

Prüfbericht-Nr.: <i>Test Report No.:</i>	10045580 001	Auftrags-Nr.: <i>Order No.:</i>	114011368 Seite 1 von 104 <i>Page 1 of 104</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	June 11, 2013
Auftraggeber: <i>Client:</i>	Allied Telesis Labs Raleigh, 900 Main Campus Drive, Suite 301, Raleigh, NC 27516, USA		
Prüfgegenstand: <i>Test item:</i>	Intelligent Multiservice Gateway		
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	AT-IMG1425W, AT-IMG1405W		
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C Test report		
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.247 RSS-210 (12-2010) A8		
Wareneingangsdatum: <i>Date of receipt:</i>	08/06/2013		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000035120-001		
Prüfzeitraum: <i>Testing period:</i>	January 9, 2014 - January 14, 2014		
Ort der Prüfung: <i>Place of testing:</i>	EMC Laboratory Taipei		
Prüflaboratorium: <i>Testing laboratory:</i>	TUV Rheinland Taiwan Ltd.		
Prüfergebnis*: <i>Test result*:</i>	Pass		
geprüft von / tested by: 2014-02-13 Danny S. C. Sung/Project Manager <i>Datum Name / Stellung Unterschrift</i> <i>Date Name / Position Signature</i>		kontrolliert von / reviewed by: 2014-02-13 Rene Charton/Senior Project Manager <i>Datum Name / Stellung Unterschrift</i> <i>Date Name / Position Signature</i>	
Sonstiges / Other:			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>	
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>			

v04

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: *Passed*

5.1.2 PEAK OUTPUT POWER

RESULT: *Passed*

5.1.3 6dB AND 99% BANDWIDTH

RESULT: *Passed*

5.1.4 POWER DENSITY

RESULT: *Passed*

5.1.5 CONDUCTED SPURIOUS EMISSIONS AND FREQUENCY BAND EDGE MEASURED IN 100kHz BANDWIDTH

RESULT: *Passed*

5.1.6 SPURIOUS EMISSION

RESULT: *Passed*

5.2.1 MAINS CONDUCTED EMISSIONS

RESULT: *Passed*

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: *Passed*

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix P: Photo Documentation external view
(File Name: 10045580APPENDIX P)

Appendix D: Test Result of Radiated Emissions
(File Name: 10045580APPENDIX D)

Test Specifications

The following standards were applied:.

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.247 ANSI C63.10:2009, KDB558074 D01 DTS Meas Guidance v03 KDB662911 D01 Multiple Transmitter Output KDB662911 D02 MIMO with Cross-Polarized Antennas RSS-210 (12-2010) Issue 8

2. Test Sites

2.1 Test Facilities

TUV Rheinland Taiwan Ltd.

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC Registration No.: 365730
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2013-Jul-1st to 2016-Jun-30th



Testing Laboratory
0759

2.2 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	R&S	ESCI 7	101062	1-Sep-14
Bilog Antenna	TESEQ	CBL6111D	29802	29-Jun-14
Spectrum Analyzer	R&S	FSV 40	100921	10-Dec-14
Horn Antenna	ETS-Lindgren	3117	138160	10-Jan-15
Horn Antenna (18GHz~40GHz)	COM-POWER	AH840	101031	29-Oct-15
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	2-Sep-14
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	2-Sep-14
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM30180	60558	23-Oct-14
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	28-Sep-14
EMI Test Receiver	R&S	ESCI	101094	29-Aug-14
LISN (1 phase)	R&S	ENV216	101243	5-Jun-14
LISN	Rolf Heine	NNB-2/16Z	99080	30-Aug-14

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are $\pm 3\text{dB}$.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
RF power, conducted	$\pm 1 \text{ dB}$
Adjacent channel power	$\pm 3 \text{ dB}$
Radiated emission of transmitter, valid up to 26 GHz	$\pm 6 \text{ dB}$
Radiated emission of receiver, valid up to 26 GHz	$\pm 6 \text{ dB}$
Temperature	$\pm 2 \text{ }^{\circ}\text{C}$
Humidity	$\pm 10 \text{ \%}$

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a fiber optic fed Network Gateway which includes a Wireless 802.11 b/g/n WiFi access point. The model AT-iMG1405W is a depopulated version (some VoIP components removed) of the model AT-iMG1425W. The model tested is AT-iMG1425W. For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 Ratings and System Details

Table 4: Technical Specification of EUT

Technical Specification	Value
Kind of Equipment	Intelligent Multiservice Gateway
FCC ID	XA5-IMG1425W IC ID:11704A-IMG14X5
Type Designation	AT-iMG1425W, AT-iMG1405W
Operating Frequencies	2412~2462MHz
Channel Spacing	5 MHz for highest and lowest channel
Channel number	11
Operation Voltage	115V / 230 V
Modulation	CCK, DQPSK, DBPSK for DSSS; QAM, QPSK, BPSK for OFDM
Antenna gain	3.4 dBi

3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Receiving
- C. Standby
- D. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Technical Description
- Instruction Manual
- Photo Document
- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Production samples are provided with a Data interface through which can be set frequency and modulation

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate. The samples were used as follows:

Conducted: A000035120-001
Radiation: A000035120-001

Full test was applied on all test modes, but only worst case was shown.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Kind of Equipment	Manufacturer	Model Name	S/N
Notebook	HP	HSTNN-Q78C-3	CNF0339QBM

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

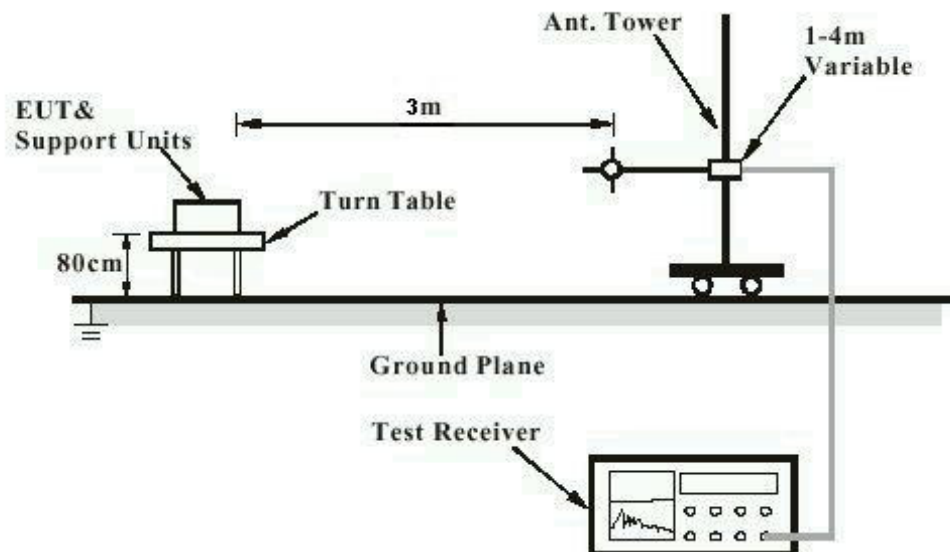


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)

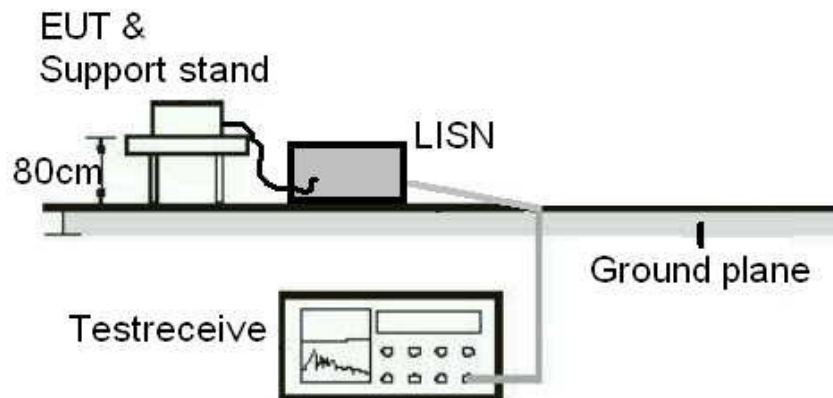
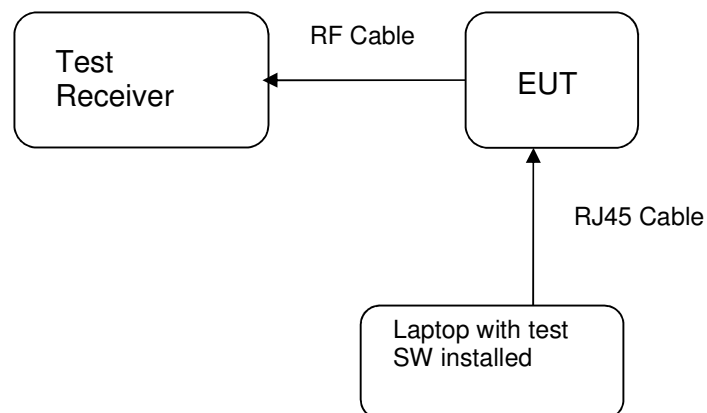


Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Test standard	:	FCC Part 15.247(b)(4), Part 15.203 and RSS-Gen 7.1.4
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an internal antenna with an directional gain of 3.4 dBi , and the antenna is Dipole Antenna fixed to inside of the enclosure with no possibility of replacement. Therefore, the EUT is considered to comply the provision.

Refer to EUT photo for details.

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5.1.2 Peak Output Power**RESULT:****Passed**

Test standard	:	FCC Part 15.247(b)(3), RSS-210 A8.4(4)
Basic standard	:	ANSI C63.10:2009, KDB558074
Limit	:	1 Watt
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A
Ambient temperature	:	18-22 °C
Relative humidity	:	50-65 %
Atmospheric pressure	:	100-103 kPa

Table 5: Test results of Peak Output Power Antenna 1

Pmax: 183.231 mW
(HT17)

Ant 1 Mode: 802.11b DSSS QPSK

Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2412	22.63	183.231	500mW	Pass
Mid	2437	22.33	171.002	500mW	Pass
High	2462	22.55	179.887	500mW	Pass

Pmax: 72.444 mW
(HT20)

Ant 1 Mode: 802.11g OFDM BPSK

Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2412	18.53	71.285	500mW	Pass
Mid	2437	18.32	67.920	500mW	Pass
High	2462	18.6	72.444	500mW	Pass

Pmax: 73.114 mW
(HT20)

Ant 1 Mode: 802.11n OFDM QPSK

Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2412	18.36	68.549	500mW	Pass
Mid	2437	18.24	66.681	500mW	Pass
High	2462	18.64	73.114	500mW	Pass

Pmax: 33.113 mW
(HT40)

Ant 1 Mode: 802.11n OFDM QPSK

Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2422	15.2	33.113	500mW	Pass
Mid	2437	14.39	27.479	500mW	Pass
High	2452	14.89	30.832	500mW	Pass

Table 6: Test results of Peak Output Power Antenna 2

Pmax: 256.448 mW
(HT17)

Ant 2 Mode:	802.11b	DSSS	QPSK		
Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2412	24.09	256.448	500mW	Pass
Mid	2437	23.76	237.684	500mW	Pass
High	2462	23.22	209.894	500mW	Pass

Pmax: 141.579 mW
(HT20)

Ant 2 Mode:	802.11g	OFDM	BPSK		
Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2412	21.51	141.579	500mW	Pass
Mid	2437	20.13	103.039	500mW	Pass
High	2462	19.64	92.045	500mW	Pass

Pmax: 110.408 mW
(HT20)

Ant 2 Mode:	802.11n	OFDM	QPSK		
Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2412	20.43	110.408	500mW	Pass
Mid	2437	19.68	92.897	500mW	Pass
High	2462	19.29	84.918	500mW	Pass

Pmax: 54.954 mW
(HT40)

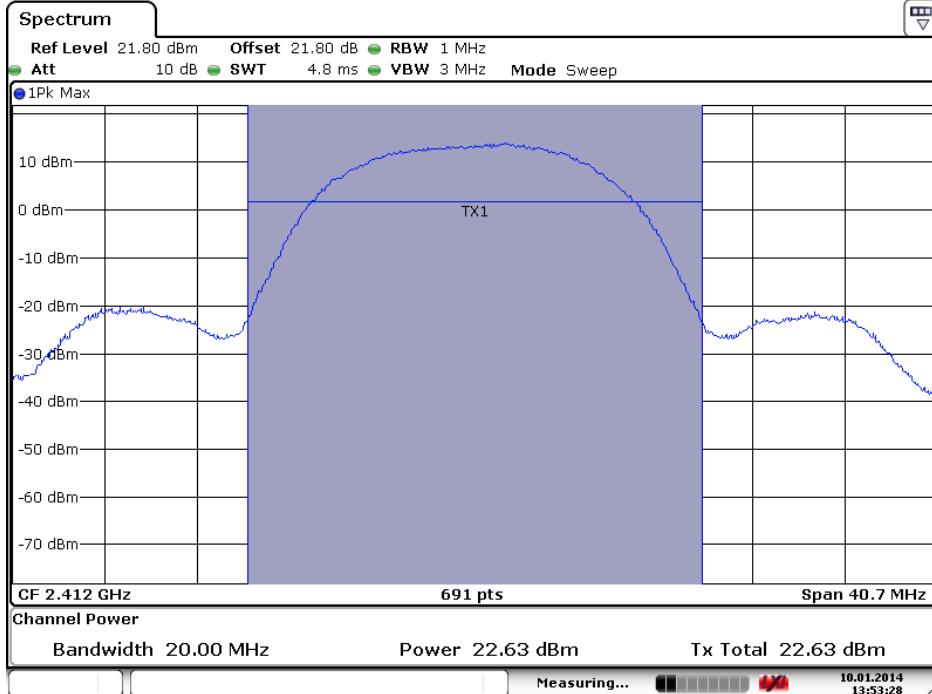
Ant 2 Mode:	802.11n	OFDM	QPSK		
Channel	Frequency MHz	Power dBm	Power mW	Limit	Result
Low	2422	16.1	40.738	500mW	Pass
Mid	2437	17.4	54.954	500mW	Pass
High	2452	15.7	37.154	500mW	Pass

Result Diagrams

ANT 1 MODE:	802.11B DSSS DBPSK (HT17).....	18
ANT 1 MODE:	802.11G OFDM BPSK (HT20)	20
ANT 1 MODE:	802.11N OFDM BPSK (HT20).....	22
ANT 1 MODE:	802.11N OFDM BPSK (HT40).....	24
ANT 2 MODE:	802.11B DSSS DBPSK (HT17).....	26
ANT 2 MODE:	802.11G OFDM BPSK (HT20)	28
ANT 2 MODE:	802.11N OFDM BPSK (HT20).....	30
ANT 2 MODE:	802.11N OFDM BPSK (HT40).....	32

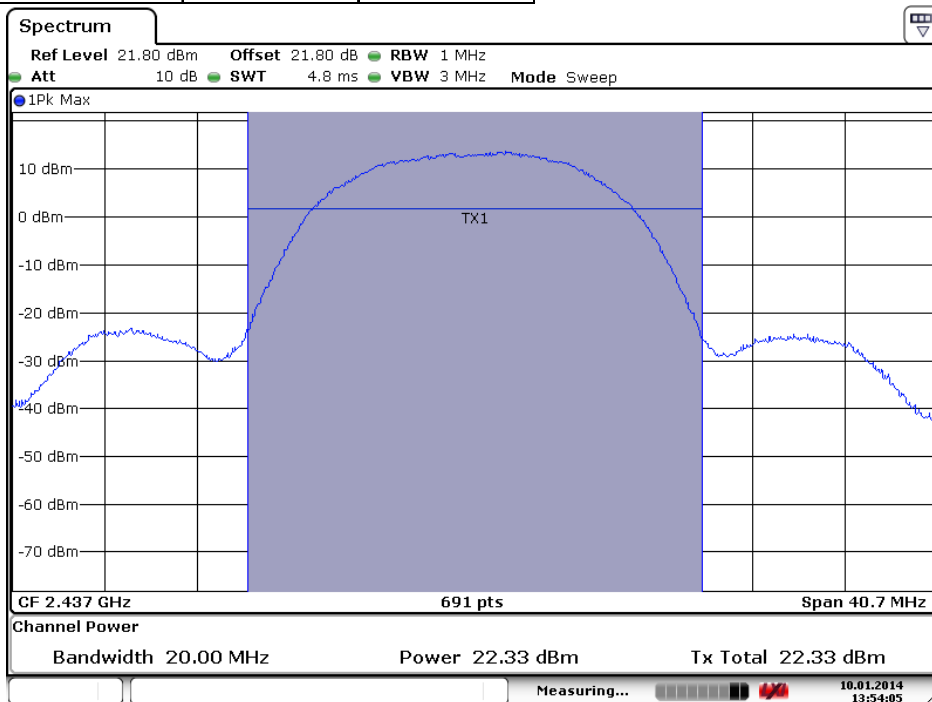
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Ant 1 Mode: 802.11b DSSS QPSK (HT17)

Channel	MHz	dBm
Low	2412	22.63



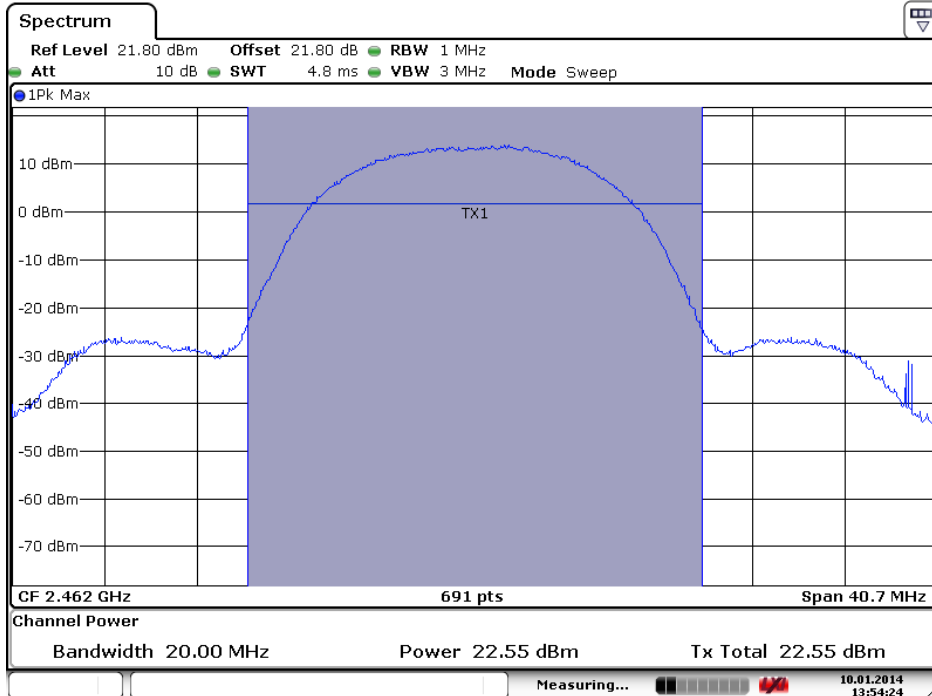
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Mid	2437	22.33
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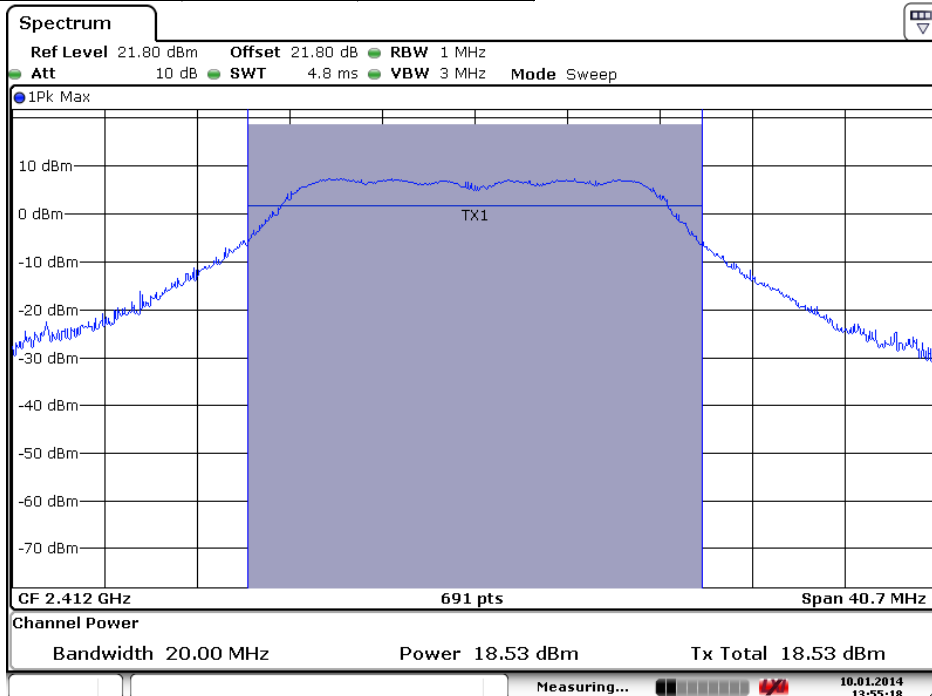
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Channel	MHz	dBm		
High	2462	22.55		



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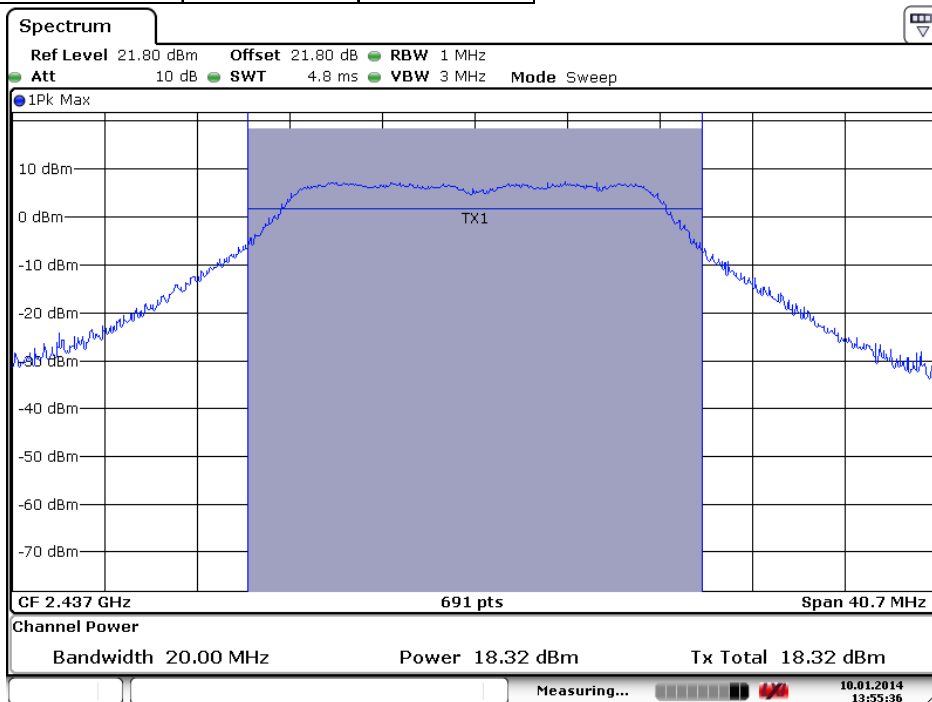
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Ant 1 Mode: 802.11g OFDM BPSK (HT20)

Channel	MHz	dBm
Low	2412	18.53



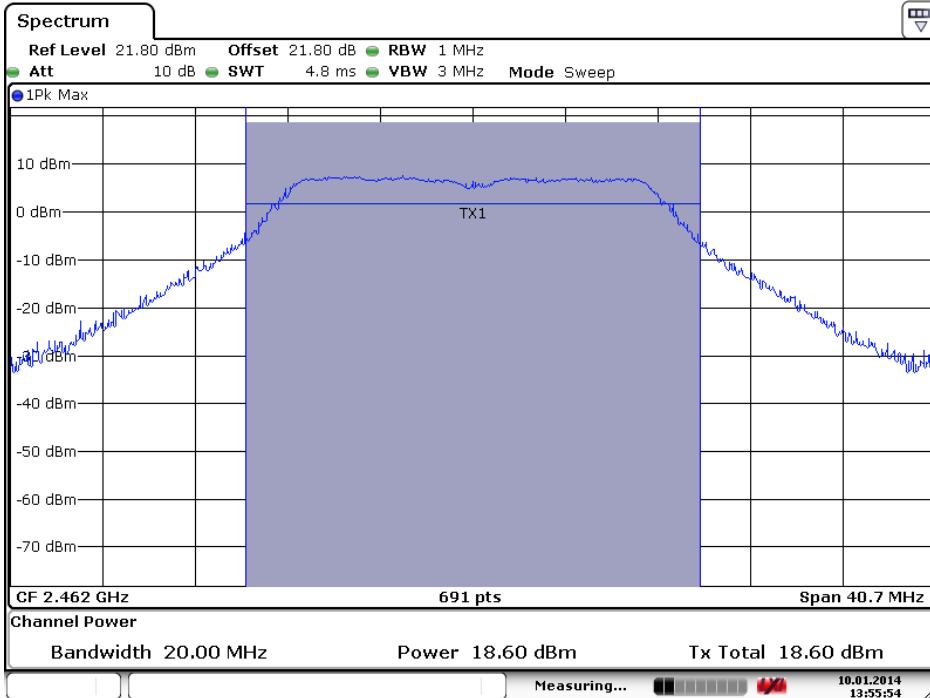
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Mid	2437	18.32
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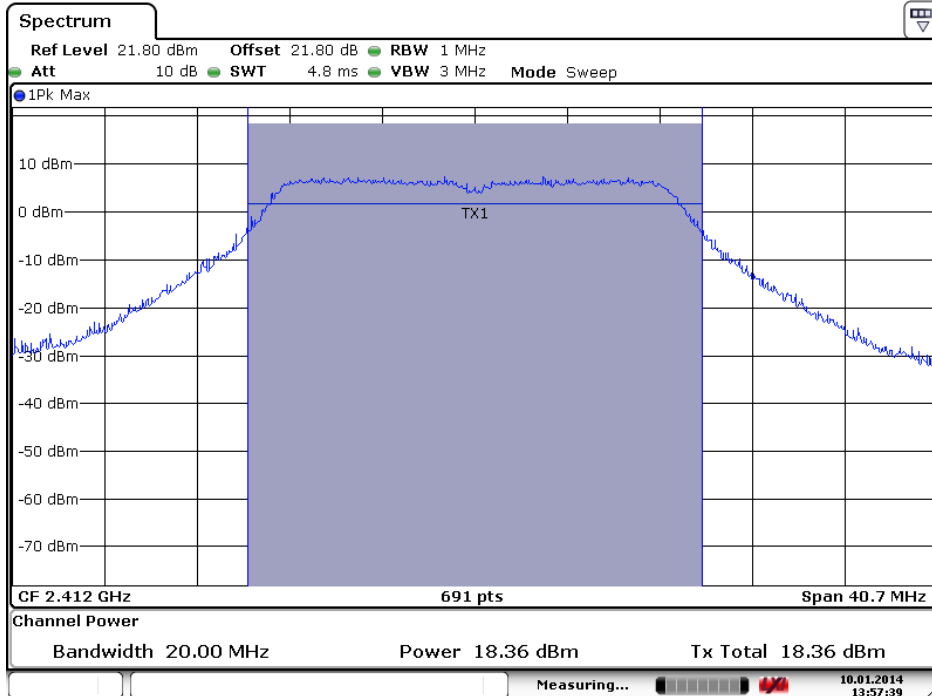
Ant 1 Mode:	802.11g	OFDM	BPSK	(HT20)
Channel	MHz	dBm		
High	2462	18.6		



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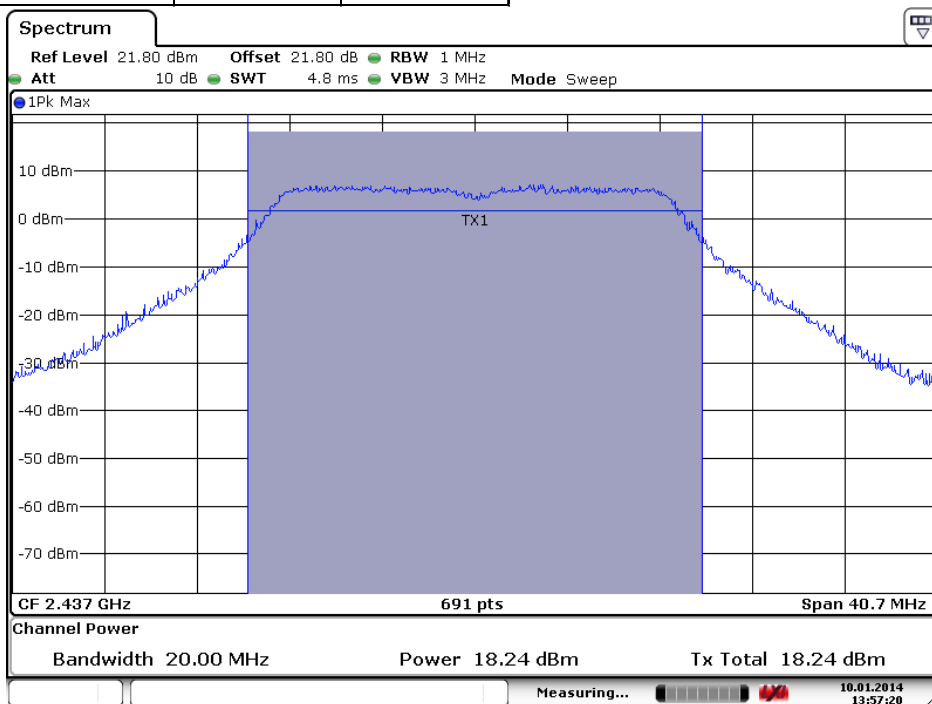
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Ant 1 Mode: 802.11n OFDM QPSK (HT20)

Channel	MHz	dBm
Low	2412	18.36



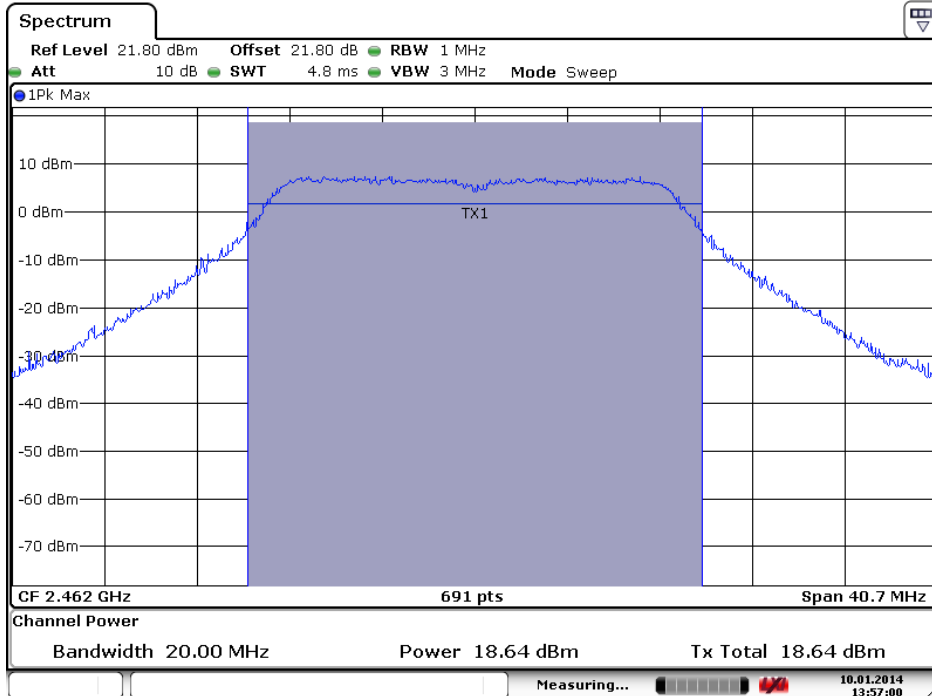
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Mid	2437	18.24
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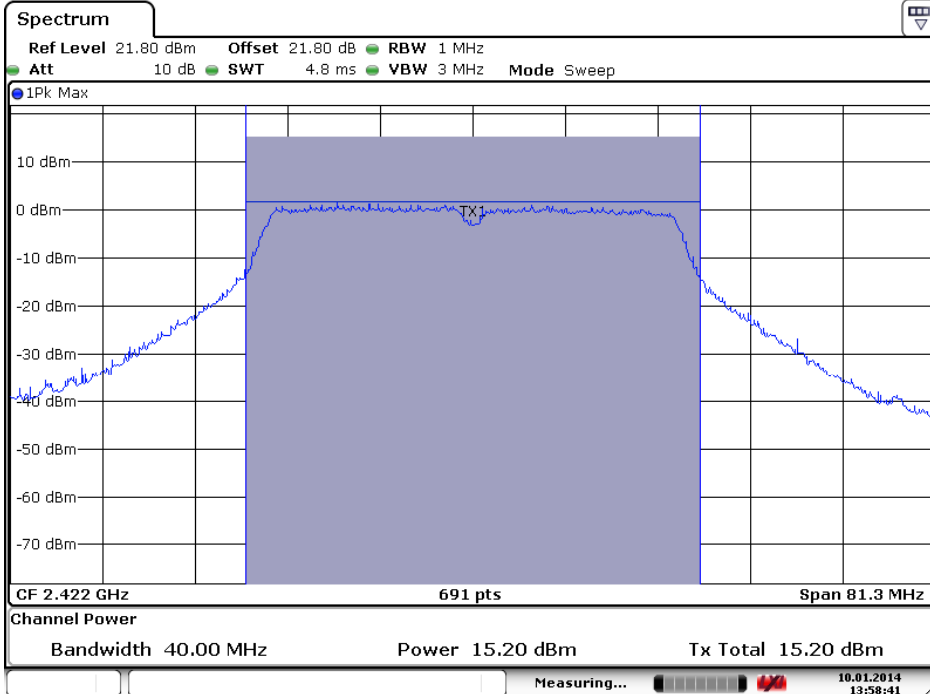
Ant 1 Mode:	802.11n	OFDM	QPSK	(HT20)
Channel	MHz	dBm		
High	2462	18.64		



