LTA
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NETISIT

Dates of Tests: Dec 29, 2013 ~ Jan 21,2014
Test Report S/N: LR500111401E
Test Site : LTA Co., Ltd.

CERTIFICATION OF COMPLIANCE

FCC ID. **2ABQ2N9000**

APPLICANT **netisit co., ltd**

Equipment Class	:	**Digital Transmission System (DTS)**
Manufacturing Description	:	**netis tablet PC**
Manufacturer	:	**netisit co., ltd**
Model name	:	**N9000**
Test Device Serial No.:	:	**Identical prototype**
Rule Part(s)	:	**FCC Part 15.247 Subpart C; ANSI C-63.4-2003**
Frequency Range	:	**2412MHz ~ 2462MHz for 802.11b/g/n20** **2422MHz ~ 2452MHz for 802.11n40**
Max. Output Power	:	**Max 15.32dBm Conducted (802.11b)**
	:	**Max 14.19dBm - Conducted (802.11g)** **Max 19.11dBm – Conducted (802.11n_20MHz)** **Max 18.35dBm – Conducted (802.11n_40MHz)**
Data of issue	:	**January 22, 2014**

This test report is issued under the authority of:

Jae-Ho Lee, Manager

The test was supervised by:

Young-Jin Lee, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.

NVLAP

NVLAP LAB Code.: 200723-0

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1. General information

1-1 Test Performed

Company name : LTA Co., Ltd.
Address : 243, Jubug-ri,Yangji-Myeon,Youngin-Si, Kyunggi-Do, Korea. 449-822
Web site : http://www.ltalab.com
E-mail : chahn@ltalab.com
Telephone : +82-31-323-6008
Facsimile +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2014-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	2015-03-06	EMC accredited Lab.
FCC	U.S.A	610755	2014-04-27	FCC filing
FCC	U.S.A	649054	2015-04-17	FCC CAB
VCCI	JAPAN	R2133(10m), C2307	2014-03-21	VCCI registration
VCCI	JAPAN	T-2009	2016-12-23	VCCI registration
VCCI	JAPAN	G-563	2015-05-28	VCCI registration
IC	CANADA	5799A-1	2015-06-21	IC filing

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2. Information about test item

2-1 Manufacturer

Company name	:	netisit co., ltd
Address	:	Anyang K-center 1002~1003, 25, Simin-daero 248beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do
Tel / Fax	:	Tel : +82-31-387-1988 / Fax :+82-31-387-1989

2-2 Equipment Under Test (EUT)

Trade name	:	netisit co., ltd
Model name	:	N9000
Serial number	:	Identical prototype
Date of receipt	:	Dec 23, 2013
EUT condition	:	Pre-production, not damaged
Antenna type	:	Internal PiFA Antenna Max Gain 3.8dBi
Frequency Range	:	2412MHz ~ 2462MHz for 802.11b/g/n20 2422MHz ~ 2452MHz for 802.11n40
RF output power	:	Max 15.40dBm - Conducted (802.11b)
	:	Max 14.19dBm - Conducted (802.11g)
	:	Max 19.11dBm - Conducted(802.11n_20MHz)
	:	Max 18.35dBm - Conducted(802.11_40MHz)
Number of channels	:	11 for 802.11b & 802.11g & 802.11n_20MHz
	:	7 for 802.11n_40MHz
Type of Modulation	:	CCK, DQPSK, DBPSK for DSSS
	:	64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer Rate	:	11/5.5/2/1Mbps for 802.11b
	:	54/48/36/24/18/12/9/6Mbps for 802.11g
	:	Up to 300.0Mbps
Power Source for Batt.	:	DC 7.4V by Battery
Power for Adaptor.	:	Input: 100-240Vac, 1.5A Output: 12.0Vdc, 5A
Firmware Version	:	V 1.0.0

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2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz) for 802.11b/g/n20	2412	2437	2462
Frequency (MHz) for 802.11n40	2422	2437	2452

2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
-	-	-	-

2-5 Description of Test modes

For 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 802.11n_20MHz

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

For 2.4GHz:

7 channels are provided for 802.11n_40MHz

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

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3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500kHz	Conducted	C
15.247(b)	Transmitter Peak Output Power	< 1Watt		C
15.247(d)	Transmitter Power Spectral Density	< 8dBm @ 3kHz		C
15.247(d)	Band Edge & Spurious	> 20 dBc		C
15.209	Field Strength of Harmonics	Emission	Radiated	C
15.207	AC Conducted Emissions	Emissions	Conducted	C
15.203	Antenna requirement	-	-	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

→ Antenna Requirement

The **netisit co., ltd FCC ID: 2ABQ2N9000** unit complies with the requirement of §15.203. The antenna is connected to inside of EUT. And type is Internal PiFA Antenna

The sample was tested according to the following specification:

*FCC Parts 15.247; ANSI C-63.4-2009
*FCC KDB Publication No. 558074 D01 DTS Meas. Guidance V02
*FCC TCB Workshop 2012, April

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3.2 Technical Characteristics Test

3.2.1 6 dB Bandwidth

Procedure:

*The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 30 MHz

VBW = 300 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data: 2.4GHz Band

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	10.51	Complies
	2437	6	11.25	Complies
	2462	11	11.20	Complies
802.11g	2412	1	16.54	Complies
	2437	6	16.59	Complies
	2462	11	16.59	Complies
802.11n _20MHz	2412	1	17.76	Complies
	2437	6	17.71	Complies
	2462	11	17.76	Complies
802.11n _40MHz	2422	3	36.30	Complies
	2437	6	36.30	Complies
	2452	9	36.21	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

6 dB Bandwidth > 500kHz

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Measurement Setup

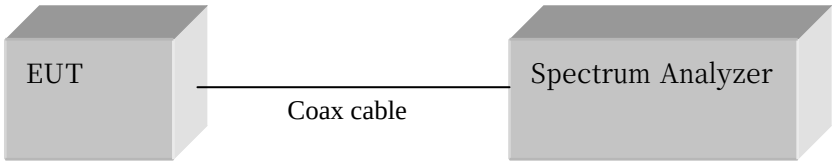

Figure 1: Measurement setup for the carrier frequency separation

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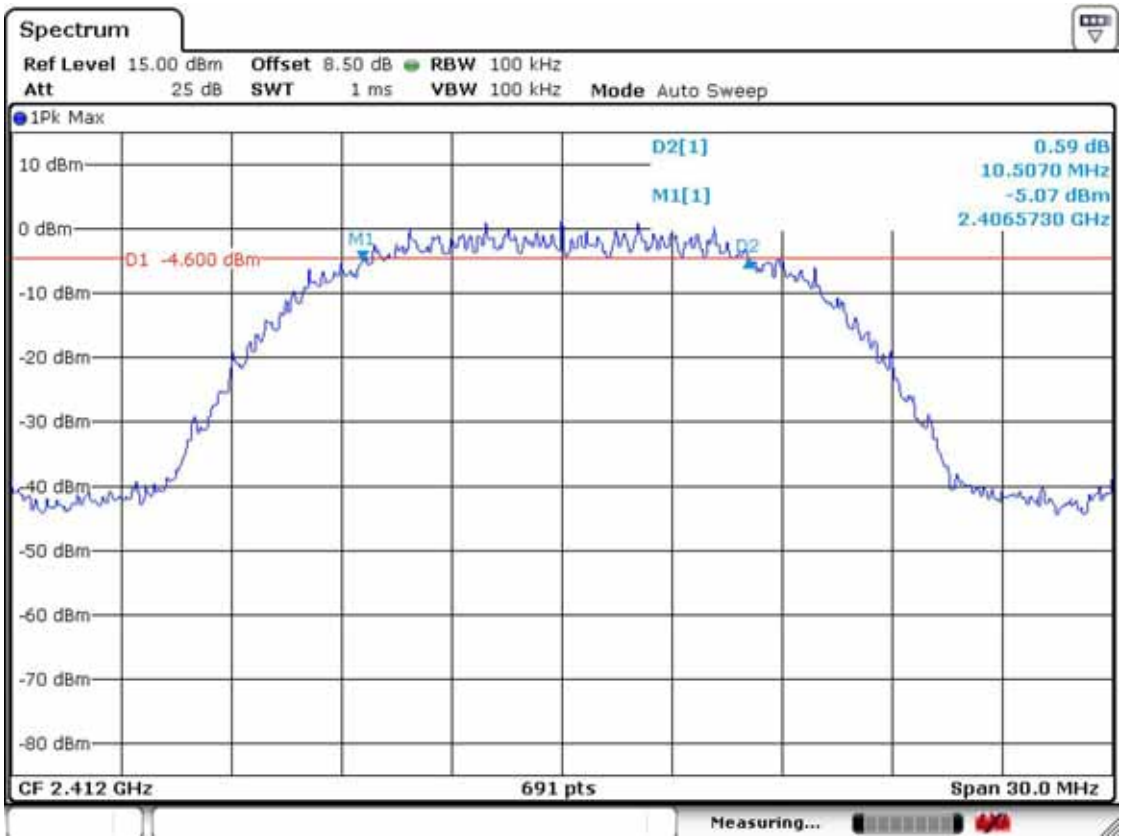
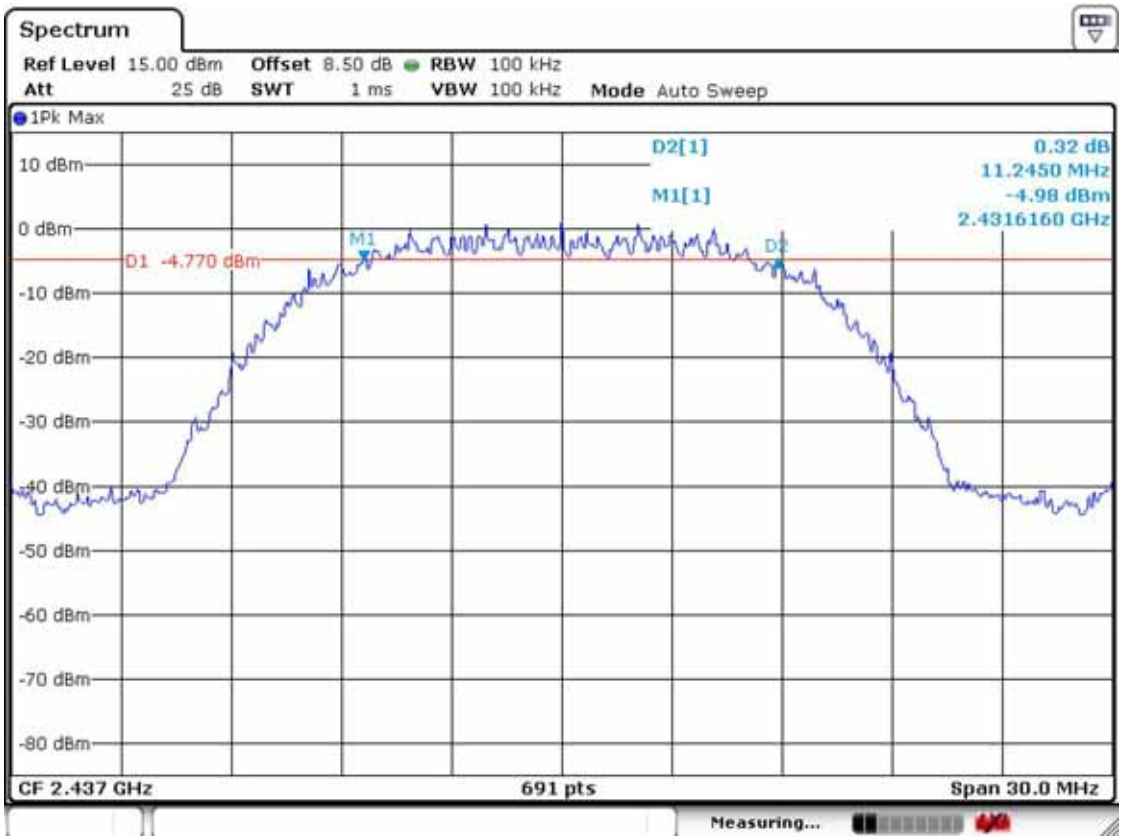
802.11b

