7.66	46.33	74.00	-27.67	peak	
2		4872.500	29.00	7.66	36.66	54.00	-17.34	AVG	
3		7312.000	35.55	15.07	50.62	74.00	-23.38	peak	
4	*	7312.000	28.70	15.07	43.77	54.00	-10.23	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

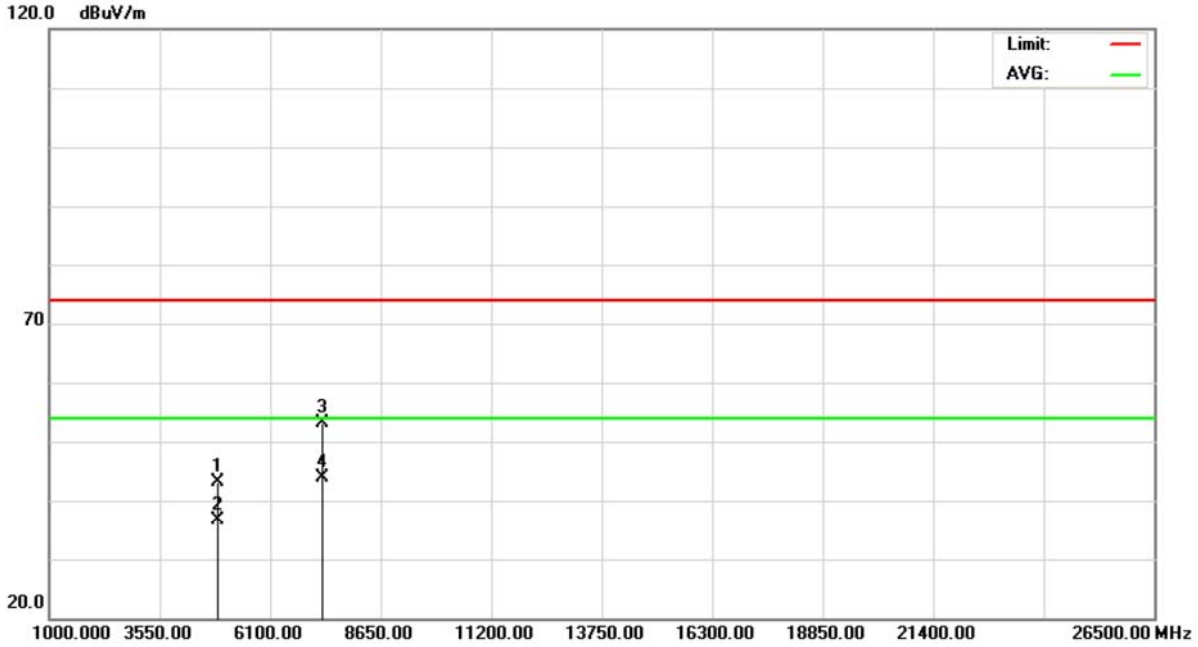
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2421.500	67.75	33.16	100.91	74.00	26.91	peak	
2	*	2421.500	62.76	33.16	95.92	54.00	41.92	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

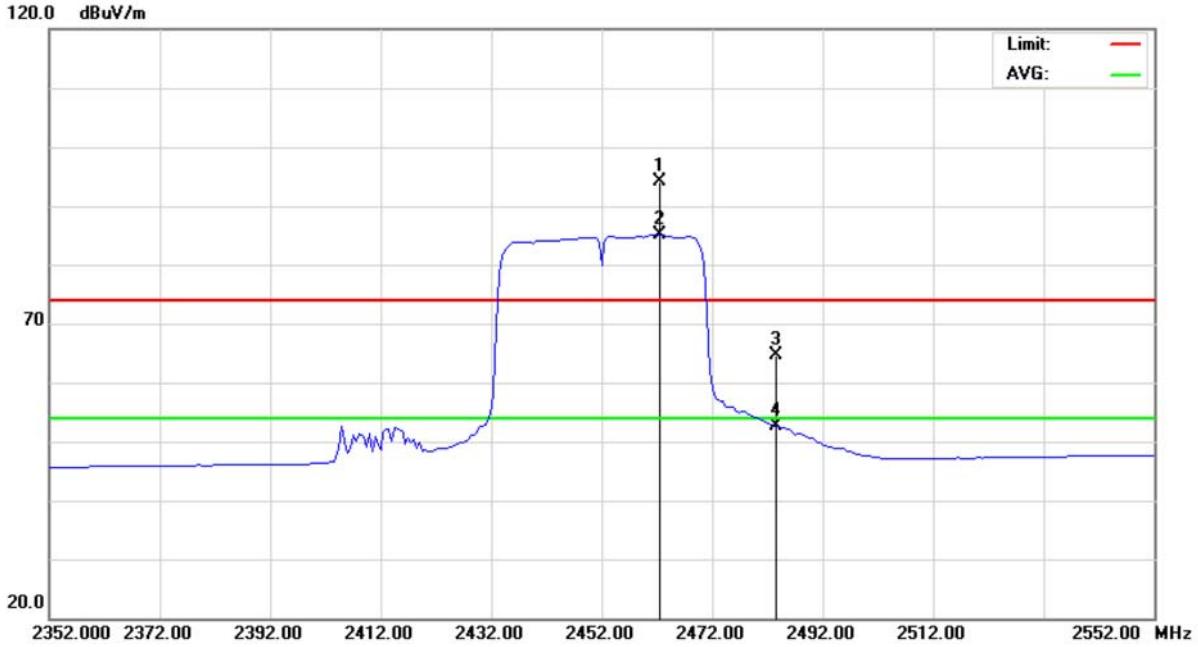
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4871.000	35.53	7.66	43.19	74.00	-30.81	peak	
2		4871.000	28.85	7.66	36.51	54.00	-17.49	AVG	
3		7309.000	38.08	15.06	53.14	74.00	-20.86	peak	
4	*	7309.000	28.74	15.06	43.80	54.00	-10.20	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

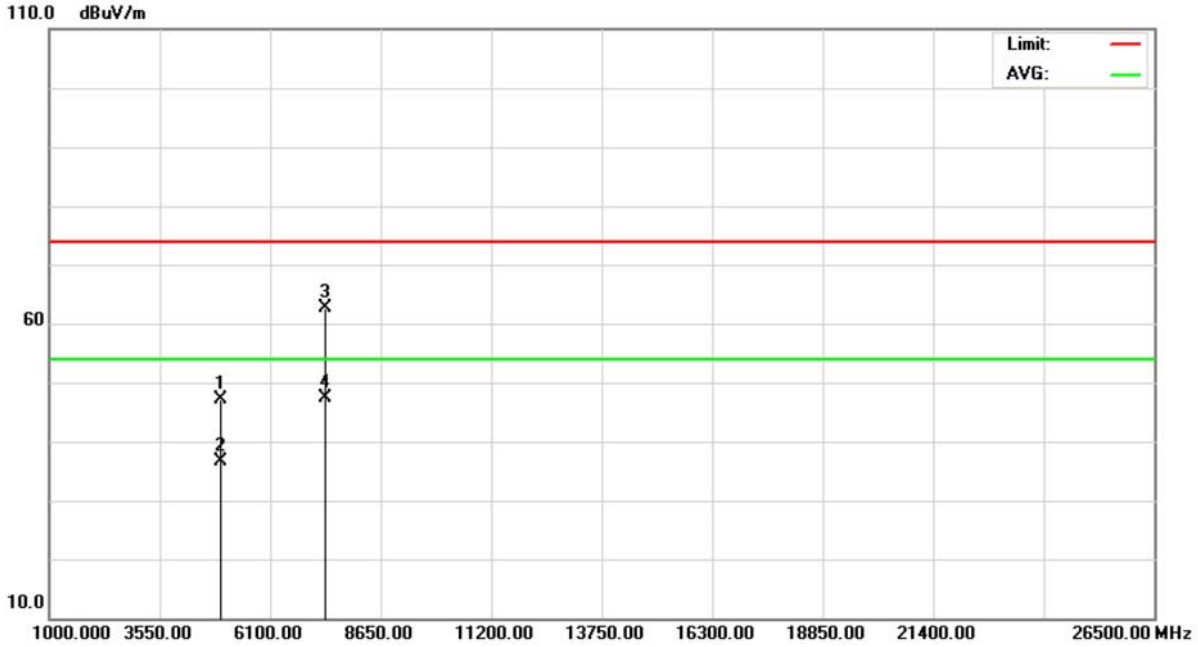
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2462.500	60.78	33.39	94.17	74.00	20.17	peak	
2	*	2462.500	51.68	33.39	85.07	54.00	31.07	AVG	
3		2483.500	31.11	33.50	64.61	74.00	-9.39	peak	
4		2483.500	19.02	33.50	52.52	54.00	-1.48	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

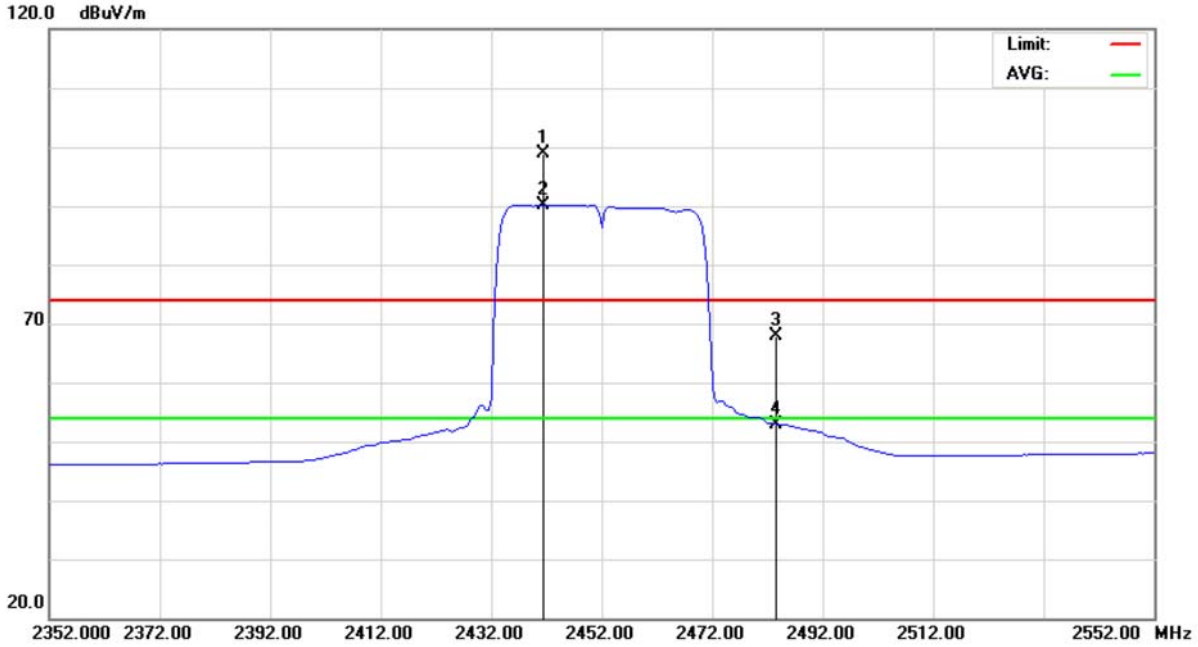
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4904.000	39.29	7.77	47.06	74.00	-26.94	peak	
2		4904.000	28.87	7.77	36.64	54.00	-17.36	AVG	
3		7356.000	47.33	15.18	62.51	74.00	-11.49	peak	
4	*	7356.000	32.22	15.18	47.40	54.00	-6.60	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

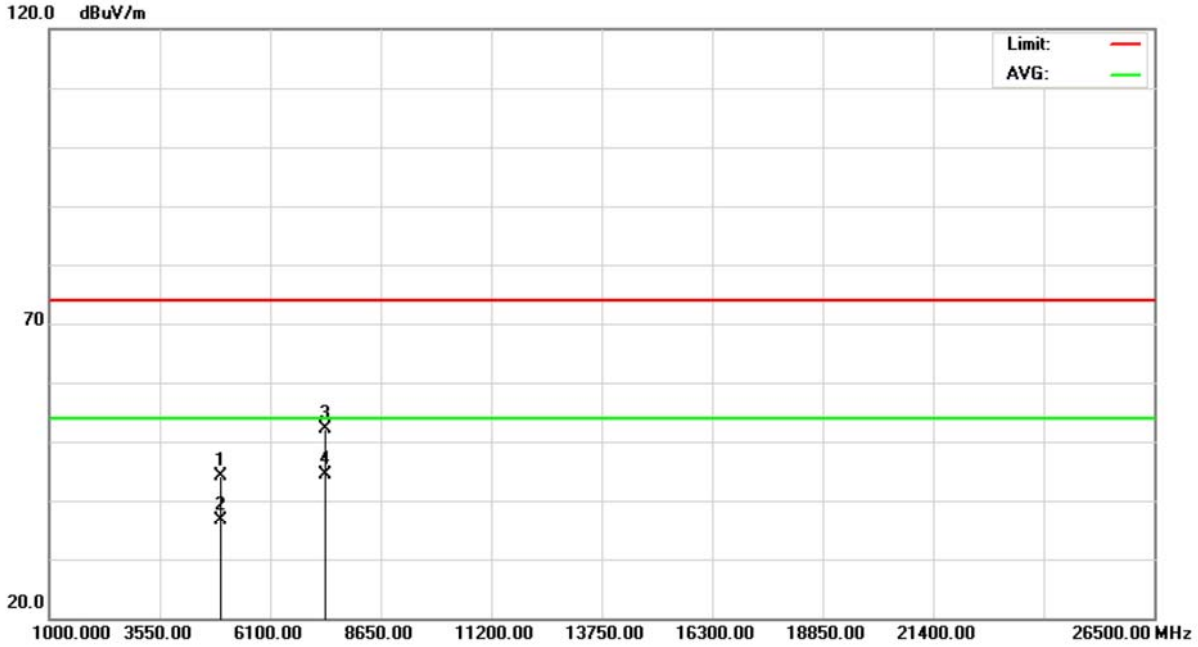
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.500	65.57	33.27	98.84	74.00	24.84	peak	
2	*	2441.500	56.96	33.27	90.23	54.00	36.23	AVG	
3		2483.500	34.38	33.50	67.88	74.00	-6.12	peak	
4		2483.500	19.44	33.50	52.94	54.00	-1.06	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