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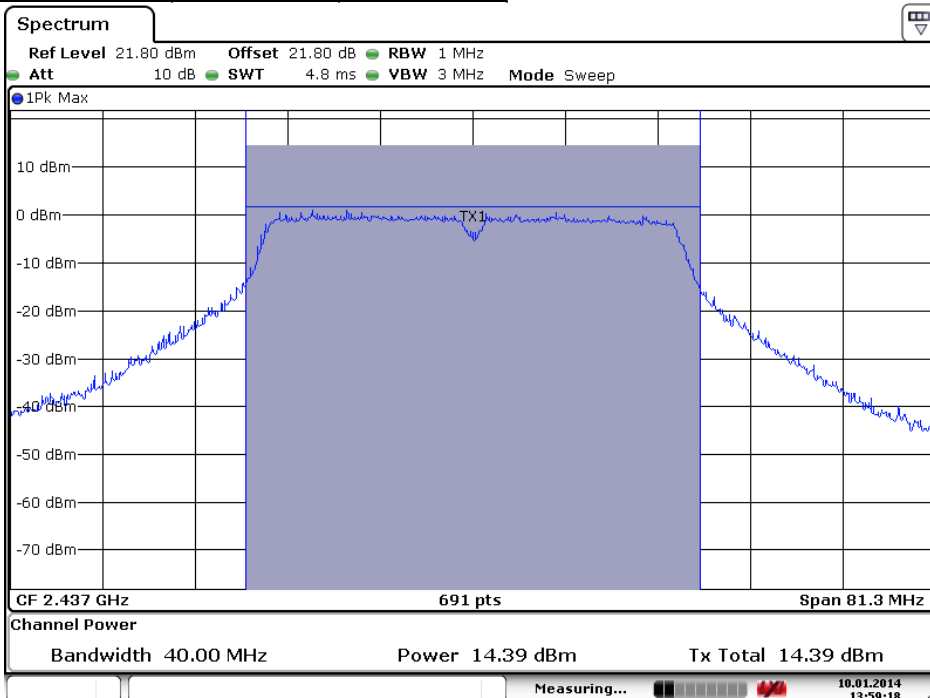
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Ant 1 Mode: 802.11n OFDM QPSK (HT40)

Channel	MHz	dBm
Low	2422	15.2



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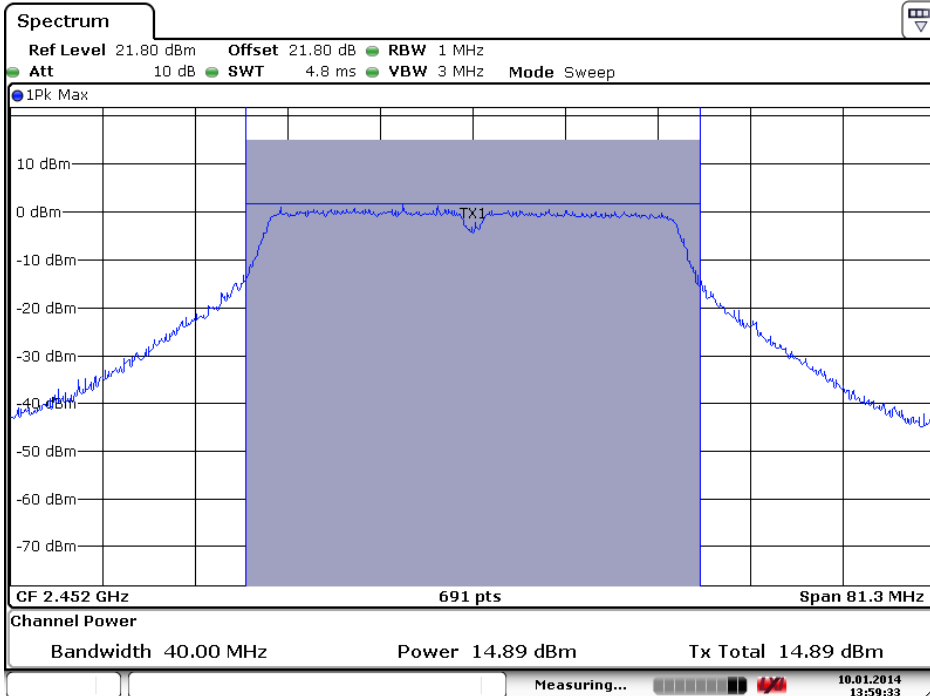
Mid	2437	14.39
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Date: 10.JAN.2014 13:59:18

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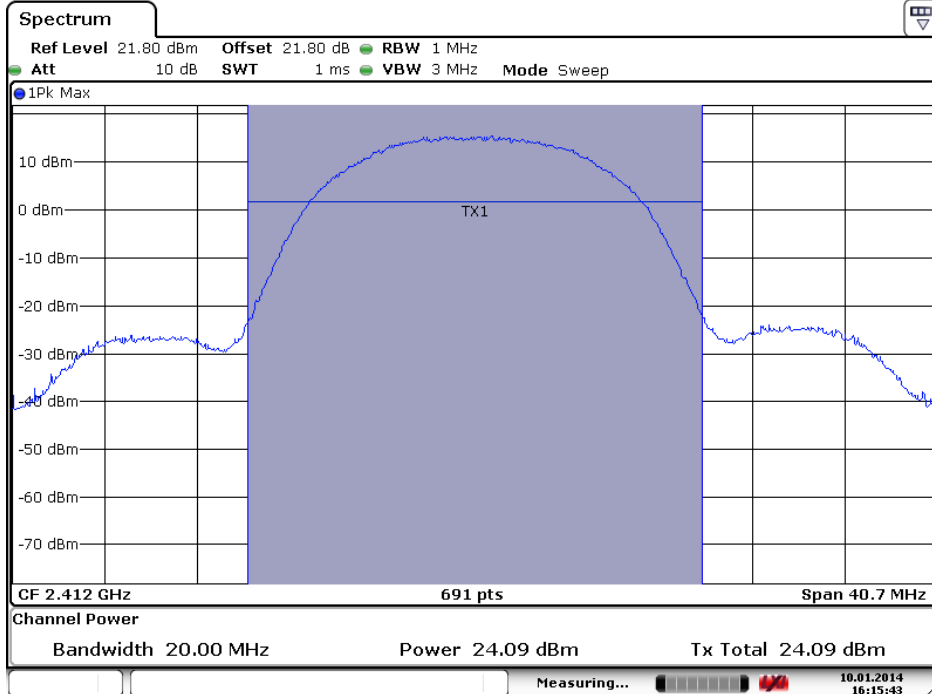
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Channel	MHz	dBm		
High	2452	14.89		



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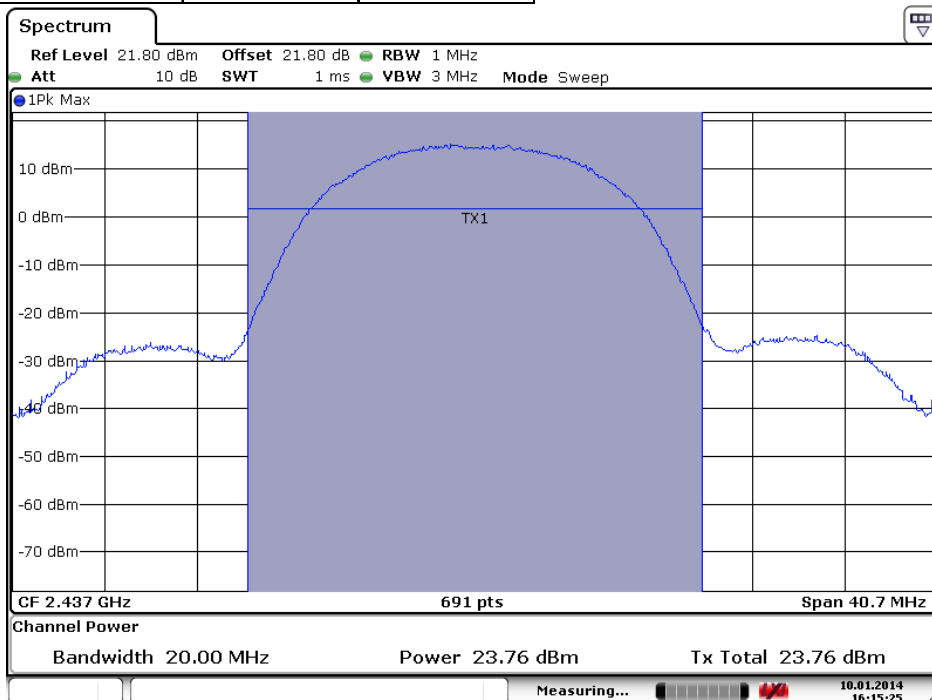
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Ant 2 Mode: 802.11b DSSS QPSK (HT17)

Channel	MHz	dBm
Low	2412	24.09



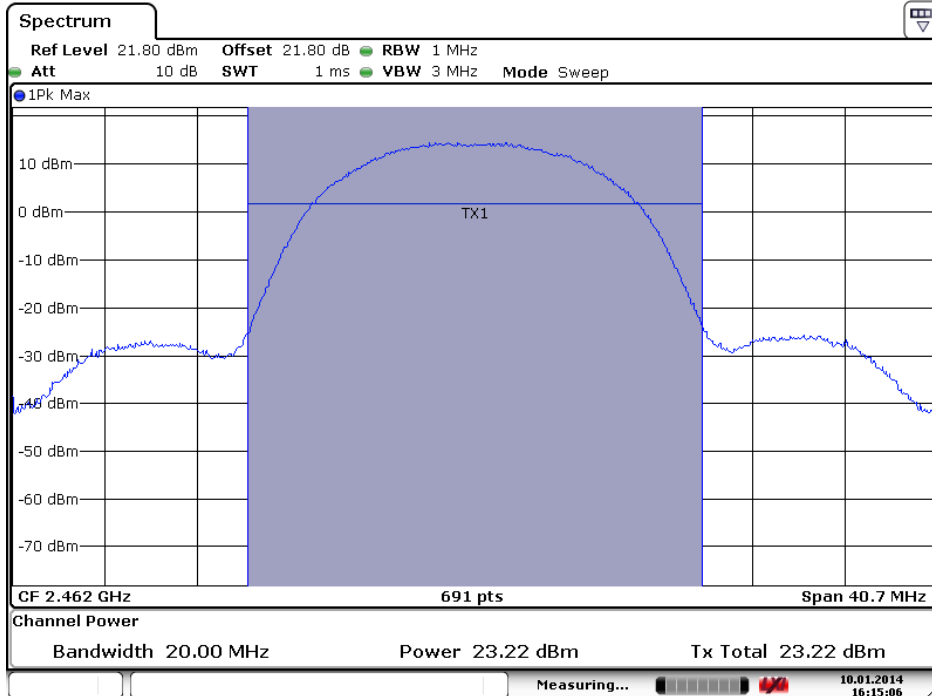
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Mid	2437	23.76
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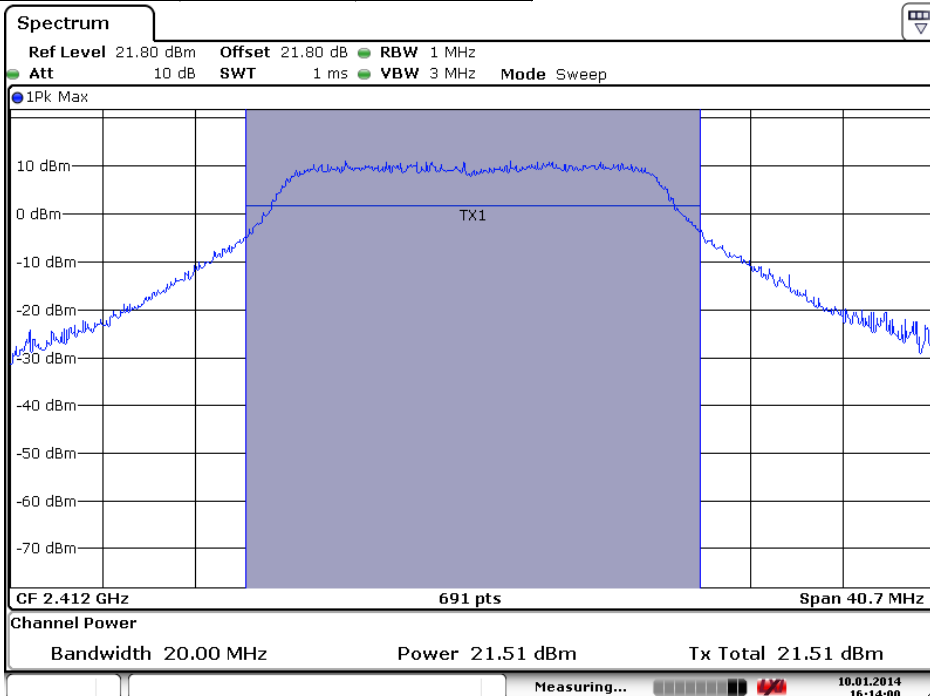
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Channel	MHz	dBm		
High	2462	23.22		



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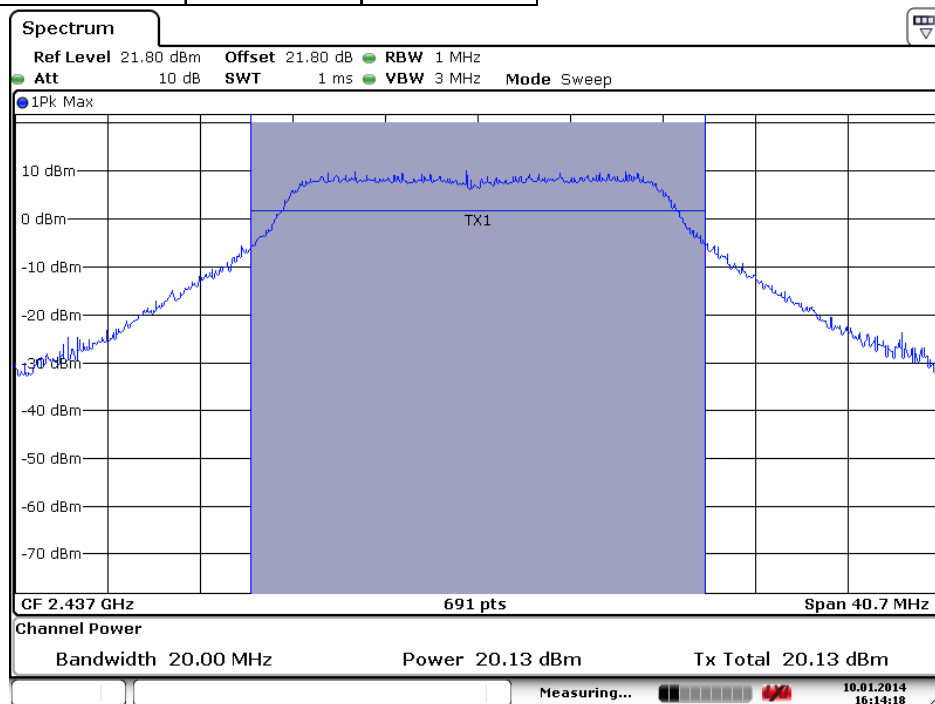
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Ant 2 Mode: 802.11g OFDM BPSK (HT20)

Channel	MHz	dBm
Low	2412	21.51



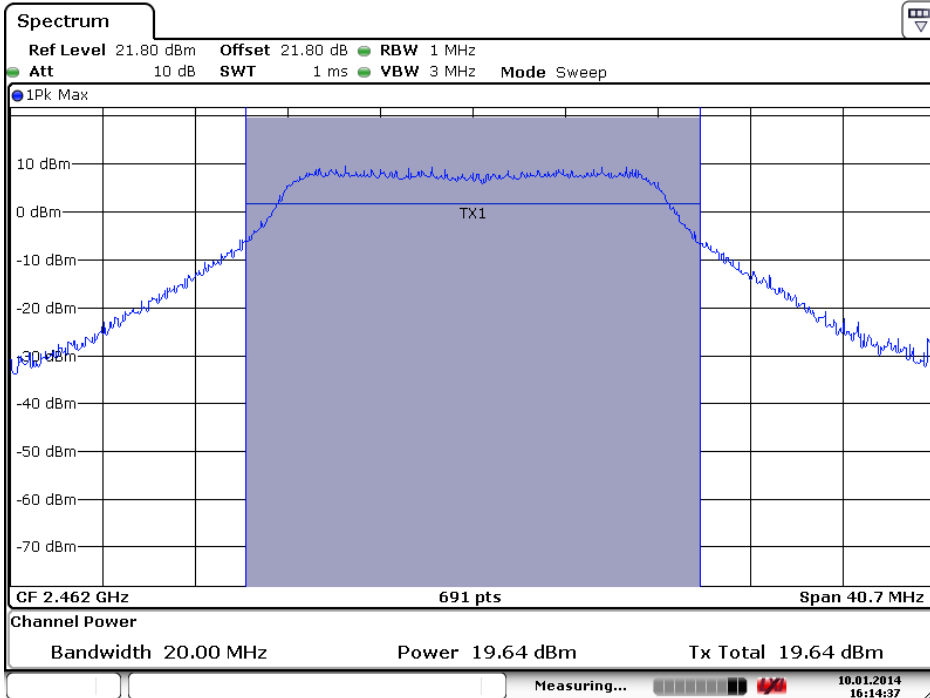
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Mid	2437	20.13
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Date: 10.JAN.2014 16:14:18

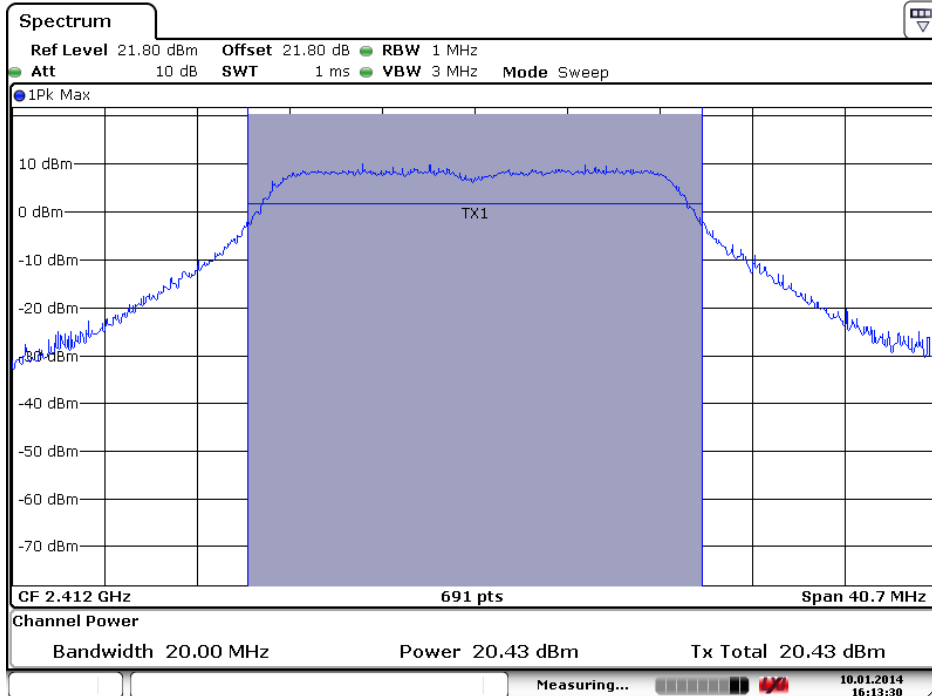
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Channel	MHz	dBm		
High	2462	19.64		



Date: 10.JAN.2014 16:14:37

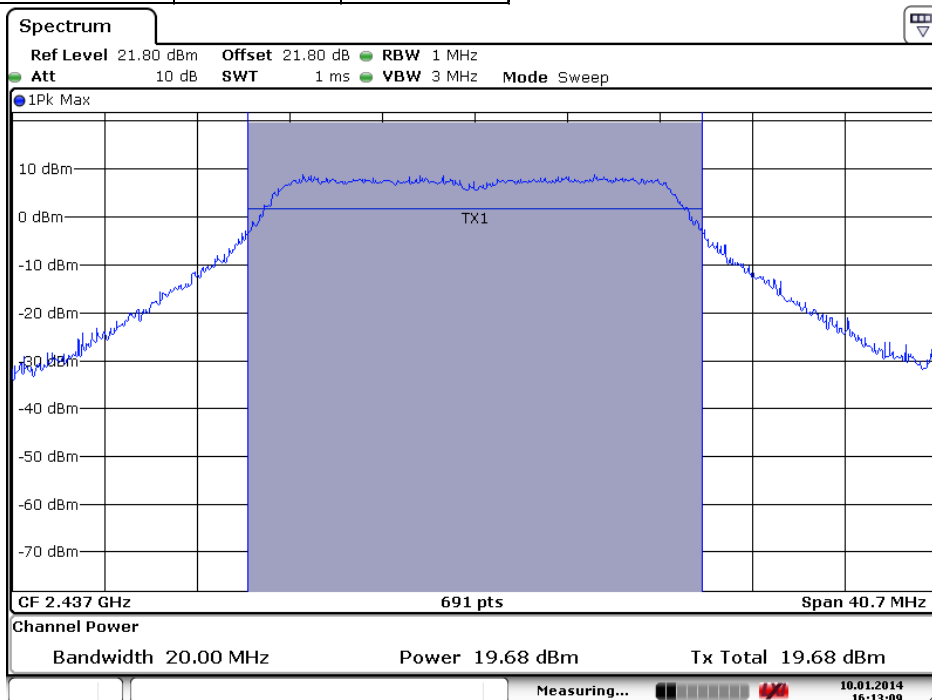
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Ant 2 Mode: 802.11n OFDM QPSK (HT20)

Channel	MHz	dBm
Low	2412	20.43



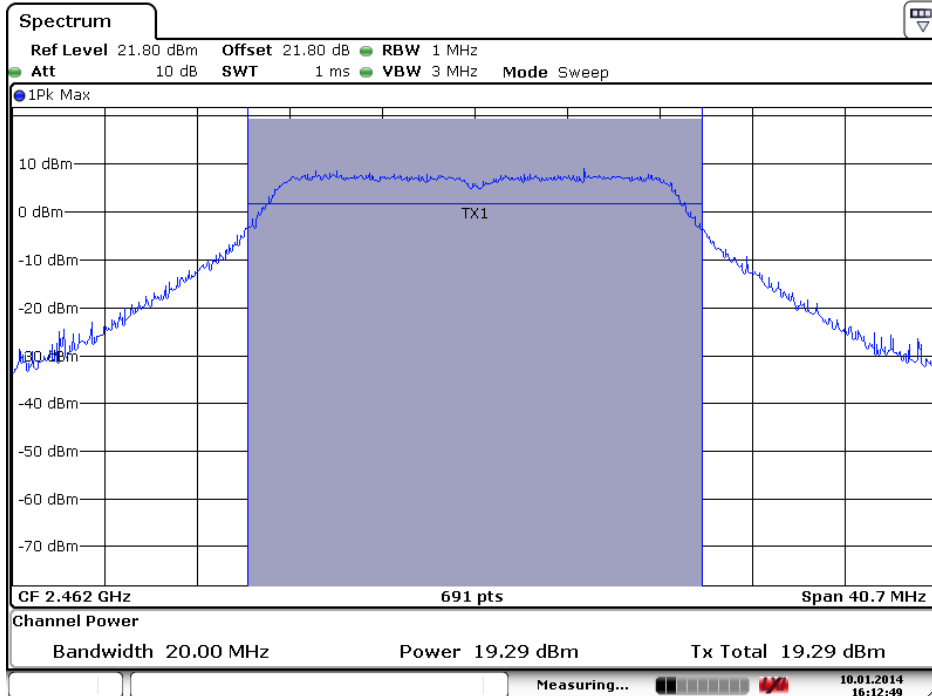
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Mid	2437	19.68
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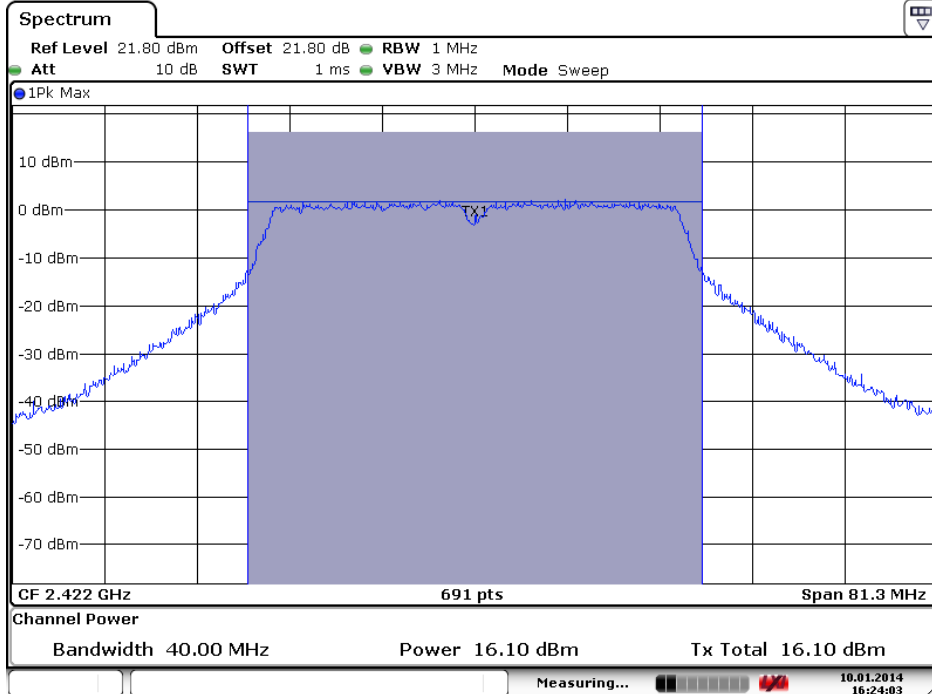
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Channel	MHz	dBm		
High	2462	19.29		



Date: 10.JAN.2014 16:12:49

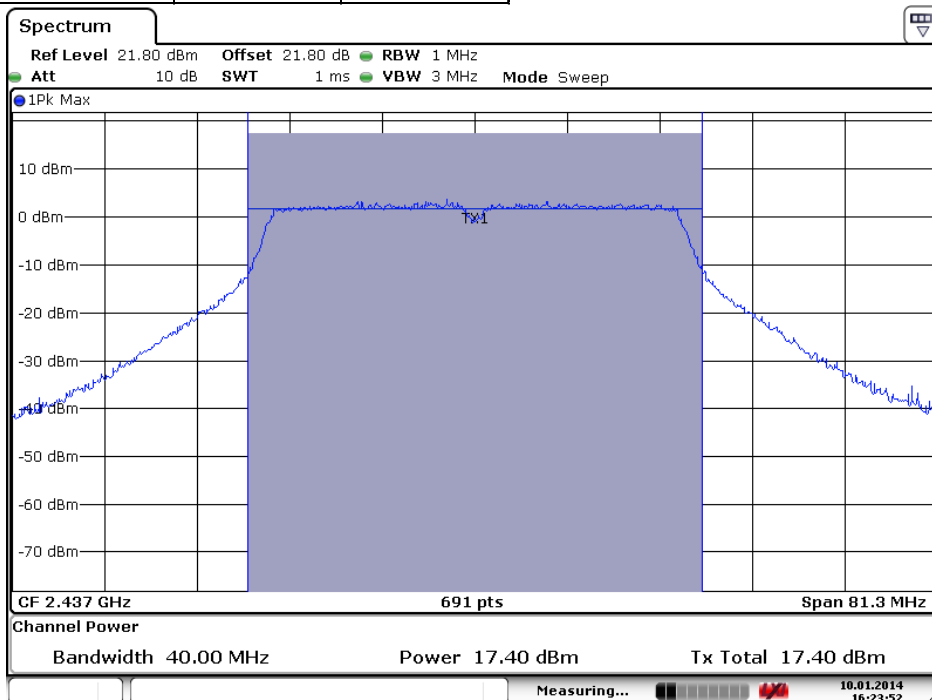
Prüfbericht - Nr.: 10045580 001
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Ant 2 Mode: 802.11n OFDM QPSK (HT40)

Channel	MHz	dBm
Low	2422	16.1



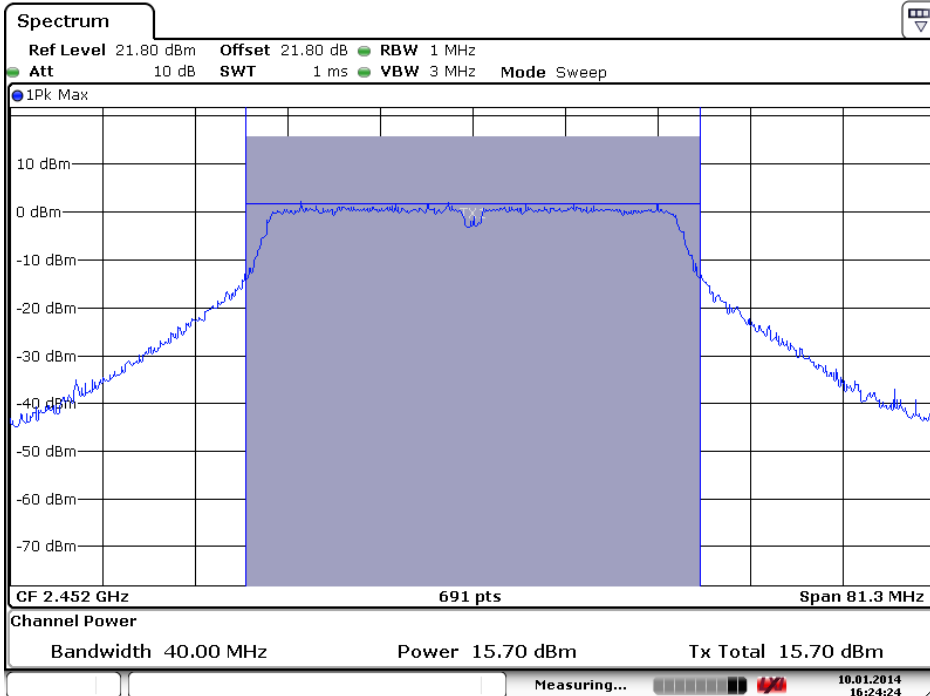
Date: 10.JAN.2014 16:24:03

Mid	2437	17.4
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Date: 10.JAN.2014 16:23:53

Ant 2 Mode:	802.11n	OFDM	QPSK	(HT40)
Channel	MHz	dBm		
High	2452	15.7		



Date: 10.JAN.2014 16:24:25

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5.1.3 6dB and 99% Bandwidth**RESULT:****Passed**

Test standard : FCC Part 15.247(a)(2), RSS-210 A8.2(1)
RSS-Gen
Basic standard : ANSI C63.10:2009, KDB558074
Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
Operation Mode : A

Ambient temperature : 18-22 °C
Relative humidity : 50-65 %
Atmospheric pressure : 100-103 kPa

Table 7: Test result of 6 dB and 99% Bandwidth, Antenna 1

Ant 1 Mode: 802.11b DSSS BW(max): 11071 kHz
QPSK (HT17)

Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2412	11071	13892	>500	Pass
Mid	2437	10203	13892	>500	Pass
High	2462	9378	13806	>500	Pass

Ant 1 Mode: 802.11g OFDM BW(max): 16411 kHz
BPSK (HT20)

Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2412	16368	17149	>500	Pass
Mid	2437	16411	17149	>500	Pass
High	2462	16411	17192	>500	Pass

Ant 1 Mode: 802.11n OFDM BW(max): 17757 kHz
QPSK (HT20)

Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2412	17627	18147	>500	Pass
Mid	2437	17713	18147	>500	Pass
High	2462	17757	18191	>500	Pass

Ant 1 Mode: 802.11n OFDM BW(max): 35890 kHz
QPSK (HT40)

Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2422	35774	37626	>500	Pass
Mid	2437	35724	37337	>500	Pass
High	2452	35890	37264	>500	Pass

Table 8: Test result of 6 dB and 99% Bandwidth, Antenna 2

Ant 2 Mode: 802.11b		DSSS	BW(max): 10593 kHz QPSK (HT17)		
Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2412	10159	13806	>500	Pass
Mid	2437	10593	13806	>500	Pass
High	2462	10333	13806	>500	Pass

Ant 2 Mode: 802.11g		OFDM	BW(max): 16454 kHz BPSK (HT20)		
Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2412	16418	17018	>500	Pass
Mid	2437	16411	17018	>500	Pass
High	2462	16454	16975	>500	Pass

Ant 2 Mode: 802.11n		OFDM	BW(max): 17713 kHz QPSK (HT20)		
Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2412	17713	18147	>500	Pass
Mid	2437	17627	18147	>500	Pass
High	2462	17627	18191	>500	Pass

Ant 2 Mode: 802.11n		OFDM	BW(max): 36107 kHz QPSK (HT40)		
Channel	Frequency MHz	6 dB BW (kHz)	99% BW (kHz)	Limit (kHz)	Result
Low	2422	35724	37264	>500	Pass
Mid	2437	35745	37264	>500	Pass
High	2452	36107	37264	>500	Pass

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Result Diagrams

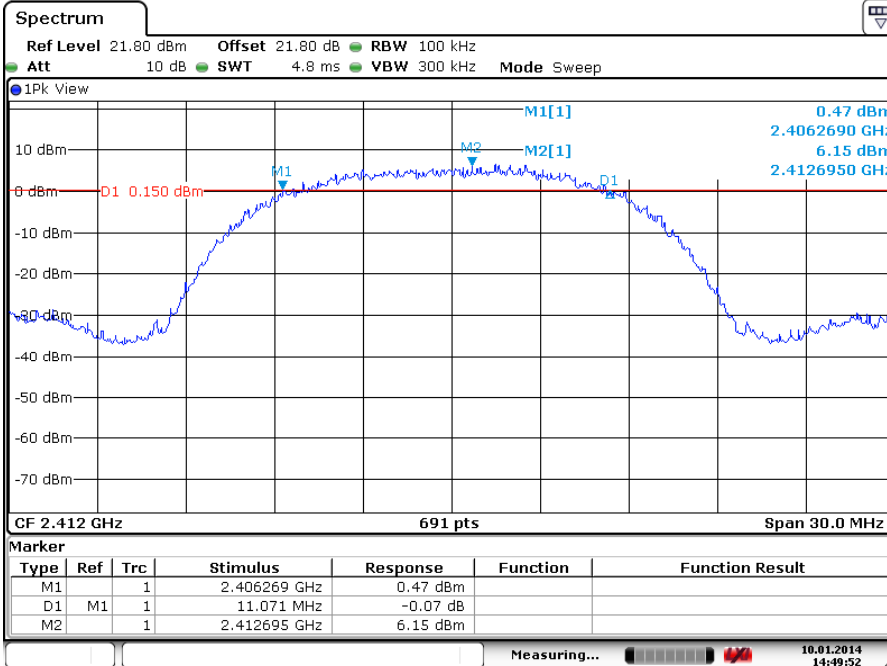
ANT 1 MODE:	802.11B DSSS DBPSK (HT17).....	38
ANT 1 MODE:	802.11G OFDM BPSK (HT20)	40
ANT 1 MODE:	802.11N OFDM BPSK (HT20).....	42
ANT 1 MODE:	802.11N OFDM BPSK (HT40).....	44
ANT 2 MODE:	802.11B DSSS DBPSK (HT17).....	46
ANT 2 MODE:	802.11G OFDM BPSK (HT20)	48
ANT 2 MODE:	802.11N OFDM BPSK (HT20).....	50
ANT 2 MODE:	802.11N OFDM BPSK (HT40).....	52

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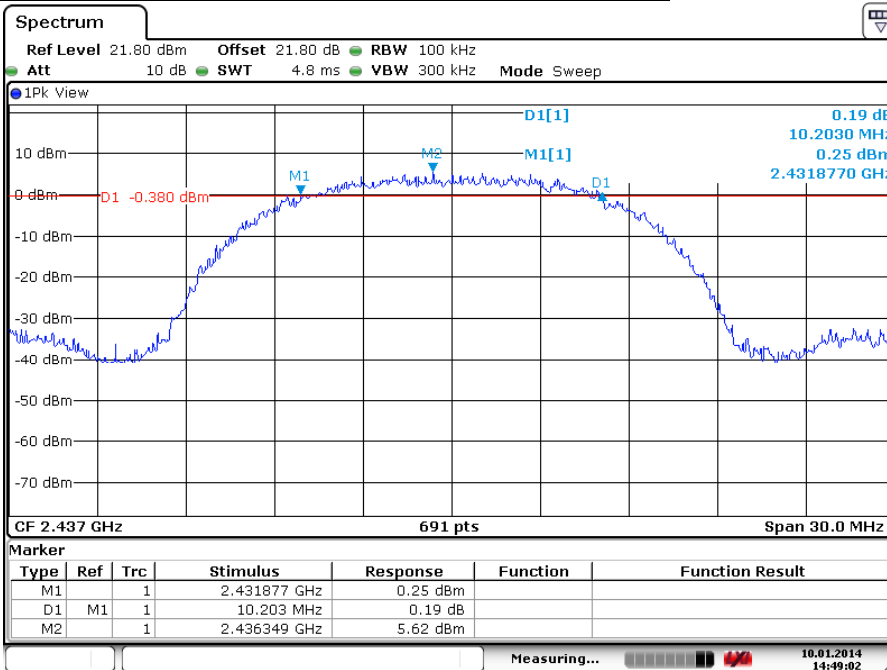
Ant 1 Mode: 802.11b DSSS QPSK (HT17)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2412	11071	13892



Date: 10.JAN.2014 14:49:53

Mid	2437	10203	13892
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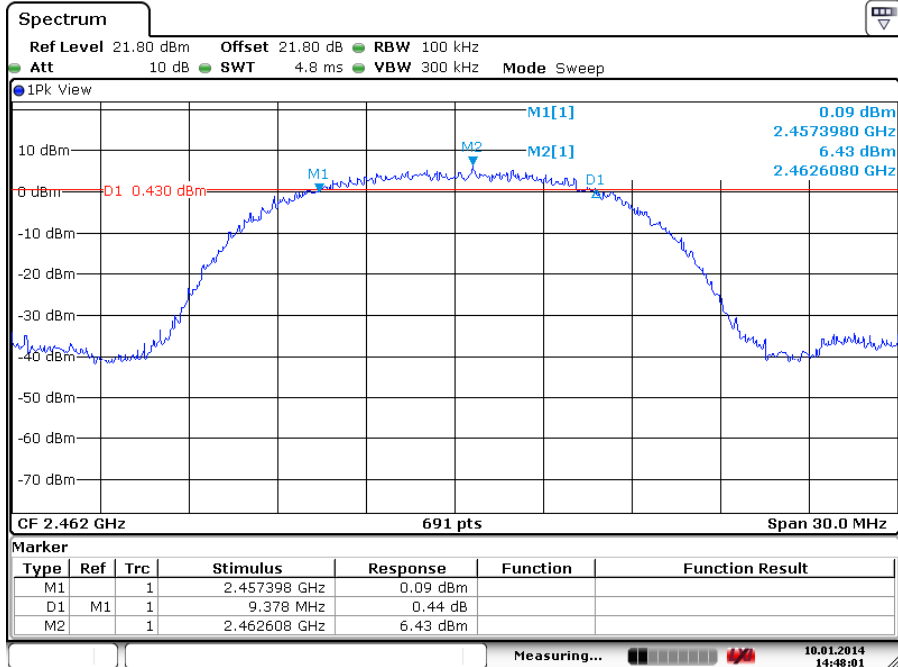


Date: 10.JAN.2014 14:49:02

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Ant 1 Mode:	802.11b	DSSS	QPSK	(HT17)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2462	9378	13806	



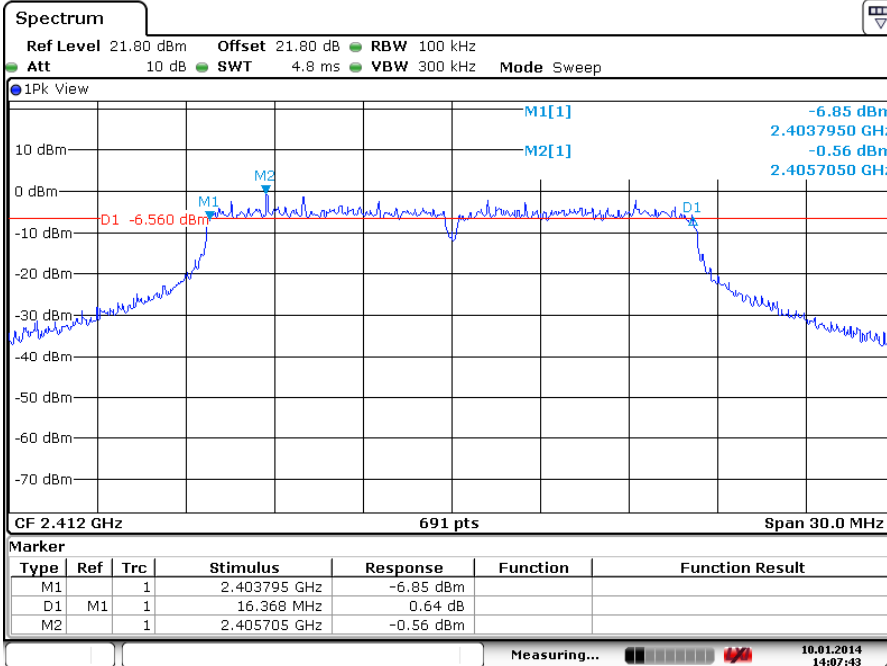
Date: 10.JAN.2014 14:48:02

Prüfbericht - Nr.: 10045580 001
 Test Report No.

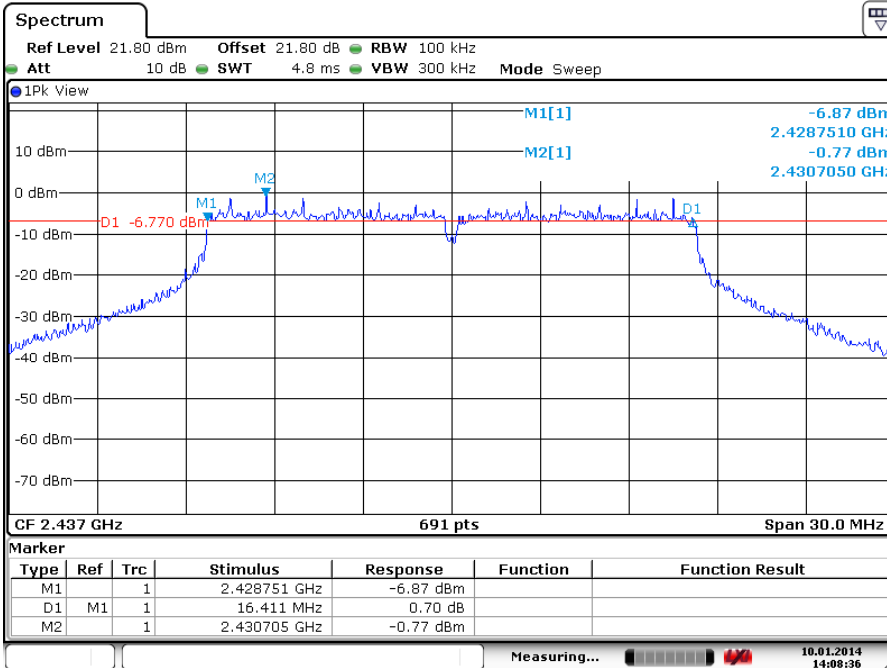
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Ant 1 Mode: 802.11g OFDM BPSK (HT20)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2412	16368	17149



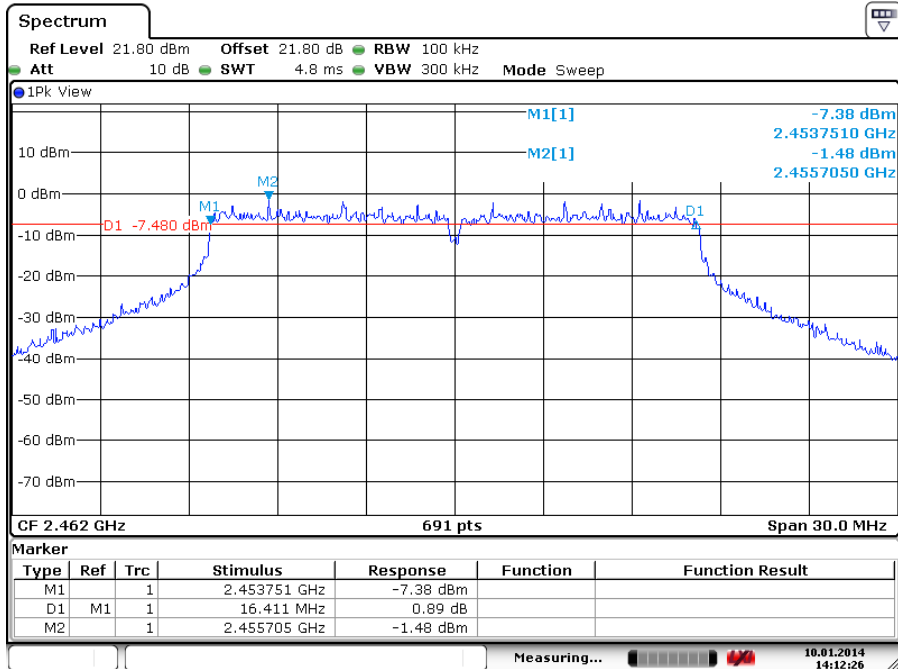
Date: 10.JAN.2014 14:07:43

Mid 2437 16411 17149


Date: 10.JAN.2014 14:08:36

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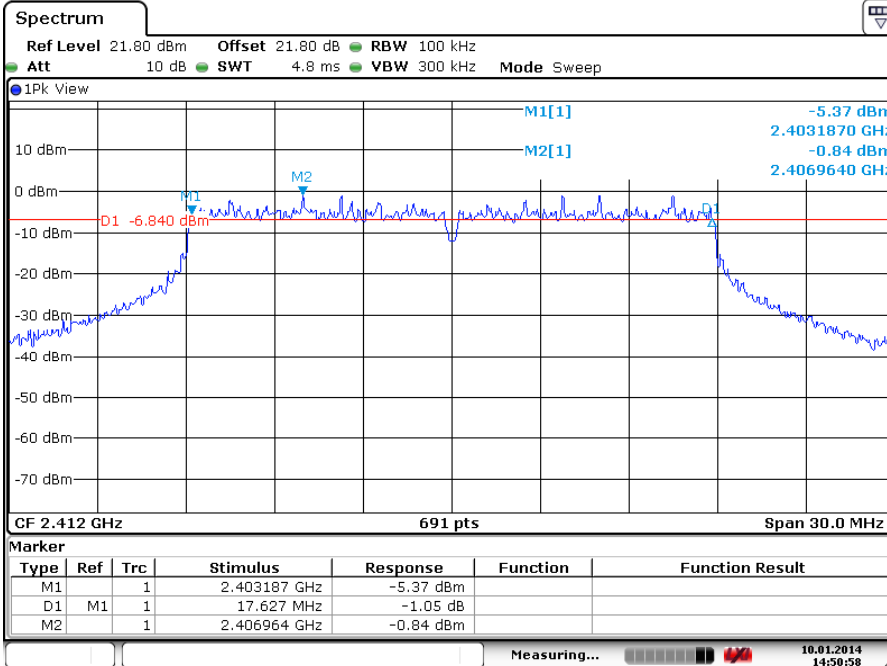
Ant 1 Mode:	802.11g	OFDM	BPSK	(HT20)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2462	16411	17192	



Date: 10.JAN.2014 14:12:27

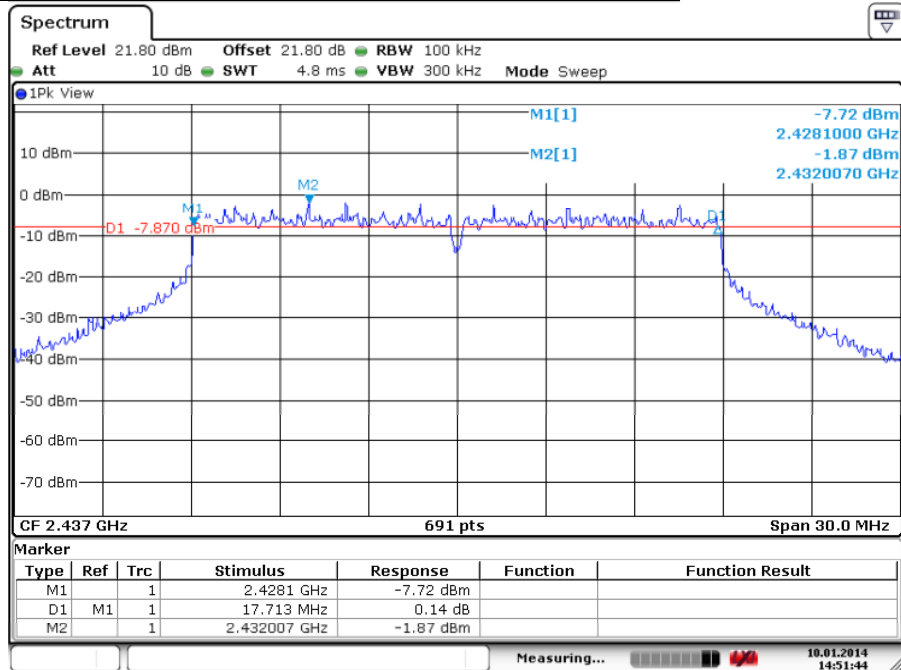
Prüfbericht - Nr.: 10045580 001
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Ant 1 Mode: 802.11n OFDM QPSK (HT20)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2412	17627	18147



Date: 10.JAN.2014 14:50:58

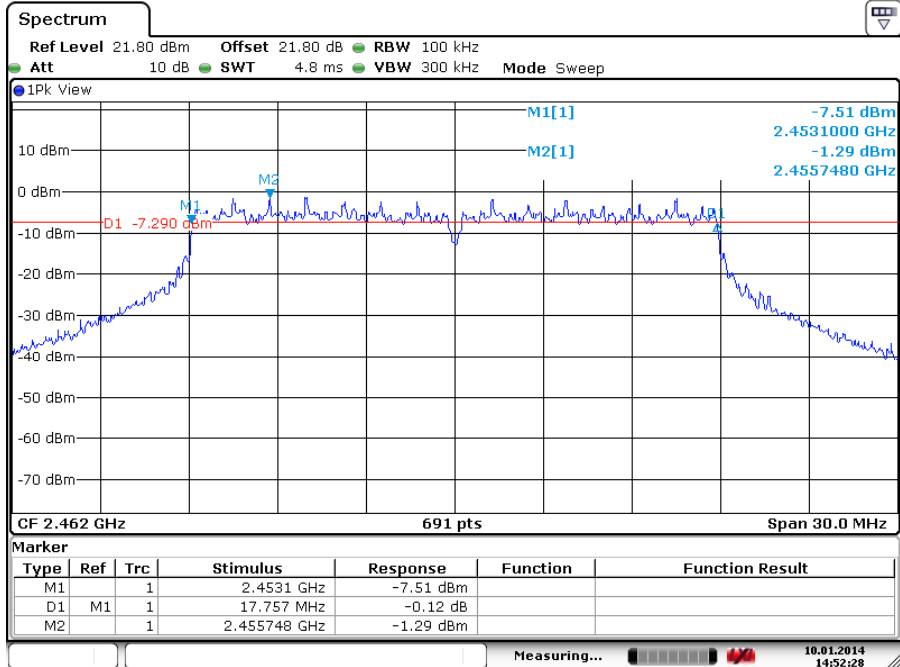
Mid	2437	17713	18147
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Date: 10.JAN.2014 14:51:44

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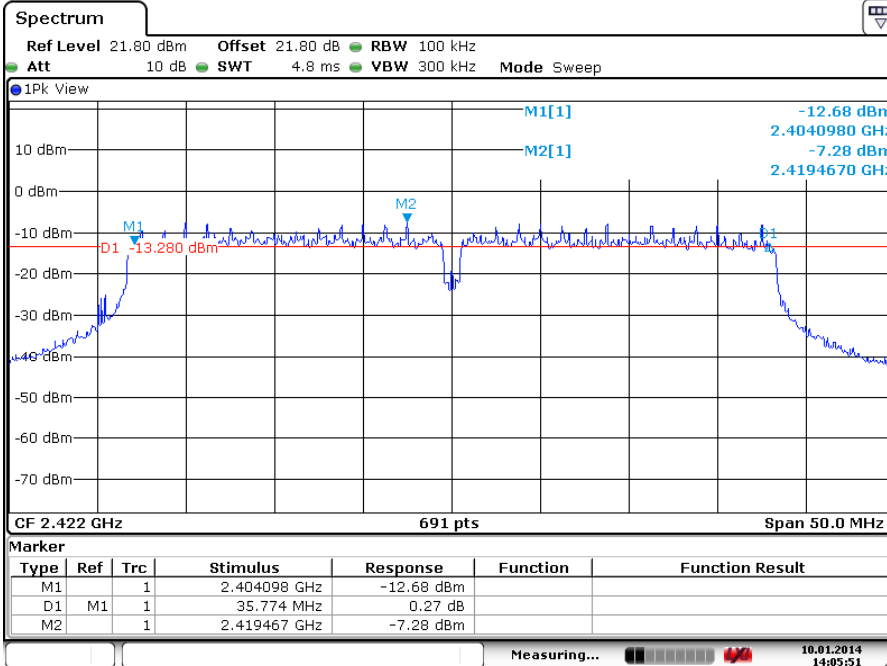
Ant 1 Mode:	802.11n	OFDM	QPSK	(HT20)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2462	17757	18191	



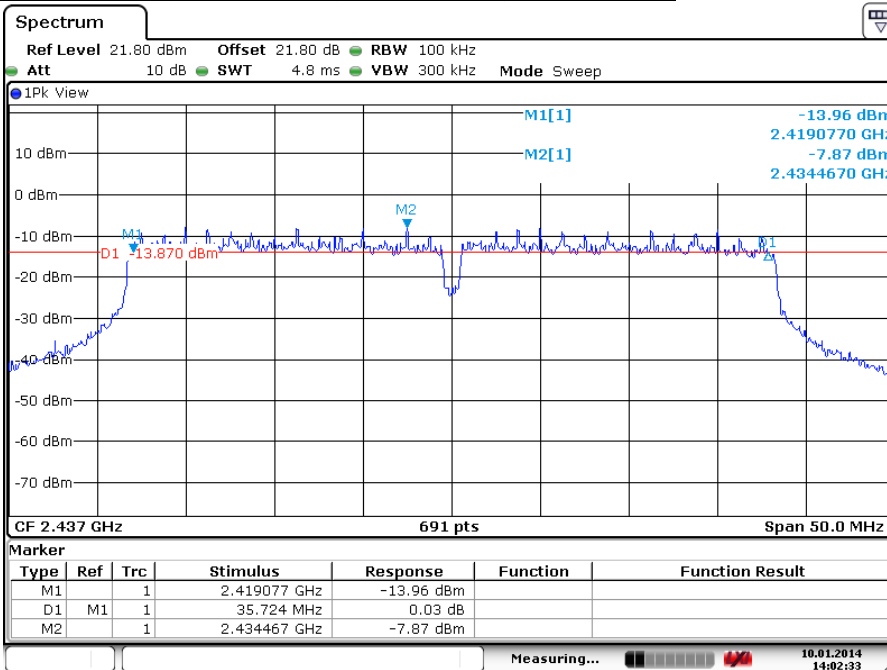
Date: 10.JAN.2014 14:52:28

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Ant 1 Mode: 802.11n OFDM QPSK (HT40)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2422	35774	37626



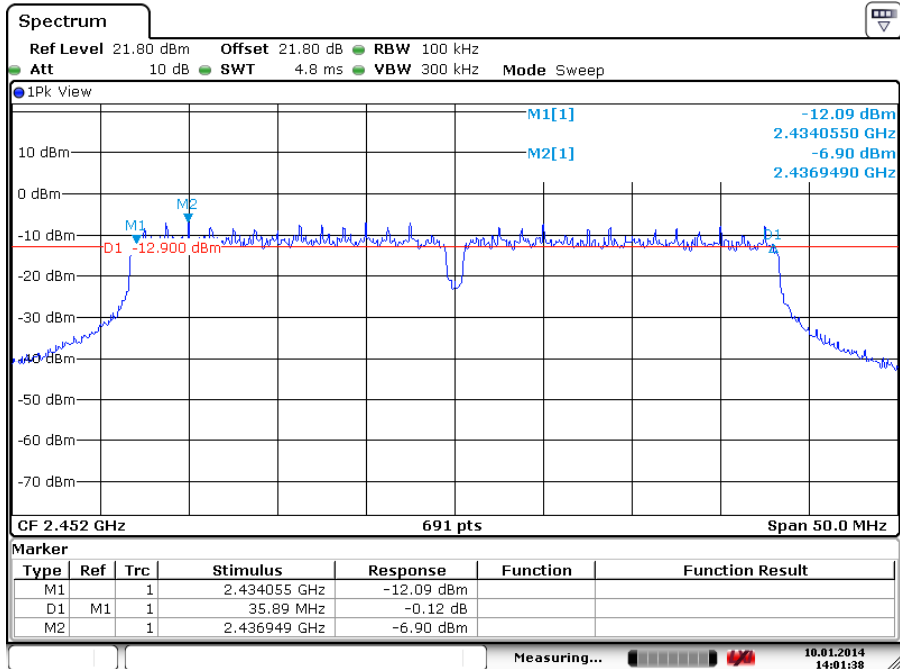
Date: 10.JAN.2014 14:05:51

Mid 2437 35724 37337


Date: 10.JAN.2014 14:02:33

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Ant 1 Mode:	802.11n	OFDM	QPSK	(HT40)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2452	35890	37264	



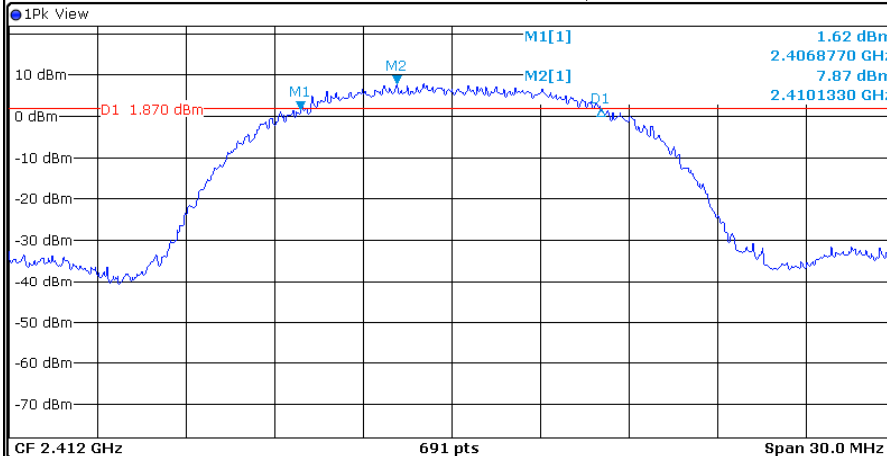
Date: 10.JAN.2014 14:01:37

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Ant 2 Mode: 802.11b DSSS QPSK (HT17)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2412	10159	13806

Spectrum

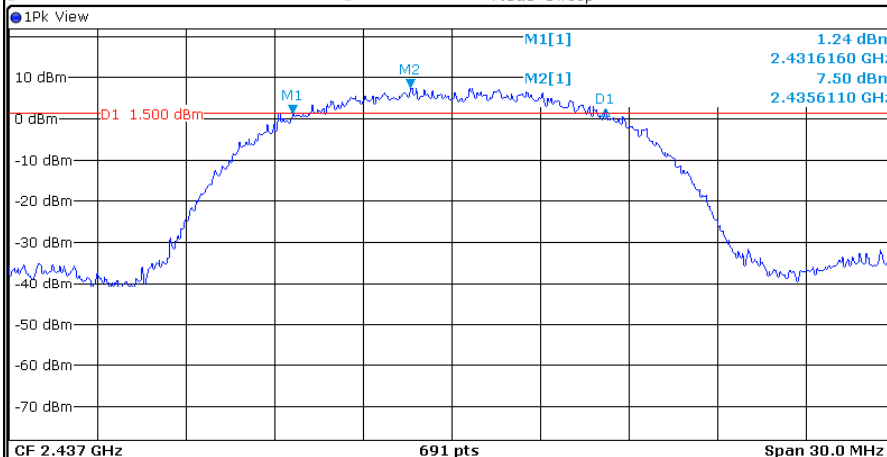
Ref Level 21.80 dBm Offset 21.80 dB RBW 100 kHz
 Att 10 dB SWT 1 ms VBW 300 kHz Mode Sweep



Date: 10.JAN.2014 16:36:07

Mid 2437 10593 13806
Spectrum

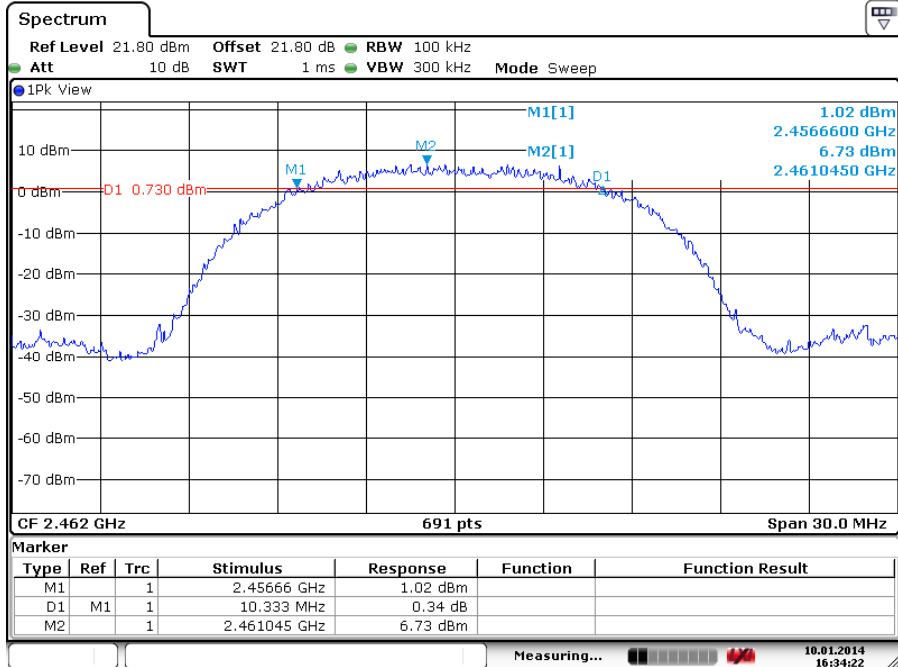
Ref Level 21.80 dBm Offset 21.80 dB RBW 100 kHz
 Att 10 dB SWT 1 ms VBW 300 kHz Mode Sweep



Date: 10.JAN.2014 16:35:01

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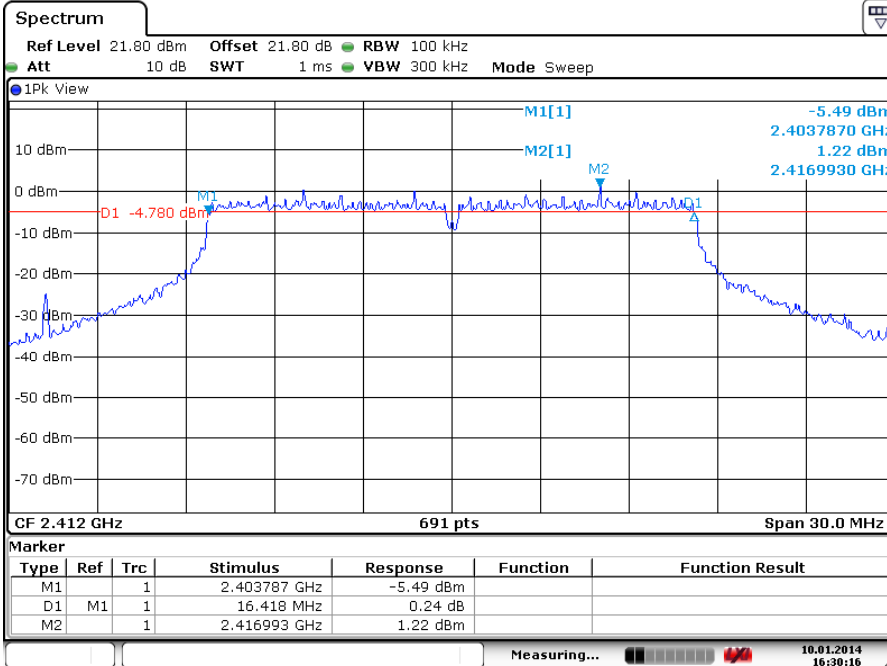
Ant 2 Mode:	802.11b	DSSS	DBPSK	(HT17)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2462	10333	13806	