CH 1



CH 6



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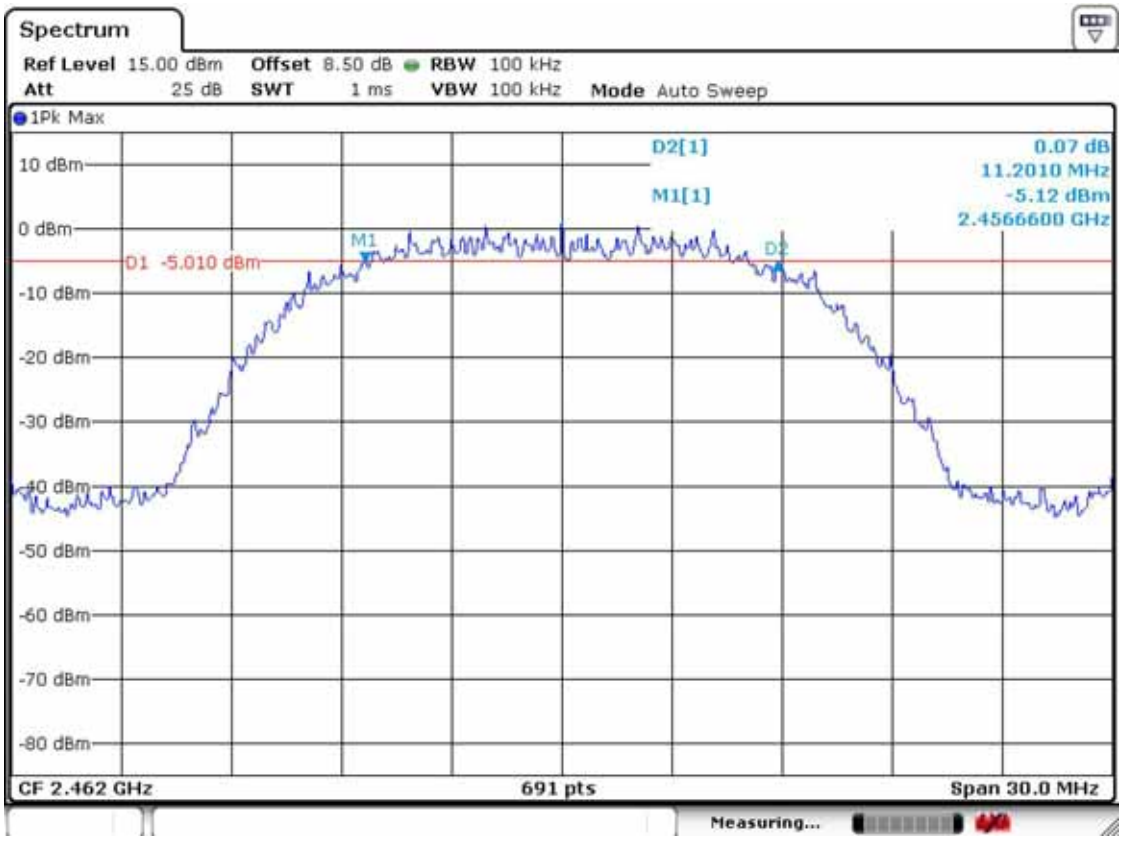
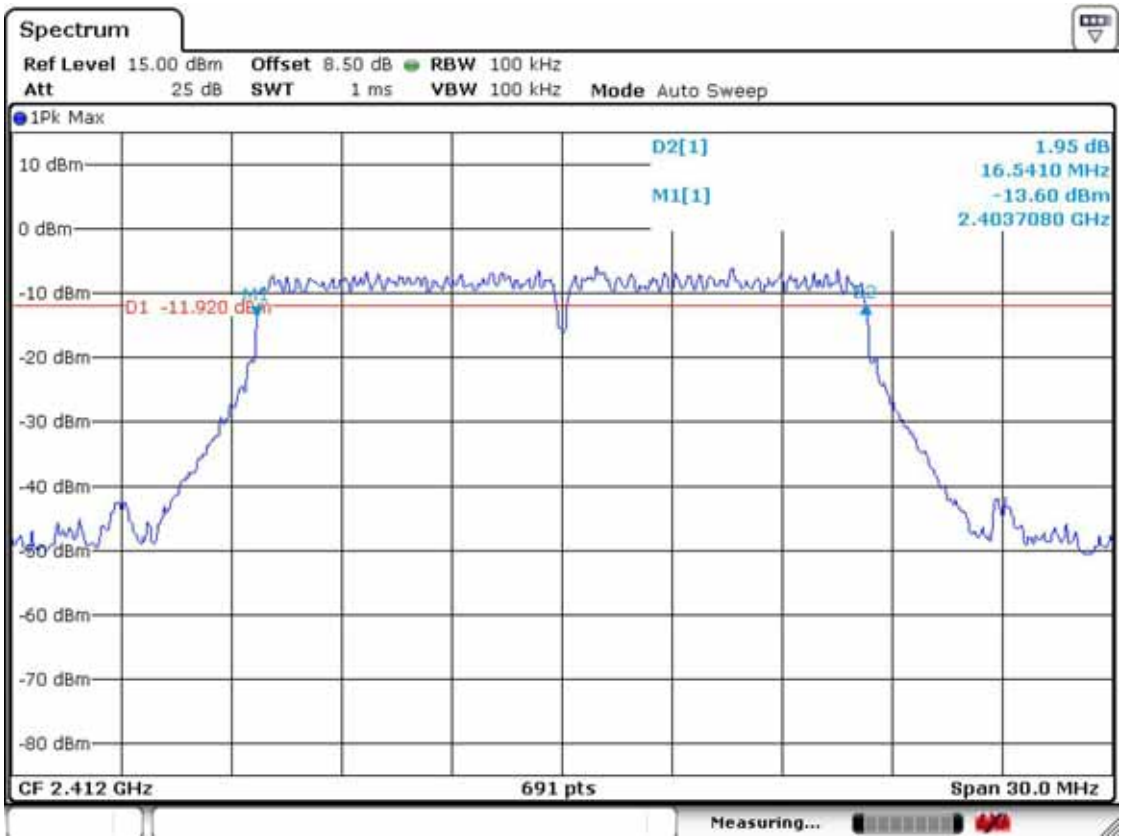

Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 100 kHz
Att 25 dB SWT 1 ms VBW 100 kHz Mode Auto Sweep
1Pk Max
D2[1] 0.07 dB
11.2010 MHz
M1[1] -5.12 dBm
2.4566600 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
D1 -5.010 dBm
M1
D2
CF 2.462 GHz
691 pts
Span 30.0 MHz
Measuring...

802.11g
CH 1



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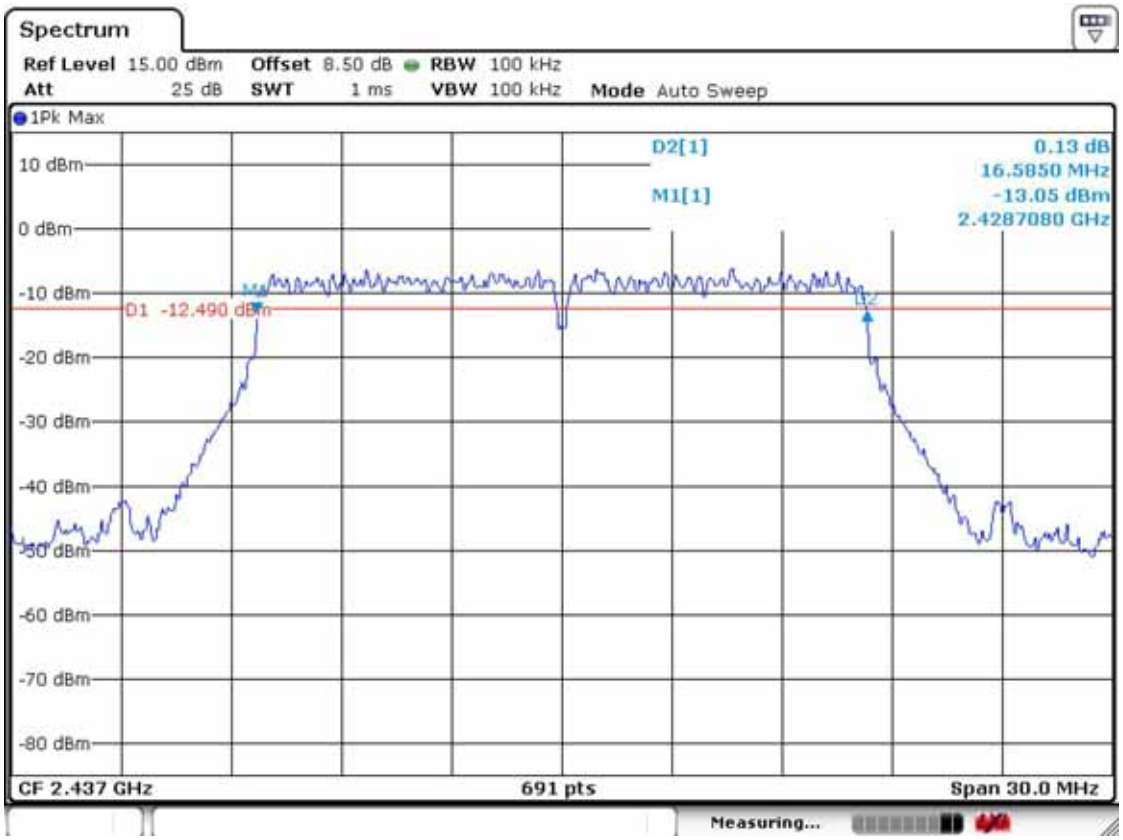