Polarization: Horizontal

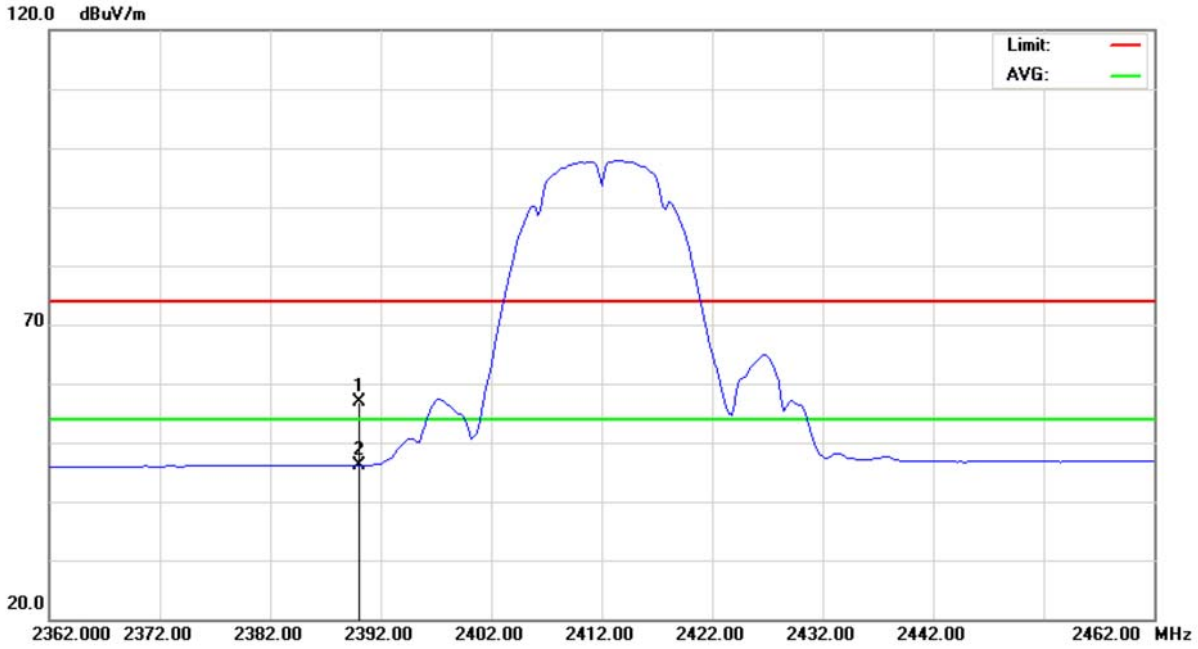


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4902.000	36.30	7.77	44.07	74.00	-29.93	peak	
2		4902.000	28.74	7.77	36.51	54.00	-17.49	AVG	
3		7357.500	37.03	15.19	52.22	74.00	-21.78	peak	
4	*	7357.500	29.10	15.19	44.29	54.00	-9.71	AVG	

9.9 TEST RESULTS (RESTRICTED BANDS)

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

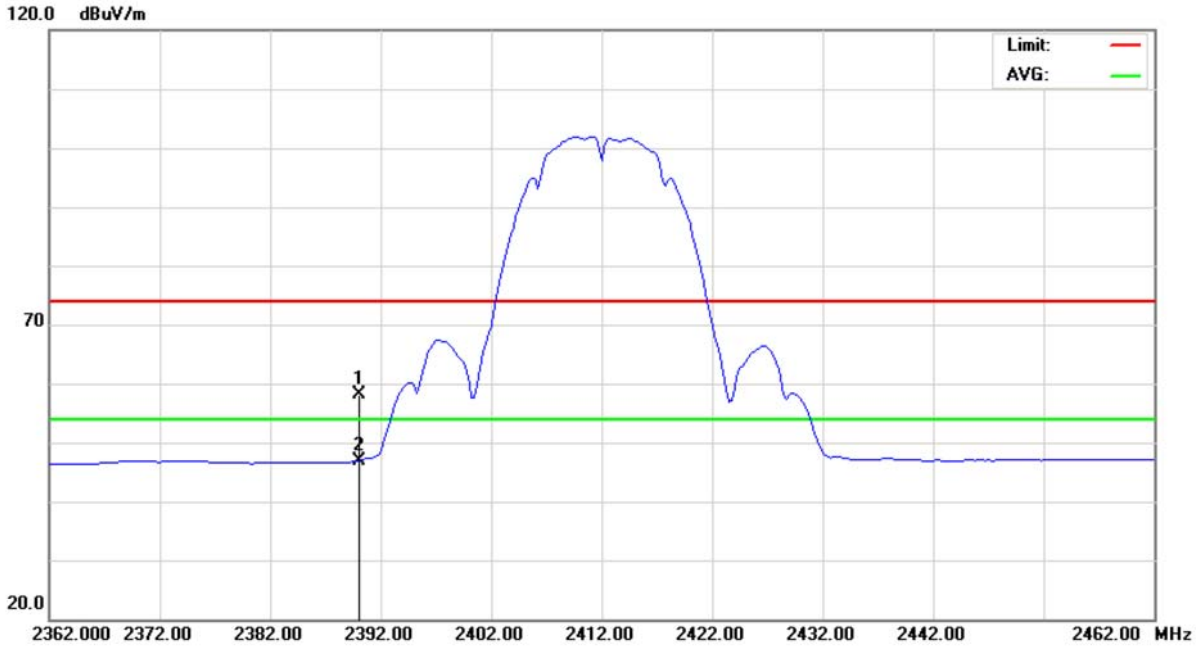
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.87	32.99	56.86	74.00	-17.14	peak	
2	*	2390.000	13.21	32.99	46.20	54.00	-7.80	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

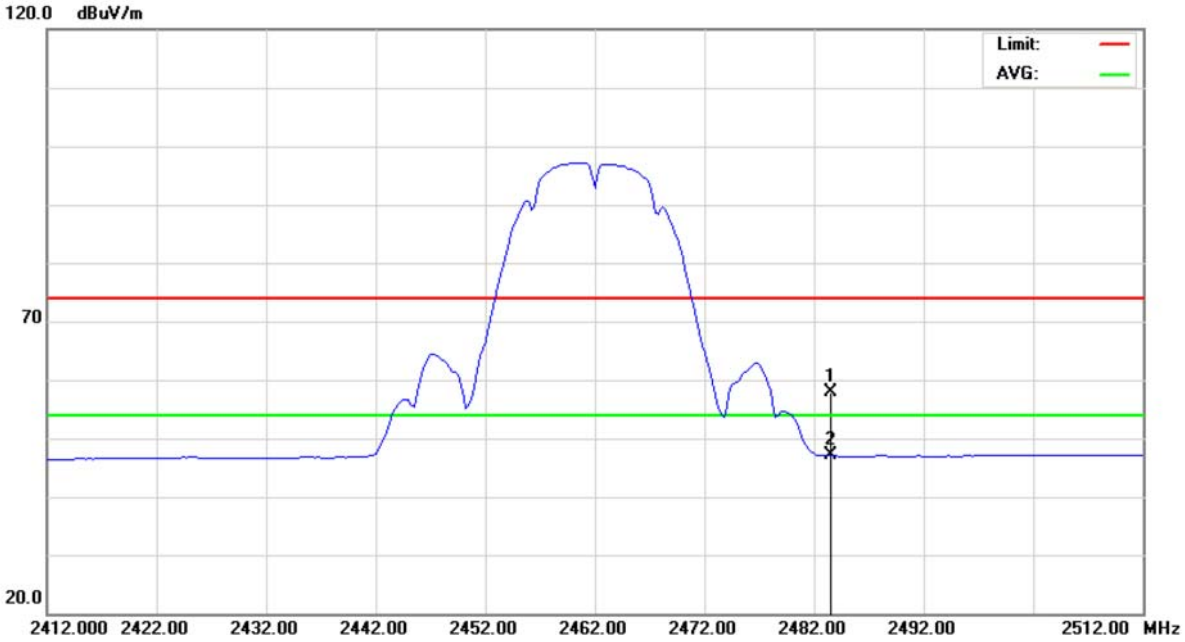
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	25.21	32.99	58.20	74.00	-15.80	peak	
2	*	2390.000	13.96	32.99	46.95	54.00	-7.05	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

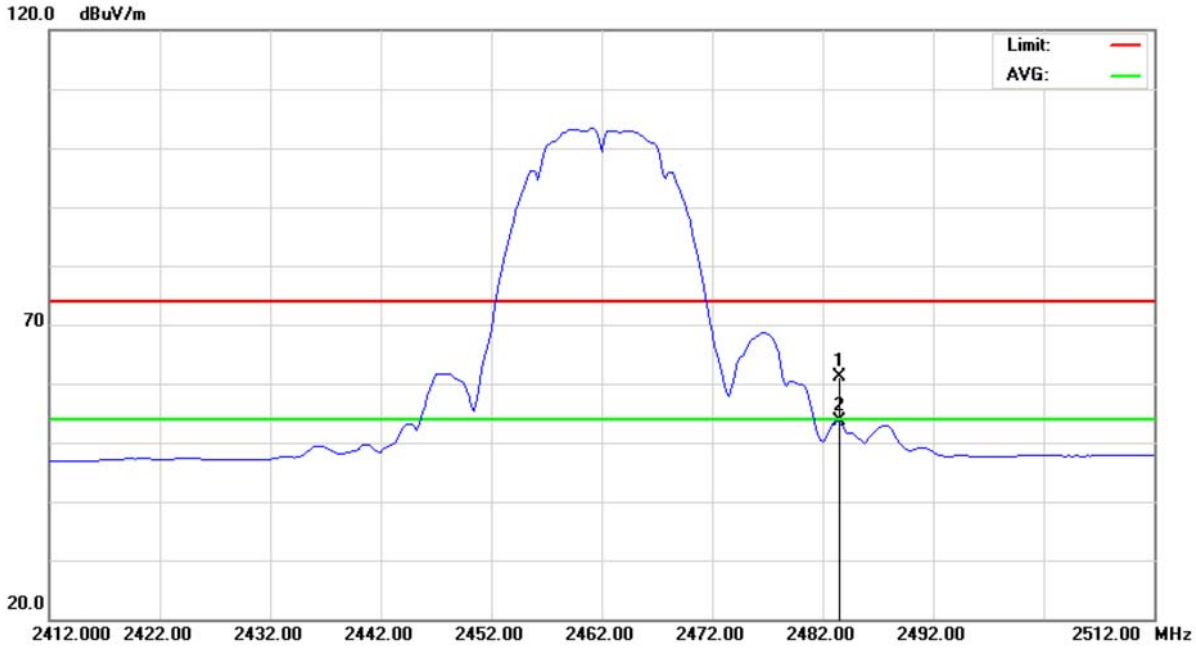
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.30	33.50	57.80	74.00	-16.20	peak	
2	*	2483.500	13.58	33.50	47.08	54.00	-6.92	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

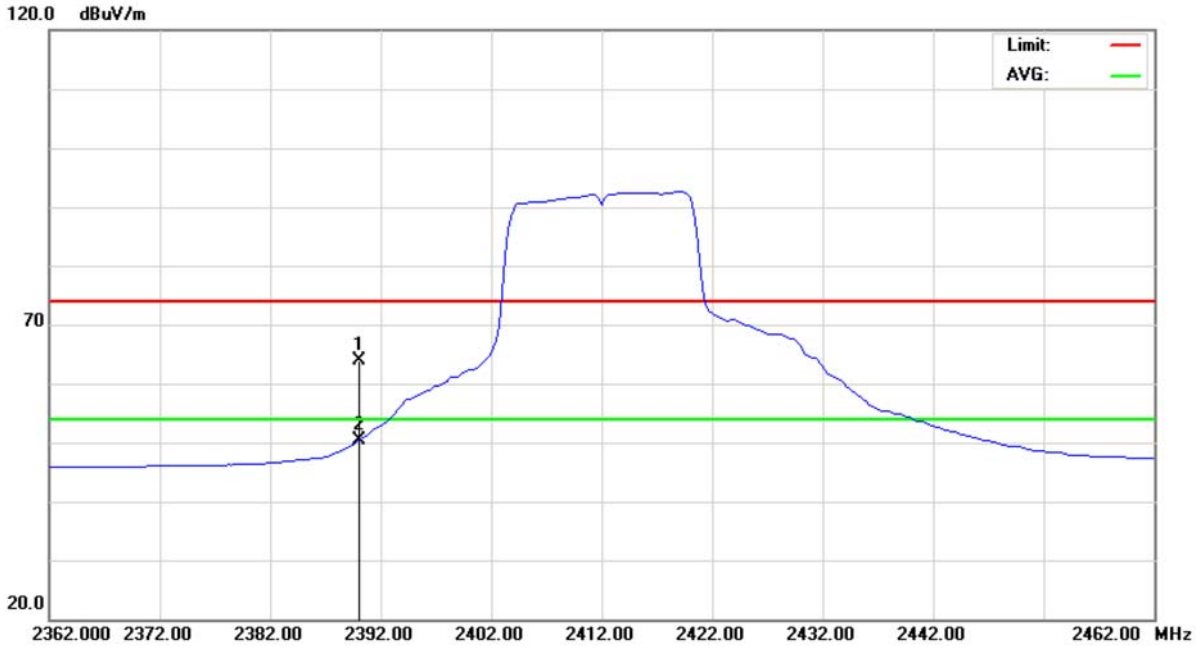
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	27.73	33.50	61.23	74.00	-12.77	peak	
2	*	2483.500	20.03	33.50	53.53	54.00	-0.47	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