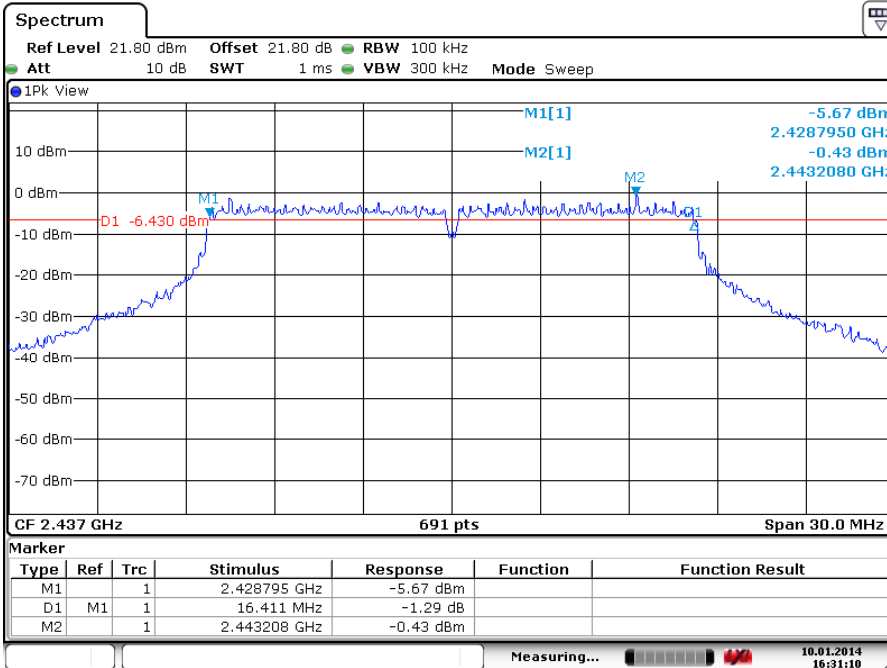
Date: 10.JAN.2014 16:34:22

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Ant 2 Mode: 802.11g OFDM BPSK (HT20)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2412	16418	17018



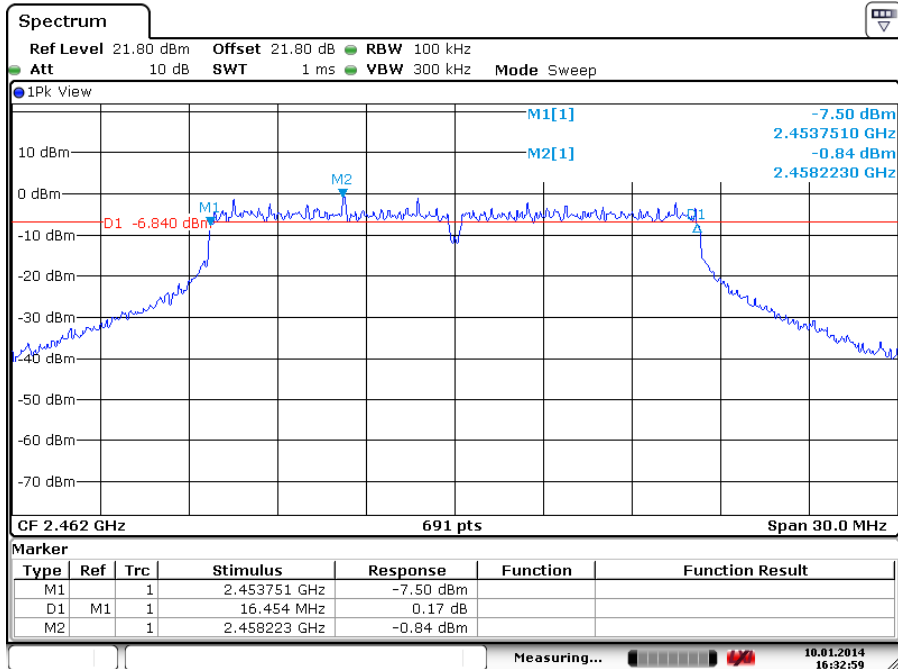
Date: 10.JAN.2014 16:30:16

Mid 2437 16411 17018


Date: 10.JAN.2014 16:31:11

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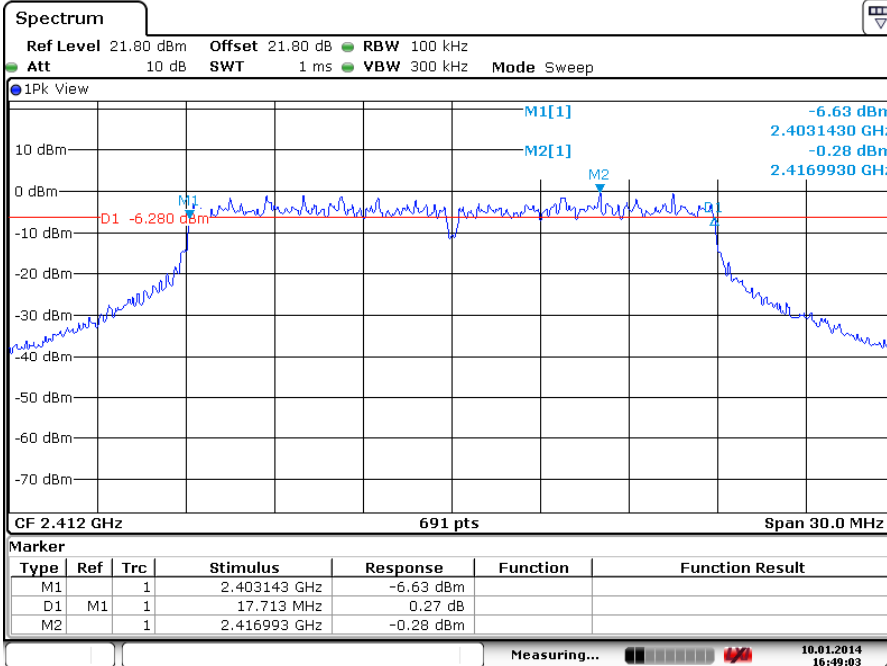
Ant 2 Mode:	802.11g	OFDM	BPSK	(HT20)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2462	16454	16975	



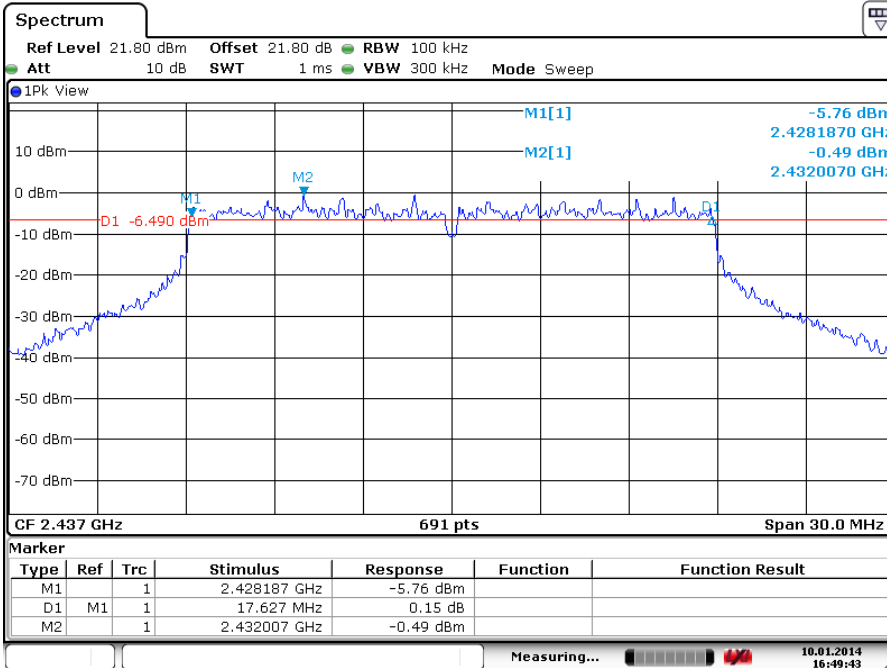
Date: 10.JAN.2014 16:33:00

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Ant 2 Mode: 802.11n OFDM QPSK (HT20)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2412	17713	18147



Date: 10.JAN.2014 16:49:03

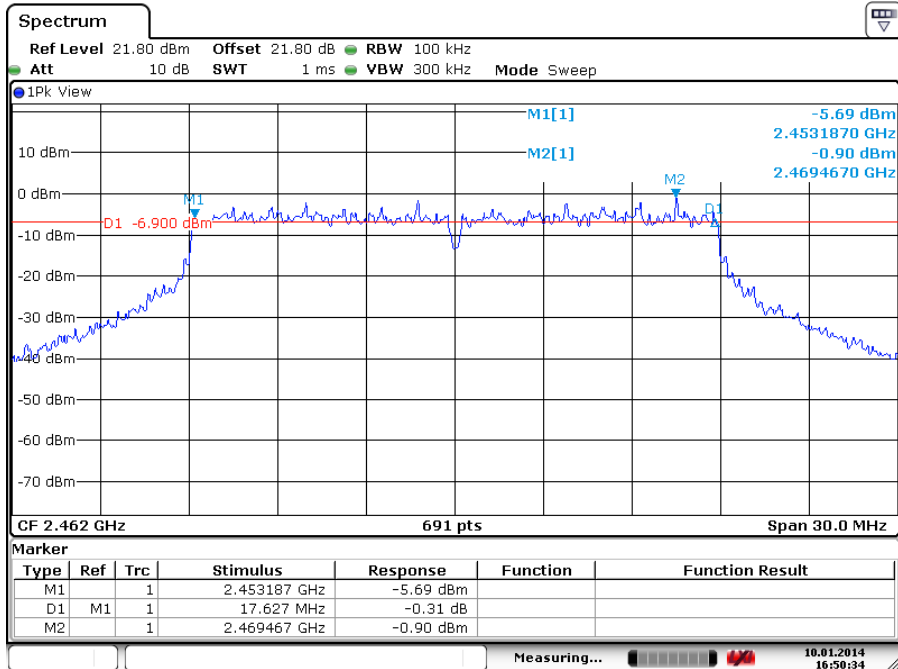
Mid 2437 17627 18147


Date: 10.JAN.2014 16:49:43

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Ant 2 Mode:	802.11n	OFDM	QPSK	(HT20)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2462	17627	18191	



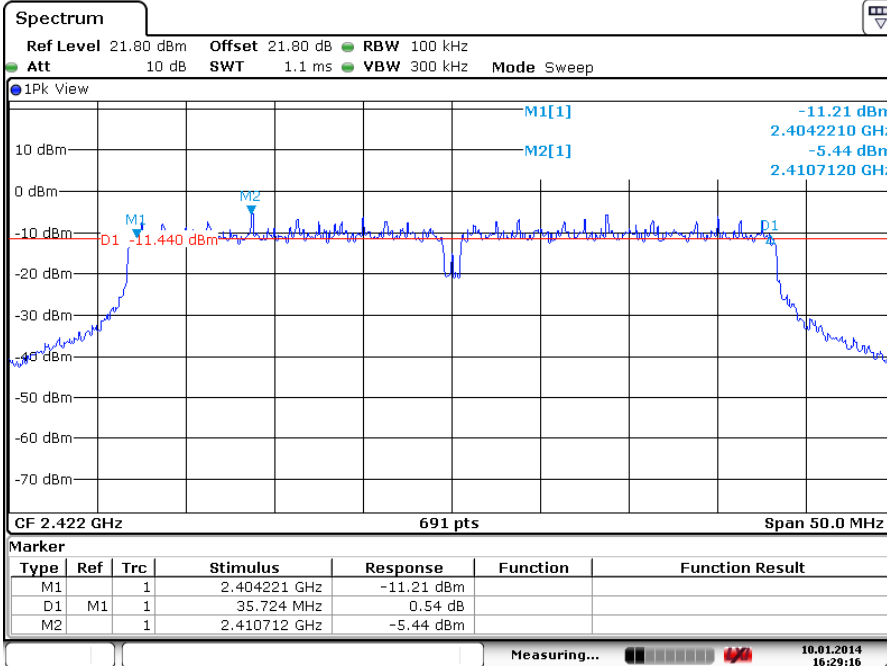
Date: 10.JAN.2014 16:50:35

Prüfbericht - Nr.: 10045580 001
 Test Report No.

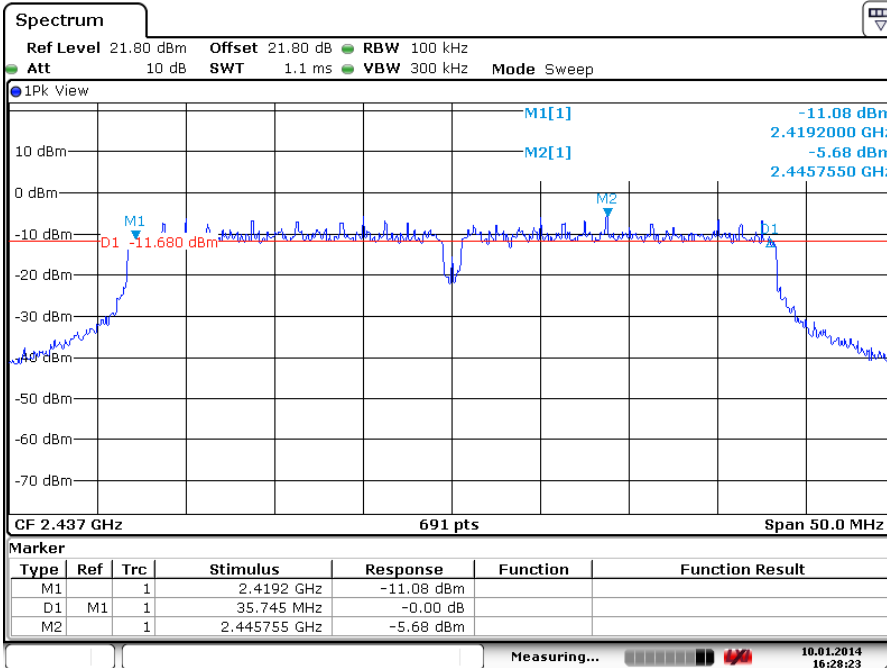
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Ant 2 Mode: 802.11n OFDM QPSK (HT40)

Channel	MHz	6dB(kHz)	99%(kHz)
Low	2422	35724	37264



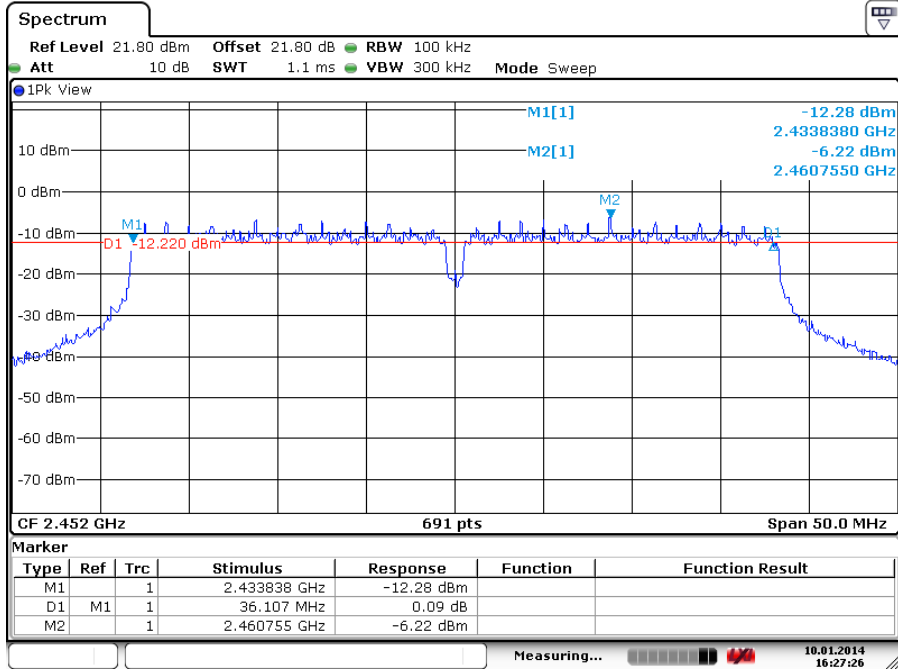
Date: 10.JAN.2014 16:29:17

Mid 2437 35745 37264


Date: 10.JAN.2014 16:28:23

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Ant 2 Mode:	802.11n	OFDM	QPSK	(HT40)
Channel	MHz	6dB(kHz)	99%(kHz)	
High	2452	36107	37264	



Date: 10.JAN.2014 16:27:26

5.1.4 Power Density

RESULT:**Passed**

Test standard : FCC Part 15.247(e) , RSS-210 A8.2(2)
Basic standard : ANSI C63.10:2009, KDB558074
Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 18-22 °C
Relative humidity : 50-65 %
Atmospheric pressure : 100-103 kPa

Table 9: Test result of Power Density Antenna 1

Ant 1 Mode: 802.11b DSSS QPSK (HT17)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2412	-5.41	5	Pass
Mid	2437	-2.95	5	Pass
High	2462	-7.23	5	Pass

Ant 1 Mode: 802.11g OFDM BPSK (HT20)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2412	-14.96	5	Pass
Mid	2437	-14.38	5	Pass
High	2462	-15.24	5	Pass

Ant 1 Mode: 802.11n OFDM QPSK (HT20)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2412	-15.86	5	Pass
Mid	2437	-14.23	5	Pass
High	2462	-15.91	5	Pass

Ant 1 Mode: 802.11n OFDM QPSK (HT40)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2422	-20	5	Pass
Mid	2437	-19.89	5	Pass
High	2452	-19.62	5	Pass

Table 10: Test result of Power Density Antenna 2

Ant 2 Mode: 802.11b DSSS QPSK (HT17)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2412	-0.85	5	Pass
Mid	2437	-2.67	5	Pass
High	2462	-4.63	5	Pass

Ant 2 Mode: 802.11g OFDM BPSK (HT20)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2412	-11.77	5	Pass
Mid	2437	-14.43	5	Pass
High	2462	-14.53	5	Pass

Ant 2 Mode: 802.11n OFDM QPSK (HT20)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2412	-14.49	5	Pass
Mid	2437	-14.13	5	Pass
High	2462	-15.3	5	Pass

Ant 2 Mode: 802.11n OFDM QPSK (HT40)

Channel	Frequency MHz	Peak Power Density dBm/3 kHz	Limit (dBm/3kHz)	Result
Low	2422	-18.65	5	Pass
Mid	2437	-17.42	5	Pass
High	2452	-17.55	5	Pass

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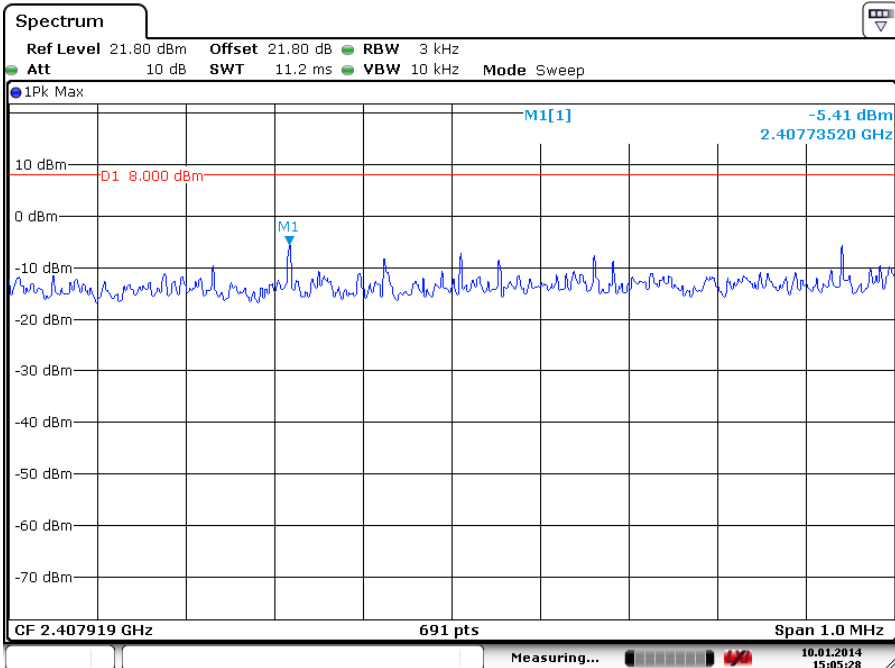
Result Diagrams

ANT 1 MODE:	802.11B DSSS DBPSK (HT17).....	58
ANT 1 MODE:	802.11G OFDM BPSK (HT20)	60
ANT 1 MODE:	802.11N OFDM BPSK (HT20).....	62
ANT 1 MODE:	802.11N OFDM BPSK (HT40).....	64
ANT 2 MODE:	802.11B DSSS DBPSK (HT17).....	66
ANT 2 MODE:	802.11G OFDM BPSK (HT20)	68
ANT 2 MODE:	802.11N OFDM BPSK (HT20).....	70
ANT 2 MODE:	802.11N OFDM BPSK (HT40).....	72

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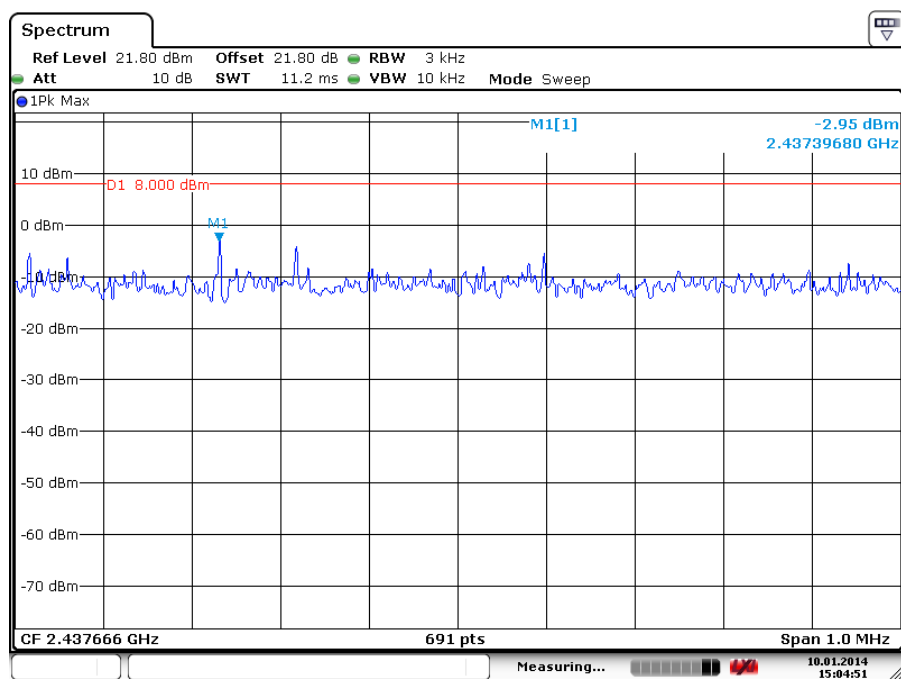
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Ant 1 Mode: 802.11b DSSS QPSK (HT17)

Channel	MHz	PPD dBm/3 kHz
Low	2412	-5.41



Date: 10.JAN.2014 15:05:27

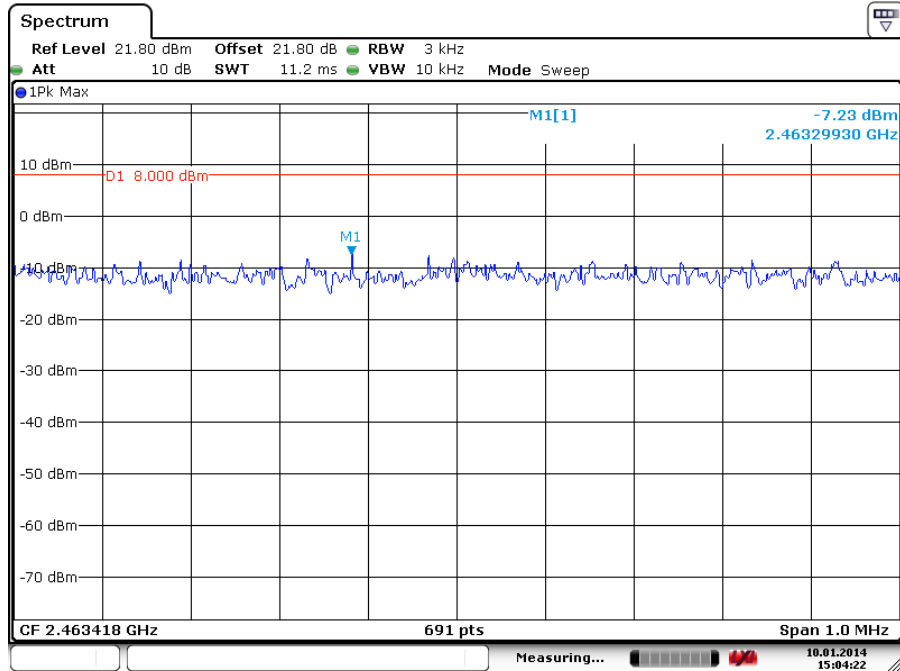
Mid	2437	-2.95
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Date: 10.JAN.2014 15:04:51

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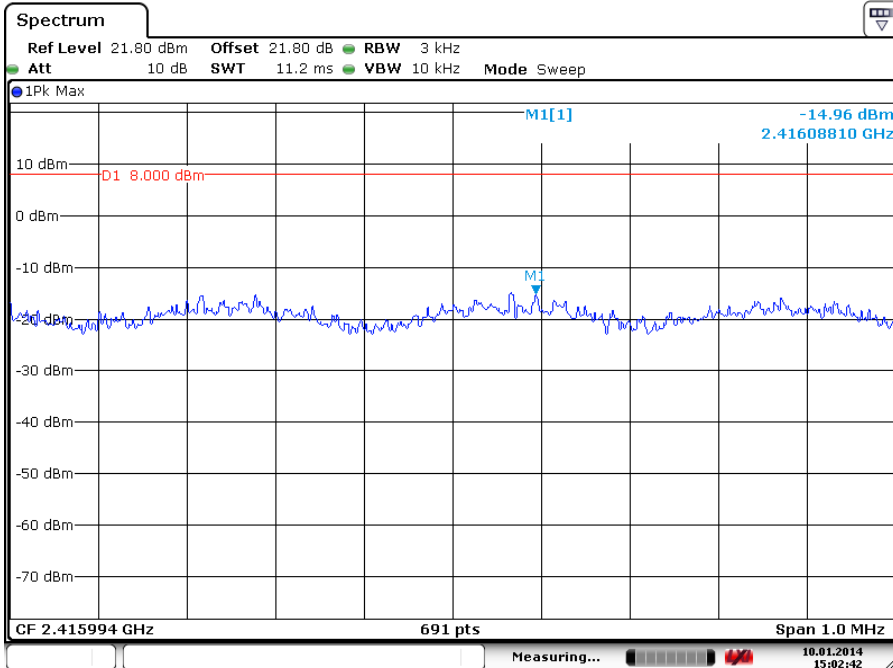
Ant 1 Mode:	802.11b	DSSS	QPSK	(HT17)
Channel	MHz	PPD dBm/3 kHz		
Low	2462	-7.23		



Date: 10.JAN.2014 15:04:23

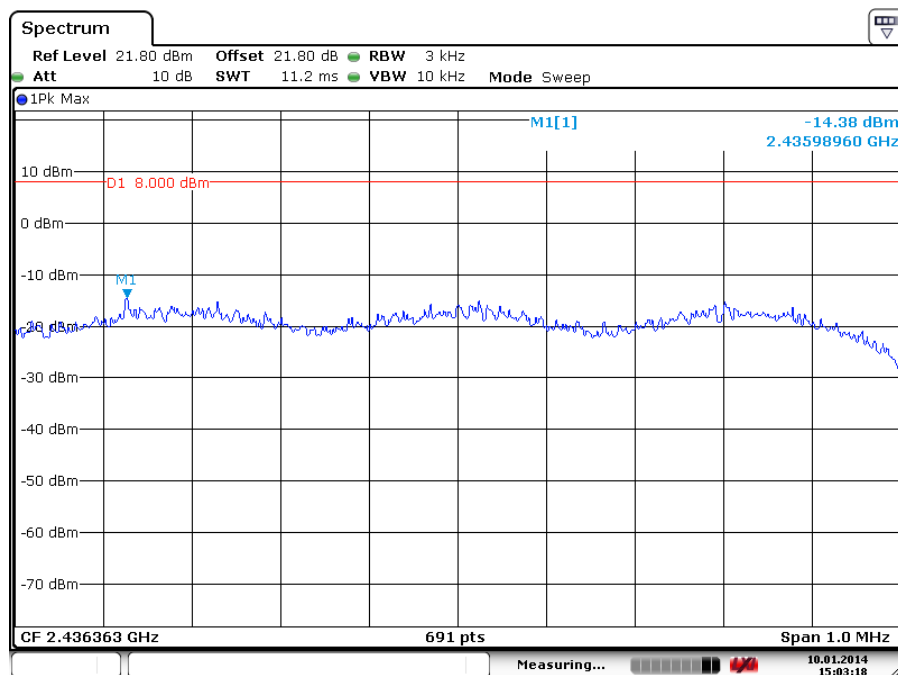
Prüfbericht - Nr.: 10045580 001
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Ant 1 Mode: 802.11g OFDM BPSK (HT20)

Channel	MHz	PPD dBm/3 kHz
Low	2412	-14.96



Date: 10.JAN.2014 15:02:41

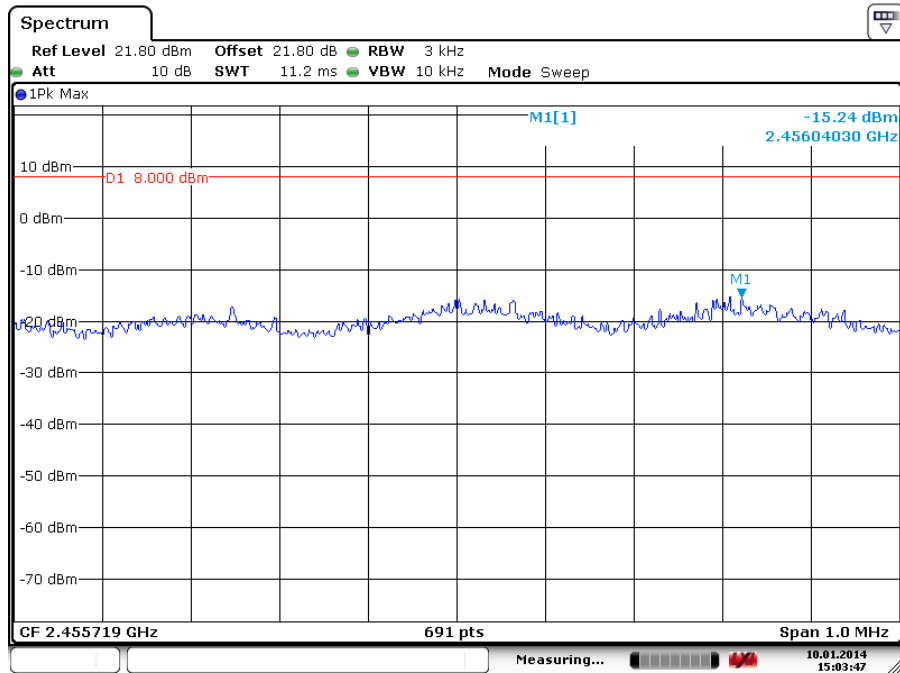
Mid	2437	-14.38
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Date: 10.JAN.2014 15:03:17