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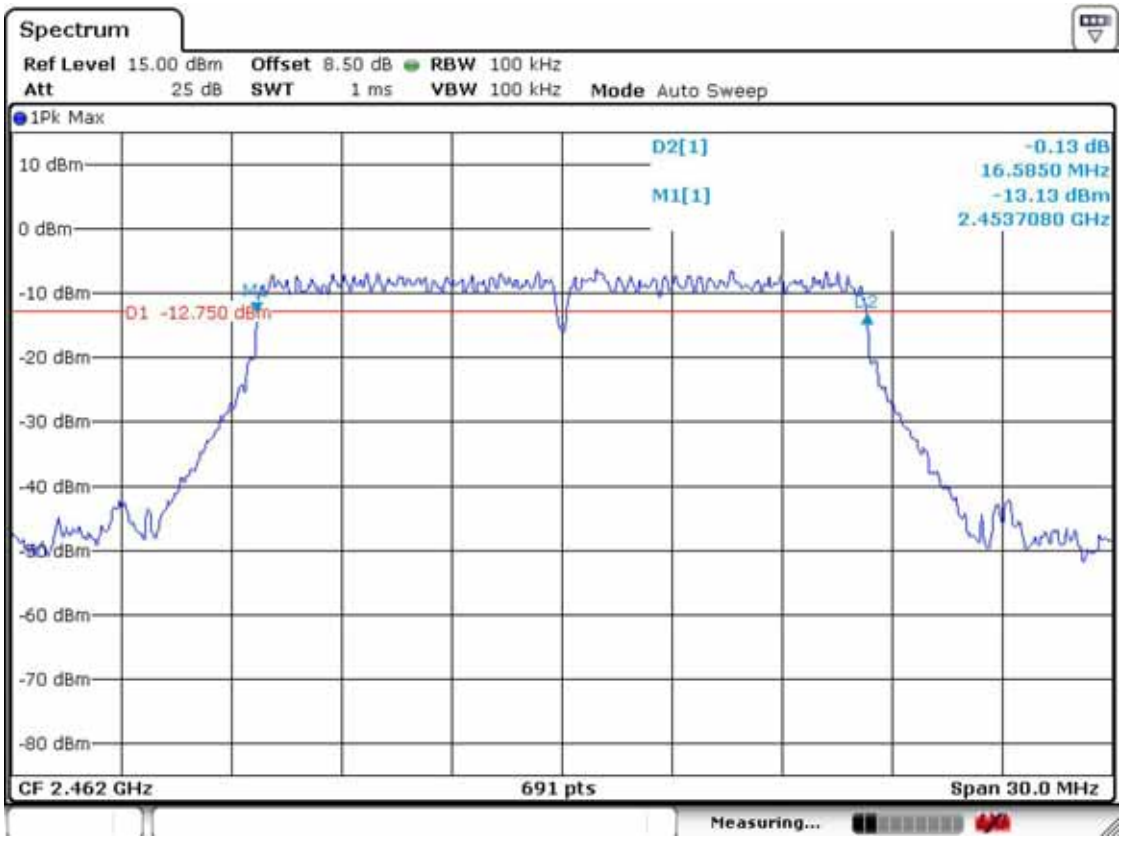
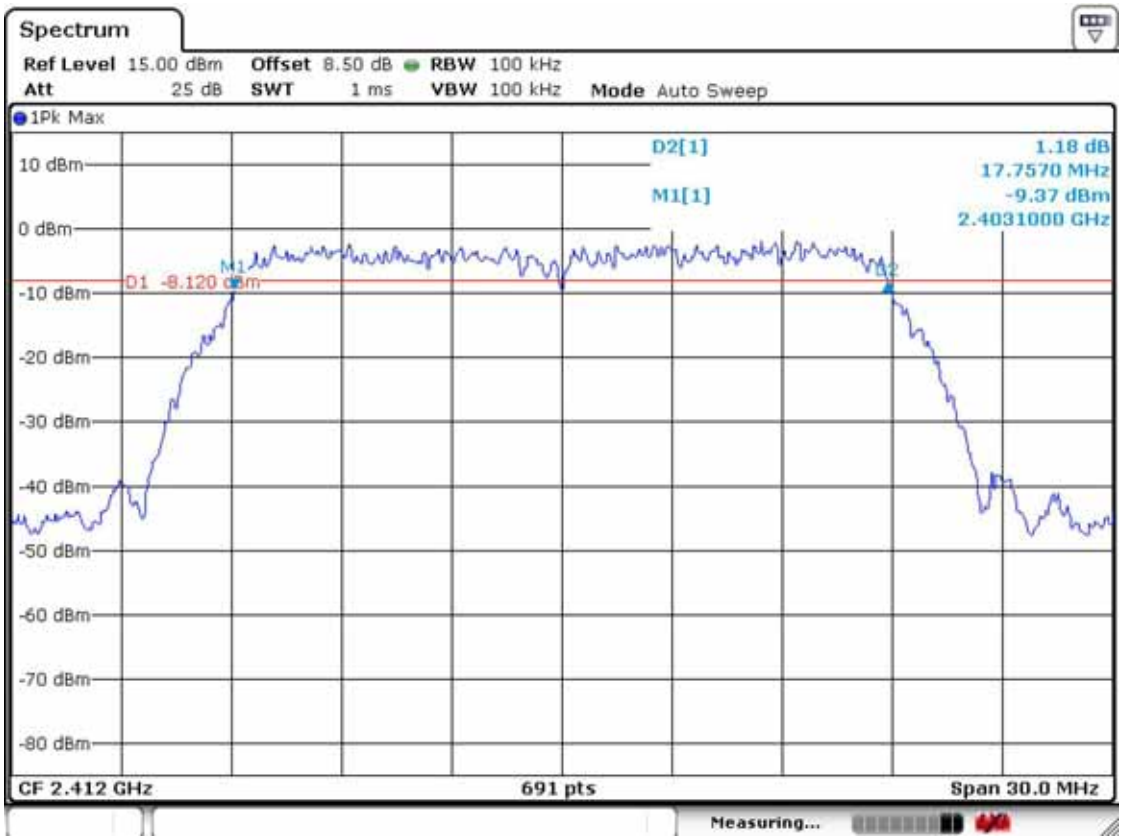
CH 11


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 100 kHz
Att 25 dB SWT 1 ms VBW 100 kHz Mode Auto Sweep
1Pk Max
D2[1] -0.13 dB
16.5850 MHz
M1[1] -13.13 dBm
2.4537080 GHz
D1 -12.750 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Measuring...

802.11n_20MHz
CH 1



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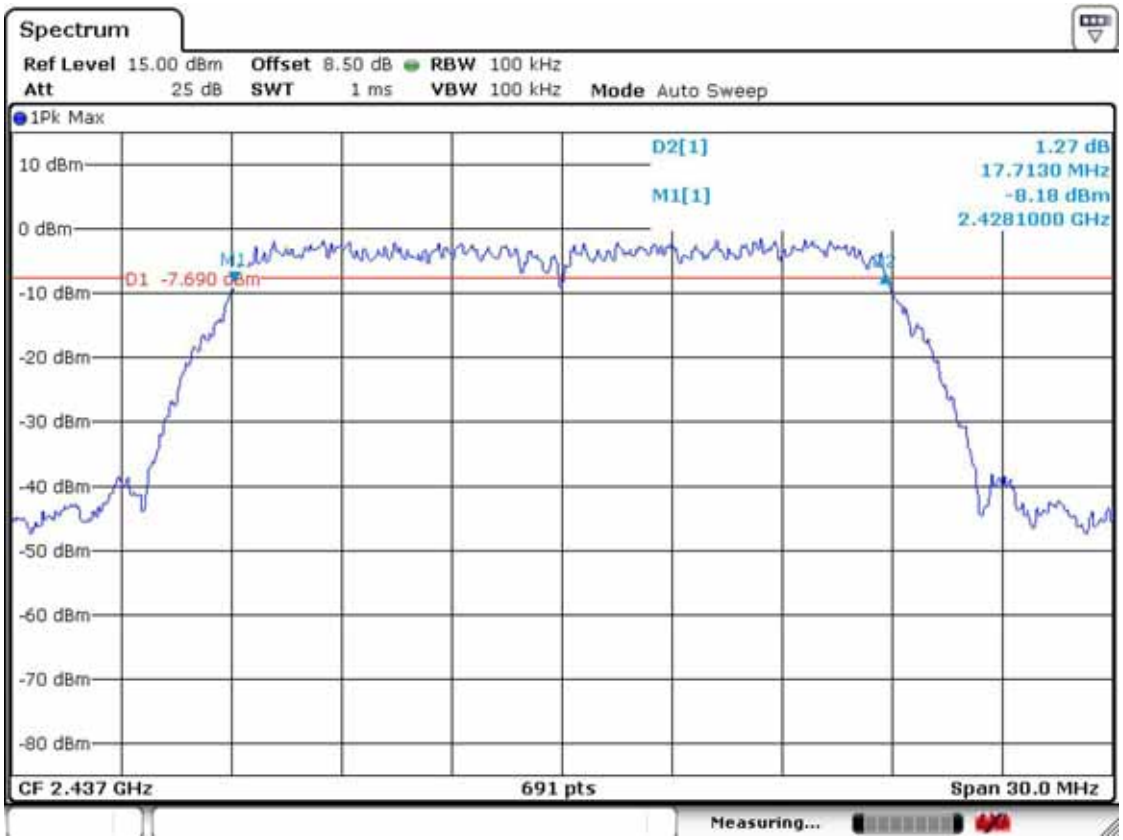

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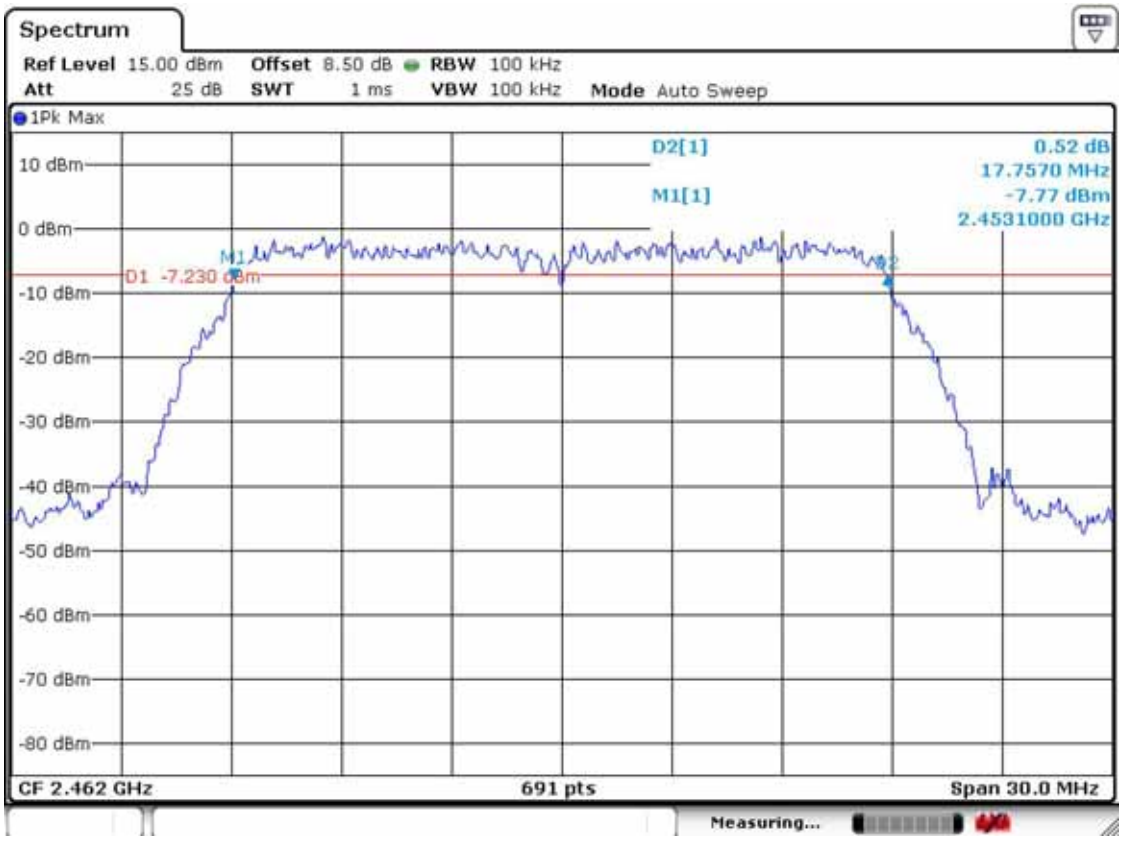
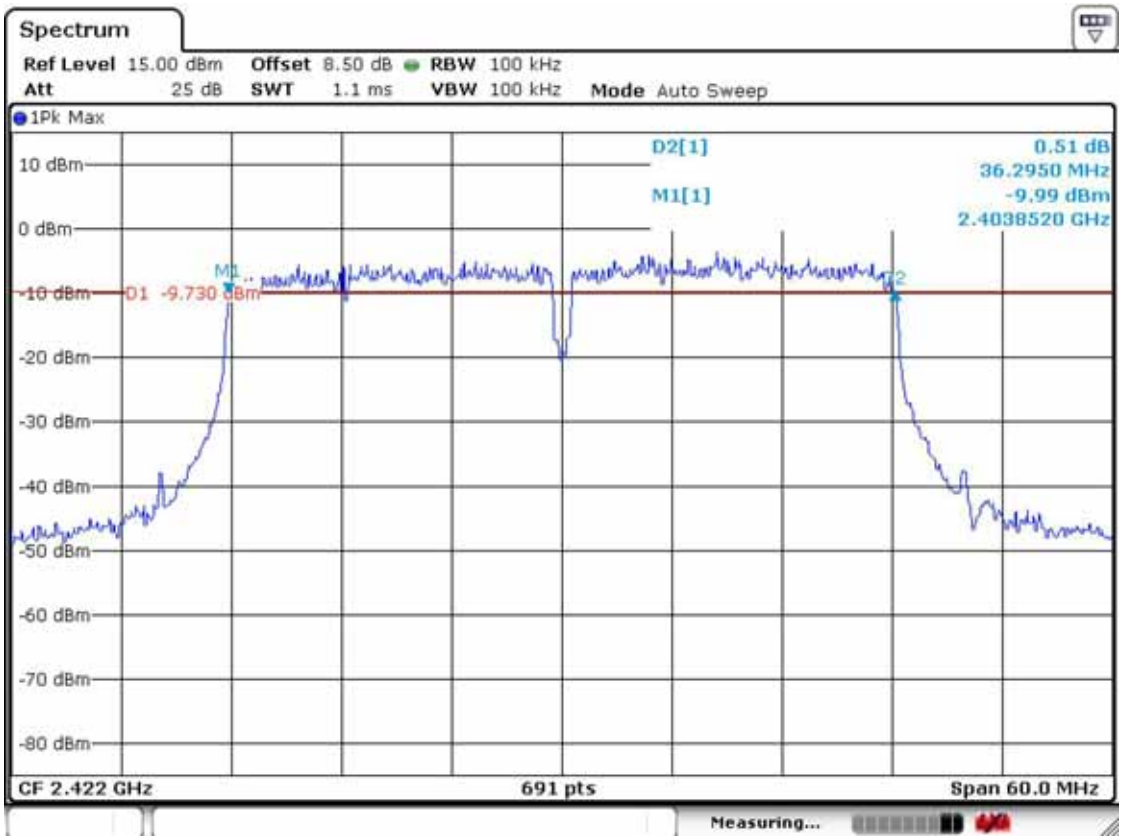
CH 11


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 100 kHz
Att 25 dB SWT 1 ms VBW 100 kHz Mode Auto Sweep
1Pk Max
D2[1] 0.52 dB
17.7570 MHz
M1[1] -7.77 dBm
2.4531000 GHz
D1 -7.230 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Measuring...