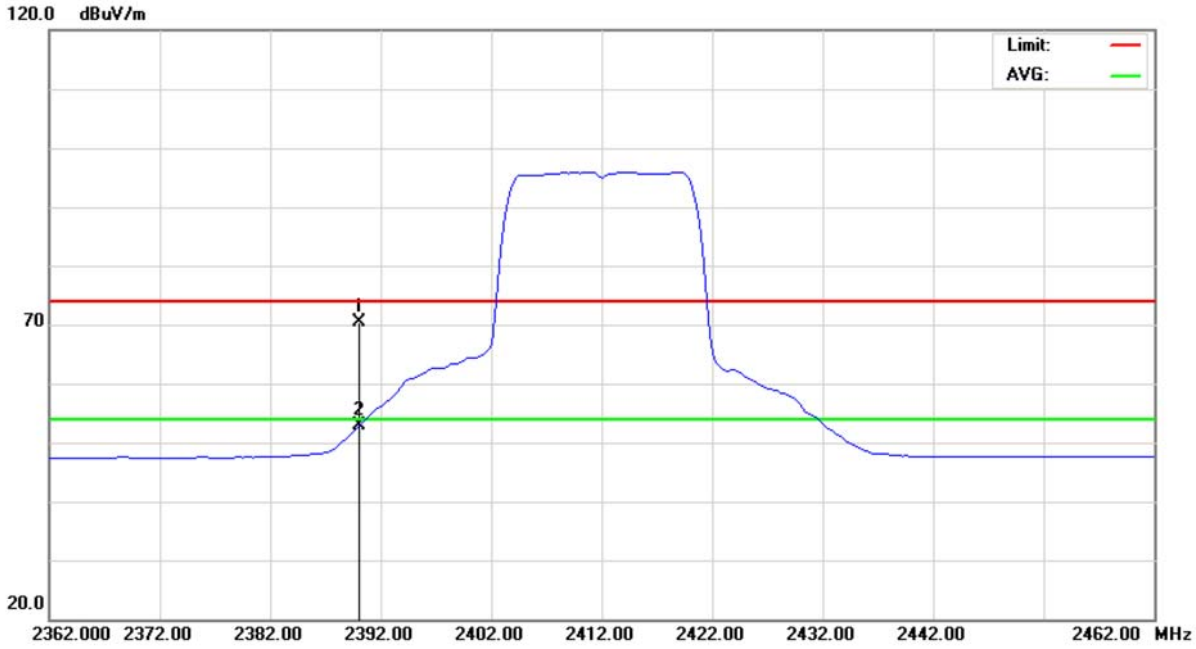
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	30.82	32.99	63.81	74.00	-10.19	peak	
2	*	2390.000	17.40	32.99	50.39	54.00	-3.61	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

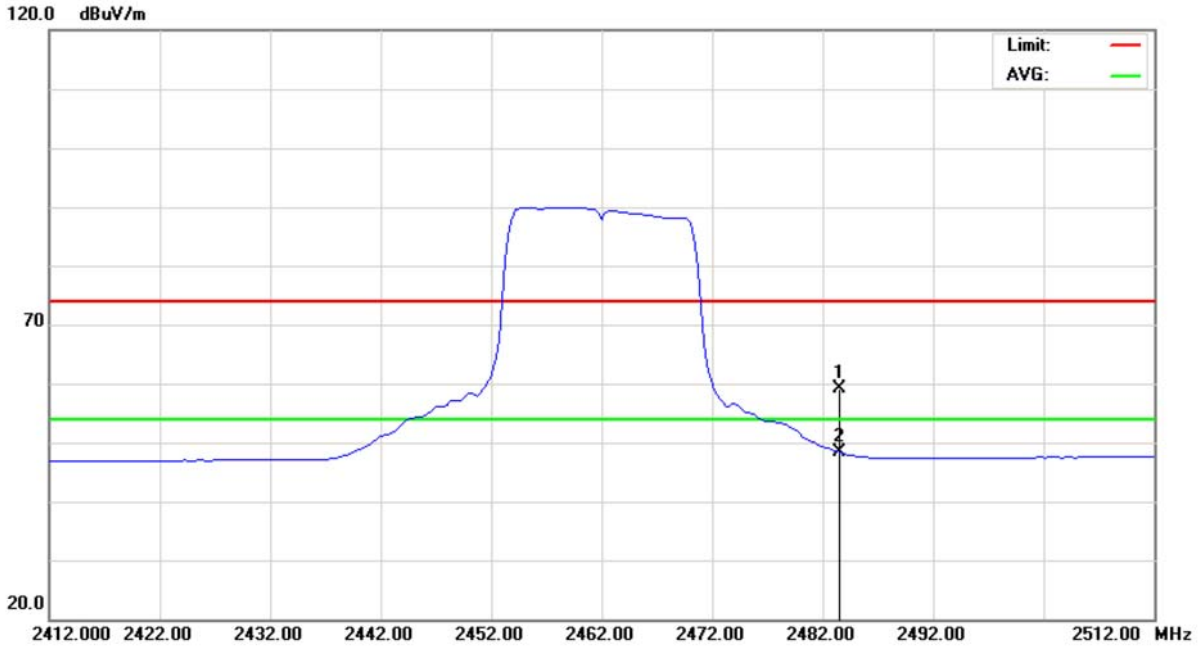
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	37.47	32.99	70.46	74.00	-3.54	peak	
2	*	2390.000	19.87	32.99	52.86	54.00	-1.14	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

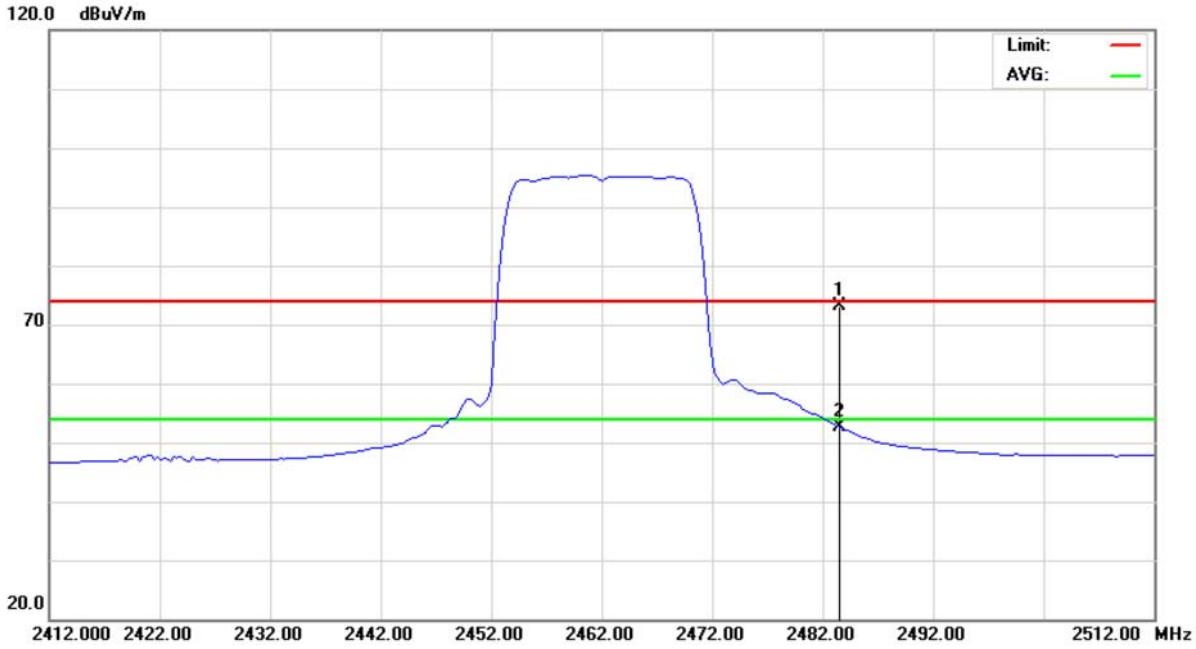
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	25.22	33.92	59.14	74.00	-14.86	peak	
2	*	2483.500	14.45	33.92	48.37	54.00	-5.63	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

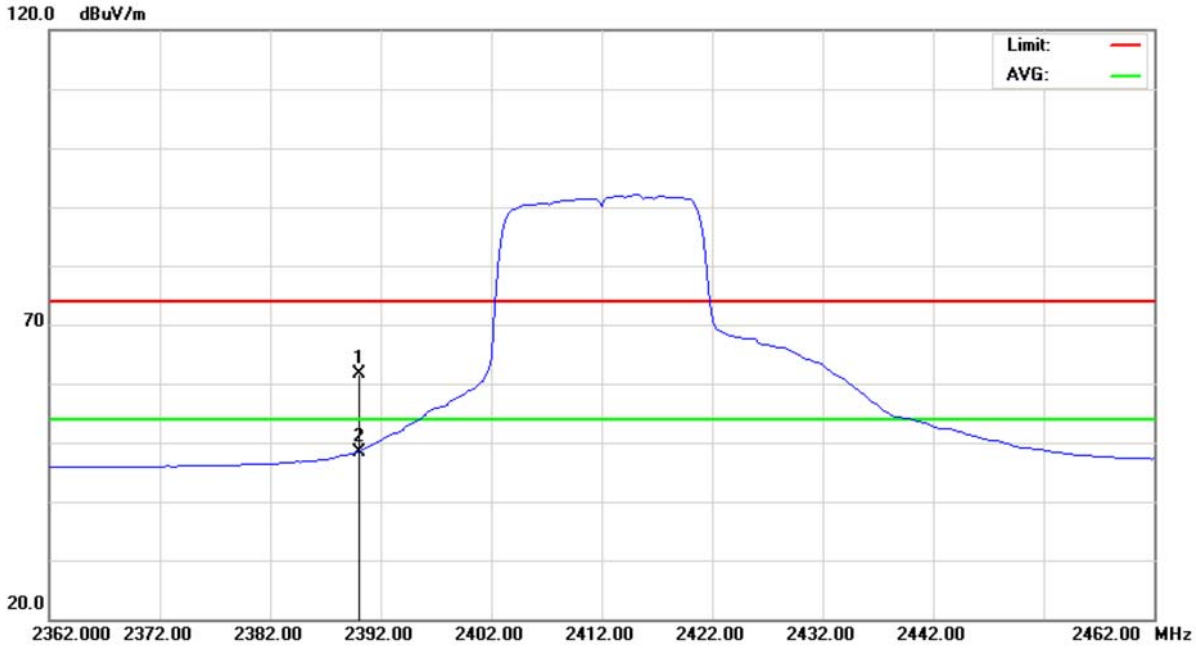
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	39.70	33.50	73.20	74.00	-0.80	peak	
2		2483.500	19.14	33.50	52.64	54.00	-1.36	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

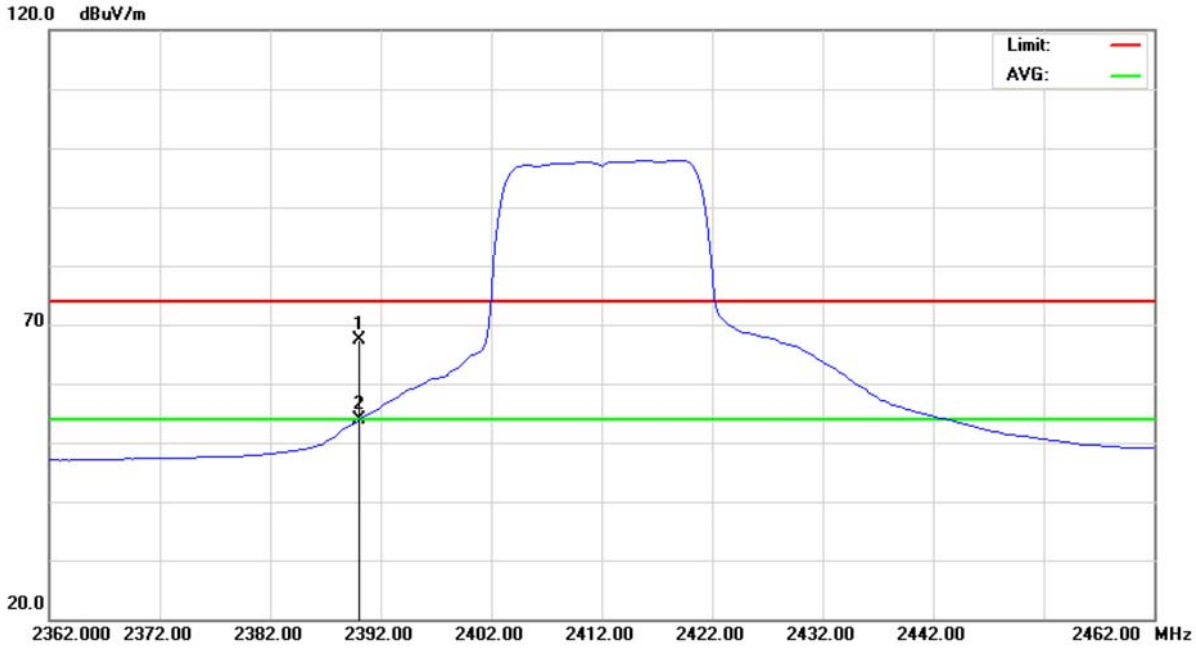
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	28.53	32.99	61.52	74.00	-12.48	peak	
2	*	2390.000	15.48	32.99	48.47	54.00	-5.53	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