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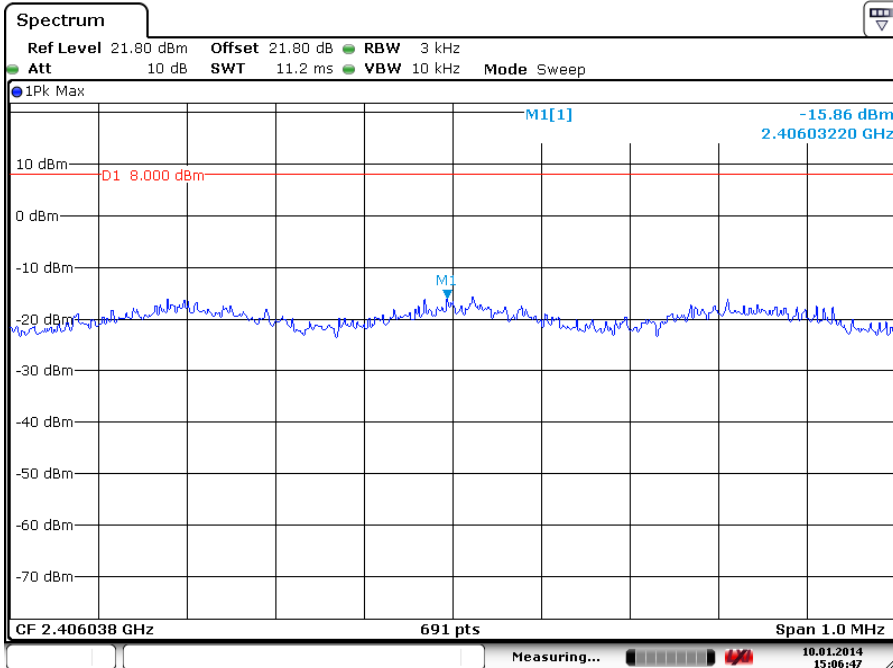
Ant 1 Mode:	802.11g	OFDM	BPSK	(HT20)
Channel	MHz	PPD dBm/3 kHz		
Low	2462	-15.24		



Date: 10.JAN.2014 15:03:47

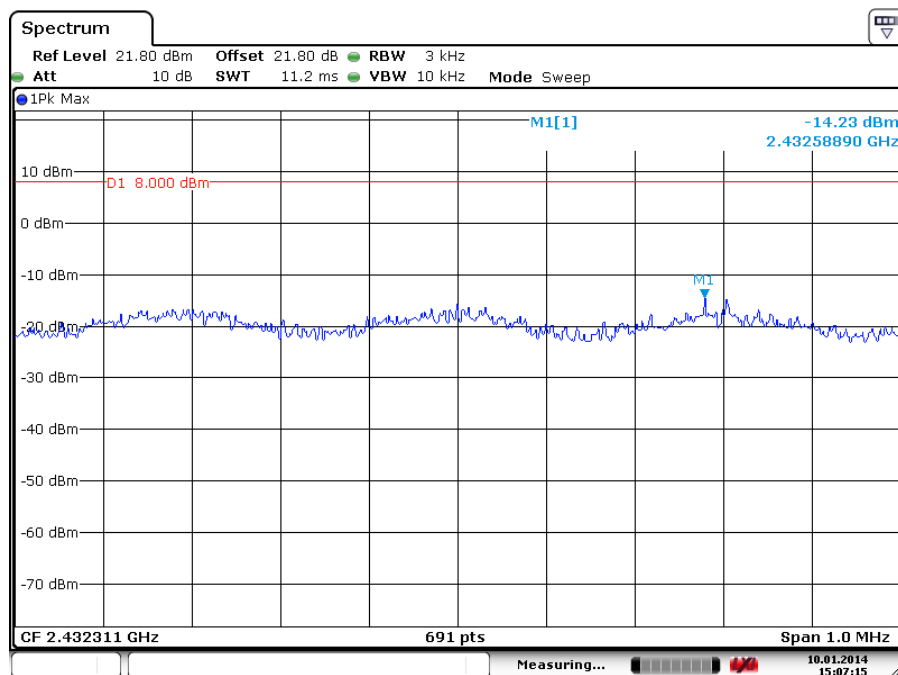
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Ant 1 Mode: 802.11n OFDM QPSK (HT20)

Channel	MHz	PPD dBm/3 kHz
Low	2412	-15.86



Date: 10.JAN.2014 15:06:47

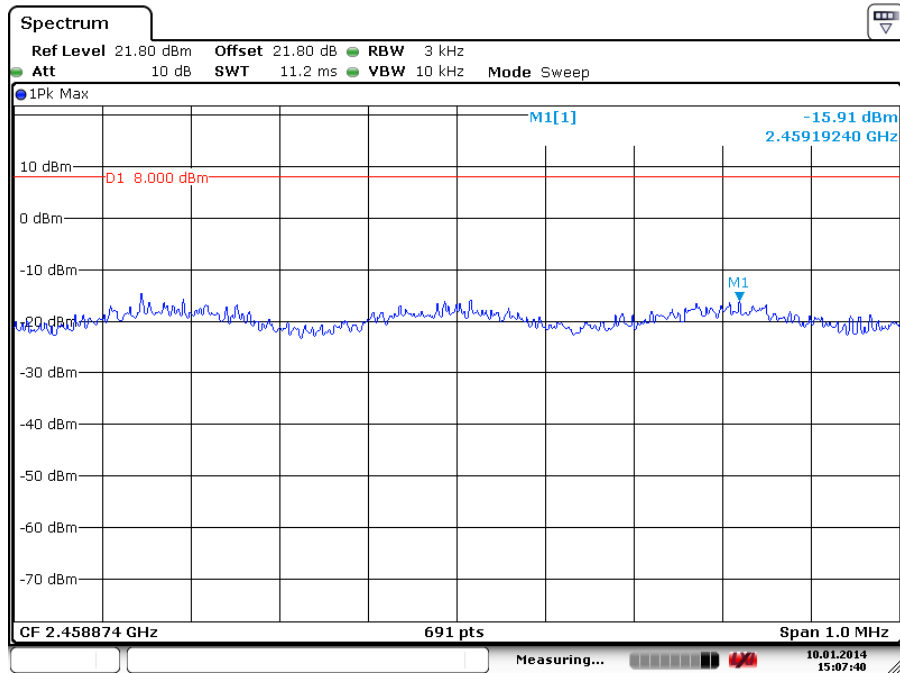
Mid	2437	-14.23
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Date: 10.JAN.2014 15:07:15

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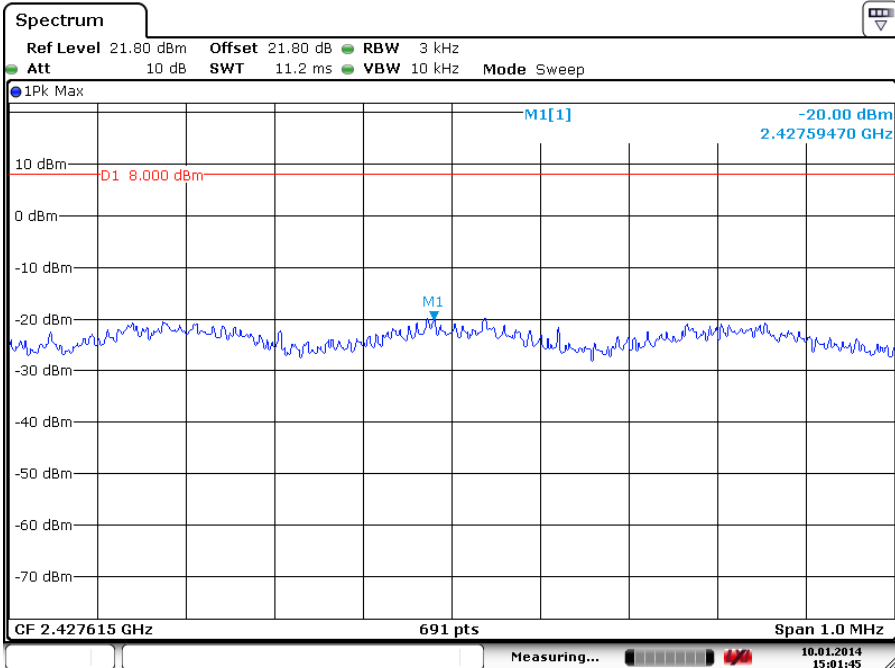
Ant 1 Mode:	802.11n	OFDM	QPSK	(HT20)
Channel	MHz	PPD dBm/3 kHz		
Low	2462	-15.91		



Date: 10.JAN.2014 15:07:40

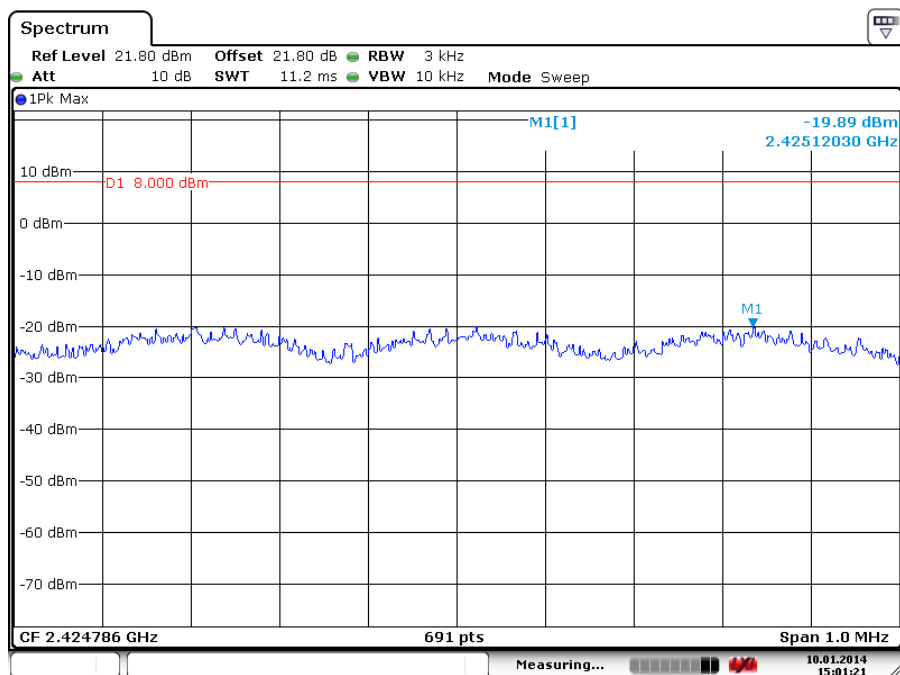
Prüfbericht - Nr.: 10045580 001
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Ant 1 Mode: 802.11n OFDM QPSK (HT40)

Channel	MHz	PPD dBm/3 kHz
Low	2422	-20



Date: 10.JAN.2014 15:01:45

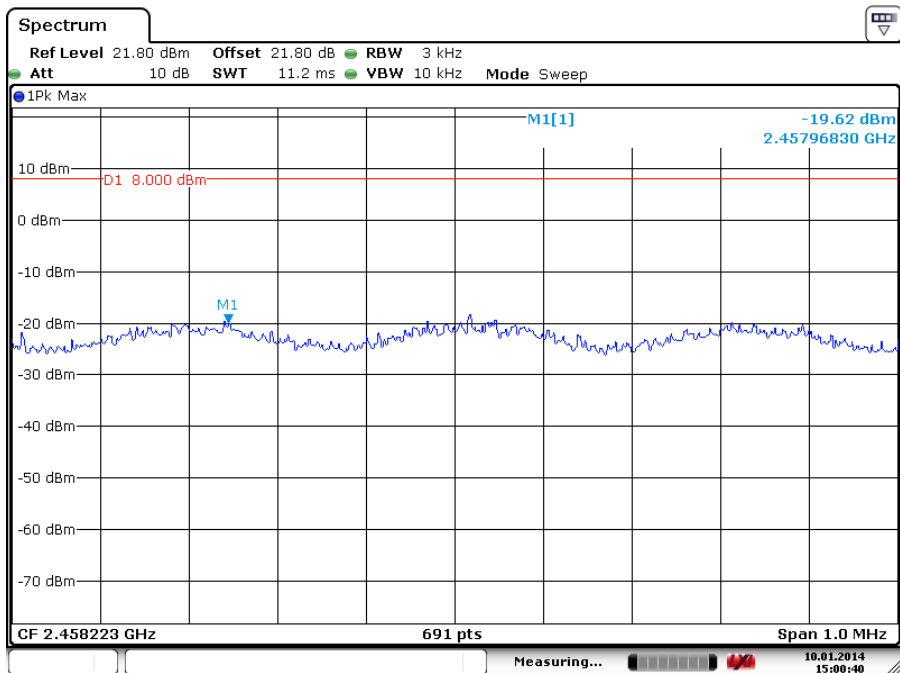
Mid	2437	-19.89
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Date: 10.JAN.2014 15:01:21

Prüfbericht - Nr.: 10045580 001
Test Report No.
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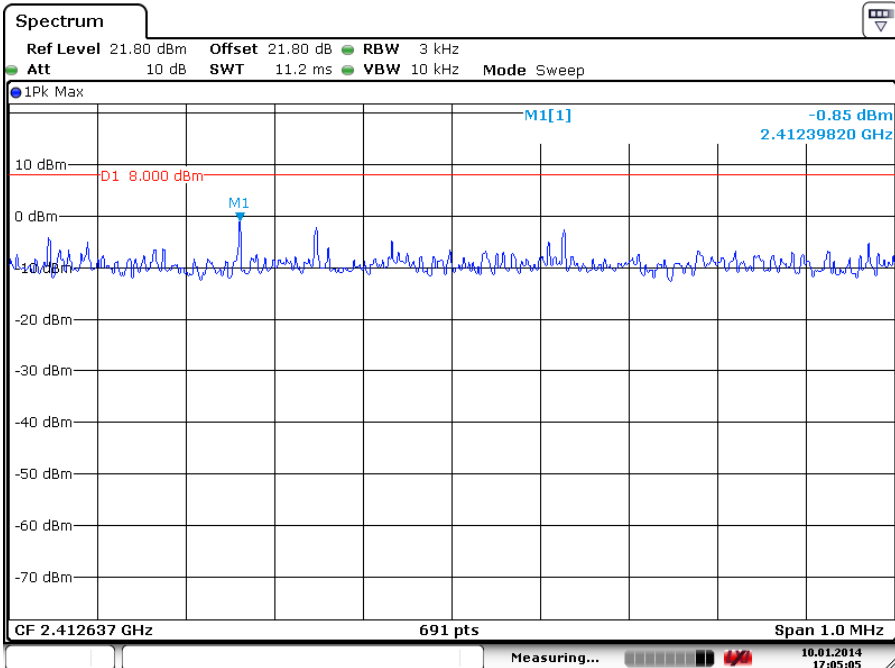
Ant 1 Mode:	802.11n	OFDM	QPSK	(HT40)
Channel	MHz	PPD dBm/3 kHz		
Low	2452	-19.62		



Date: 10.JAN.2014 15:00:40

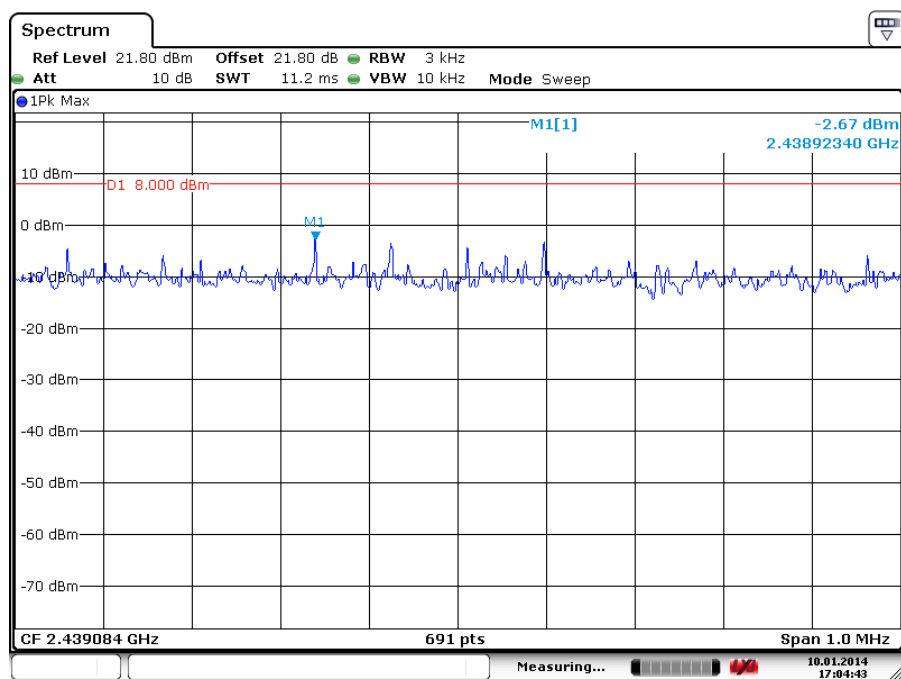
Prüfbericht - Nr.: 10045580 001
Test Report No.
Seite 66 von 104
Page 66 of 104
Ant 2 Mode: 802.11b DSSS QPSK (HT17)

Channel	MHz	PPD dBm/3 kHz
Low	2412	-0.85



Date: 10.JAN.2014 17:05:06

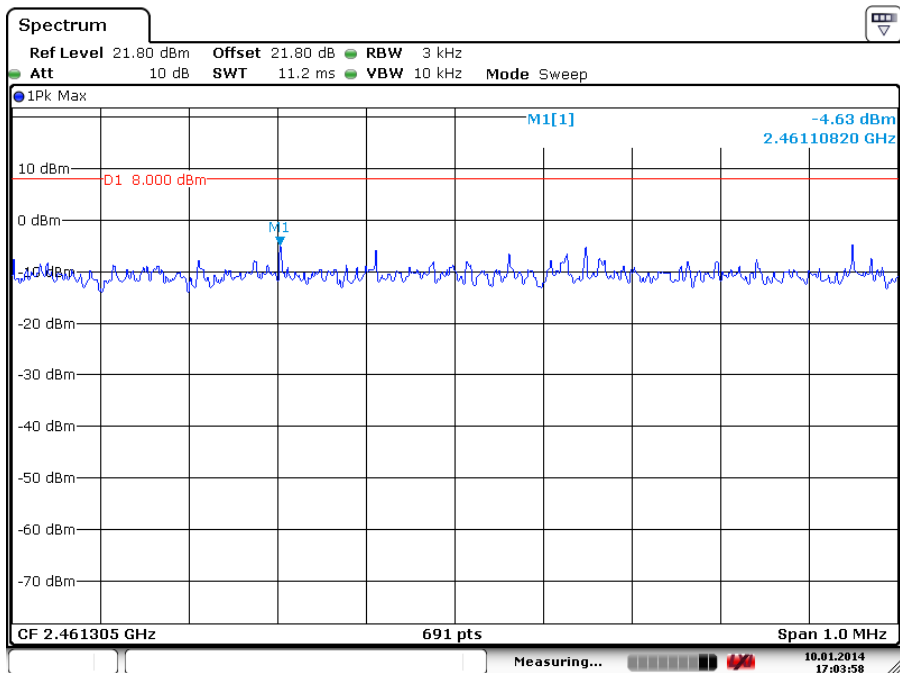
Mid	2437	-2.67
-----	------	-------



Date: 10.JAN.2014 17:04:43

Prüfbericht - Nr.: 10045580 001
Test Report No.
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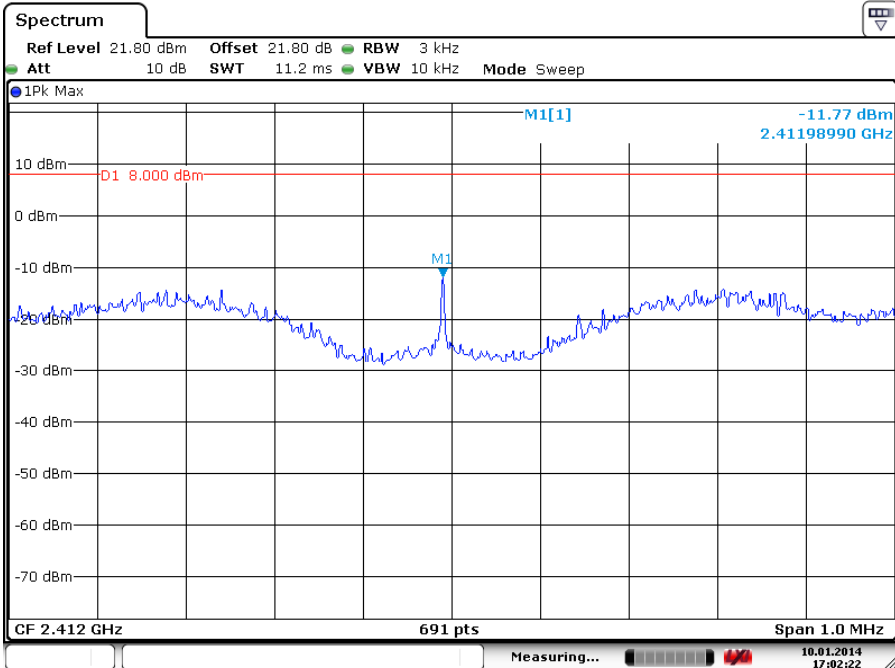
Ant 2 Mode:	802.11b	DSSS	QPSK	(HT17)
Channel	MHz	PPD dBm/3 kHz		
Low	2462	-4.63		



Date: 10.JAN.2014 17:03:58

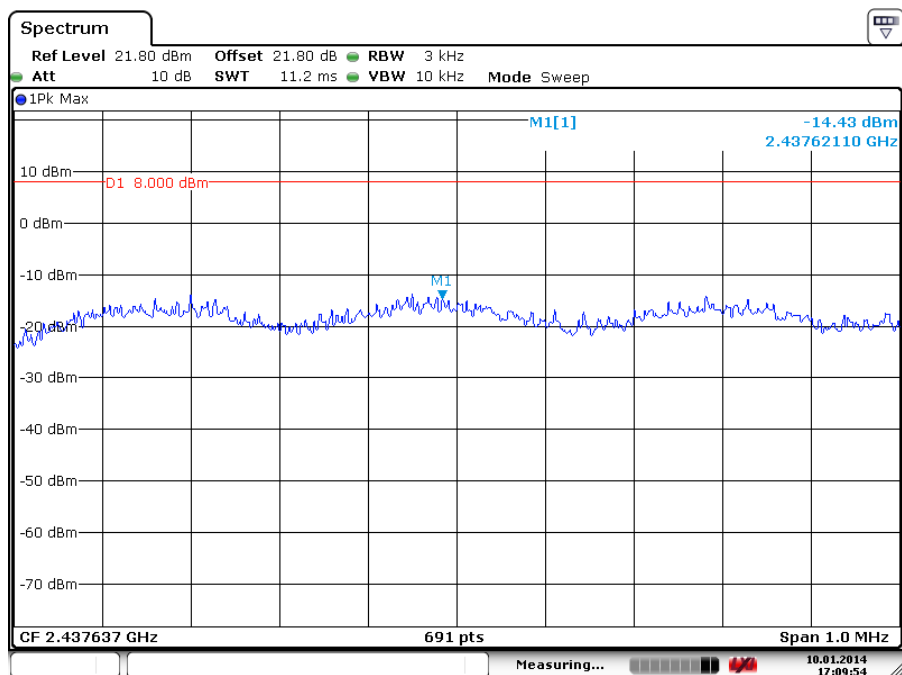
Prüfbericht - Nr.: 10045580 001
Test Report No.
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Ant 2 Mode: 802.11g OFDM BPSK (HT20)

Channel	MHz	PPD dBm/3 kHz
Low	2412	-11.77



Date: 10.JAN.2014 17:02:23

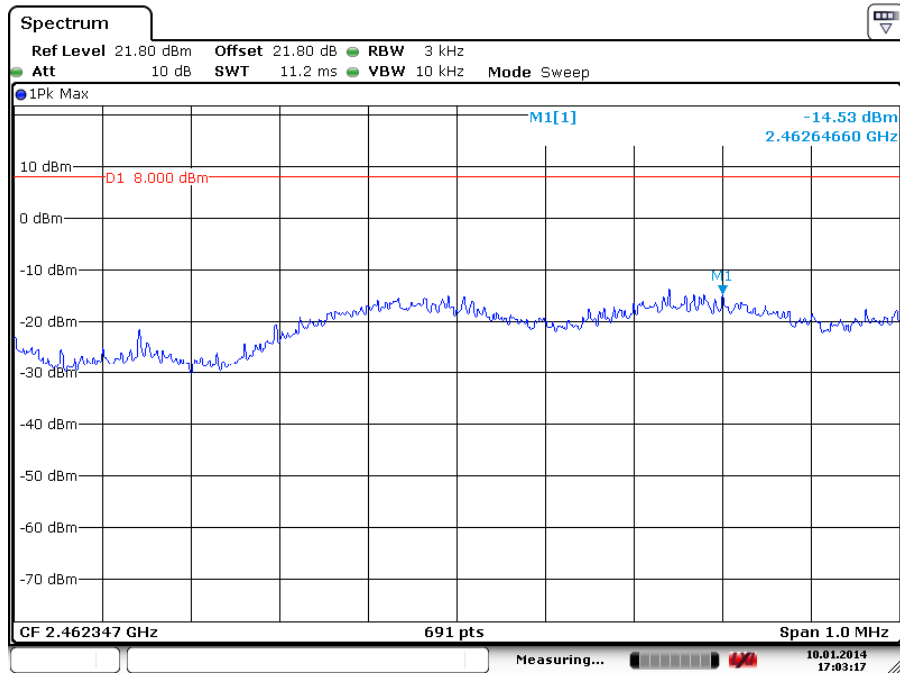
Mid	2437	-14.43
-----	------	--------



Date: 10.JAN.2014 17:09:54

Prüfbericht - Nr.: 10045580 001
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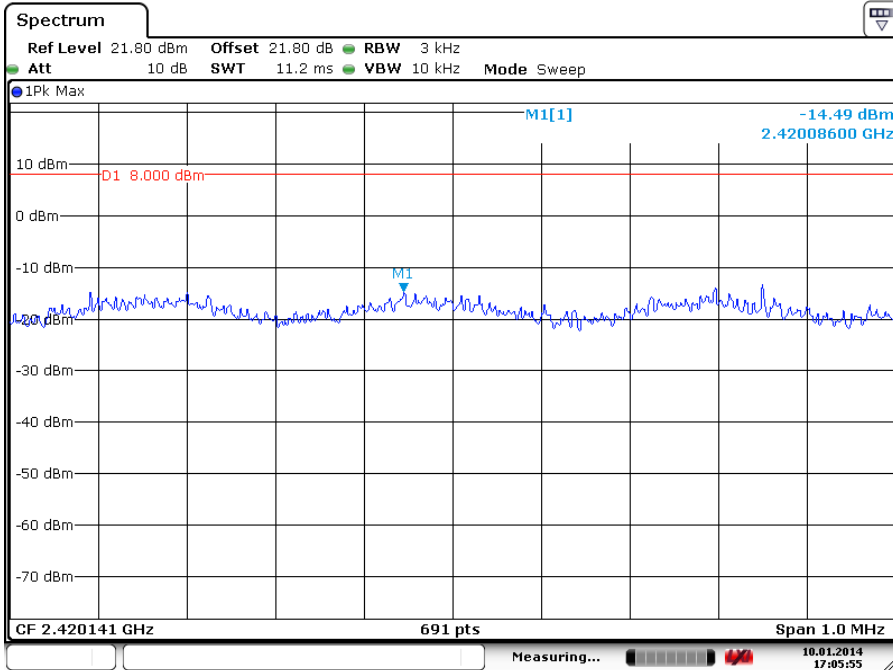
Ant 2 Mode:	802.11g	OFDM	BPSK	(HT20)
Channel	MHz	PPD dBm/3 kHz		
Low	2462	-14.53		



Date: 10.JAN.2014 17:03:18

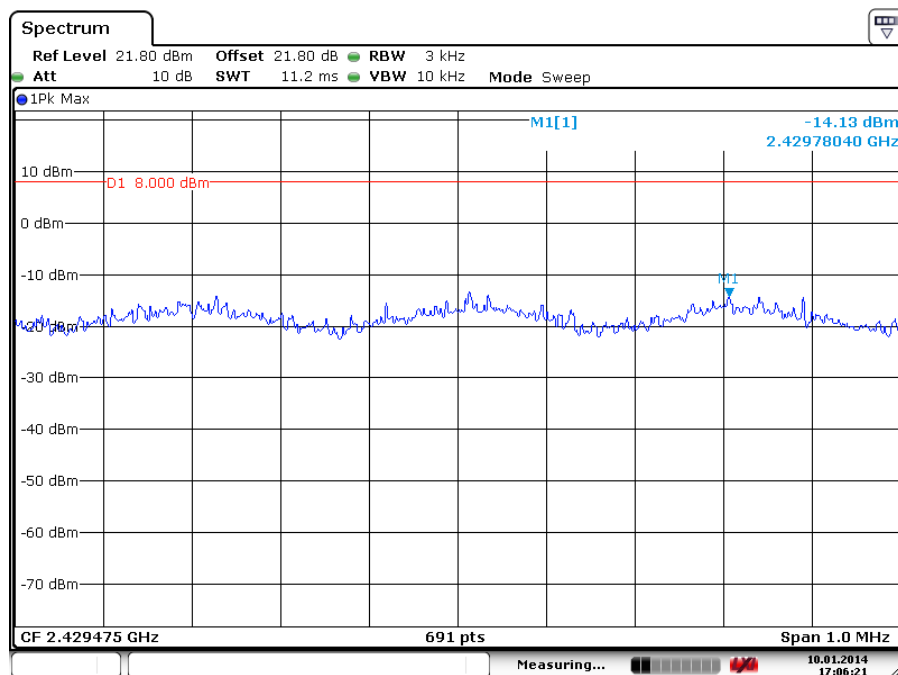
Prüfbericht - Nr.: 10045580 001
Test Report No.
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Ant 2 Mode: 802.11n OFDM QPSK (HT20)

Channel	MHz	PPD dBm/3 kHz
Low	2412	-14.49



Date: 10.JAN.2014 17:05:56

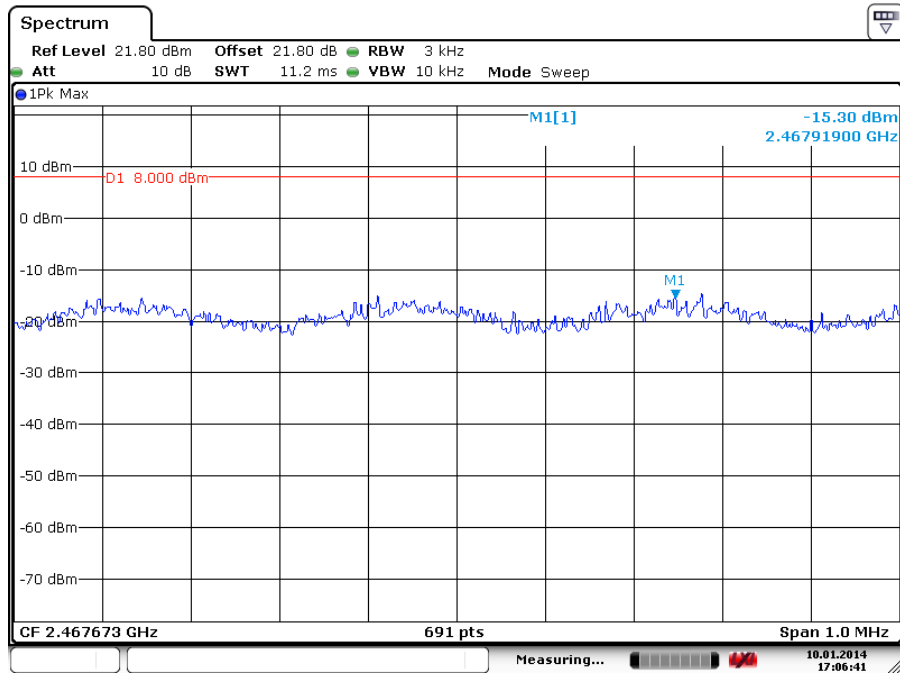
Mid	2437	-14.13
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Date: 10.JAN.2014 17:06:22