802.11n_40MHz
CH 3



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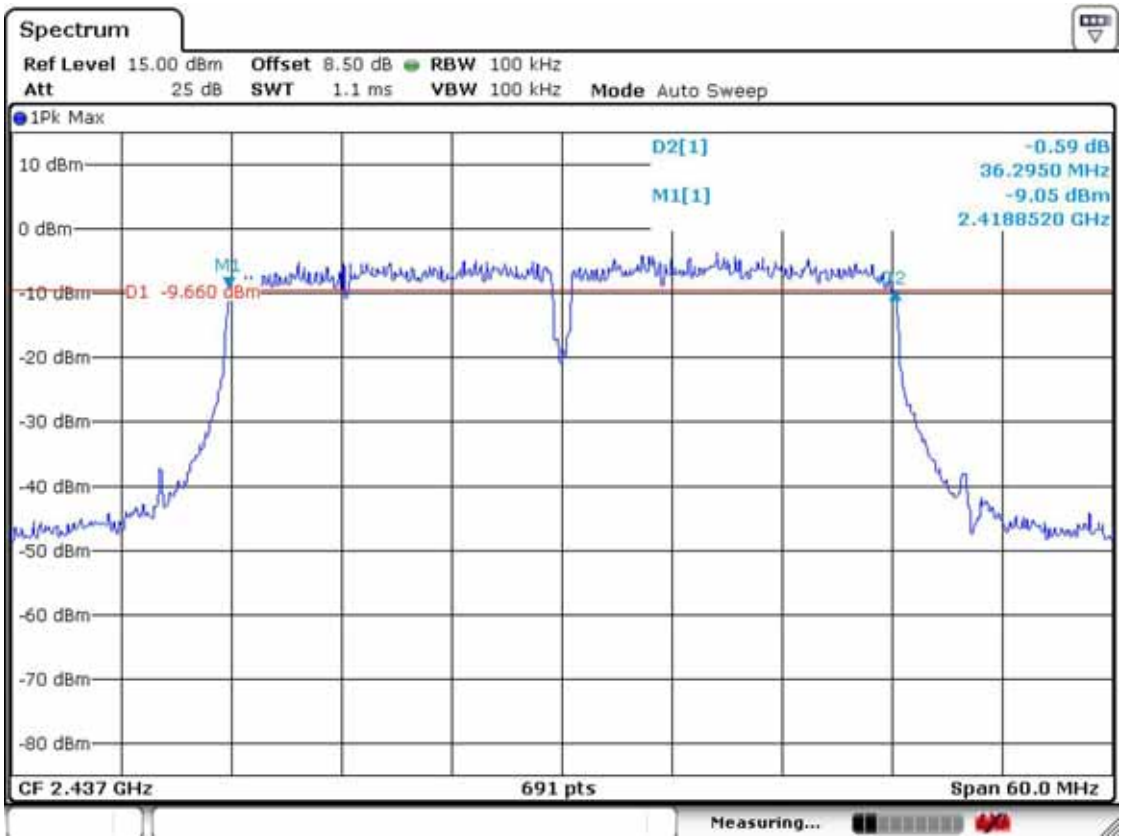

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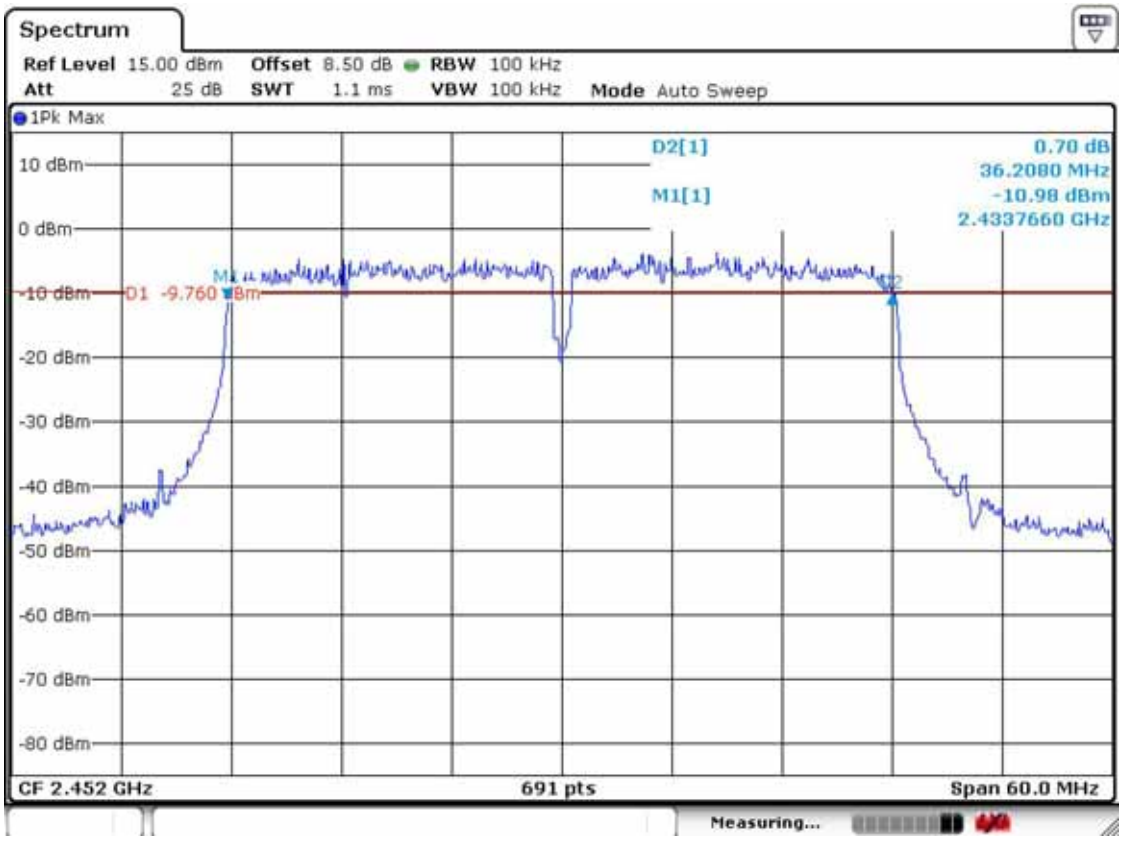
CH 9


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 100 kHz
Att 25 dB SWT 1.1 ms VBW 100 kHz Mode Auto Sweep
1Pk Max
D2[1] 0.70 dB
36.2080 MHz
M1[1] -10.98 dBm
2.4337660 GHz
10 dBm
0 dBm
-10 dBm
D1 -9.760 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.452 GHz
691 pts
Span 60.0 MHz
Measuring...

3.2.2 Peak Output Power Measurement

Procedure:

*The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1MHz Span = auto

VBW = 3MHz (VBW ≥ RBW) Sweep = auto

Detector function = peak

Measurement Data: 2.4GHz Band

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Data (dBm)	Result
802.11b	2412	1	15.31	Complies
	2437	6	15.40	Complies
	2462	11	15.32	Complies
802.11g	2412	1	14.01	Complies
	2437	6	13.91	Complies
	2462	11	14.19	Complies
802.11n _20MHz	2412	1	17.95	Complies
	2437	6	18.83	Complies
	2462	11	19.11	Complies
802.11n _40MHz	2422	3	17.59	Complies
	2437	6	18.09	Complies
	2452	9	18.35	Complies

Minimum Standard:

Peak output power	< 1W

Measurement Setup

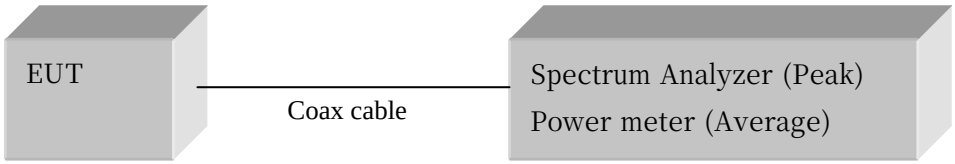


Figure 2: Measurement setup for the carrier frequency separation

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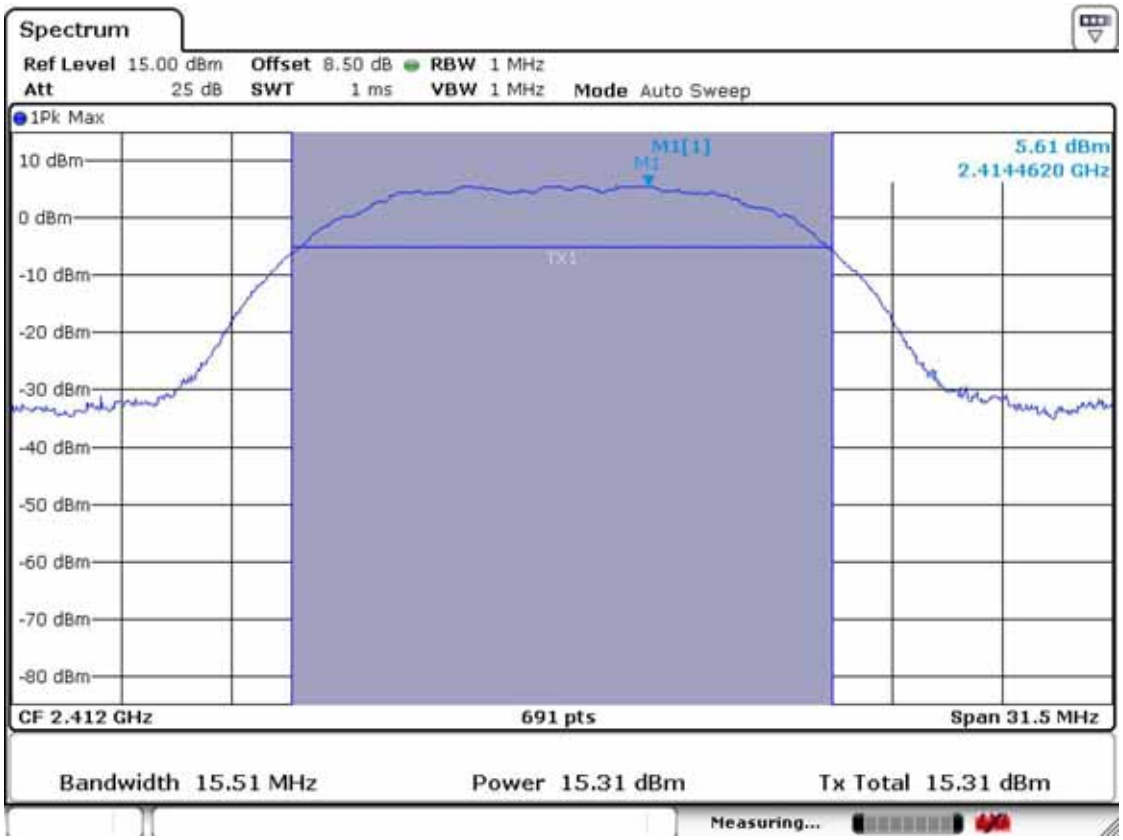
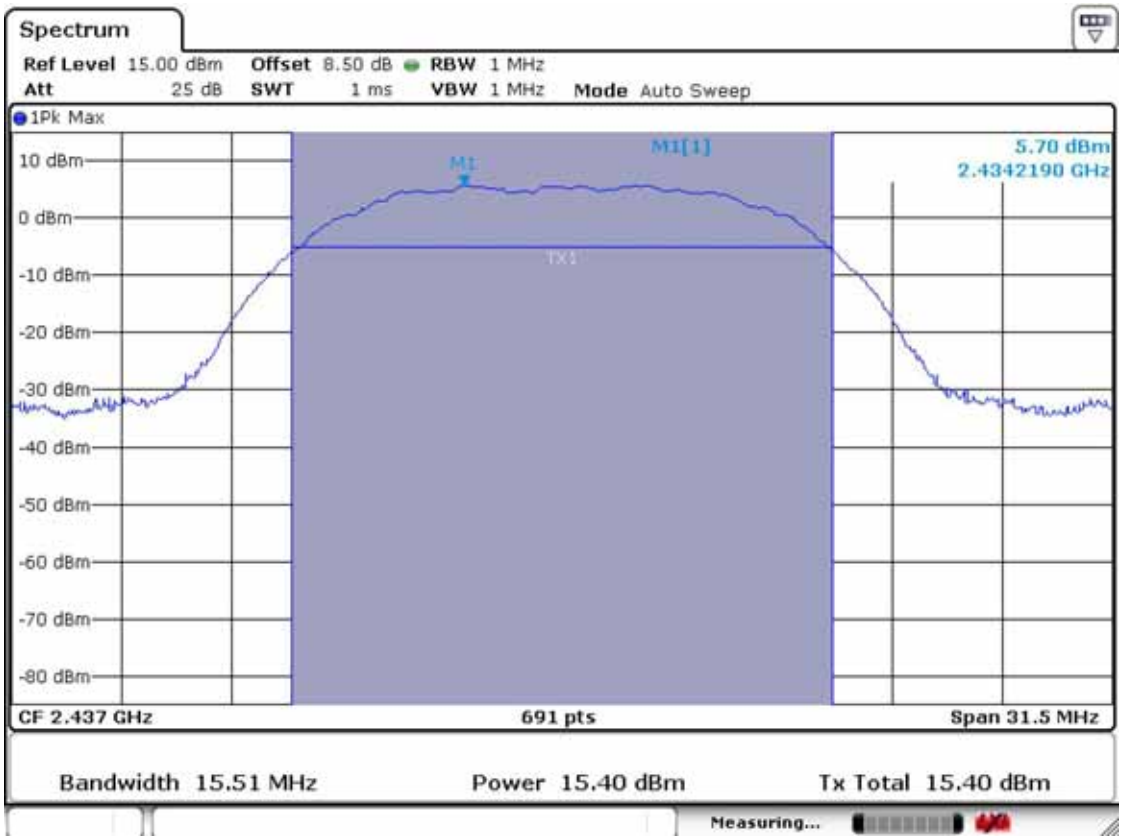
802.11b

CH 1



CH 6



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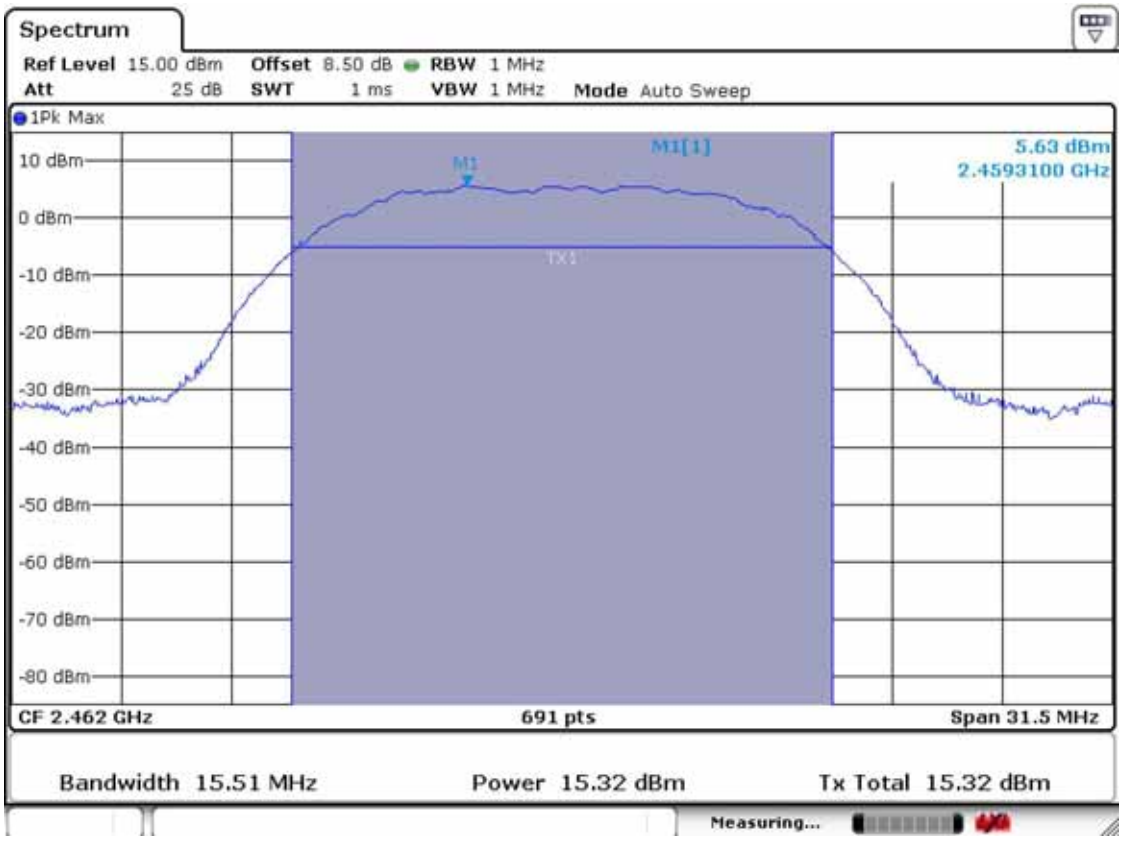
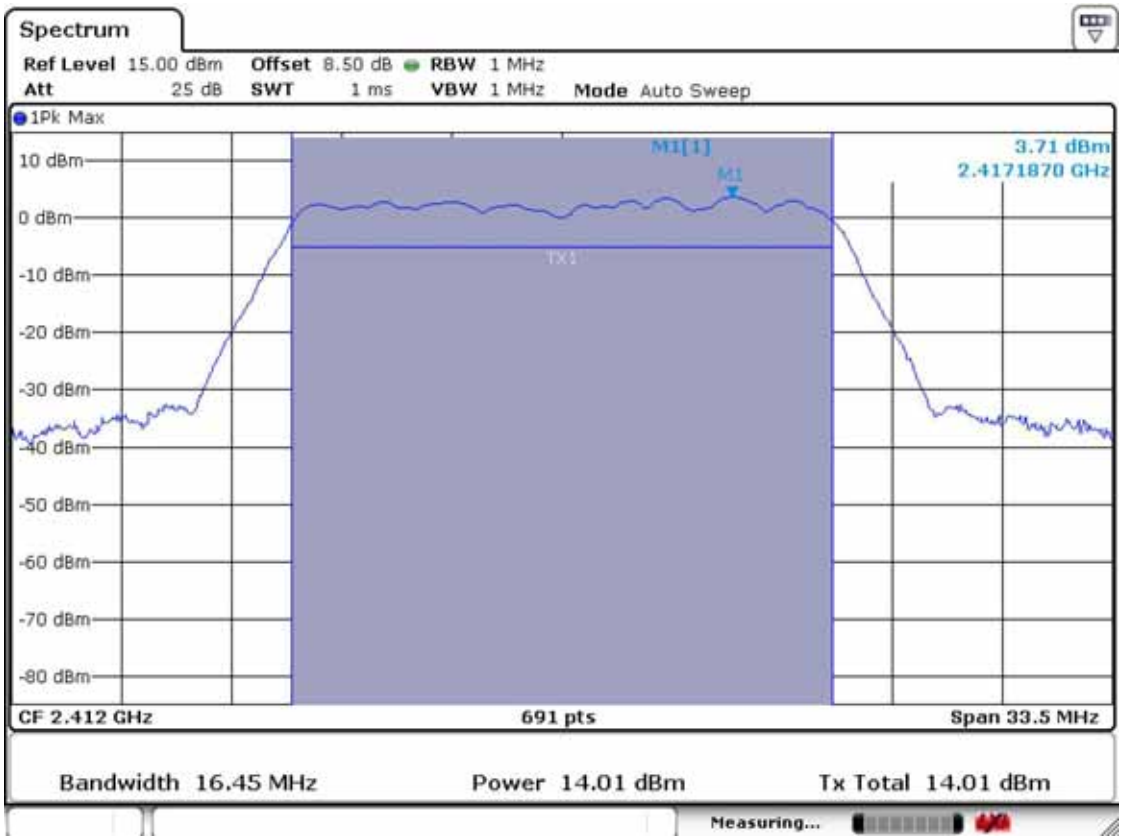
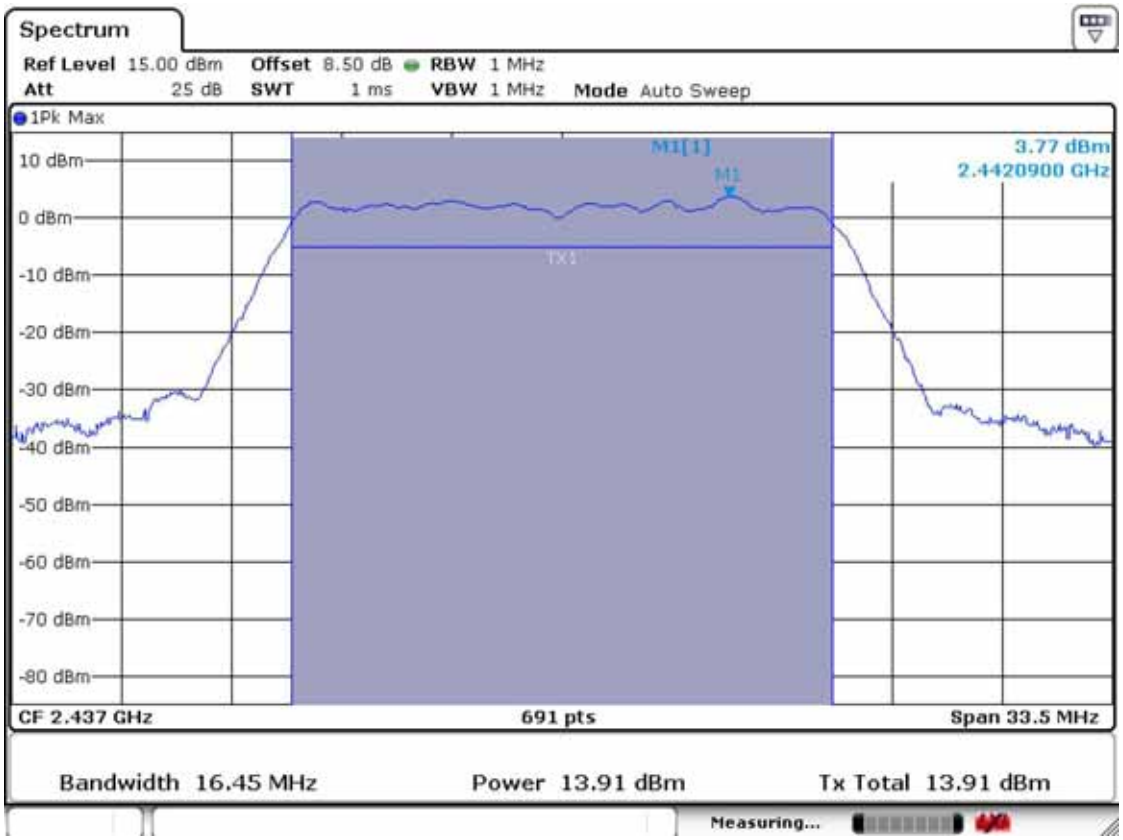
CH 11


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 1 MHz
Att 25 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Pk Max
M1[1]
M1
5.63 dBm
2.4593100 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 31.5 MHz
Bandwidth 15.51 MHz
Power 15.32 dBm
Tx Total 15.32 dBm
Measuring...