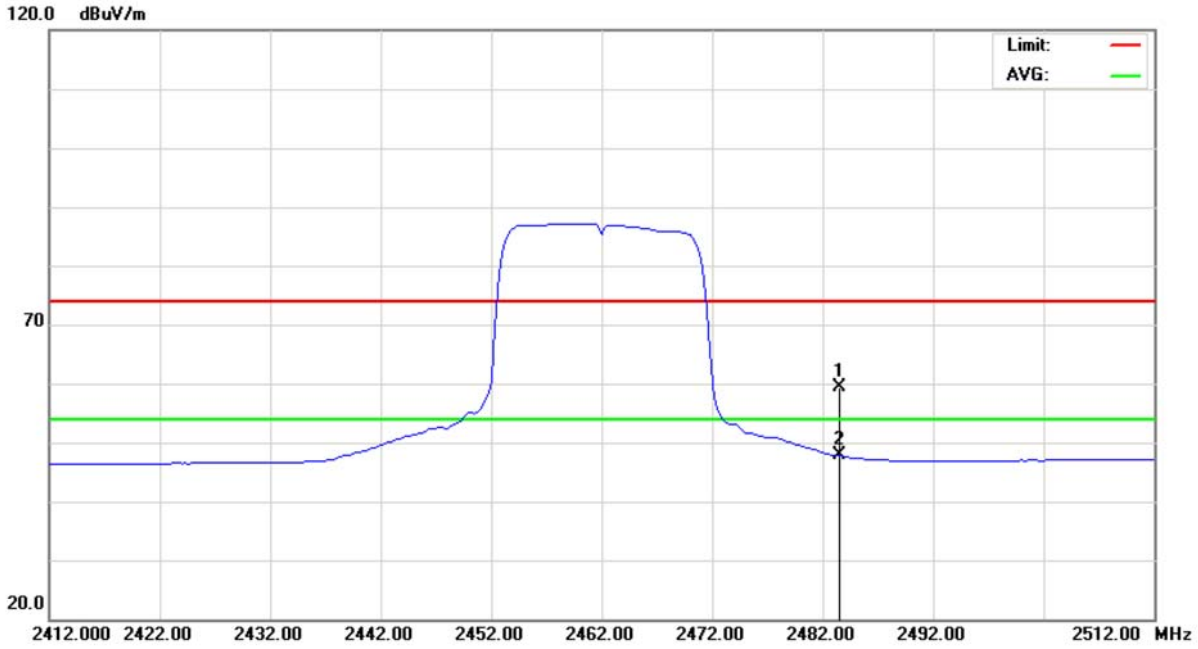
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	34.36	32.99	67.35	74.00	-6.65	peak	
2	*	2390.000	20.80	32.99	53.79	54.00	-0.21	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

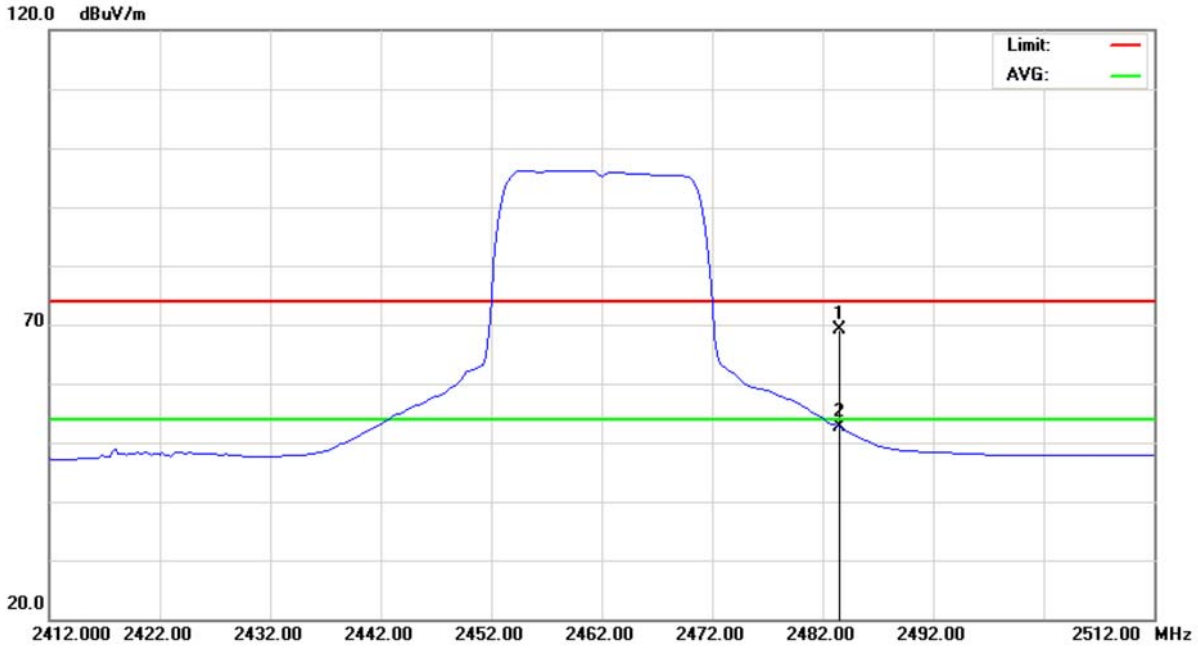
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	25.91	33.50	59.41	74.00	-14.59	peak	
2	*	2483.500	14.26	33.50	47.76	54.00	-6.24	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

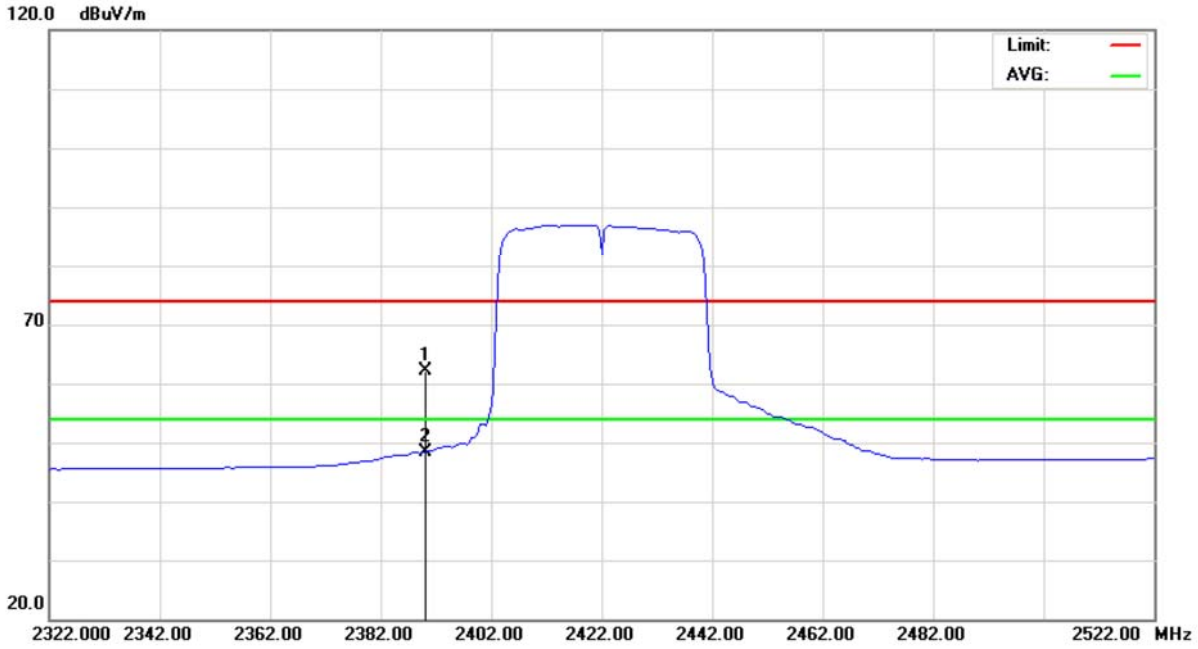
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	35.63	33.50	69.13	74.00	-4.87	peak	
2	*	2483.500	19.08	33.50	52.58	54.00	-1.42	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

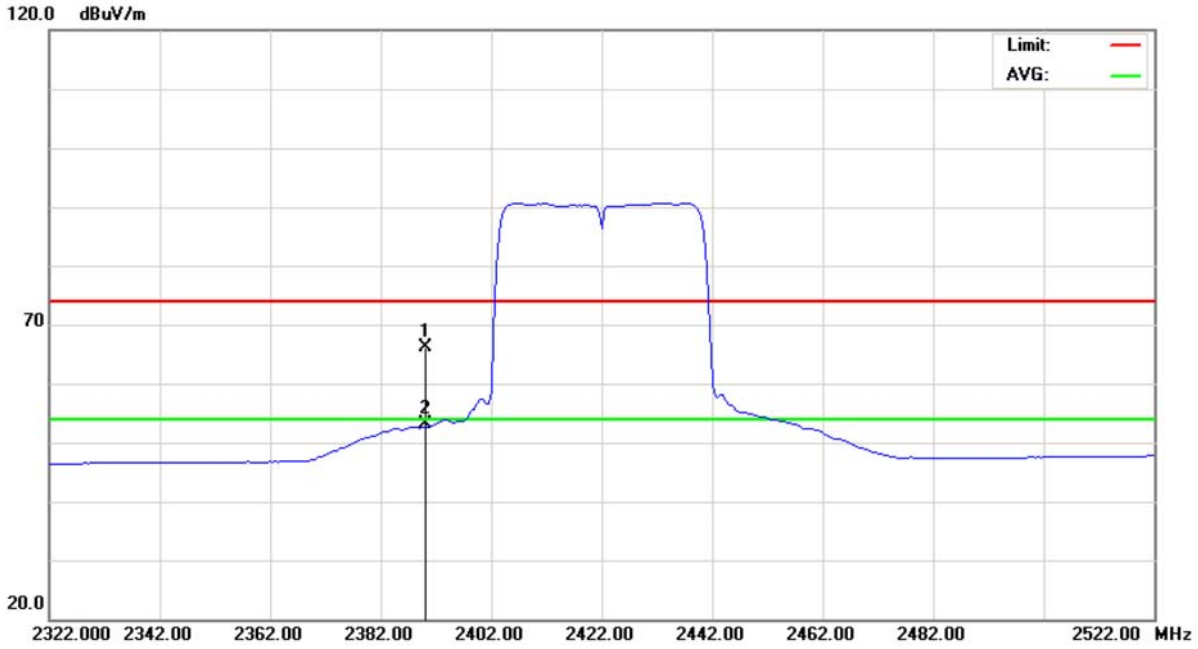
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	29.11	32.99	62.10	74.00	-11.90	peak	
2	*	2390.000	15.46	32.99	48.45	54.00	-5.55	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

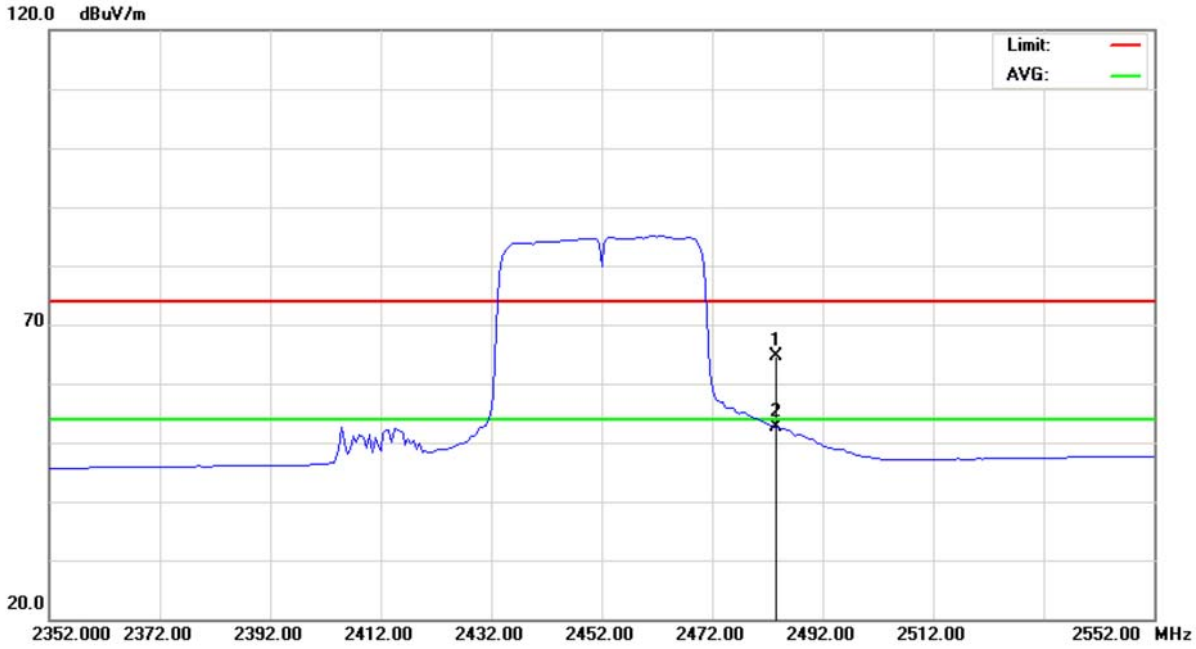
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	33.25	32.99	66.24	74.00	-7.76	peak	
2	*	2390.000	20.03	32.99	53.02	54.00	-0.98	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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.		