Prüfbericht - Nr.: 10045580 001
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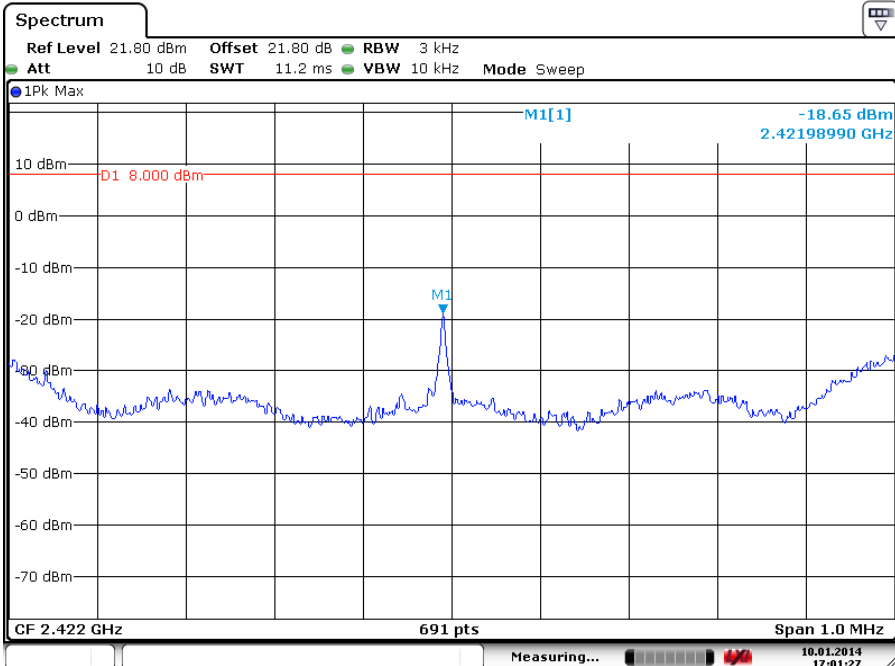
Ant 2 Mode:	802.11n	OFDM	QPSK	(HT20)
Channel	MHz	PPD dBm/3 kHz		
Low	2462	-15.3		



Date: 10.JAN.2014 17:06:41

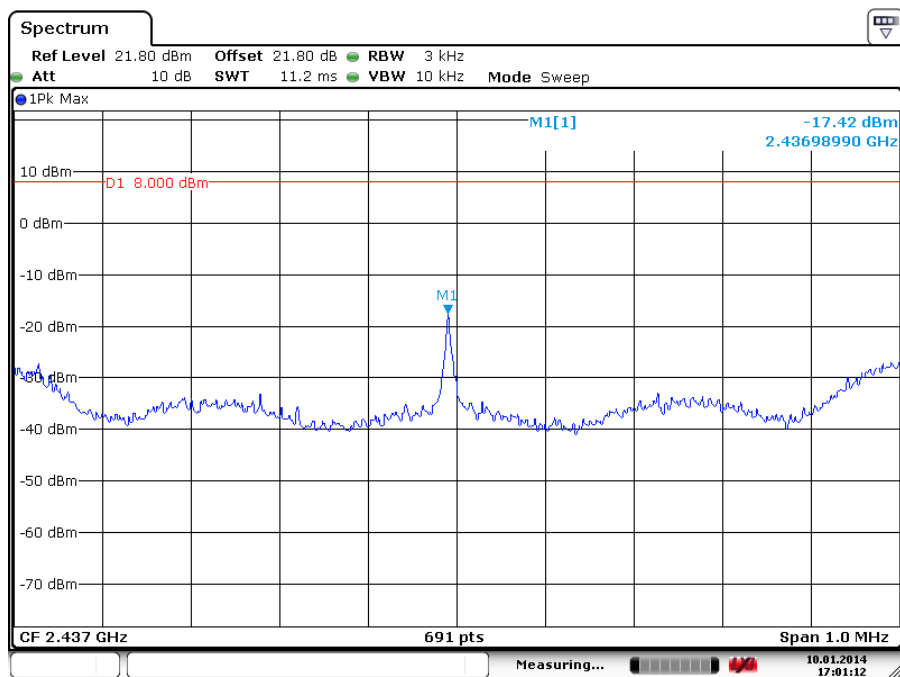
Prüfbericht - Nr.: 10045580 001
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Ant 2 Mode: 802.11n OFDM QPSK (HT40)

Channel	MHz	PPD dBm/3 kHz
Low	2422	-18.65



Date: 10.JAN.2014 17:01:27

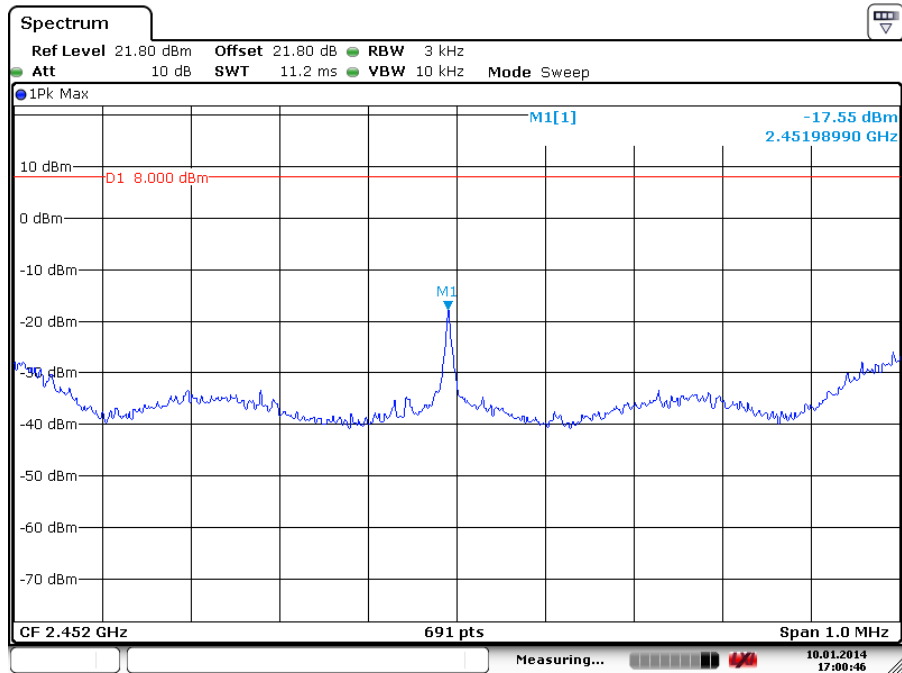
Mid	2437	-17.42
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Date: 10.JAN.2014 17:01:13

Prüfbericht - Nr.: 10045580 001
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Ant 2 Mode:	802.11n	OFDM	QPSK	(HT40)
Channel	MHz	PPD dBm/3 kHz		
Low	2452	-17.55		



Date: 10.JAN.2014 17:00:47

**5.1.5 Conducted spurious emissions and Frequency Band Edge
measured in 100kHz Bandwidth****RESULT:****Passed**

Test standard	:	FCC part 15.247(d), RSS-210 A8.5
Basic standard	:	ANSI C63.10:2009, KDB558074
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power)
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ High
Operation mode	:	A
Ambient temperature	:	18-22 °C
Relative humidity	:	50-65 %
Atmospheric pressure	:	100-103 kPa

All emissions are more than 20dB below fundamental, details refer to following test plot, and compliance is achieved as well.

Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

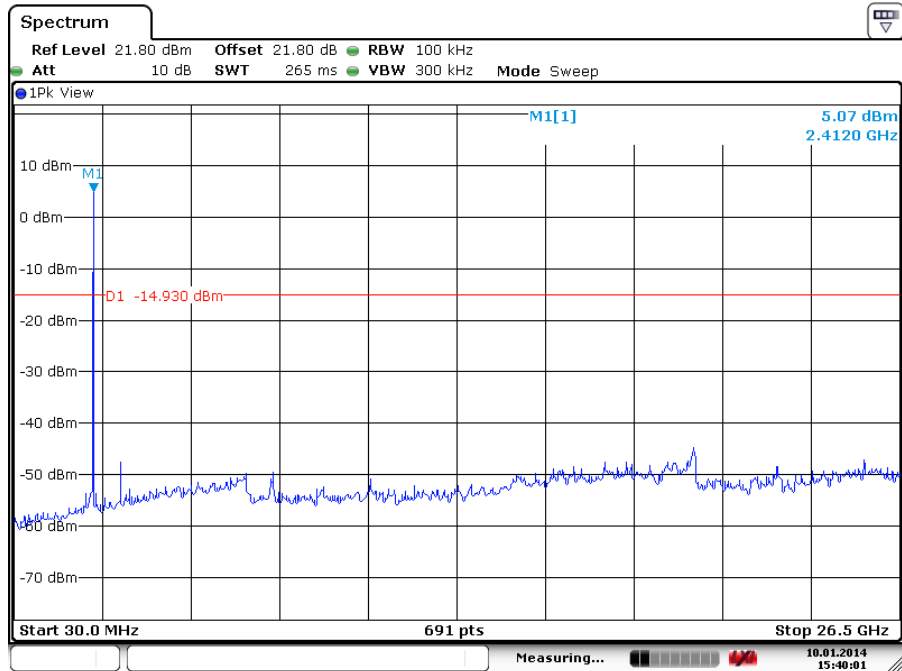
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Test Plot of 100kHz Conducted Emissions

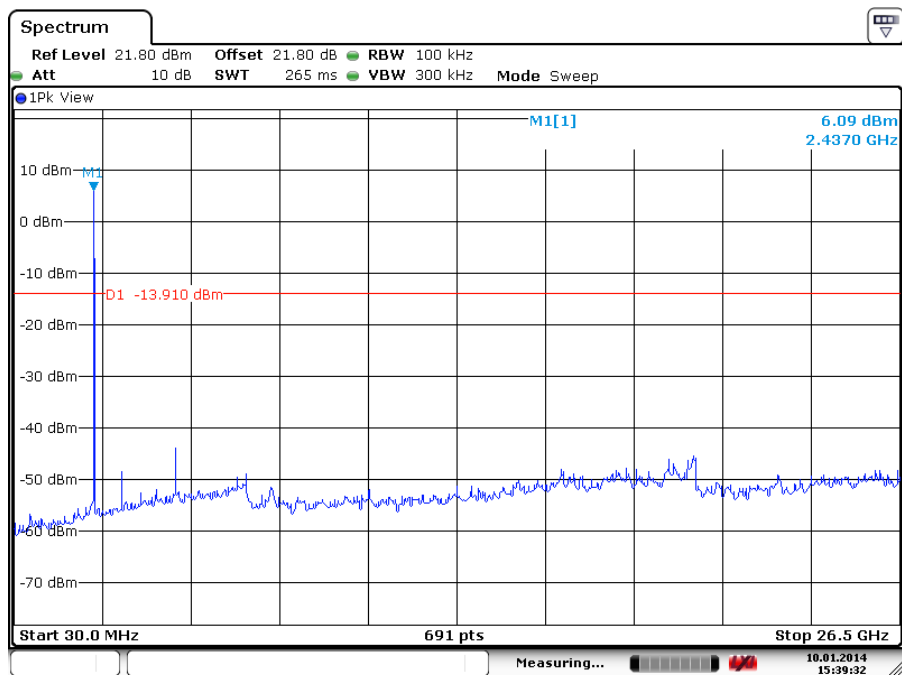
Ant 1 Mode: 802.11b DSSS QPSK (HT17)

Low Channel



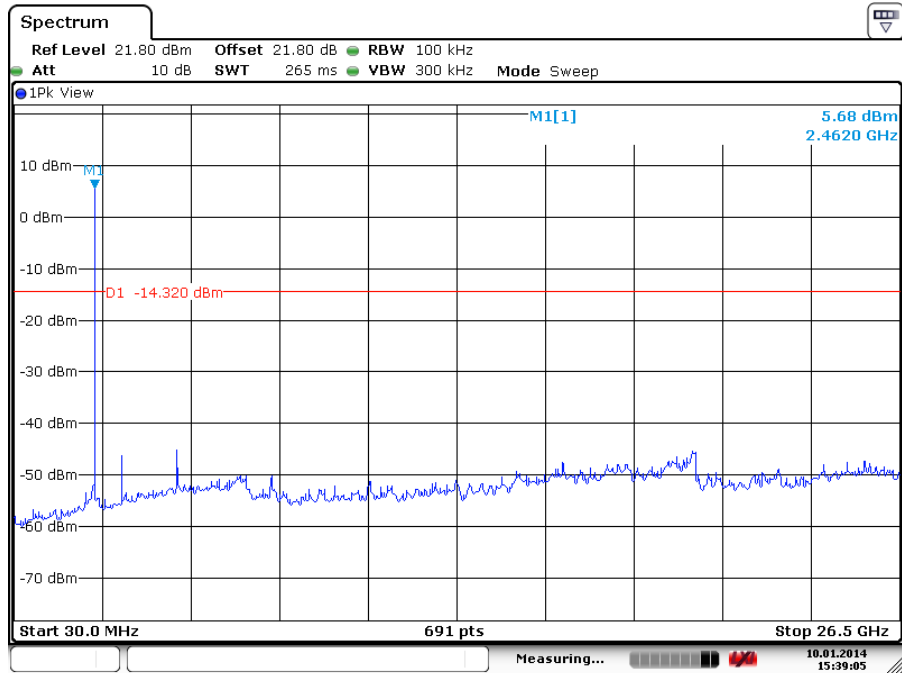
Date: 10.JAN.2014 15:40:01

Middle Channel



Date: 10.JAN.2014 15:39:32

High Channel

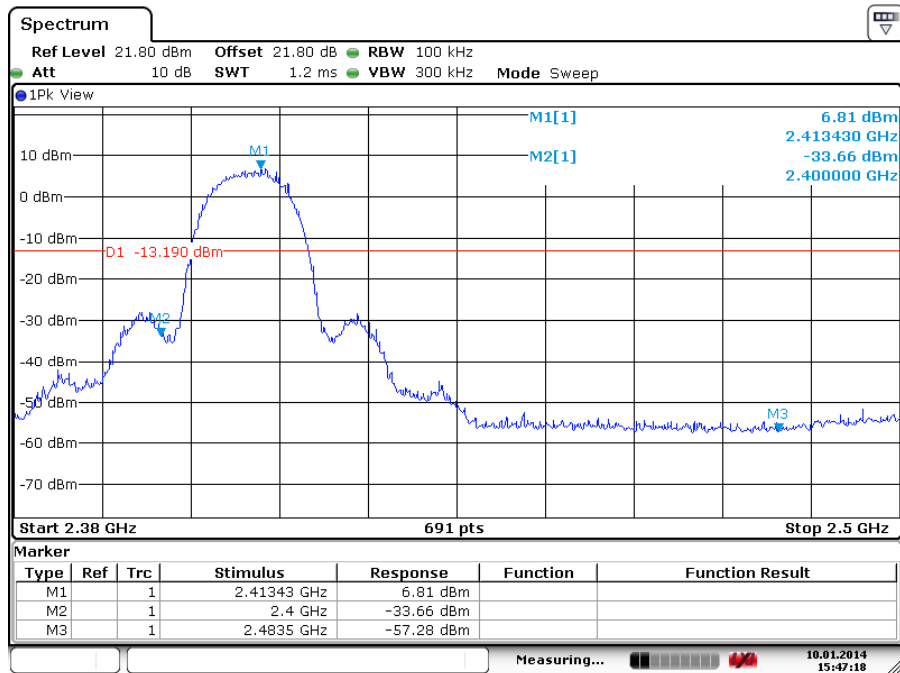


Date: 10.JAN.2014 15:39:04

Test Plot of 100kHz Bandwidth at Frequency Band Edges

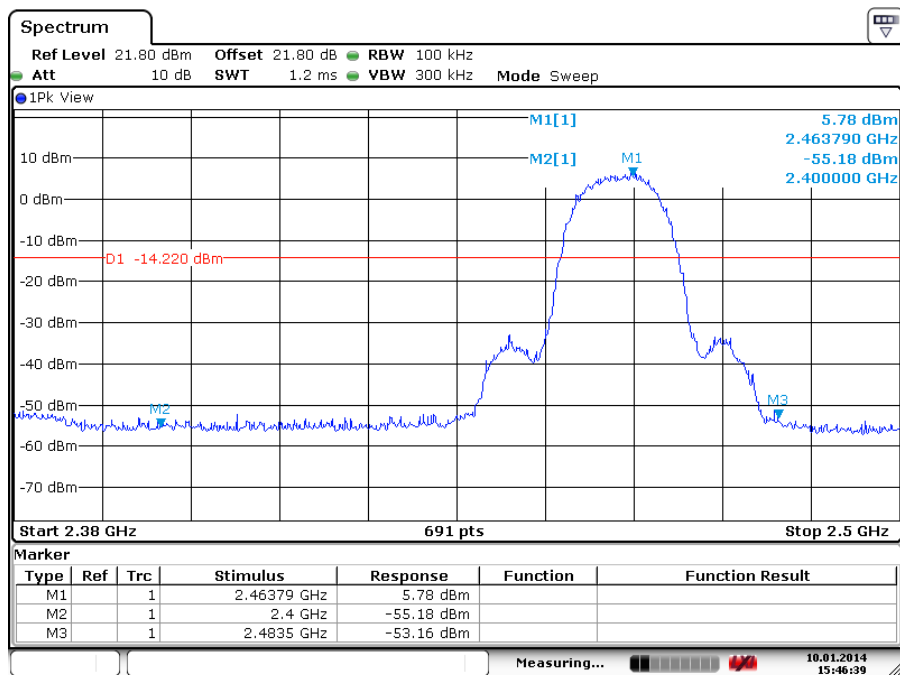
Ant 1 Mode: 802.11b DSSS QPSK (HT17)

Low Channel



Date: 10.JAN.2014 15:47:19

High Channel



Date: 10.JAN.2014 15:46:39

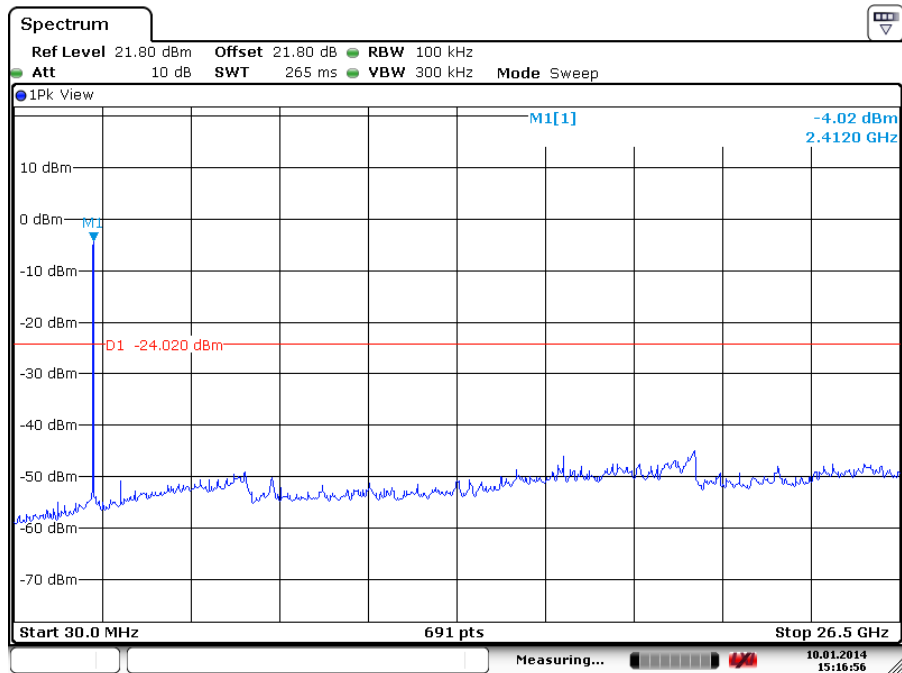
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Test Plot of 100kHz Conducted Emissions

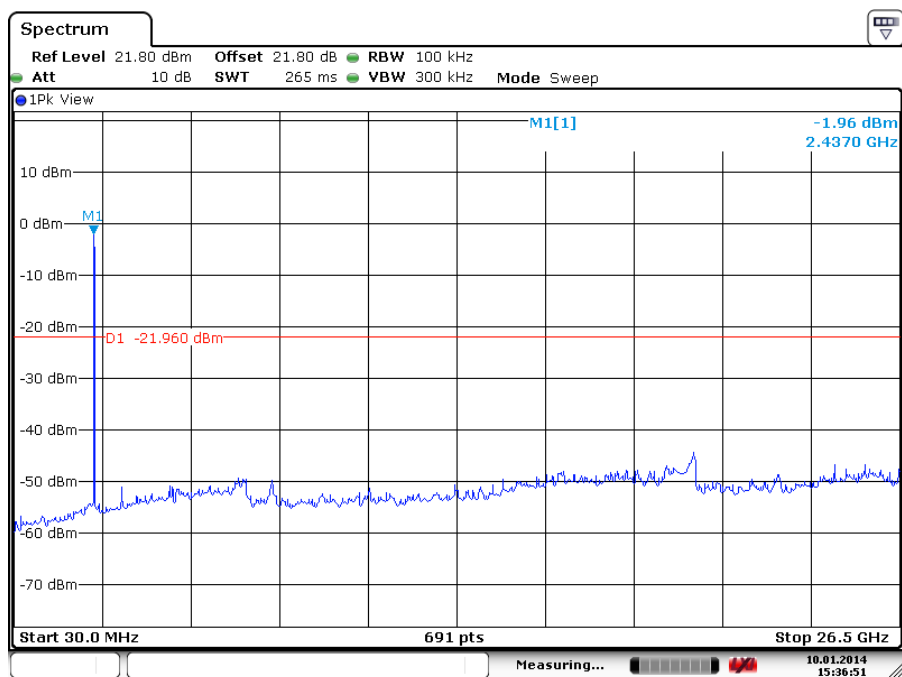
Ant 1 Mode: 802.11g OFDM BPSK (HT20)

Low Channel

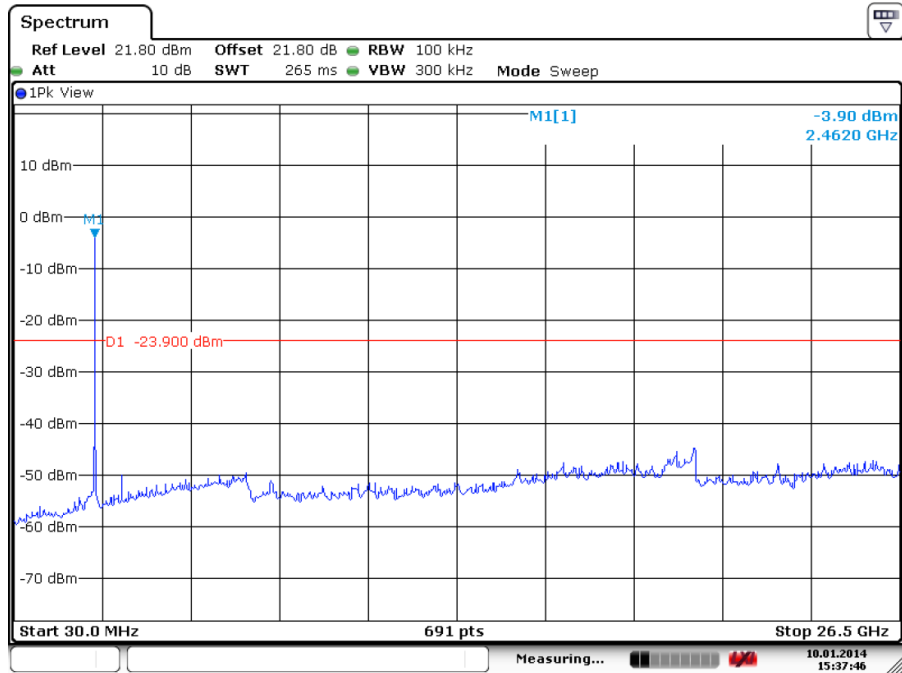


Date: 10.JAN.2014 15:16:57

Middle Channel



Date: 10.JAN.2014 15:36:51

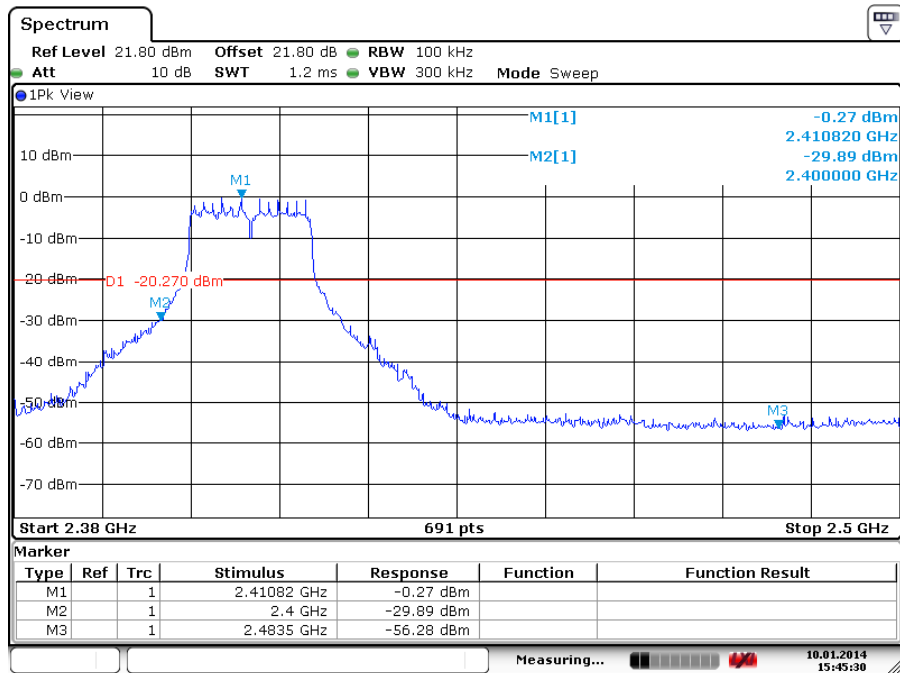
High Channel


Date: 10.JAN.2014 15:37:46

Test Plot of 100kHz Bandwidth at Frequency Band Edges

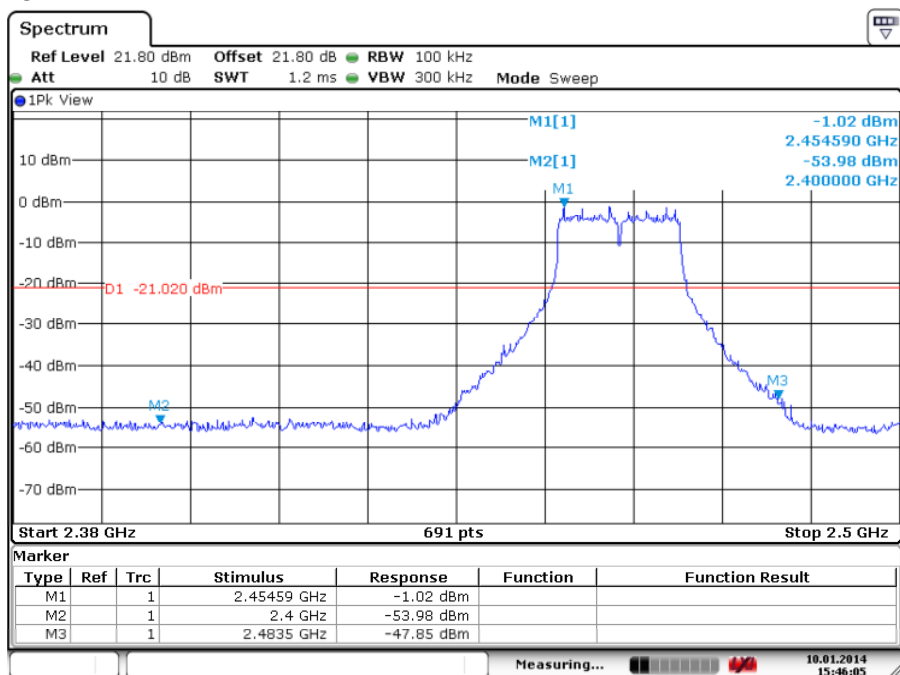
Ant 1 Mode: 802.11g OFDM BPSK (HT20)

Low Channel



Date: 10.JAN.2014 15:45:30

High Channel



Date: 10.JAN.2014 15:46:06

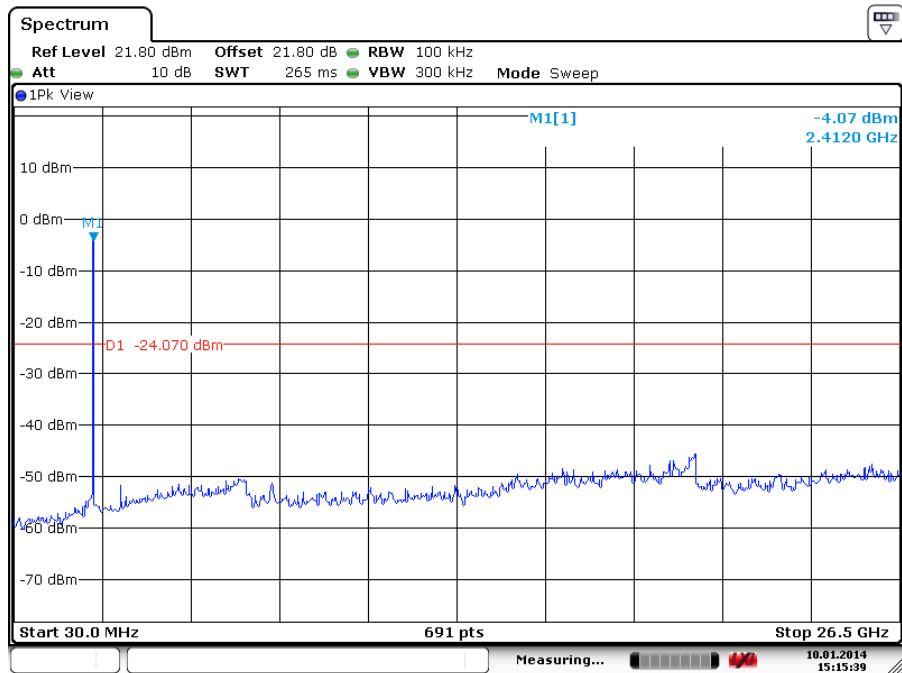
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Test Plot of 100kHz Conducted Emissions

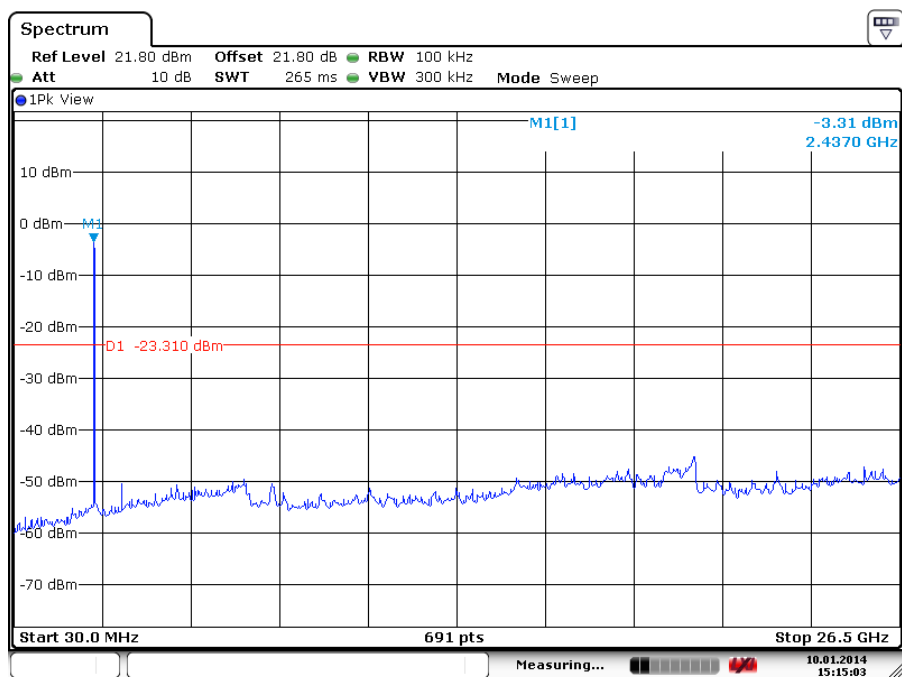
Ant 1 Mode: 802.11n OFDM QPSK (HT20)