802.11g
CH 1



CH 6



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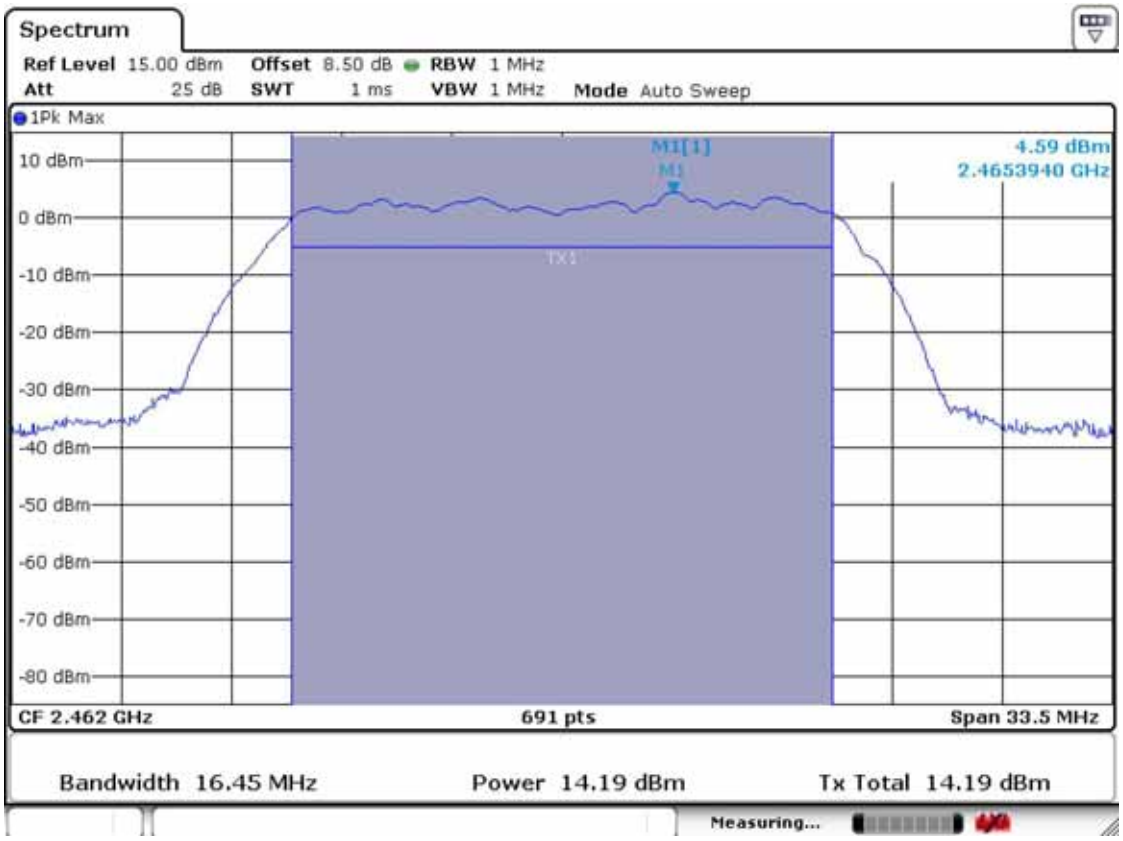
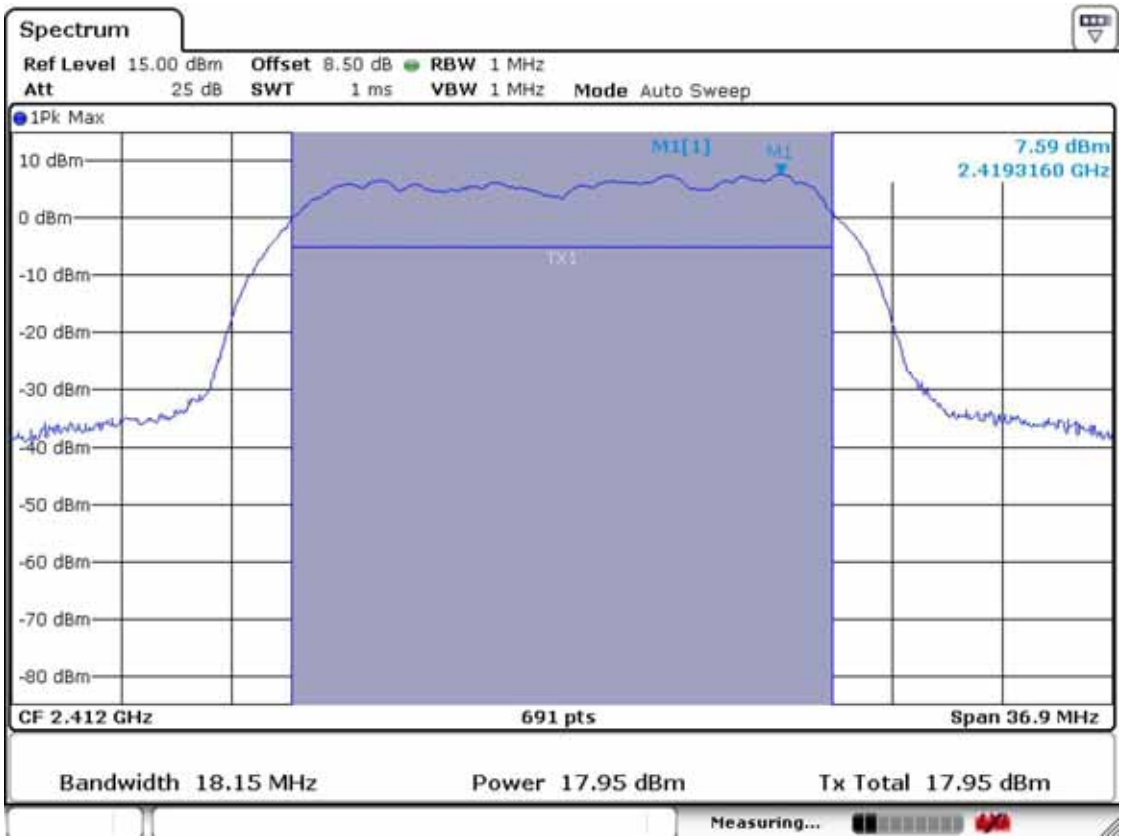
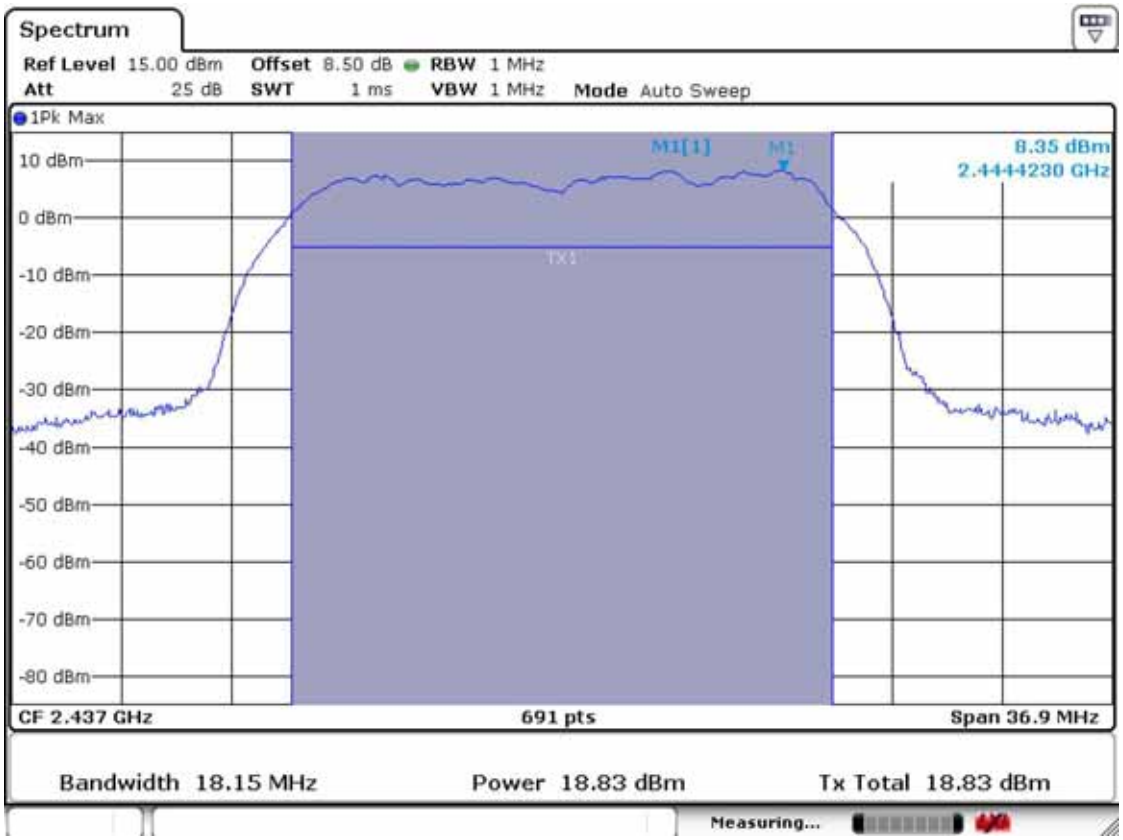
CH 11


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 1 MHz
Att 25 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Pk Max
M1[1]
M1
4.59 dBm
2.4653940 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 33.5 MHz
Bandwidth 16.45 MHz
Power 14.19 dBm
Tx Total 14.19 dBm
Measuring...