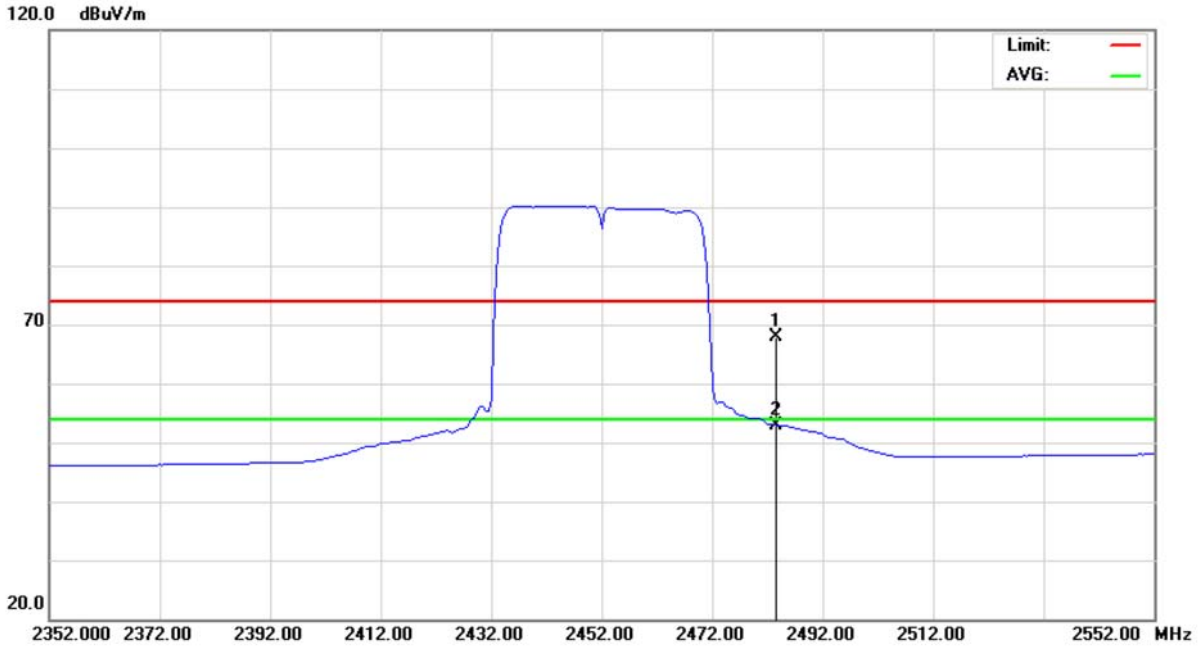
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	31.11	33.50	64.61	74.00	-9.39	peak	
2	*	2483.500	19.02	33.50	52.52	54.00	-1.48	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	34.38	33.50	67.88	74.00	-6.12	peak	
2	*	2483.500	19.44	33.50	52.94	54.00	-1.06	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

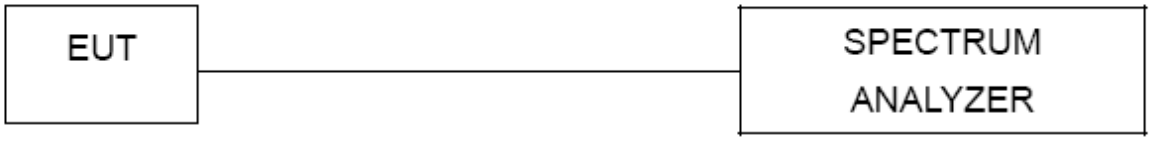
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

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

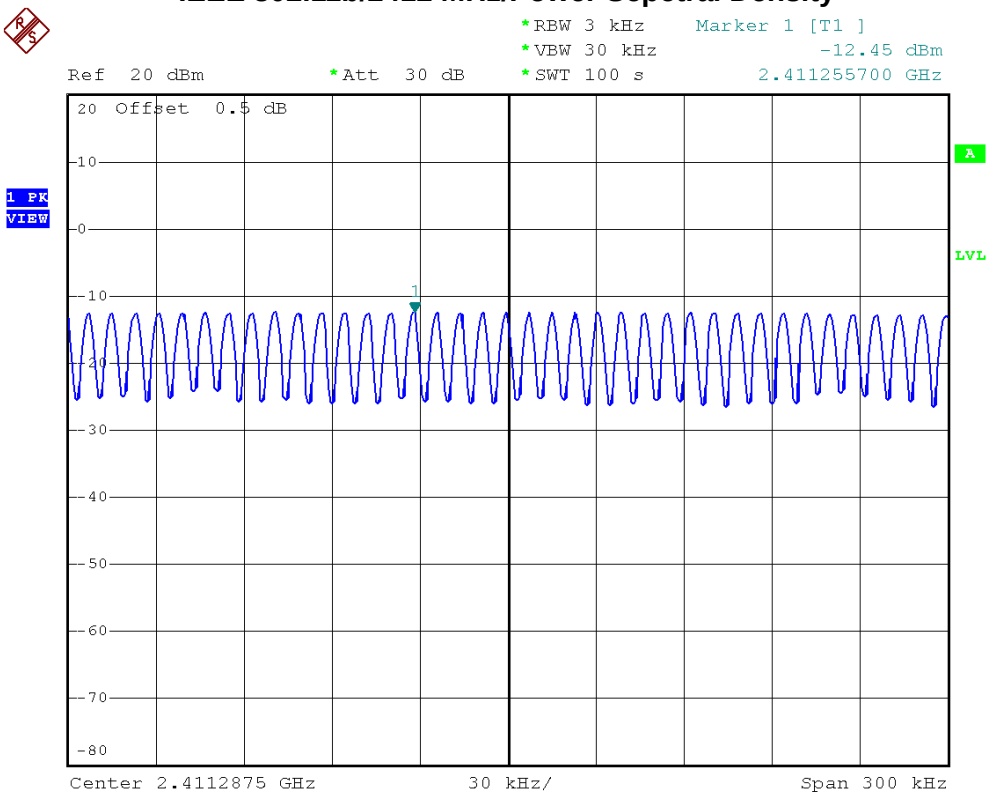
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

10.7TEST RESULTS

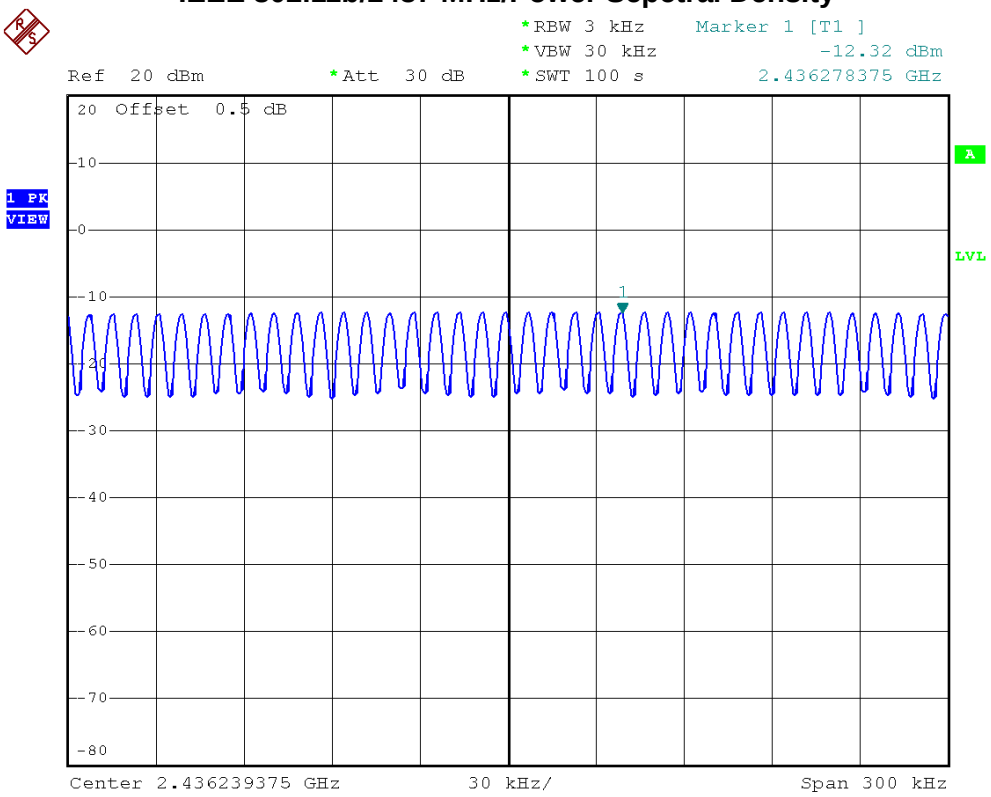
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-12.45	8	PASS
2437 MHz	-12.32	8	PASS
2462 MHz	-12.22	8	PASS

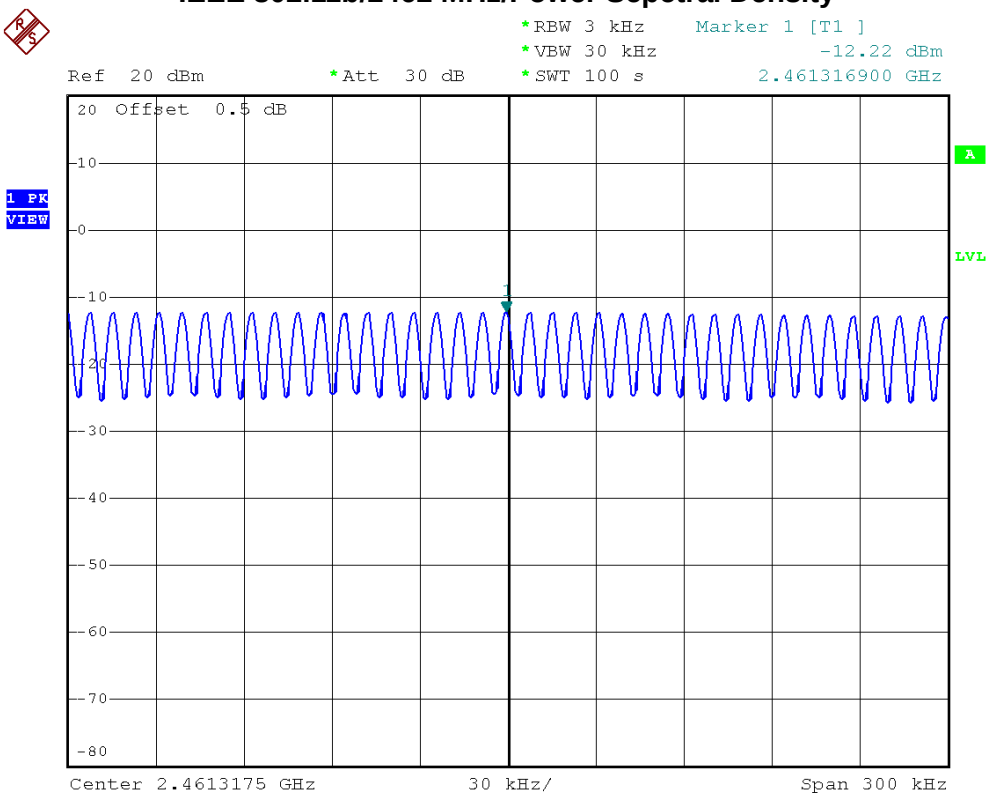
IEEE 802.11b/2412 MHz/Power Sepctral Density



IEEE 802.11b/2437 MHz/Power Sepctral Density



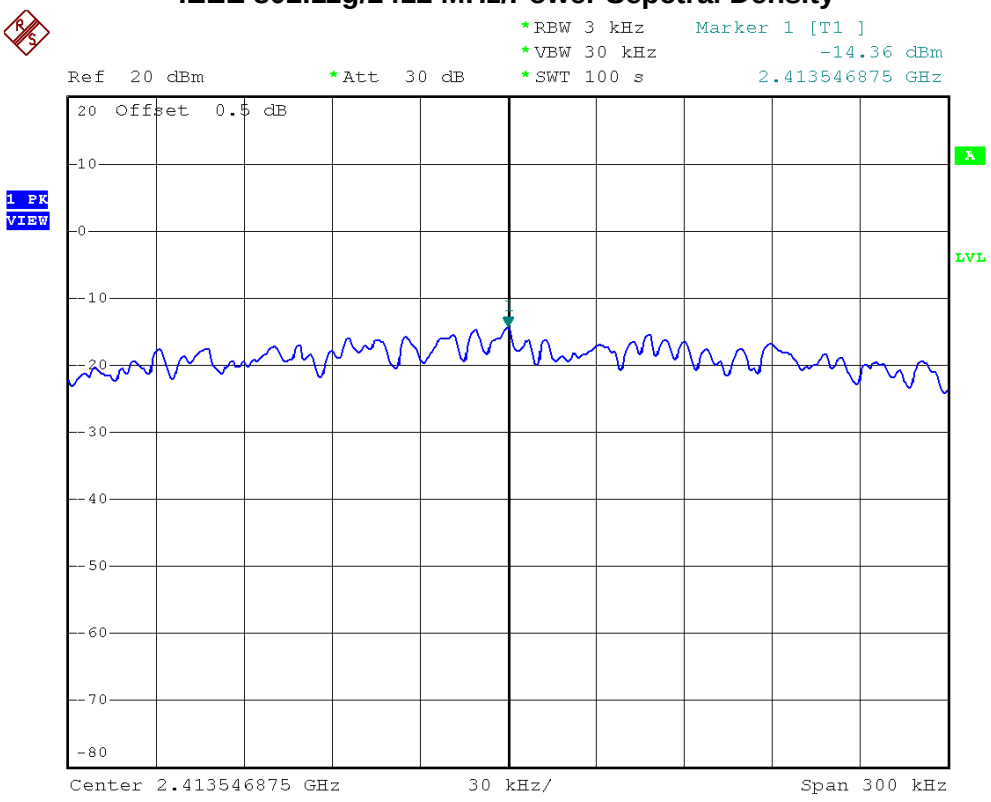
IEEE 802.11b/2462 MHz/Power Sepctral Density