Low Channel



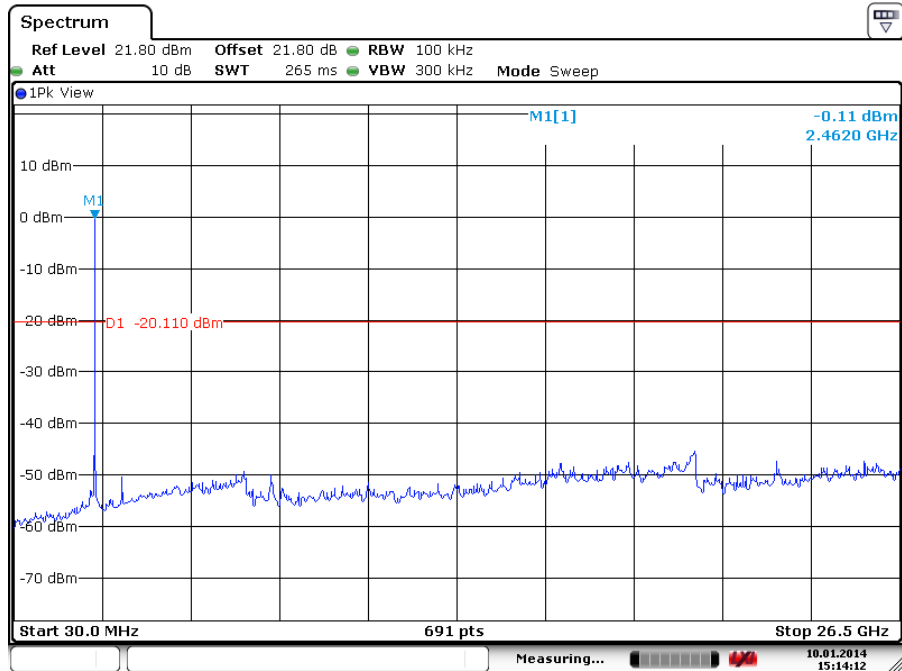
Date: 10.JAN.2014 15:15:38

Middle Channel



Date: 10.JAN.2014 15:15:03

High Channel

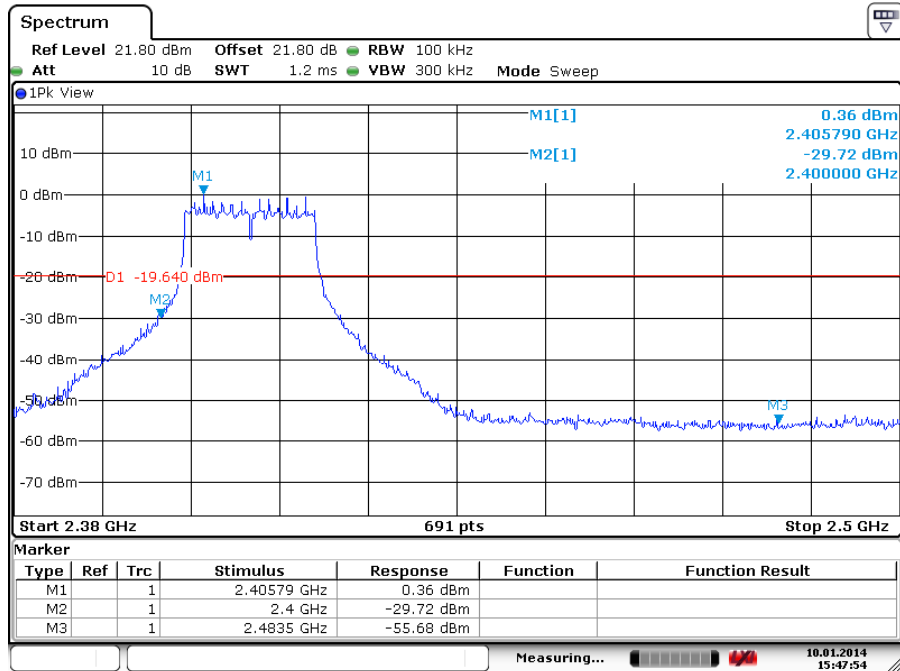


Date: 10.JAN.2014 15:14:11

Test Plot of 100kHz Bandwidth at Frequency Band Edges

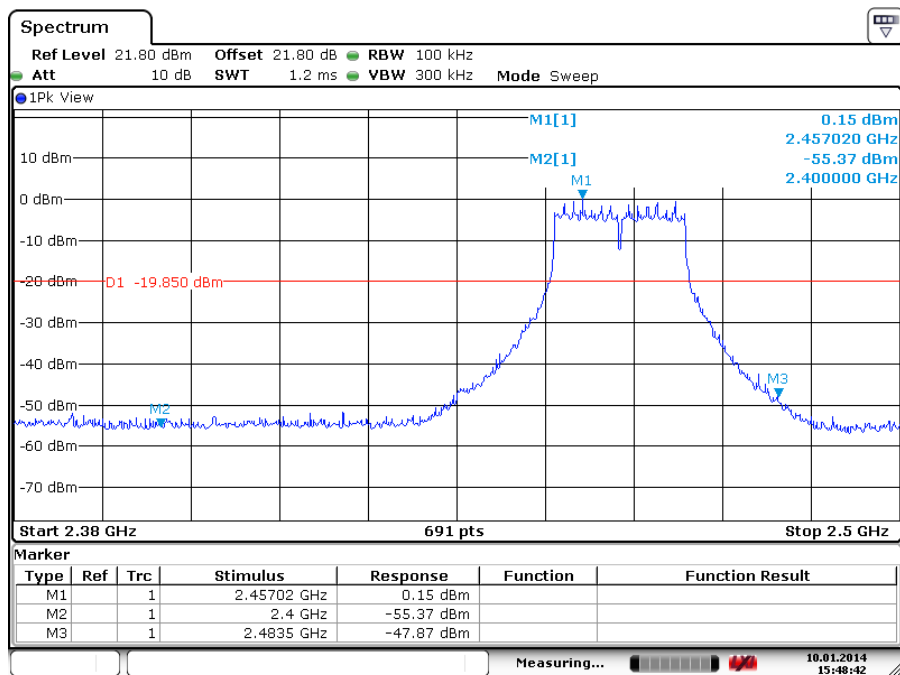
Ant 1 Mode: 802.11n OFDM QPSK (HT20)

Low Channel



Date: 10.JAN.2014 15:47:54

High Channel

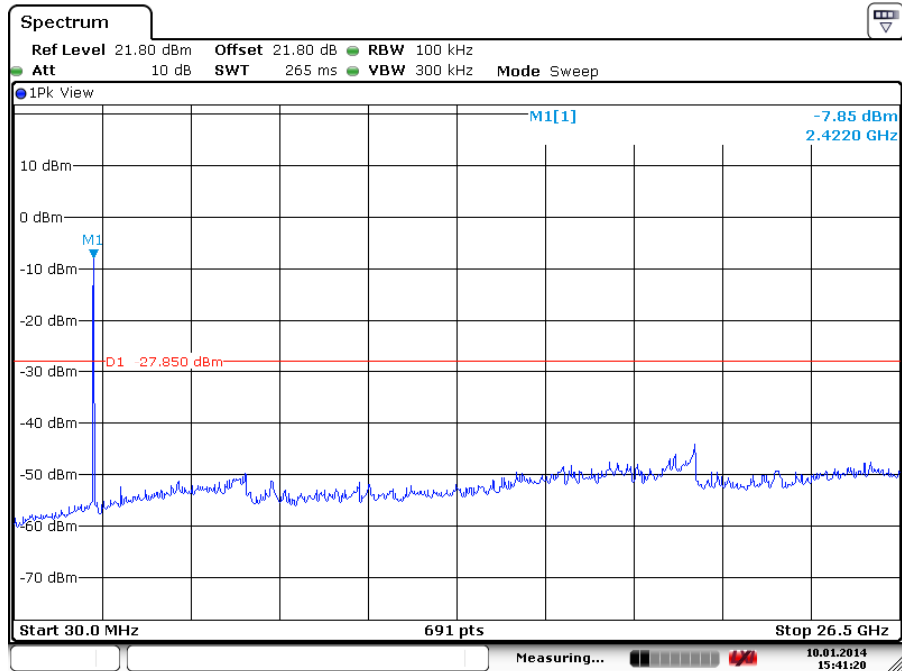


Date: 10.JAN.2014 15:48:42

Test Plot of 100kHz Conducted Emissions

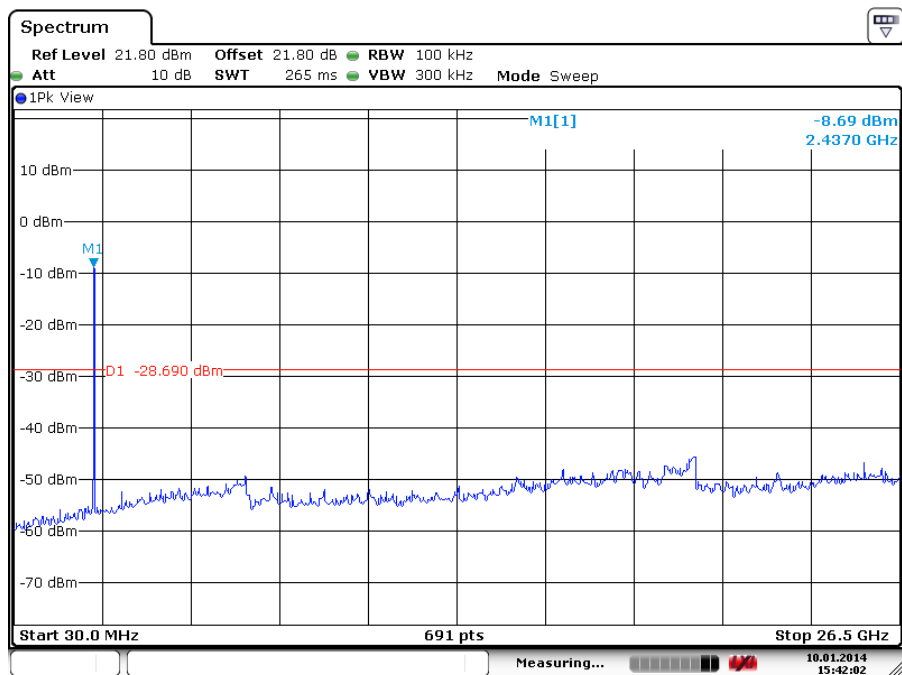
Ant 1 Mode: 802.11n OFDM QPSK (HT40)

Low Channel



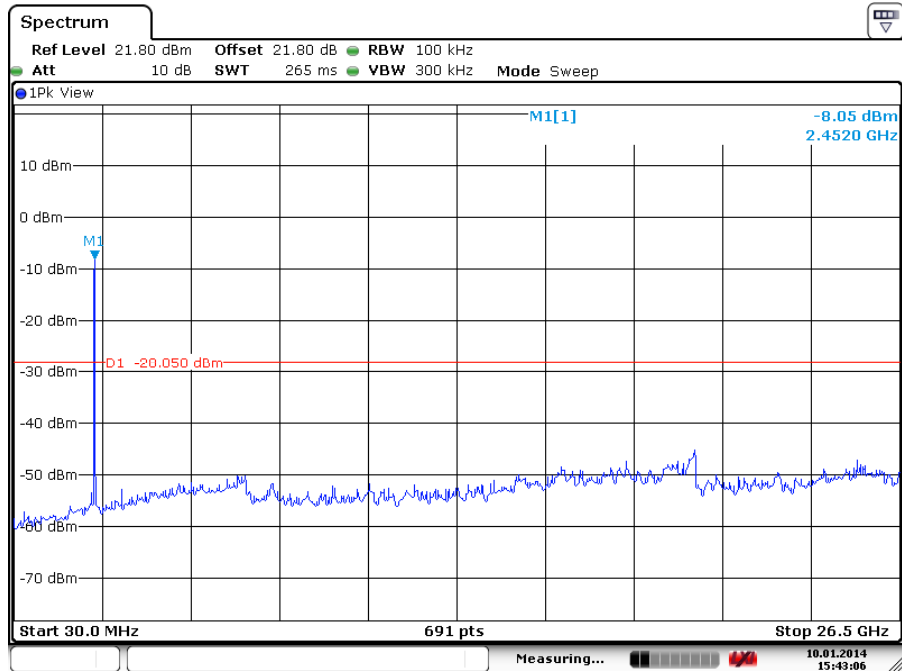
Date: 10.JAN.2014 15:41:19

Middle Channel



Date: 10.JAN.2014 15:42:01

High Channel

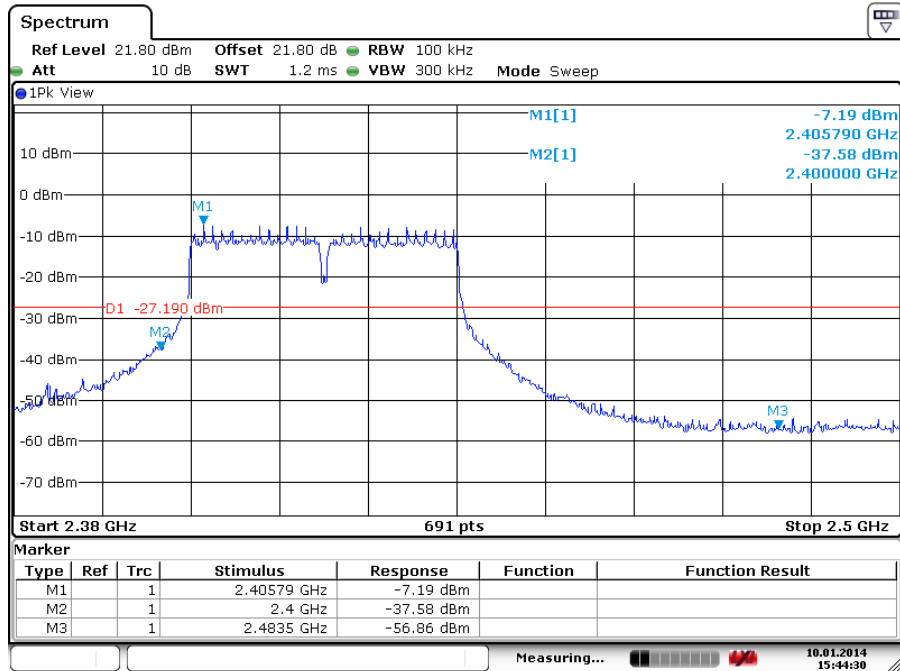


Date: 10.JAN.2014 15:43:06

Test Plot of 100kHz Bandwidth at Frequency Band Edges

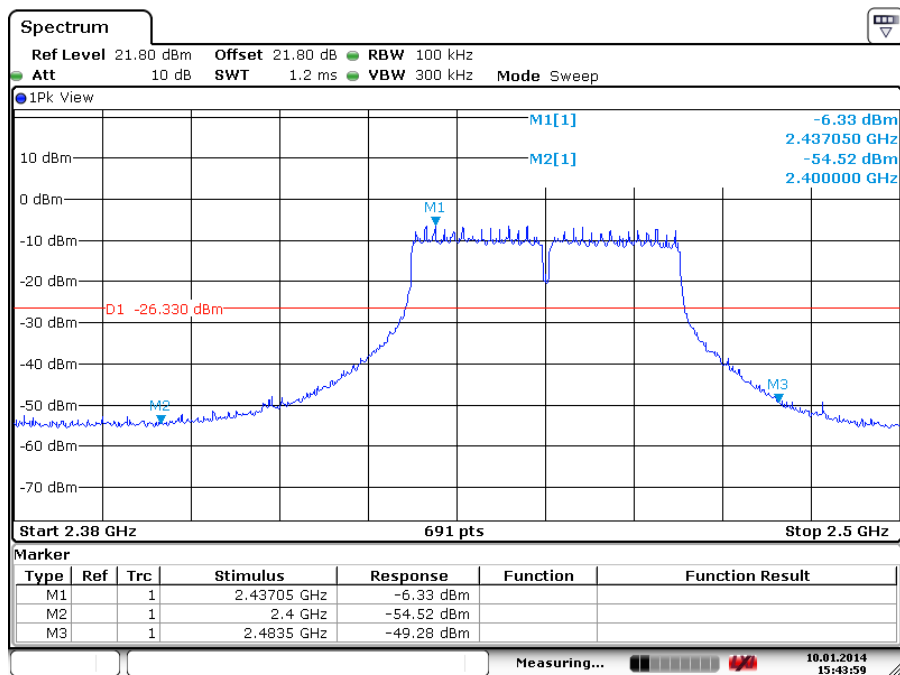
Ant 1 Mode: 802.11n OFDM QPSK (HT40)

Low Channel

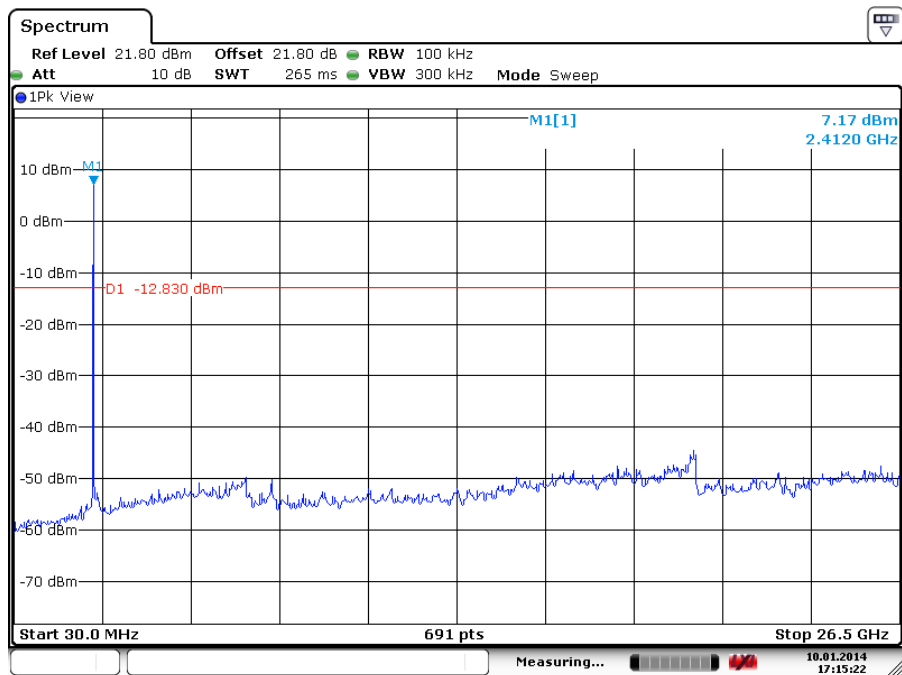


Date: 10.JAN.2014 15:44:30

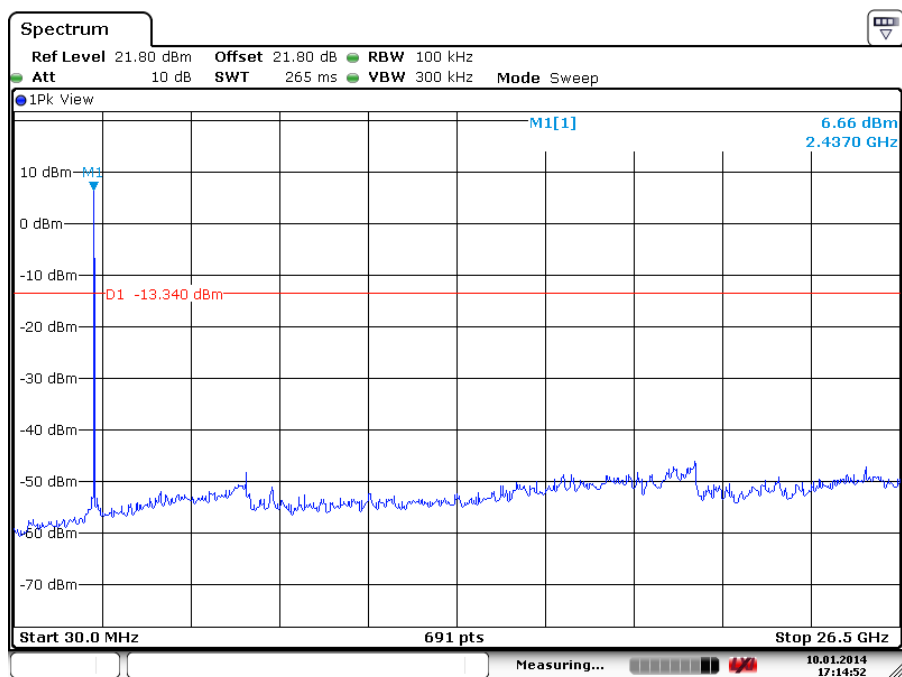
High Channel



Date: 10.JAN.2014 15:43:59

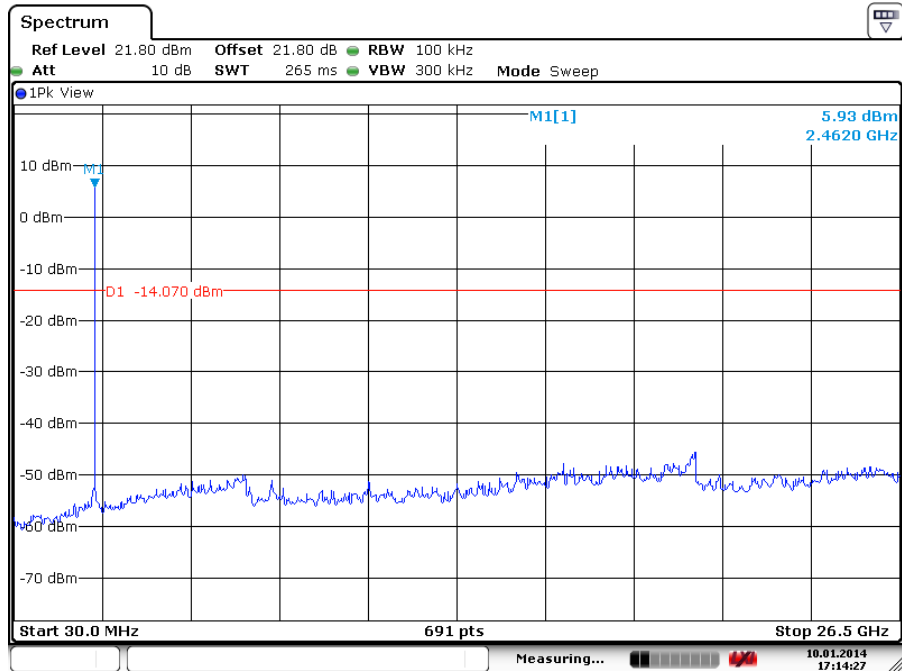
Test Plot of 100kHz Conducted Emissions
Ant 2 Mode: 802.11b DSSS QPSK (HT17)
Low Channel


Date: 10.JAN.2014 17:15:23

Middle Channel


Date: 10.JAN.2014 17:14:53

High Channel

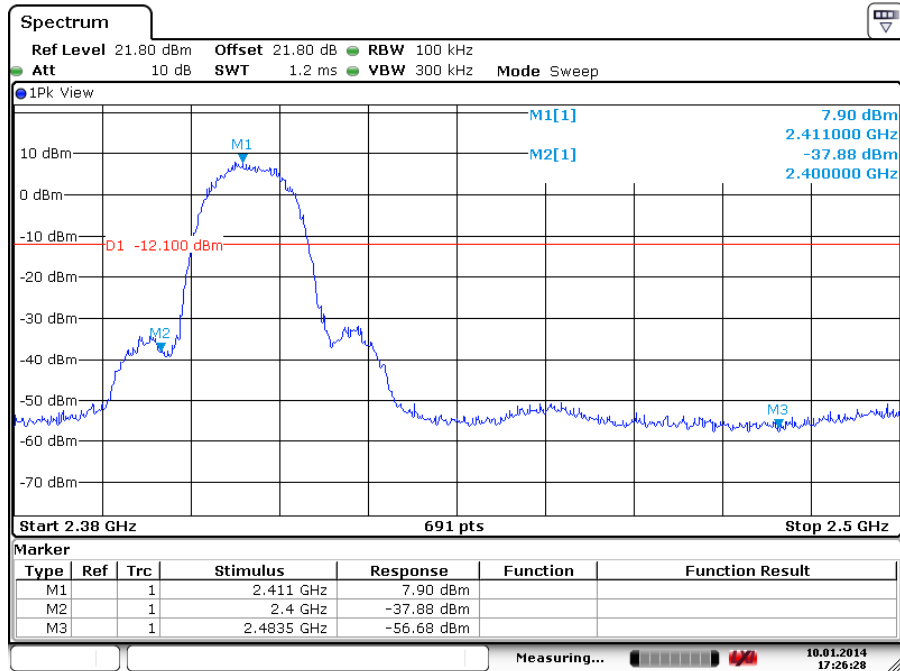


Date: 10.JAN.2014 17:14:27

Test Plot of 100kHz Bandwidth at Frequency Band Edges

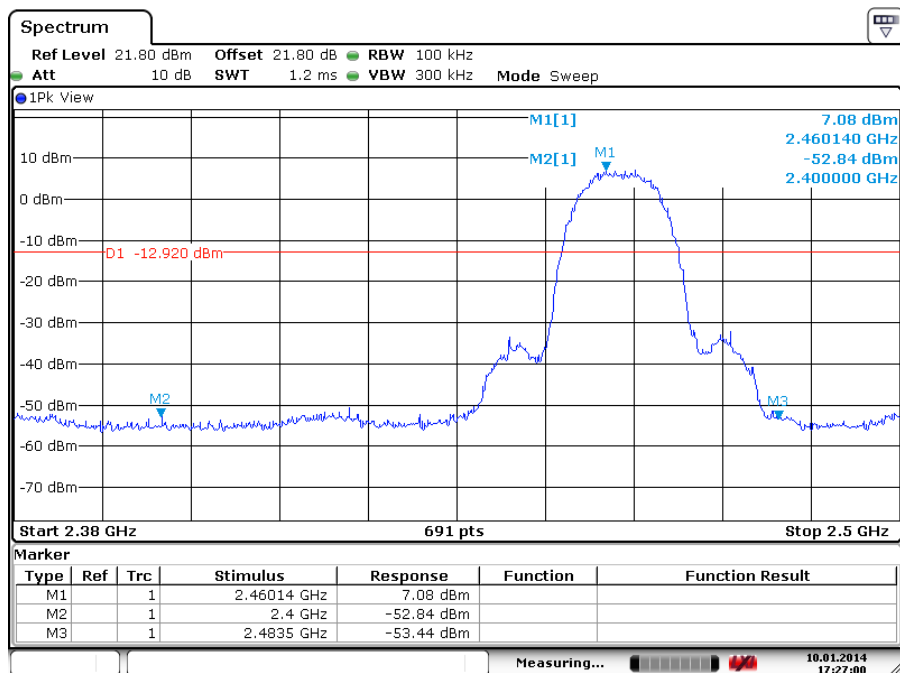
Ant 2 Mode: 802.11b DSSS QPSK (HT17)

Low Channel



Date: 10.JAN.2014 17:26:29

High Channel



Date: 10.JAN.2014 17:27:00

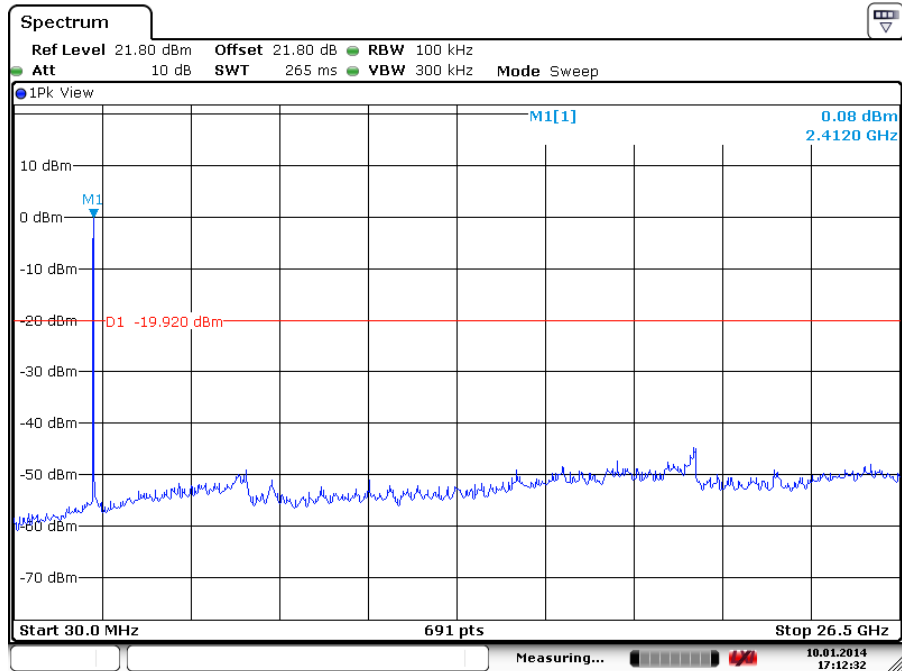
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Test Plot of 100kHz Conducted Emissions

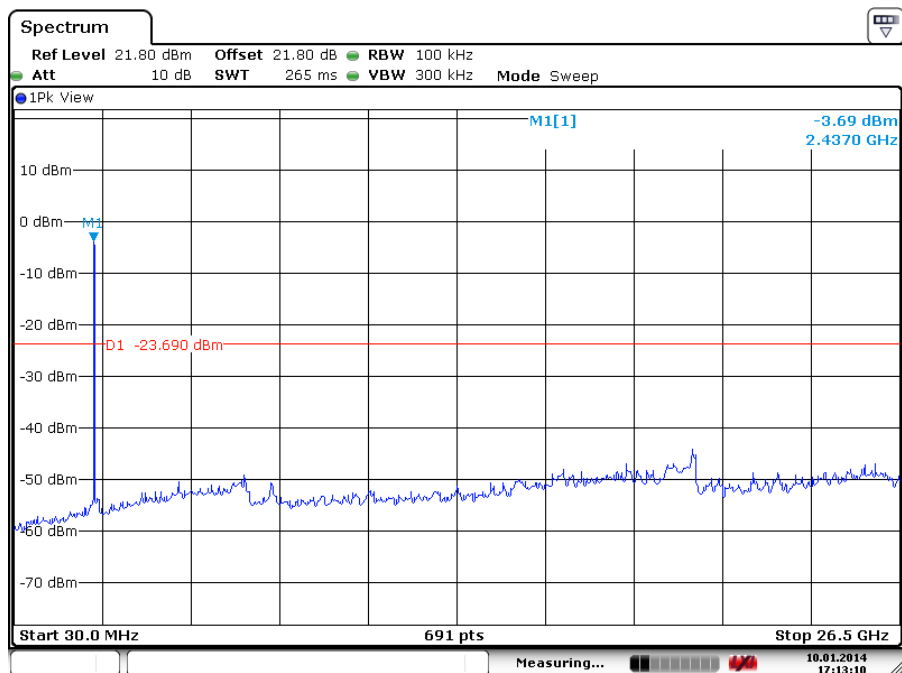
Ant 2 Mode: 802.11g OFDM BPSK (HT20)