802.11n_20MHz
CH 1



CH 6



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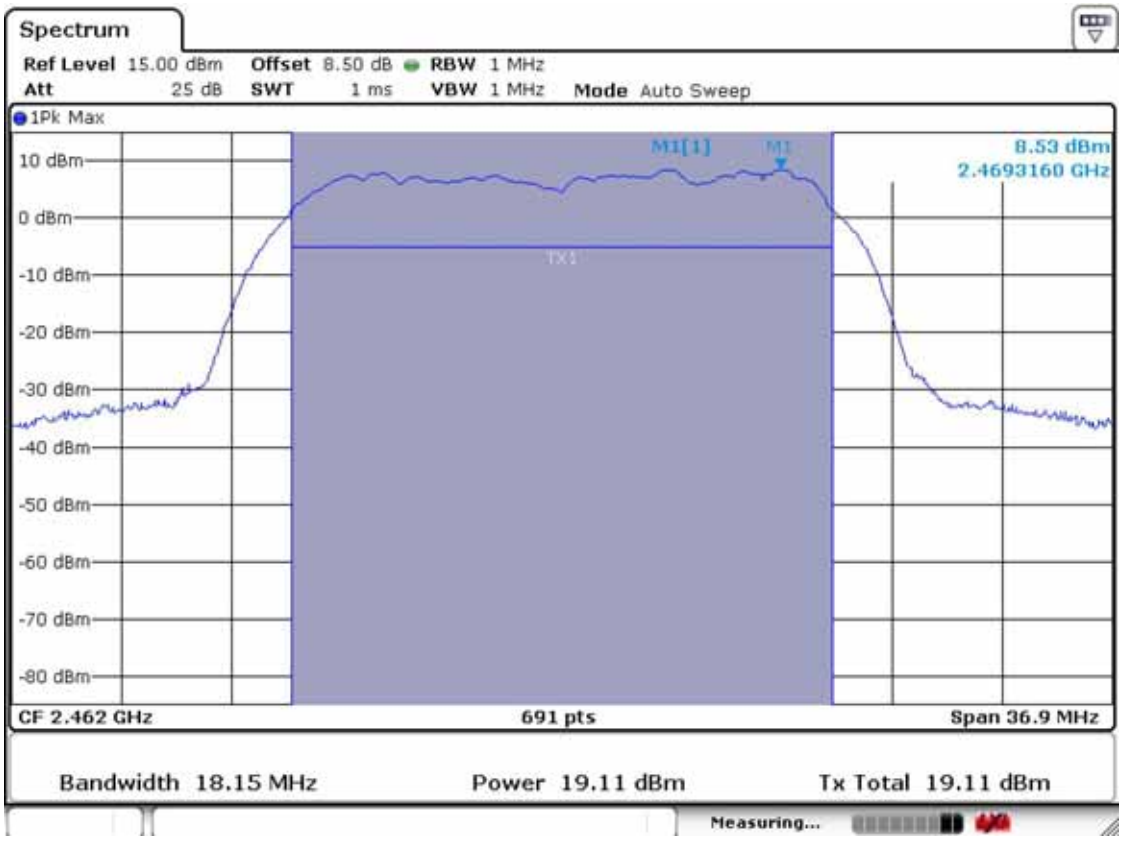
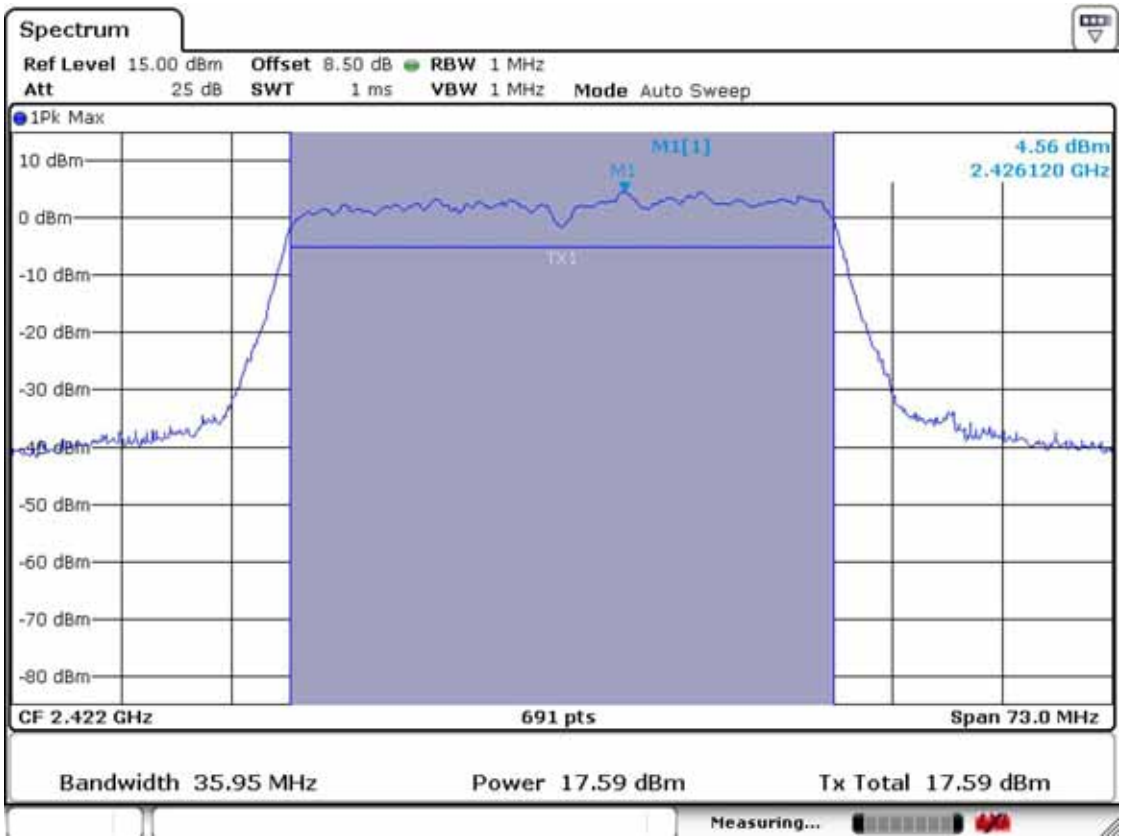
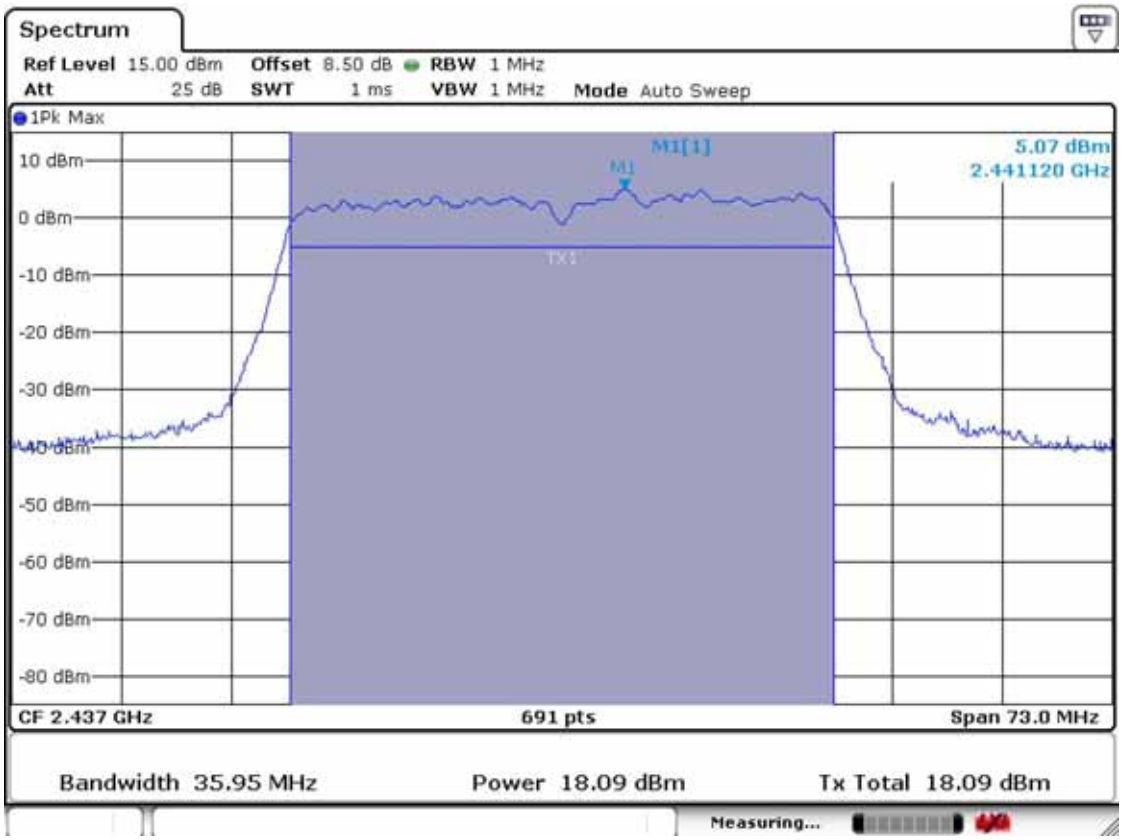
CH 11


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 1 MHz
Att 25 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Pk Max
M1[1] M1
8.53 dBm
2.4693160 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 36.9 MHz
Bandwidth 18.15 MHz
Power 19.11 dBm
Tx Total 19.11 dBm
Measuring...

802.11n40MHz
CH 3



CH 6



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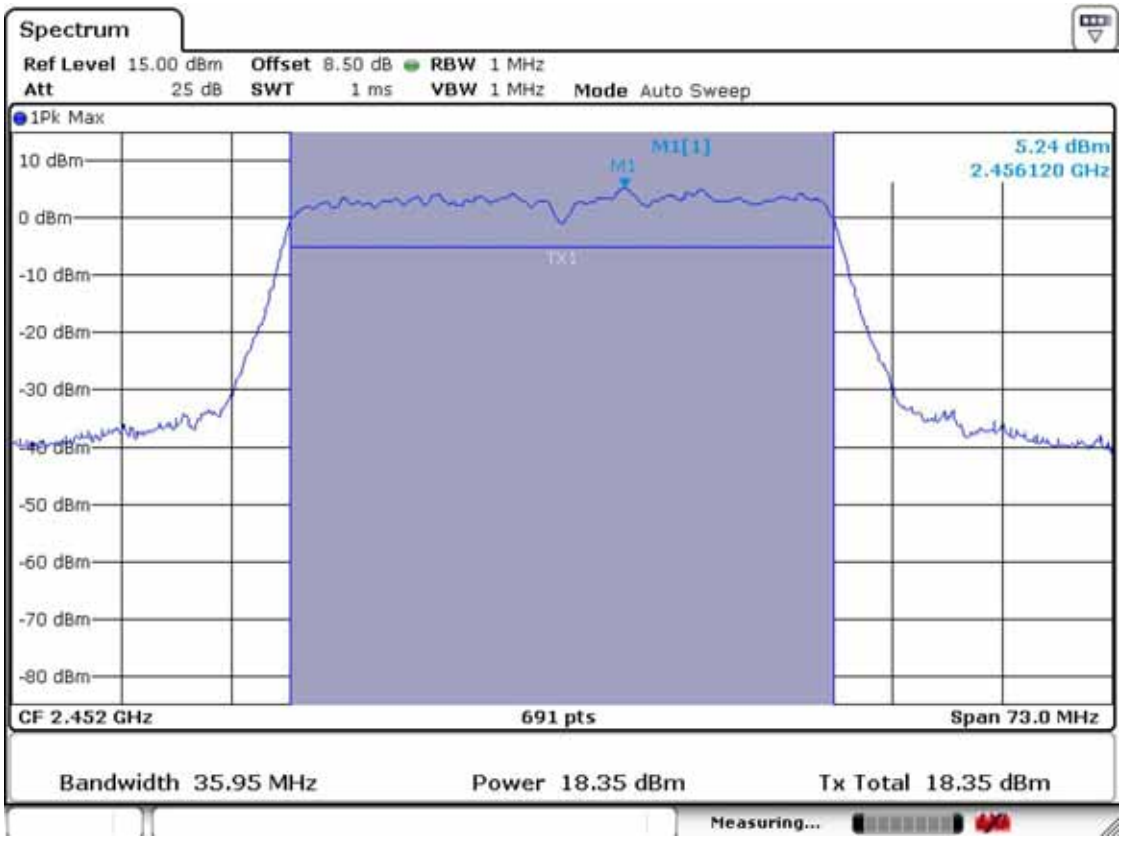
CH 9


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 1 MHz
Att 25 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Pk Max
M1[1]
M1
5.24 dBm
2.456120 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.452 GHz
691 pts
Span 73.0 MHz
Bandwidth 35.95 MHz
Power 18.35 dBm
Tx Total 18.35 dBm
Measuring...