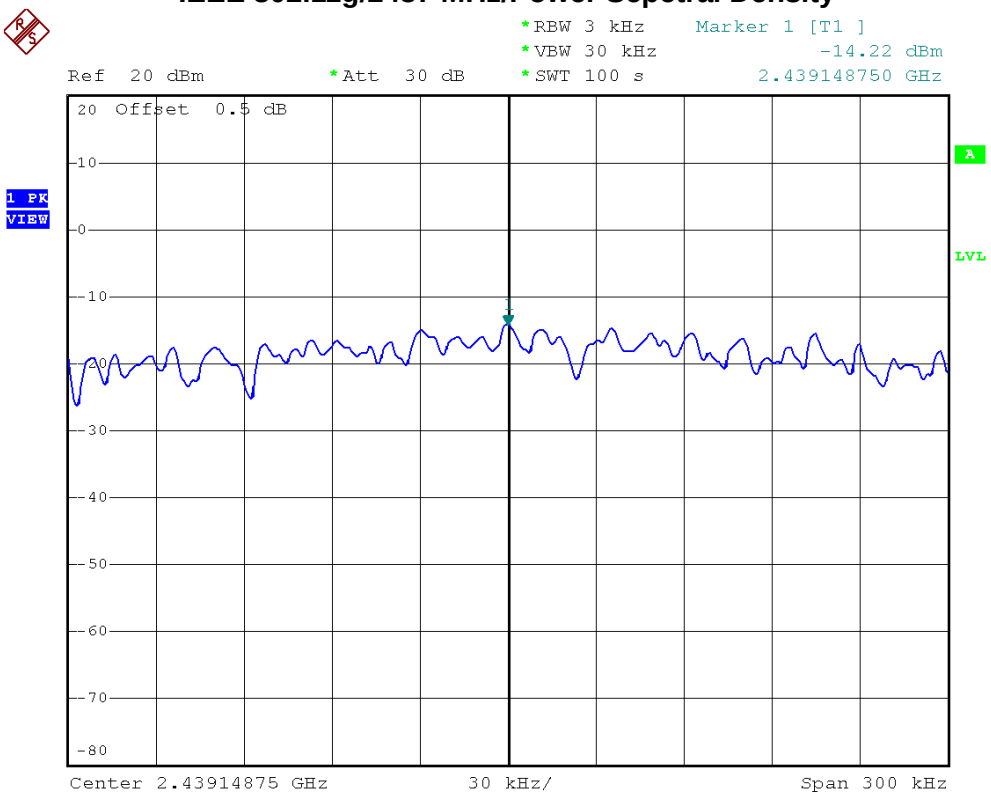
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-14.36	8	PASS
2437 MHz	-14.22	8	PASS
2462 MHz	-15.91	8	PASS

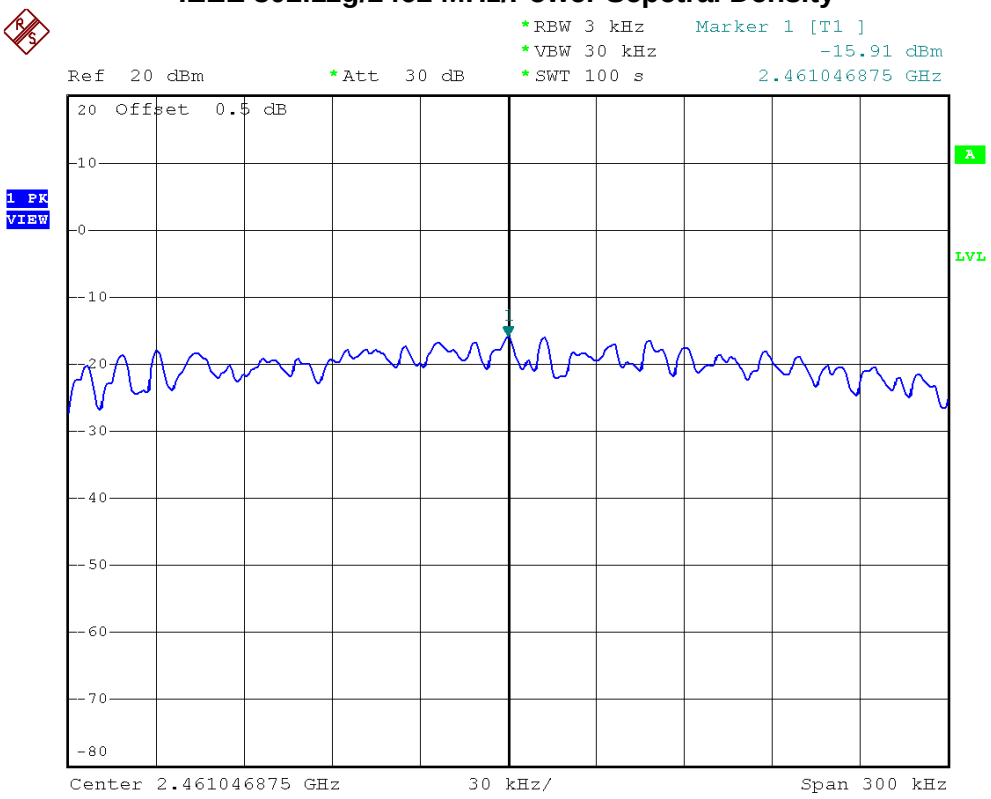
IEEE 802.11g/2412 MHz/Power Sepctral Density



IEEE 802.11g/2437 MHz/Power Sepctral Density



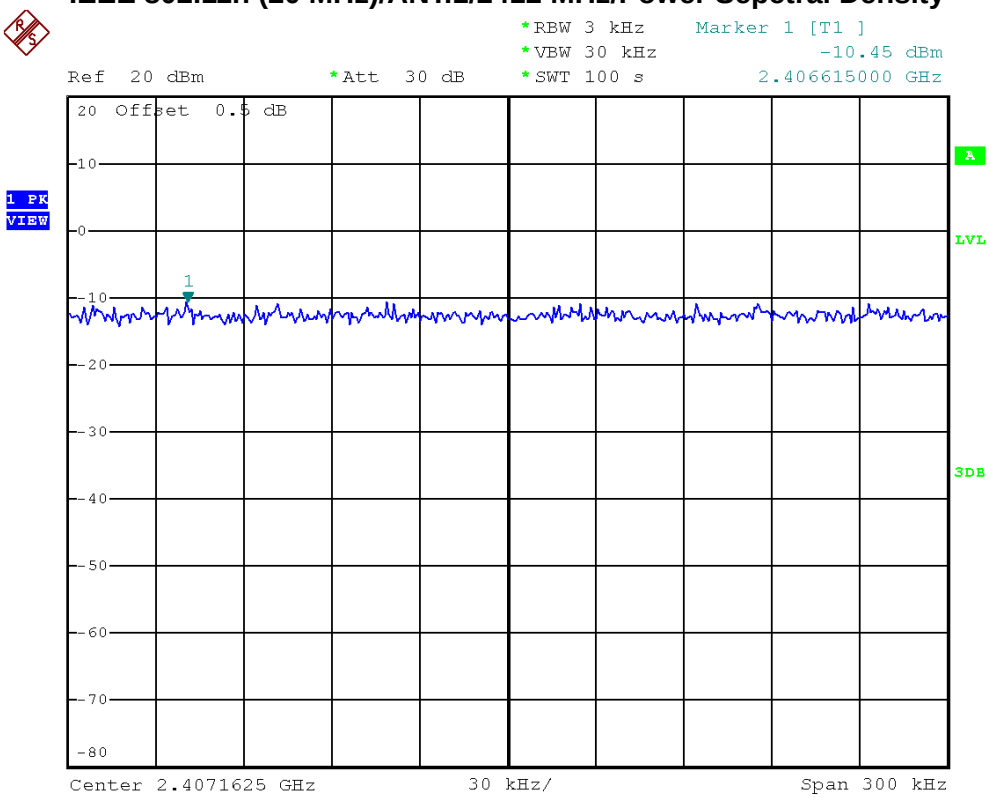
IEEE 802.11g/2462 MHz/Power Sepctral Density



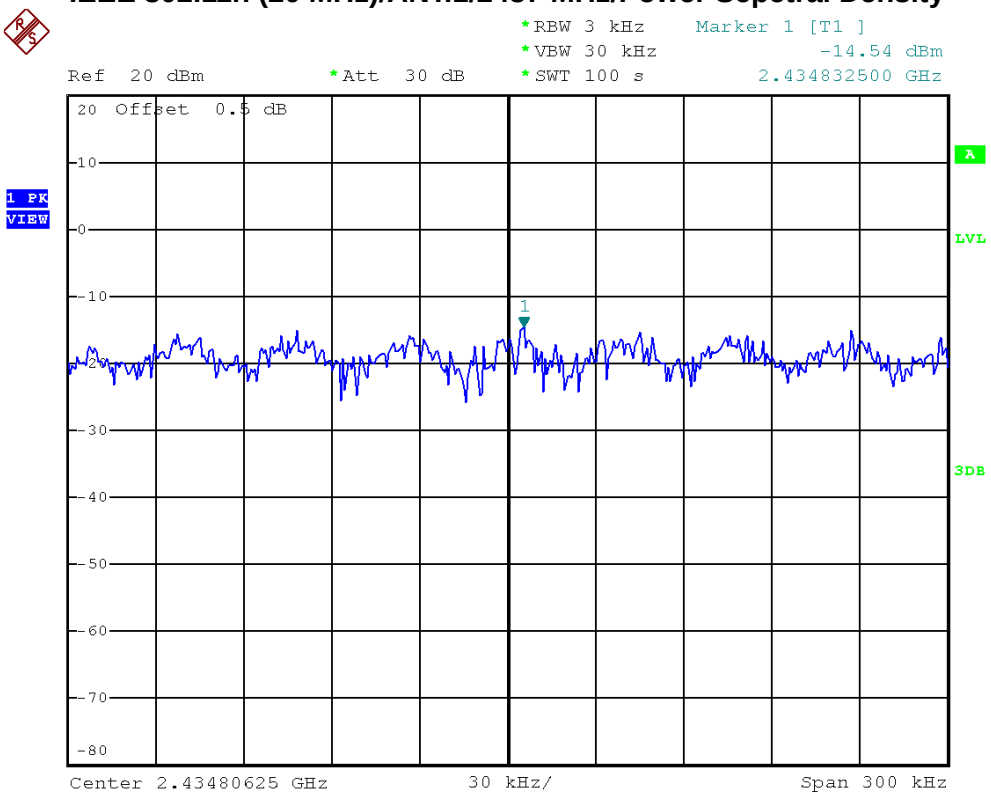
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-10.45	8	PASS
2437 MHz	-14.54	8	PASS
2462 MHz	-15.99	8	PASS

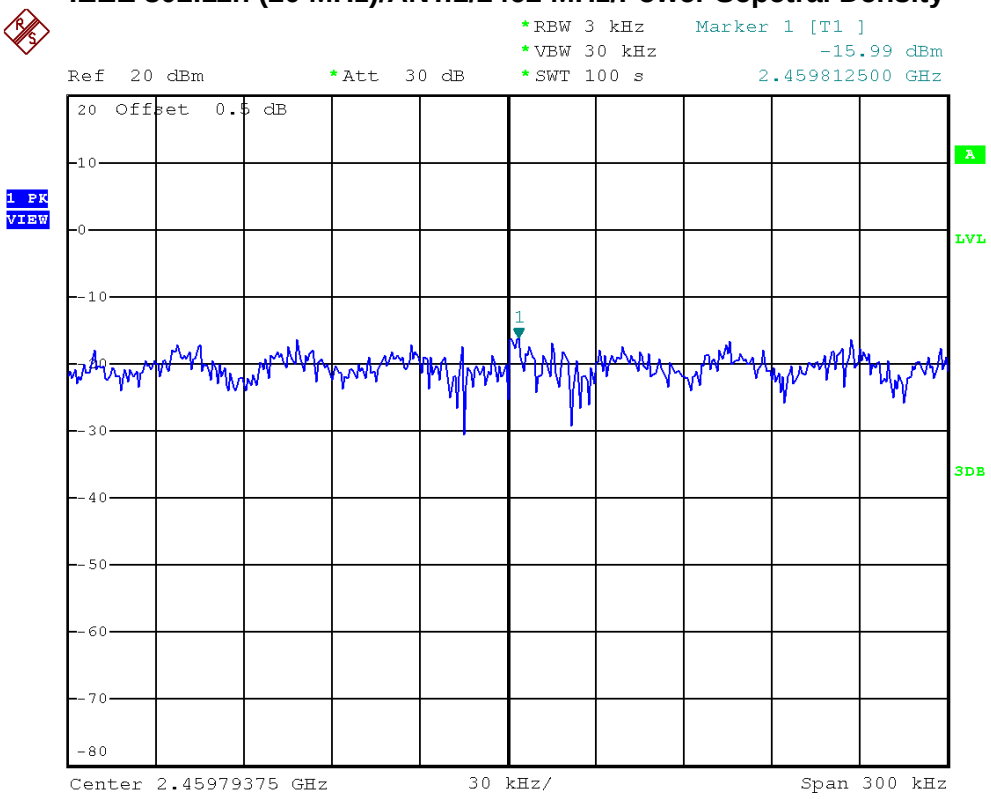
IEEE 802.11n (20 MHz)/ANT.1/2412 MHz/Power Sepctral Density