Low Channel



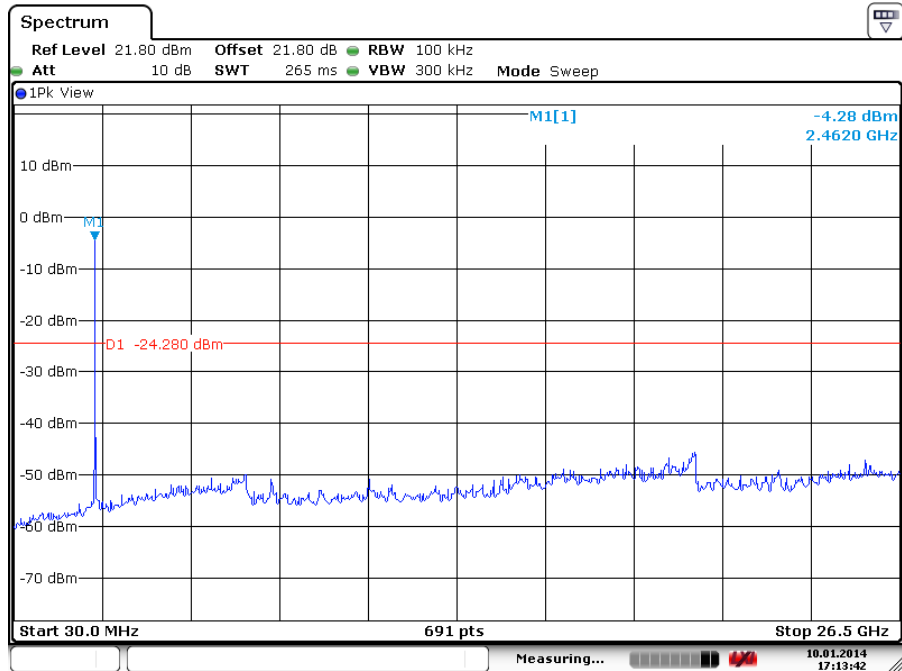
Date: 10.JAN.2014 17:12:33

Middle Channel



Date: 10.JAN.2014 17:13:11

High Channel

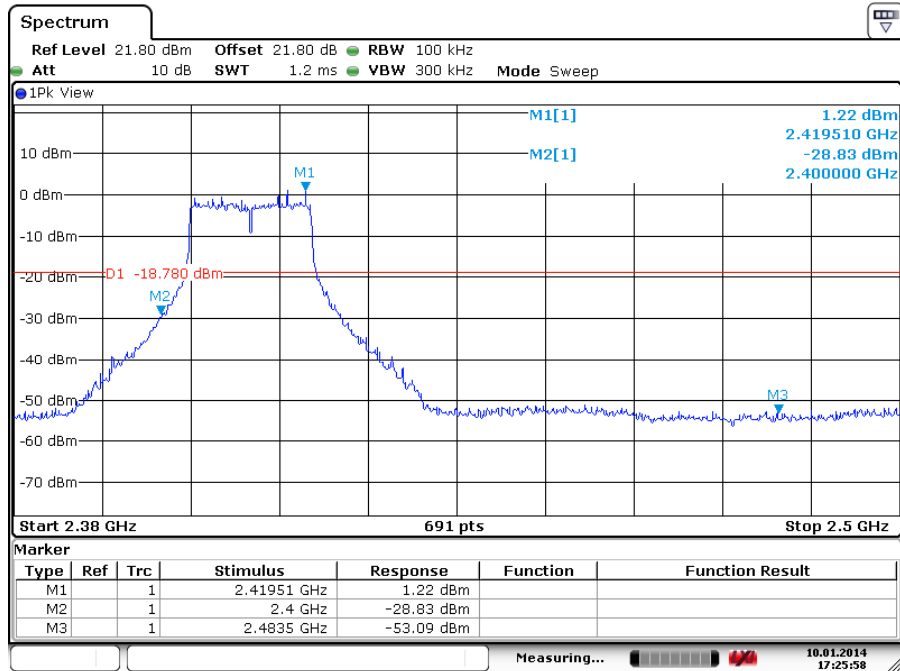


Date: 10.JAN.2014 17:13:42

Test Plot of 100kHz Bandwidth at Frequency Band Edges

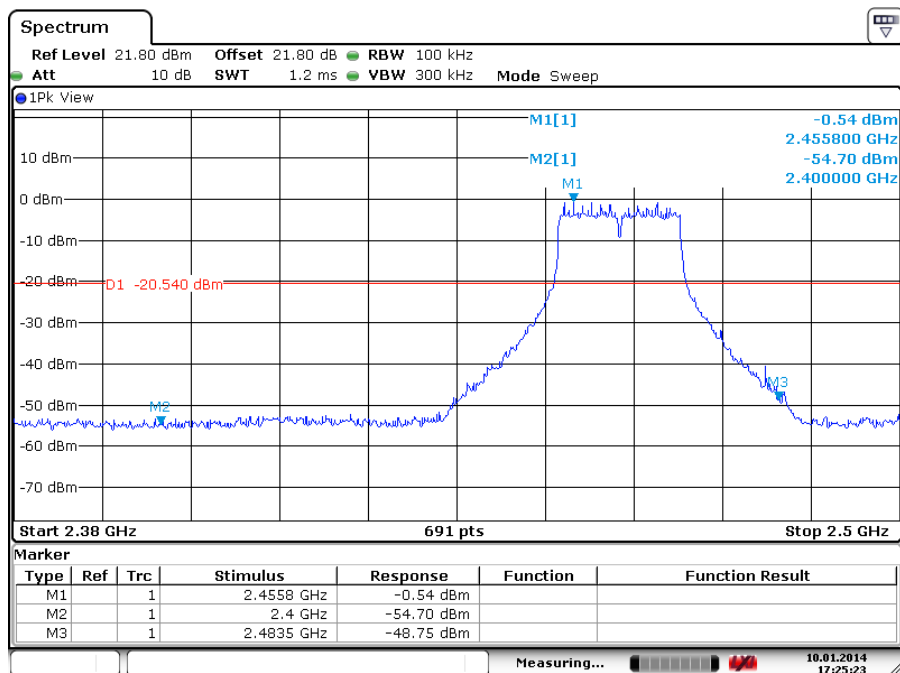
Ant 2 Mode: 802.11g OFDM BPSK (HT20)

Low Channel



Date: 10.JAN.2014 17:25:58

High Channel

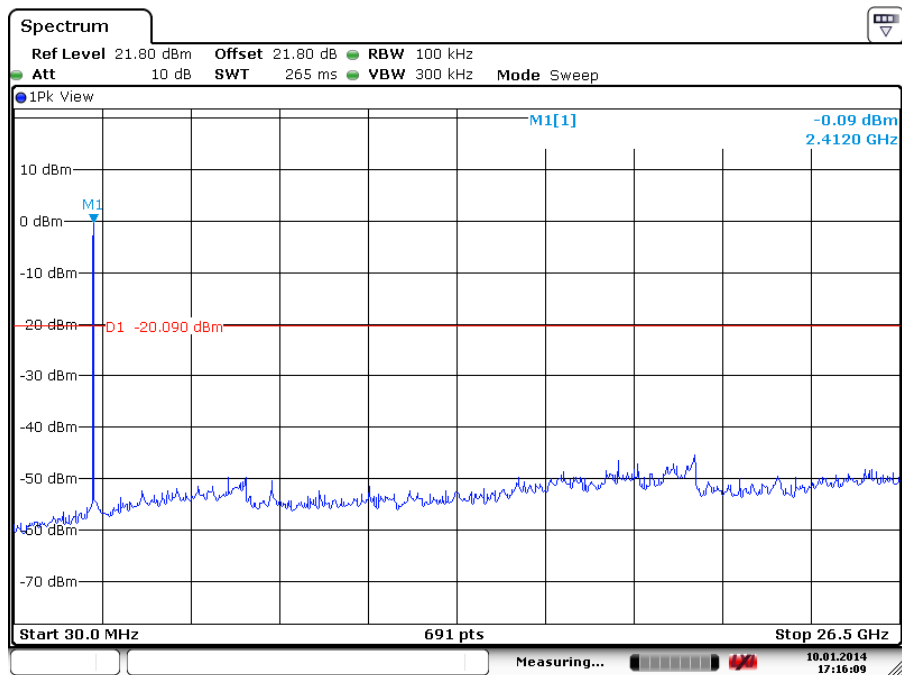


Date: 10.JAN.2014 17:25:23

Test Plot of 100kHz Conducted Emissions

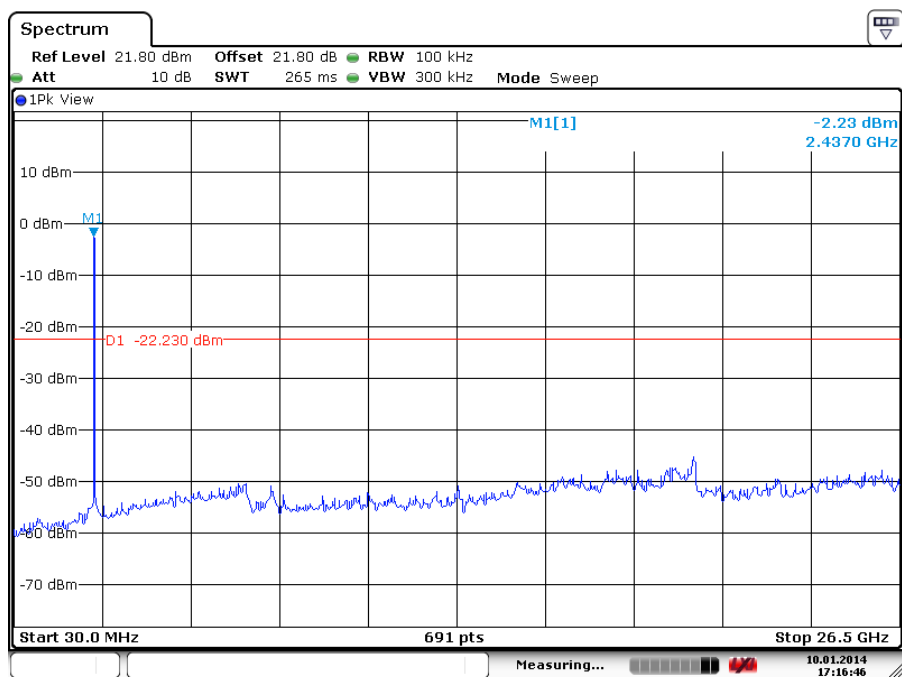
Ant 2 Mode: 802.11n OFDM QPSK (HT20)

Low Channel



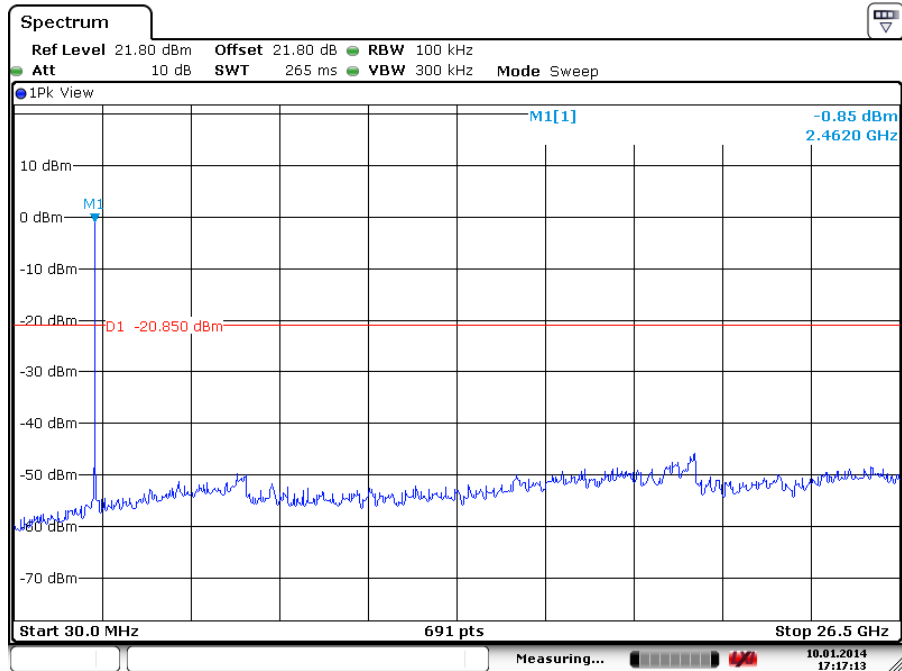
Date: 10.JAN.2014 17:16:09

Middle Channel



Date: 10.JAN.2014 17:16:46

High Channel

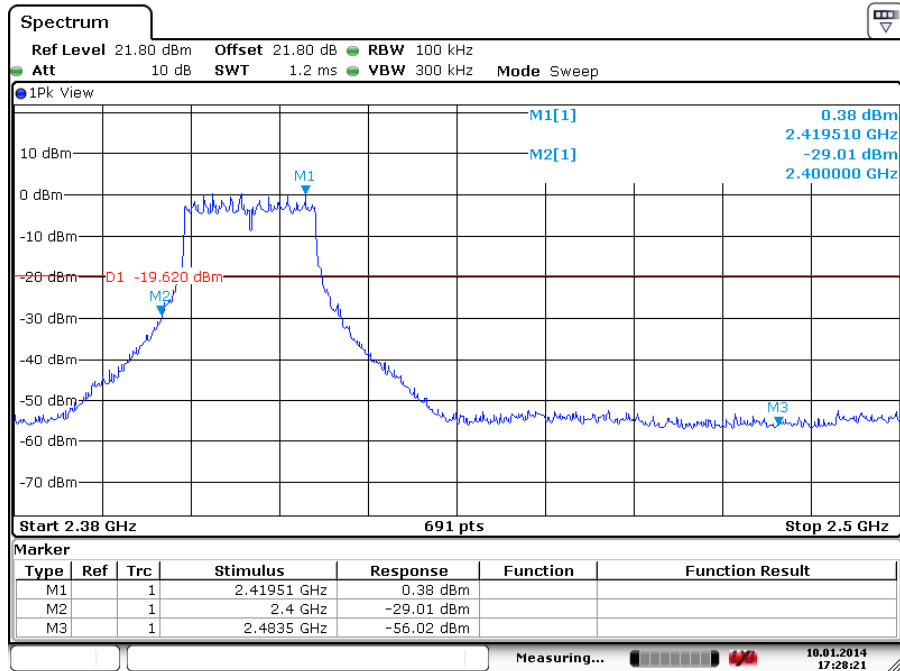


Date: 10.JAN.2014 17:17:13

Test Plot of 100kHz Bandwidth at Frequency Band Edges

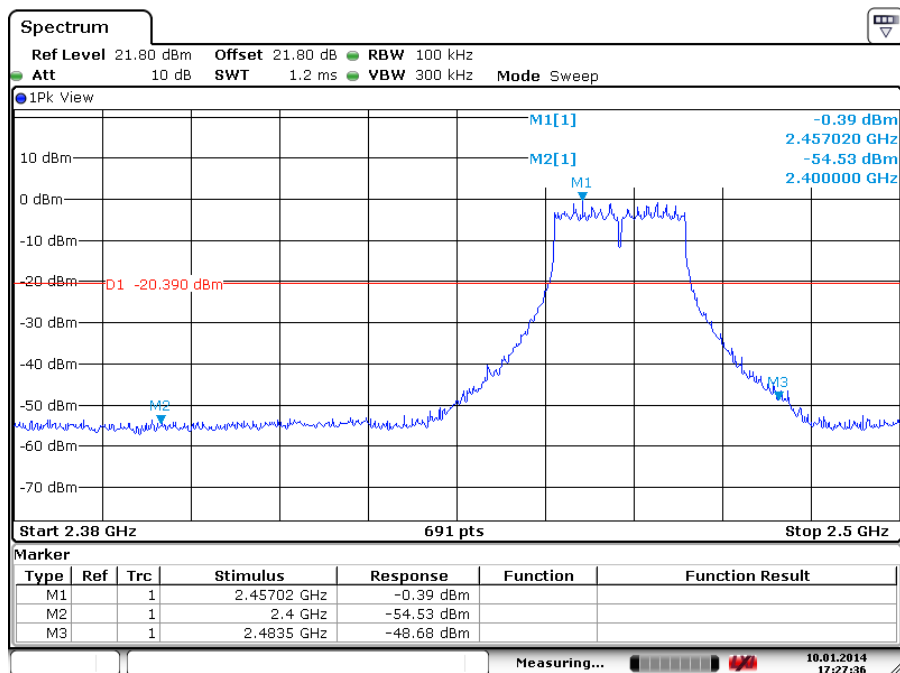
Ant 2 Mode: 802.11n OFDM QPSK (HT20)

Low Channel



Date: 10.JAN.2014 17:28:21

High Channel

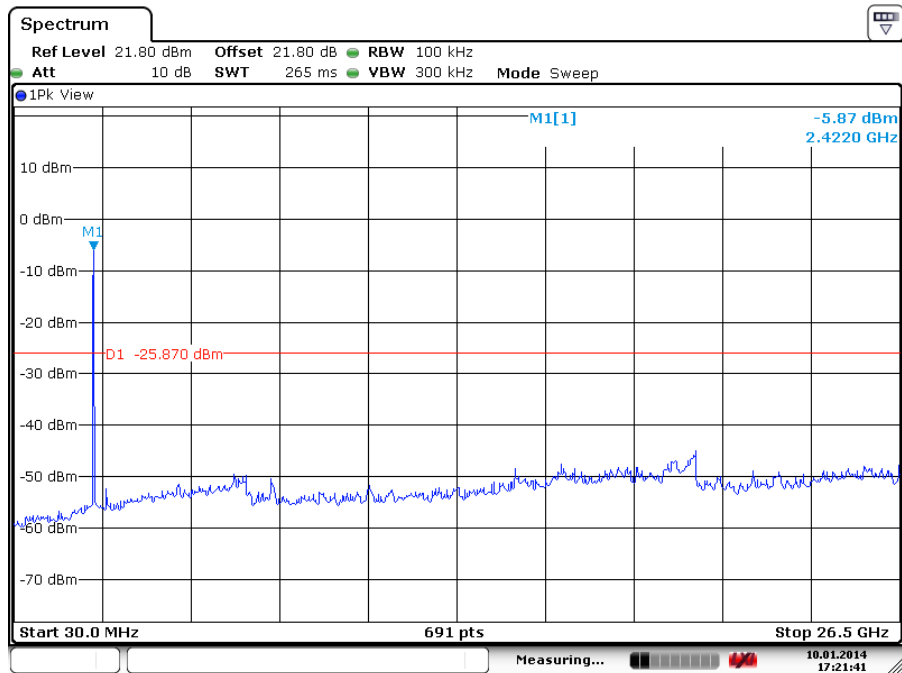


Date: 10.JAN.2014 17:27:37

Test Plot of 100kHz Conducted Emissions

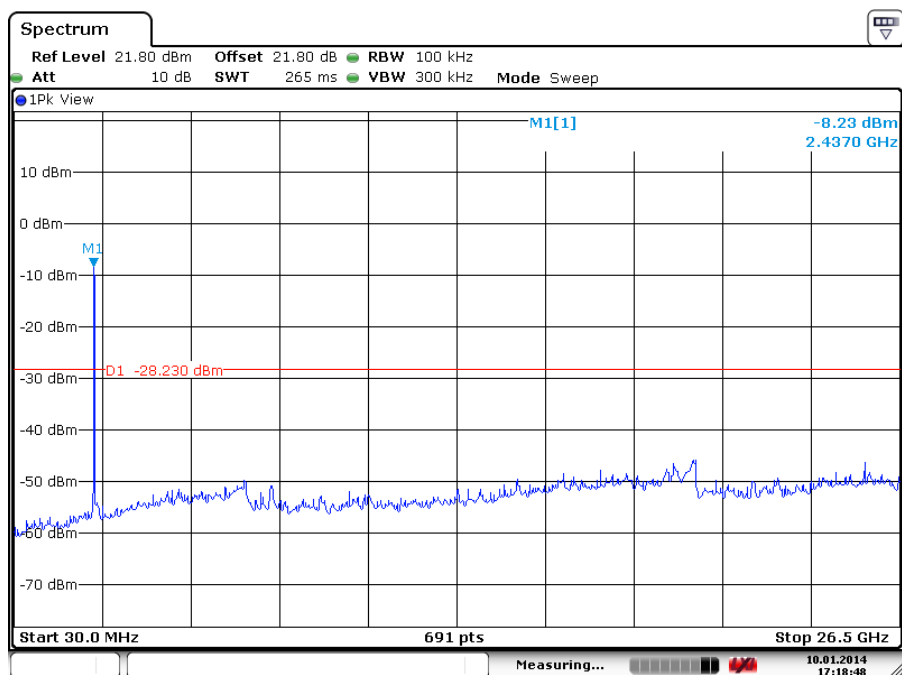
Ant 2 Mode: 802.11n OFDM QPSK (HT40)

Low Channel



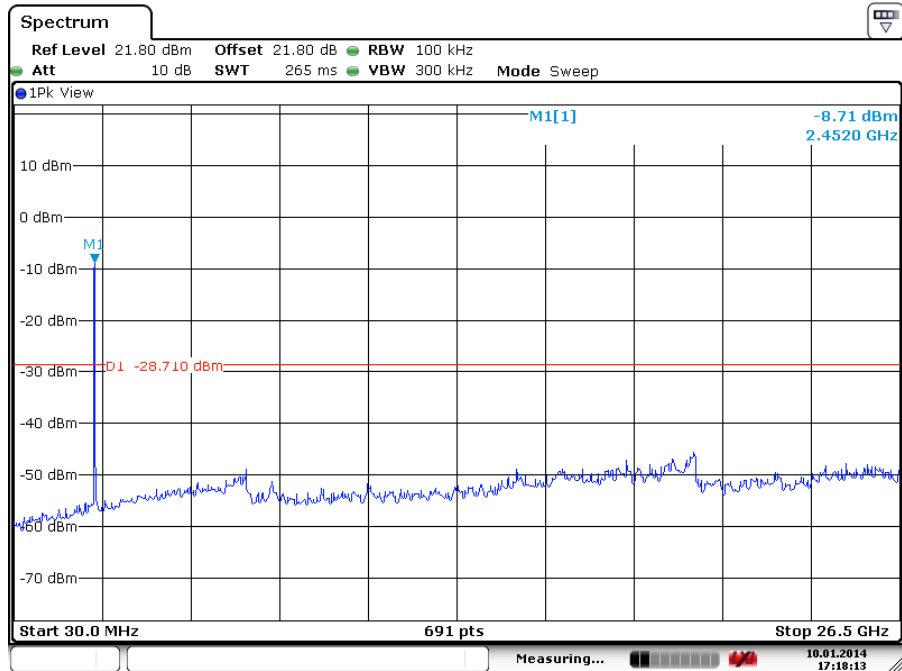
Date: 10.JAN.2014 17:21:42

Middle Channel



Date: 10.JAN.2014 17:18:49

High Channel

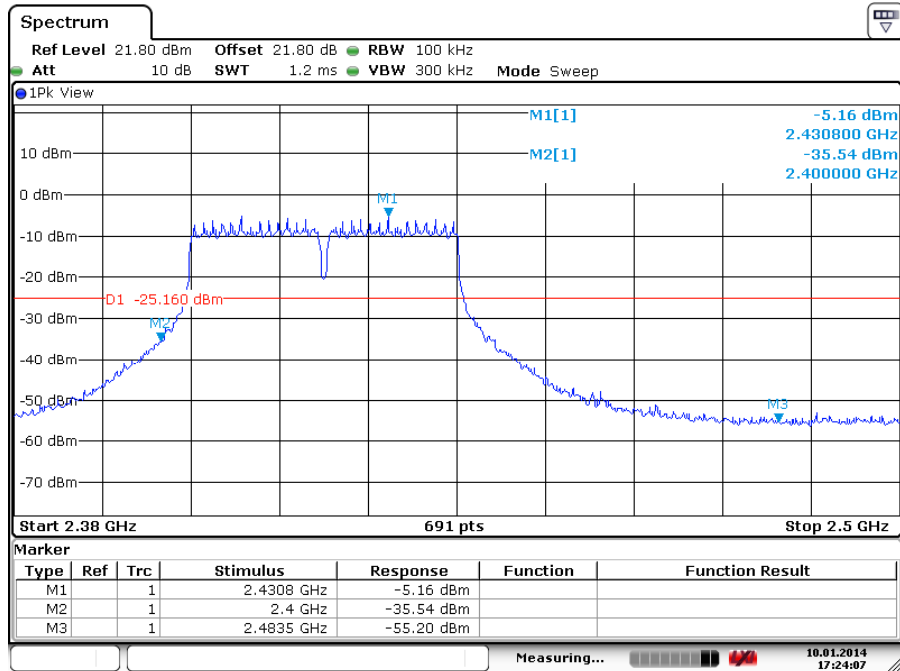


Date: 10.JAN.2014 17:18:14

Test Plot of 100kHz Bandwidth at Frequency Band Edges

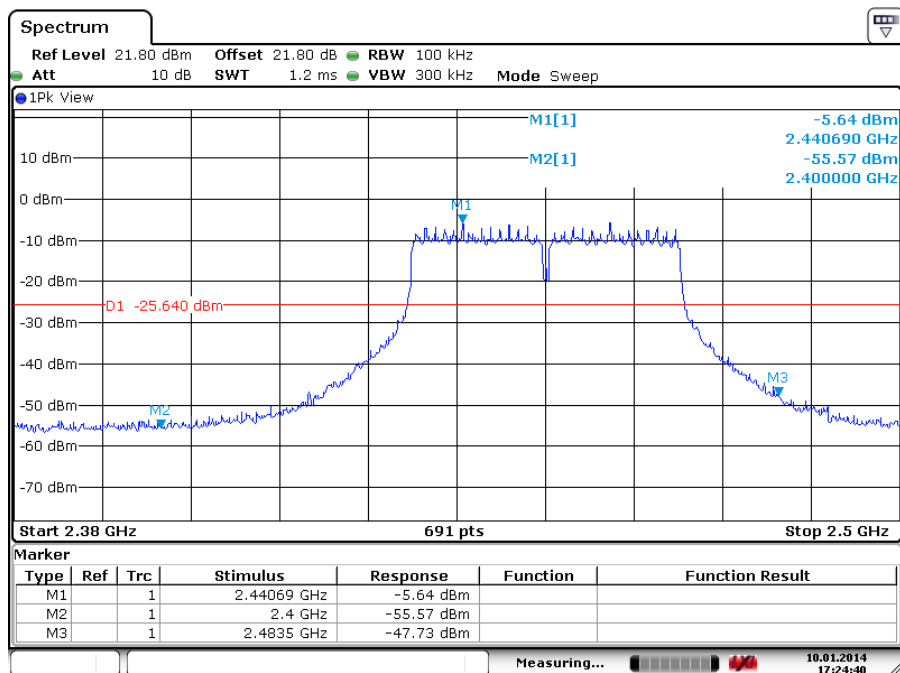
Ant 2 Mode: 802.11n OFDM QPSK (HT40)

Low Channel



Date: 10.JAN.2014 17:24:08

High Channel



Date: 10.JAN.2014 17:24:40

5.1.6 Spurious Emission

RESULT:**Passed**

Test standard	:	FCC part 15.247(d), FCC 15.205, FCC 15.209, RSS-210 2.2, RSS-210 A8.5 and RSS-Gen 7.2.1
Basic standard	:	ANSI C63.10: 2009
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must comply with the radiated emission limits specified in FCC 15.209(a). Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) and FCC 15.249(a).
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A, C

Remark: Testing was carried out within frequency range 30MHz to the tenth harmonic.

For details refer to Appendix D.

The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The X Axis orientation is the worst-case and recorded in this test report. Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

5.2 Mains Emissions

5.2.1 Mains Conducted Emissions

RESULT:**Passed**

Test standard	:	FCC Part 15.207 FCC Part 15.107 LP0002: 2.3
Limits	:	Mains Conducted emissions as defined in above standards
Kind of test site	:	Shielded Room

Test setup

Test Channel	:	Middle
Operation mode	:	A

Remark: For details refer to Appendix D.

6. Photographs of the Test Set-Up

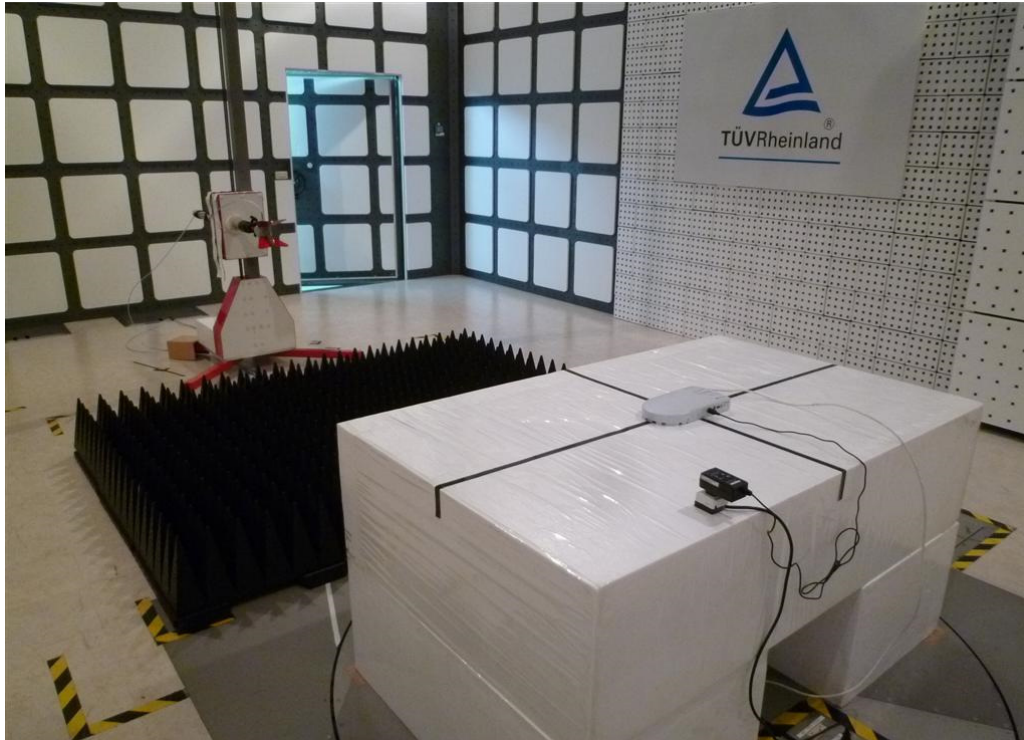
Photograph 1: Set-up for Spurious Emissions (Front View)



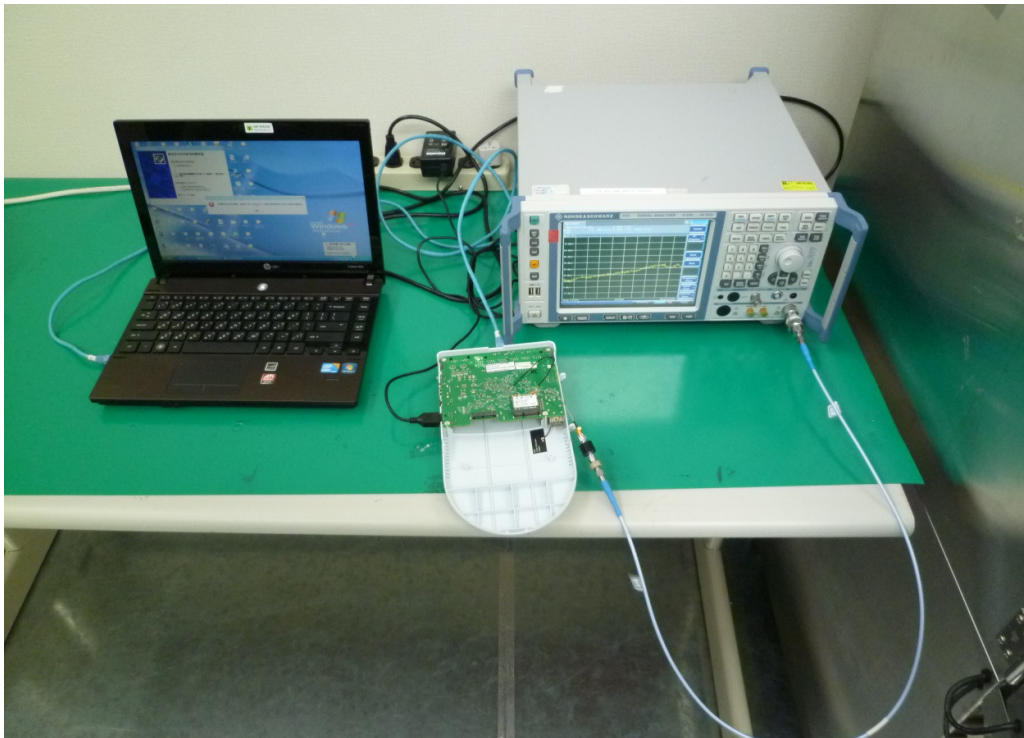
Photograph 2: Set-up for Spurious Emissions (Back View 1)



Photograph 3: Set-up for Spurious Emissions (Back View 2)



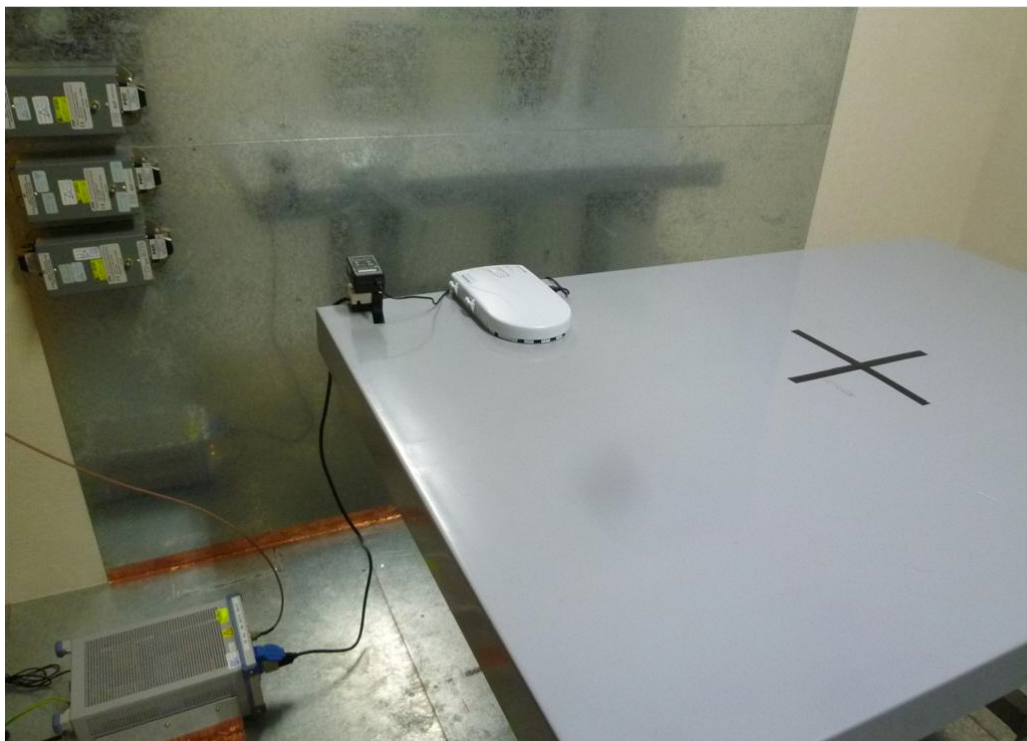
Photograph 4: Set-up for Conducted testing



Photograph 5: Set-up for for Mains Conducted testing Back



Photograph 6: Set-up for for Mains Conducted testing Front



7. List of Tables

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