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



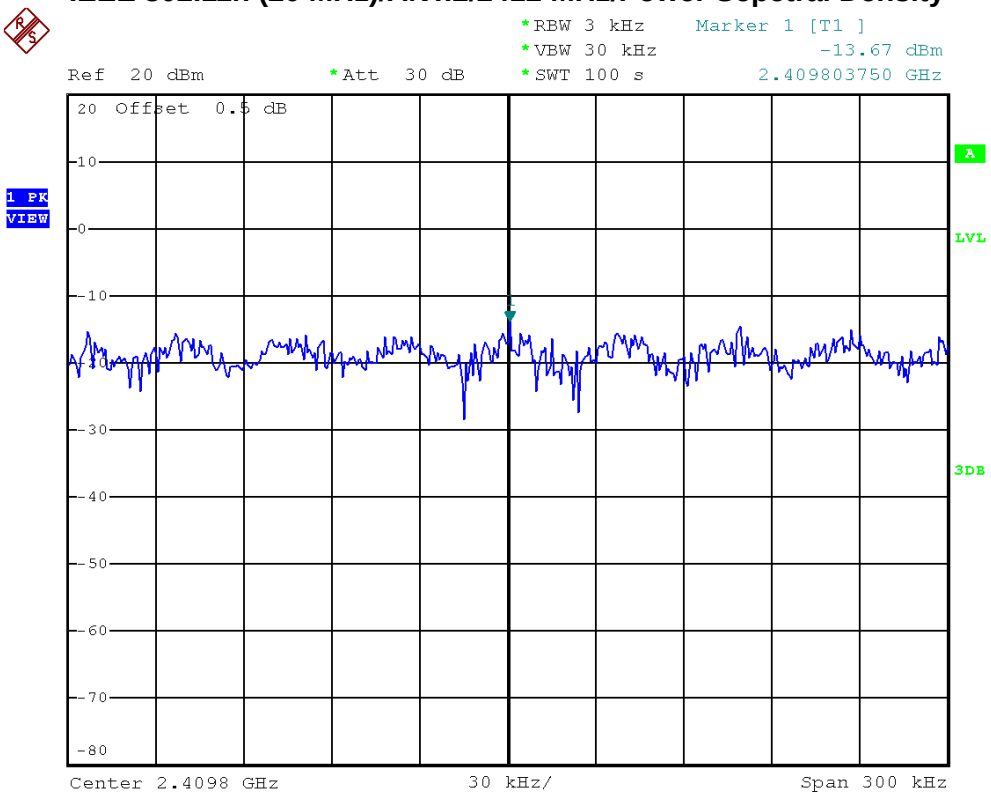
IEEE 802.11n (20 MHz)/ANT.1/2462 MHz/Power Sepctral Density



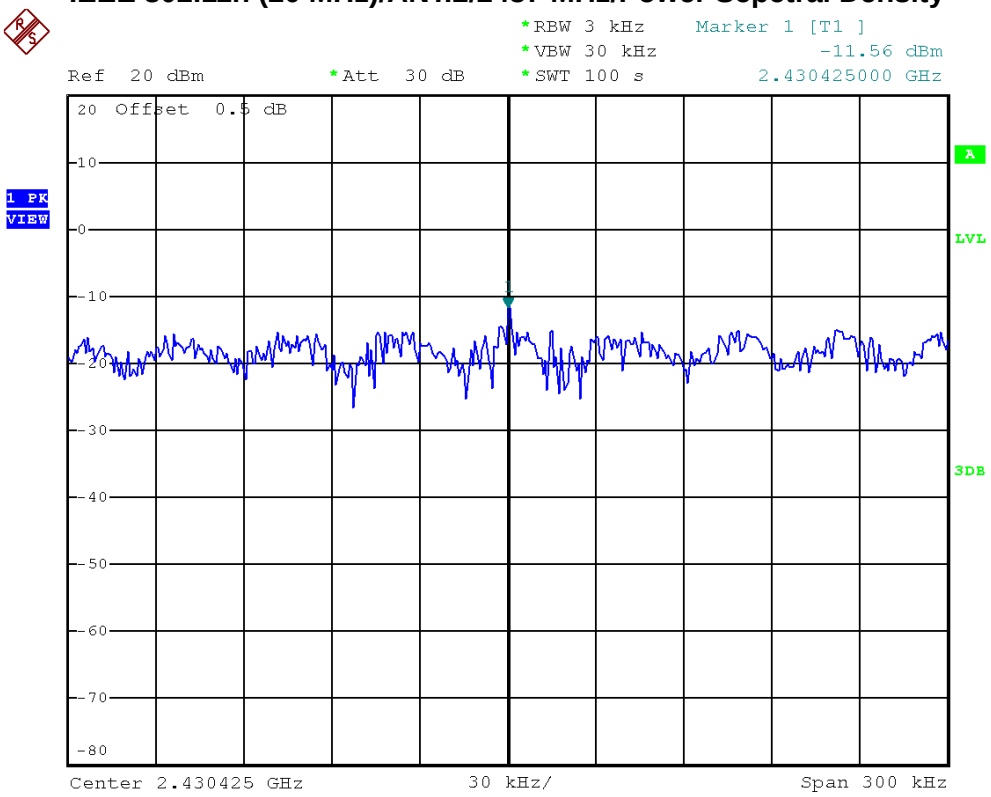
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-13.67	8	PASS
2437 MHz	-11.56	8	PASS
2462 MHz	-16.45	8	PASS

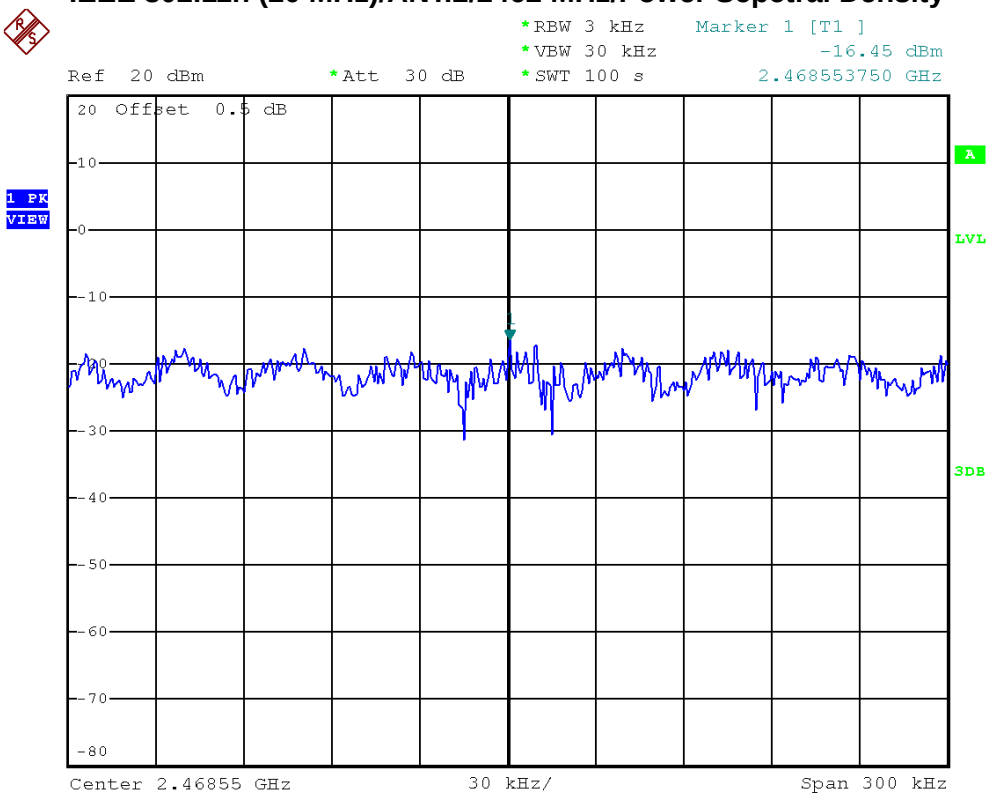
IEEE 802.11n (20 MHz)/ANT.2/2412 MHz/Power Sepctral Density



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



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



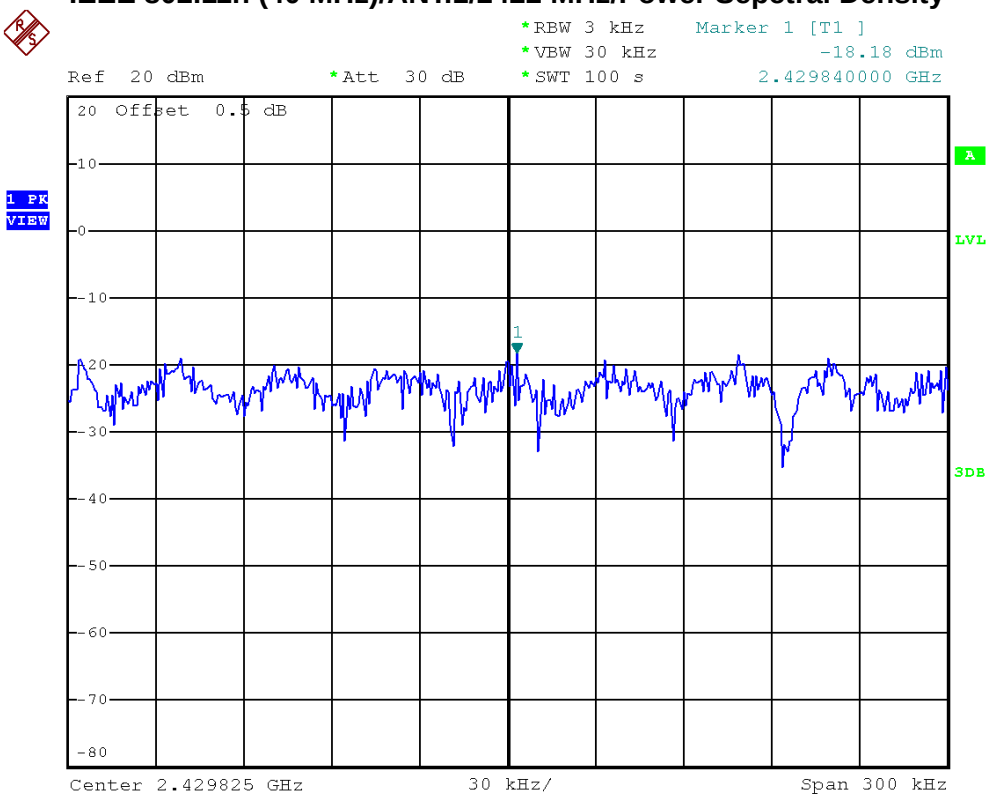
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.Total/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-8.76	8	PASS
2437 MHz	-9.79	8	PASS
2462 MHz	-13.20	8	PASS

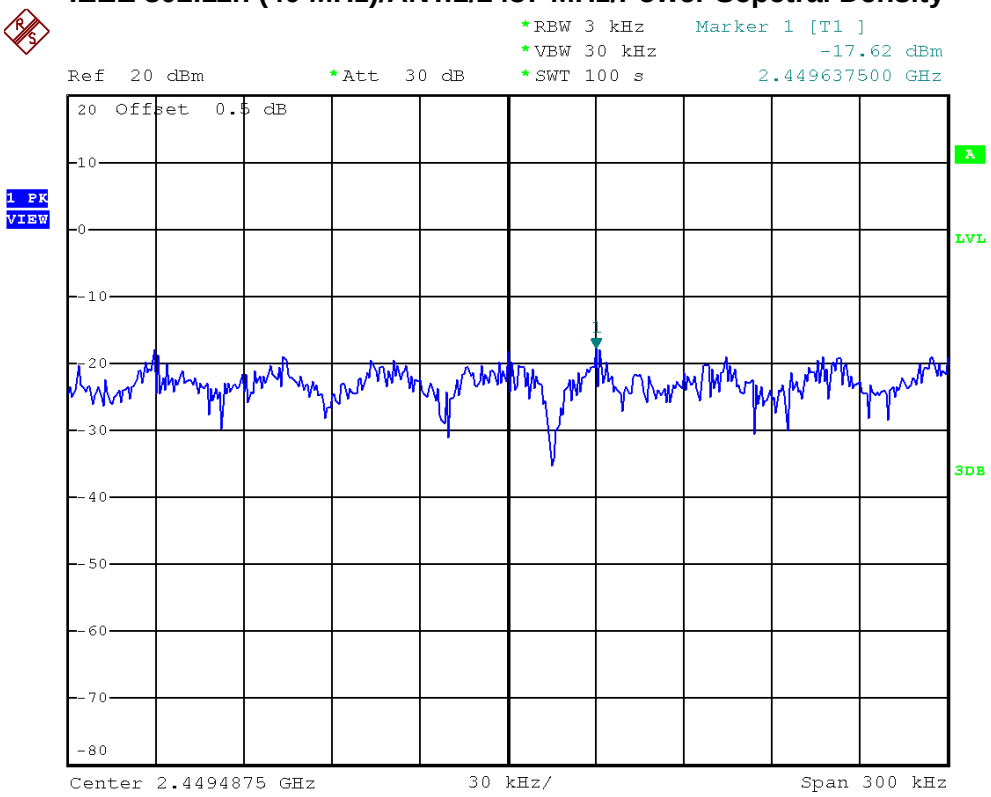
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2422 MHz	-18.18	8	PASS
2437 MHz	-17.62	8	PASS
2452 MHz	-21.51	8	PASS

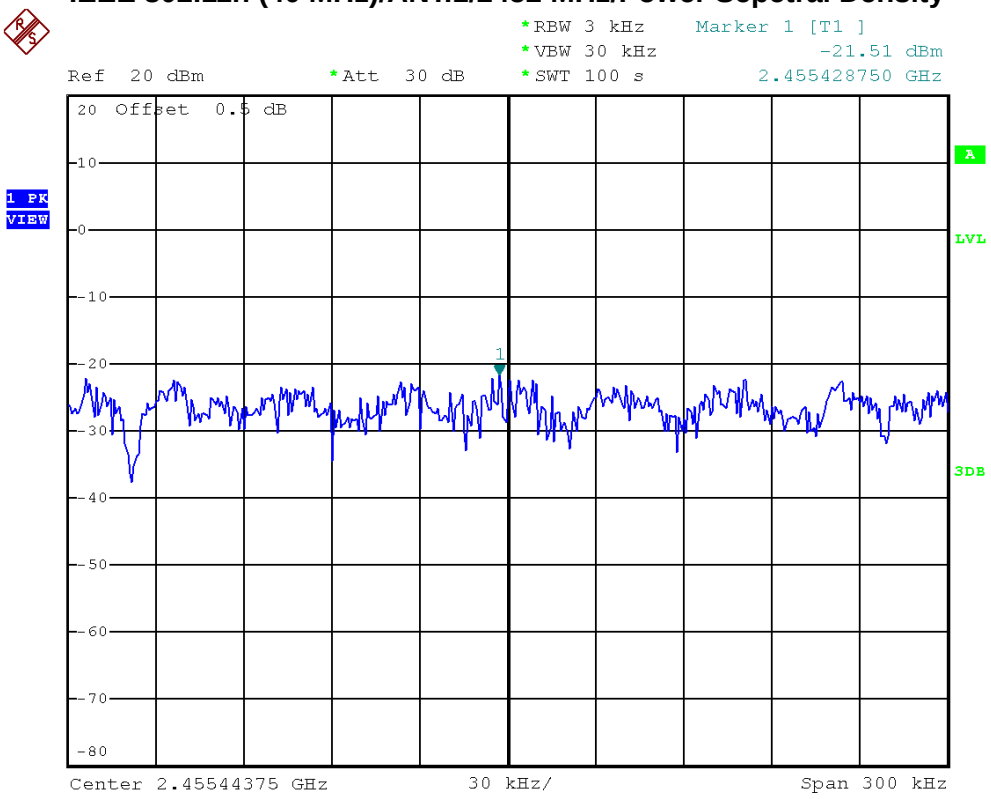
IEEE 802.11n (40 MHz)/ANT.1/2422 MHz/Power Sepctral Density



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



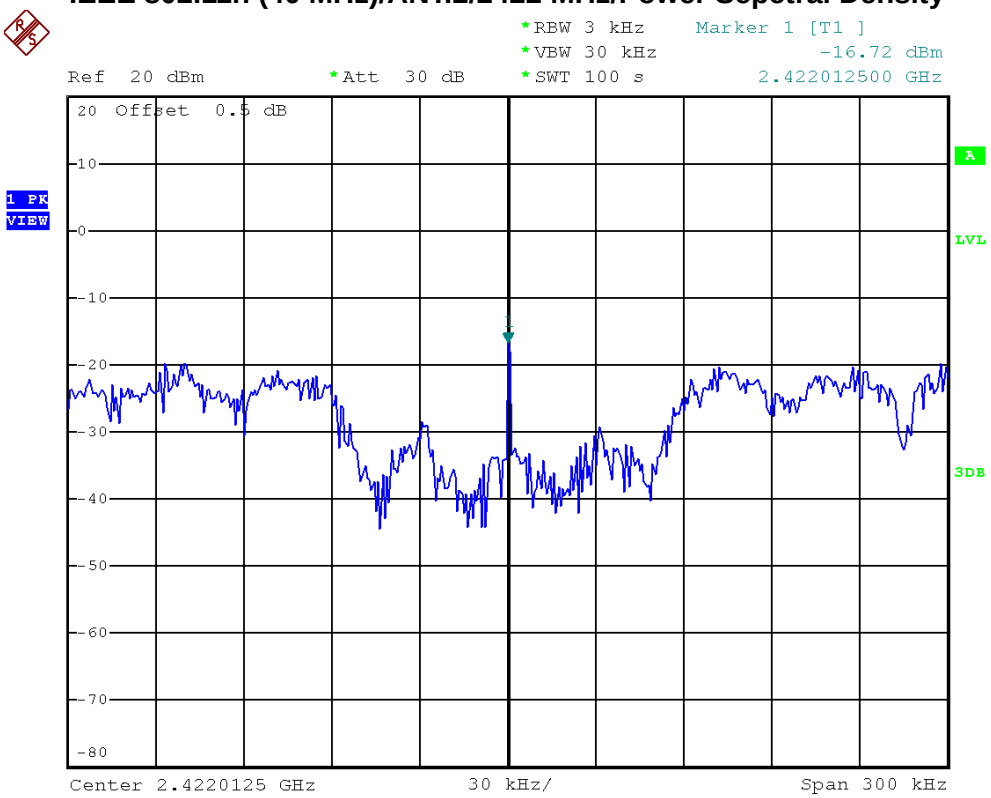
IEEE 802.11n (40 MHz)/ANT.1/2452 MHz/Power Sepctral Density



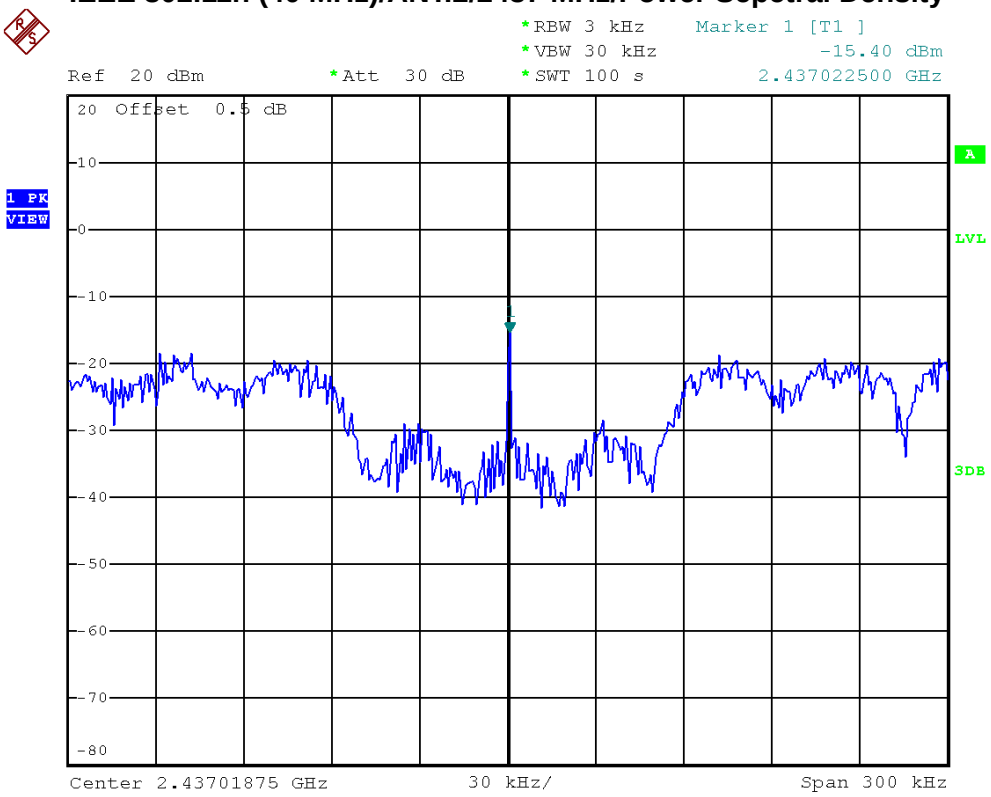
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2422 MHz	-16.72	8	PASS
2437 MHz	-15.40	8	PASS
2452 MHz	-18.36	8	PASS

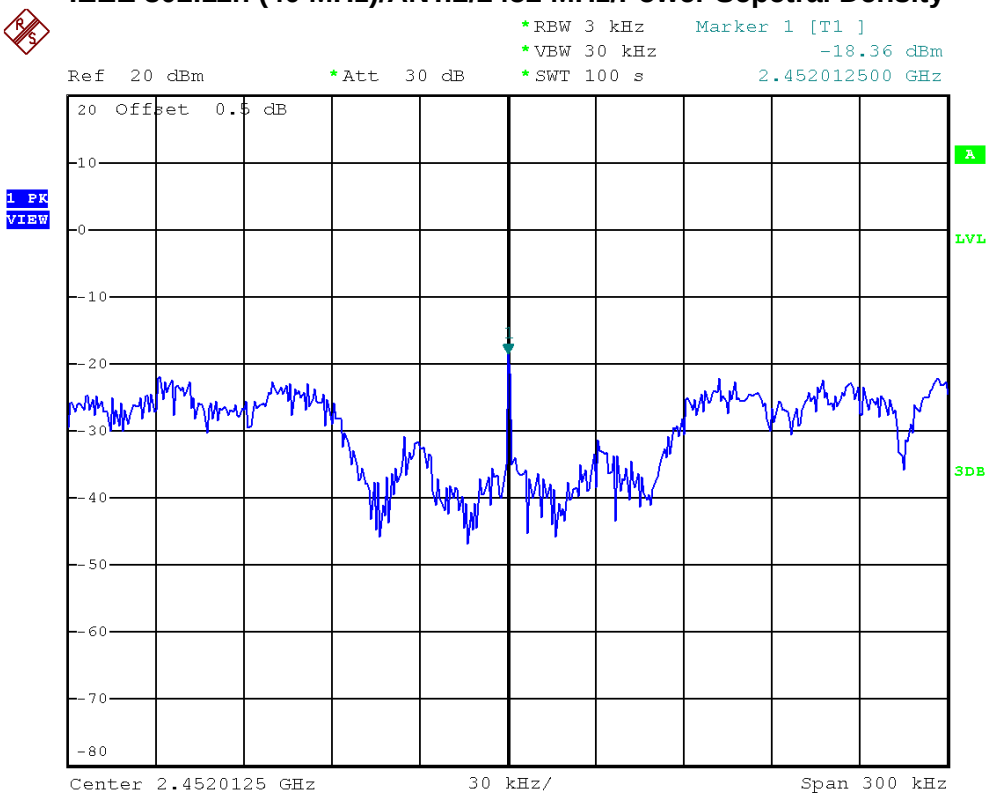
IEEE 802.11n (40 MHz)/ANT.2/2422 MHz/Power Sepctral Density



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	WN4616R
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	-14.38	8	PASS
2437 MHz	-13.36	8	PASS
2452 MHz	-16.65	8	PASS

11 RF EXPOSURE COMPLIANCE

11.1LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

NOTE: f = frequency in MHz ; *Plane-wave equivalent power density.

11.2MEASUREMENT 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.

11.3MPE CALCULATION METHOD

E (V/m) $= \frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) $= \frac{E^2}{377}$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

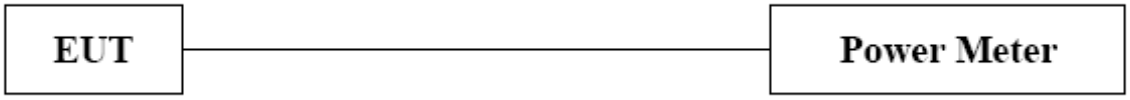
d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd $= \frac{30 \times P \times G}{377 \times d^2}$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

11.4TEST SETUP LAYOUT



11.5DEVIATION FROM TEST STANDARD

No deviation

11.6EUT 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.

11.7TEST RESULTS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	19.7100	93.5406	0.058878	1	PASS
2437 MHz	5.00	3.1623	19.7500	94.4061	0.059422	1	PASS
2462 MHz	5.00	3.1623	19.9900	99.7700	0.062799	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	24.3000	269.1535	0.169414	1	PASS
2437 MHz	5.00	3.1623	23.4500	221.3095	0.139300	1	PASS
2462 MHz	5.00	3.1623	21.7000	147.9108	0.093100	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	23.6700	232.8091	0.146538	1	PASS
2437 MHz	5.00	3.1623	22.8200	191.4256	0.120490	1	PASS
2462 MHz	5.00	3.1623	21.8300	152.4053	0.095929	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2412 MHz	5.00	3.1623	23.6600	232.2737	0.146201	1	PASS
2437 MHz	5.00	3.1623	22.8700	193.6422	0.121885	1	PASS
2462 MHz	5.00	3.1623	21.3200	135.5189	0.085300	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2412 MHz	10.00	10.0000	26.6753	465.0828	0.925722	1	PASS
2437 MHz	10.00	10.0000	25.8554	385.0678	0.766457	1	PASS
2462 MHz	10.00	10.0000	24.5928	287.9242	0.573098	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2422 MHz	5.00	3.1623	21.4000	138.0384	0.086886	1	PASS
2437 MHz	5.00	3.1623	21.8700	153.8155	0.096817	1	PASS
2452 MHz	5.00	3.1623	19.2000	83.1764	0.052354	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2422 MHz	5.00	3.1623	20.9900	125.6030	0.079059	1	PASS
2437 MHz	5.00	3.1623	21.5700	143.5489	0.090355	1	PASS
2452 MHz	5.00	3.1623	19.0000	79.4328	0.049998	1	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4616R
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	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S)	Limit of Power Density (S)	Result
2422 MHz	10.00	10.0000	24.2101	263.6414	0.524764	1	PASS
2437 MHz	10.00	10.0000	24.7329	297.3644	0.591888	1	PASS
2452 MHz	10.00	10.0000	22.1115	162.6092	0.323665	1	PASS