3.2.3 Power Spectral Density

Procedure:

*The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz	Span = 300 kHz
VBW = 3 kHz	Sweep = 100 sec
Detector function = peak	Trace = max hold

Measurement Data: 2.4GHz Band

Mode	Frequency (MHz)	Channel No.	Test Results	
			dBm	Result
802.11b	2412	1	-16.47	Complies
	2437	6	-16.45	Complies
	2462	11	-16.61	Complies
802.11g	2412	1	-21.84	Complies
	2437	6	-21.87	Complies
	2462	11	-21.87	Complies
802.11n _20MHz	2412	1	-16.57	Complies
	2437	6	-15.83	Complies
	2462	11	-15.71	Complies
802.11n _40MHz	2422	3	-19.15	Complies
	2437	6	-18.78	Complies
	2452	9	-18.60	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

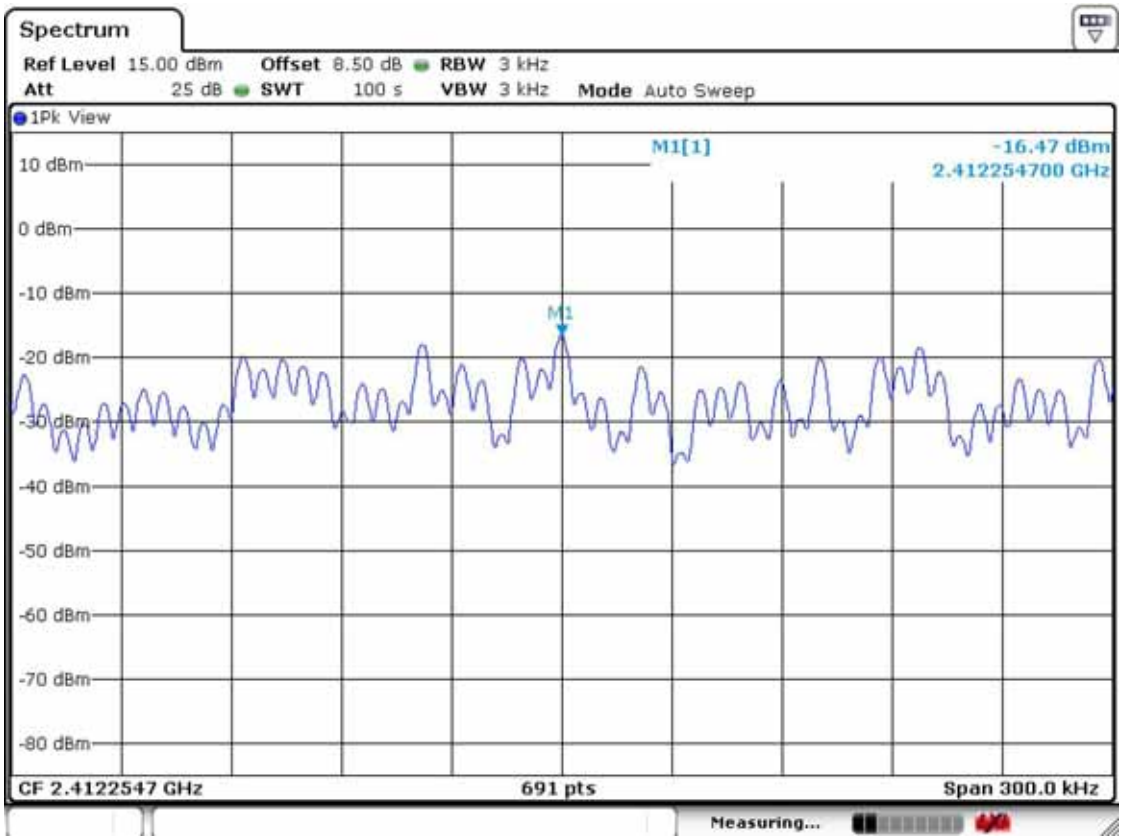
Power Spectral Density	< 8dBm @ 3kHz BW

Measurement Setup

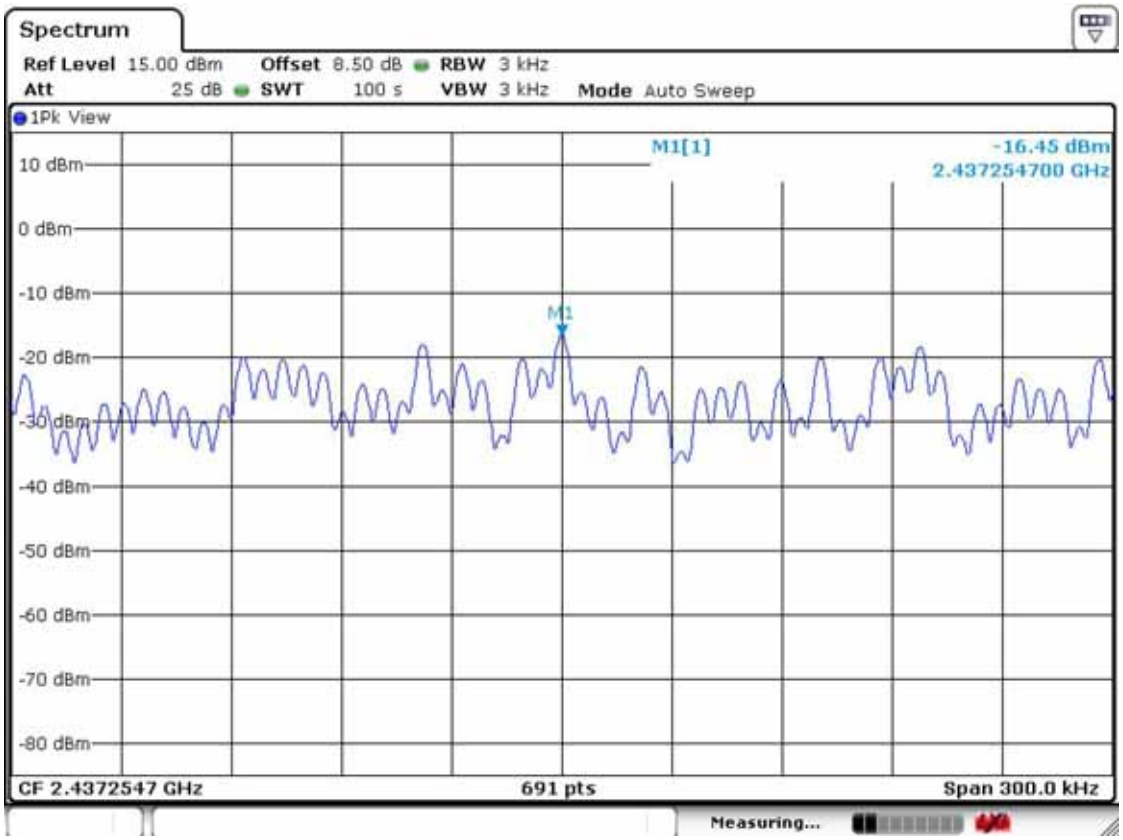
Same as the Chapter 3.2.1 (Figure 1)

802.11b Power Density Measurement

CH 1



CH 6



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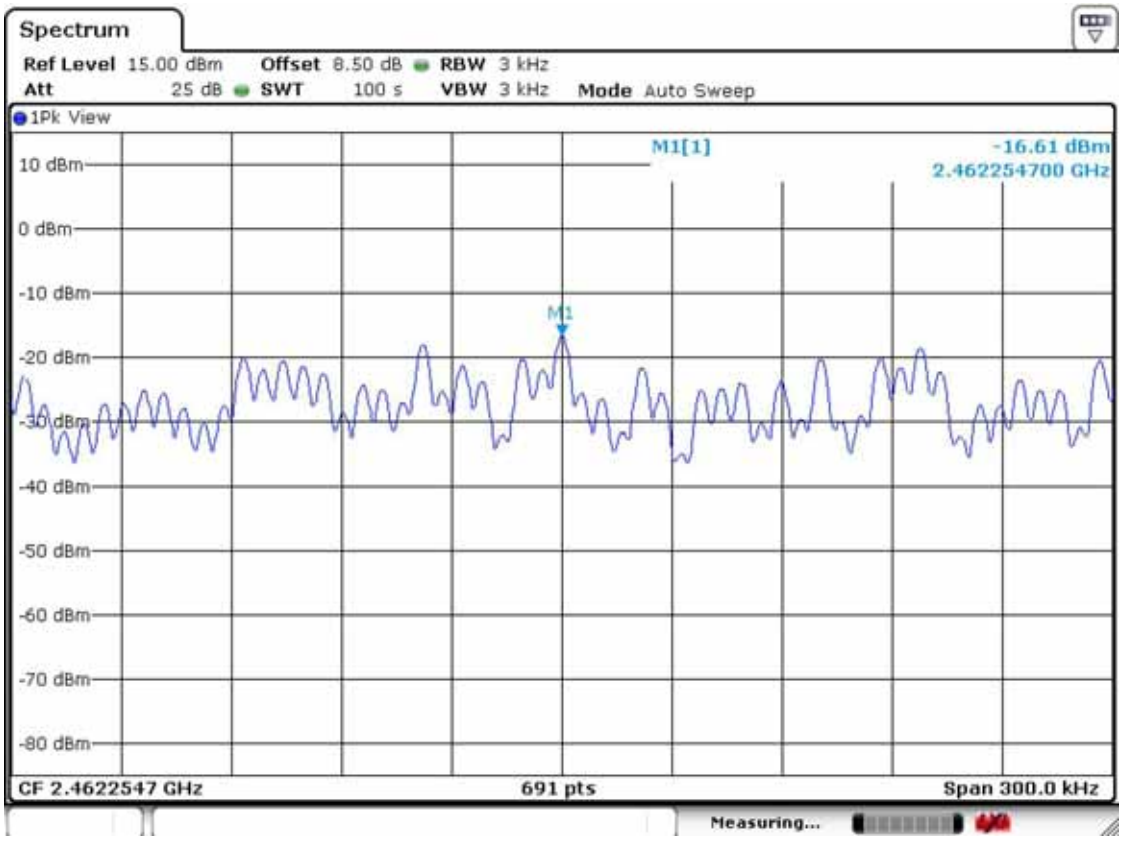
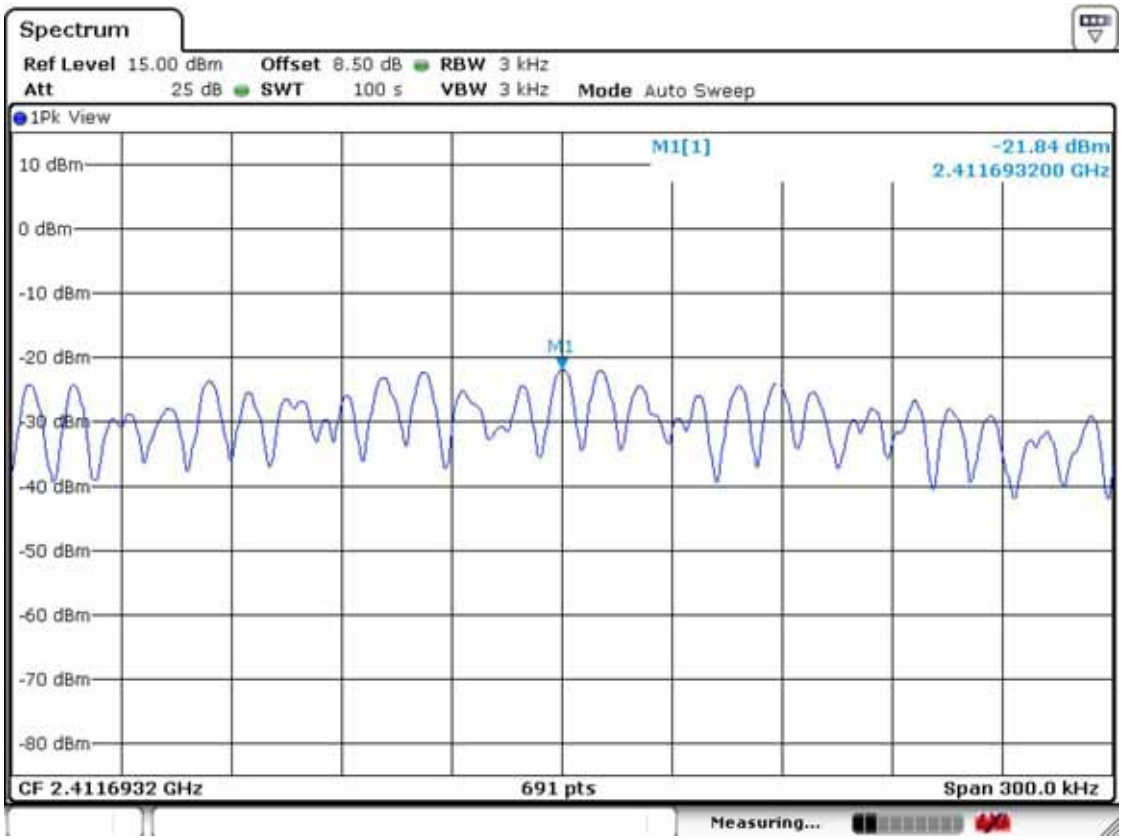
CH 11

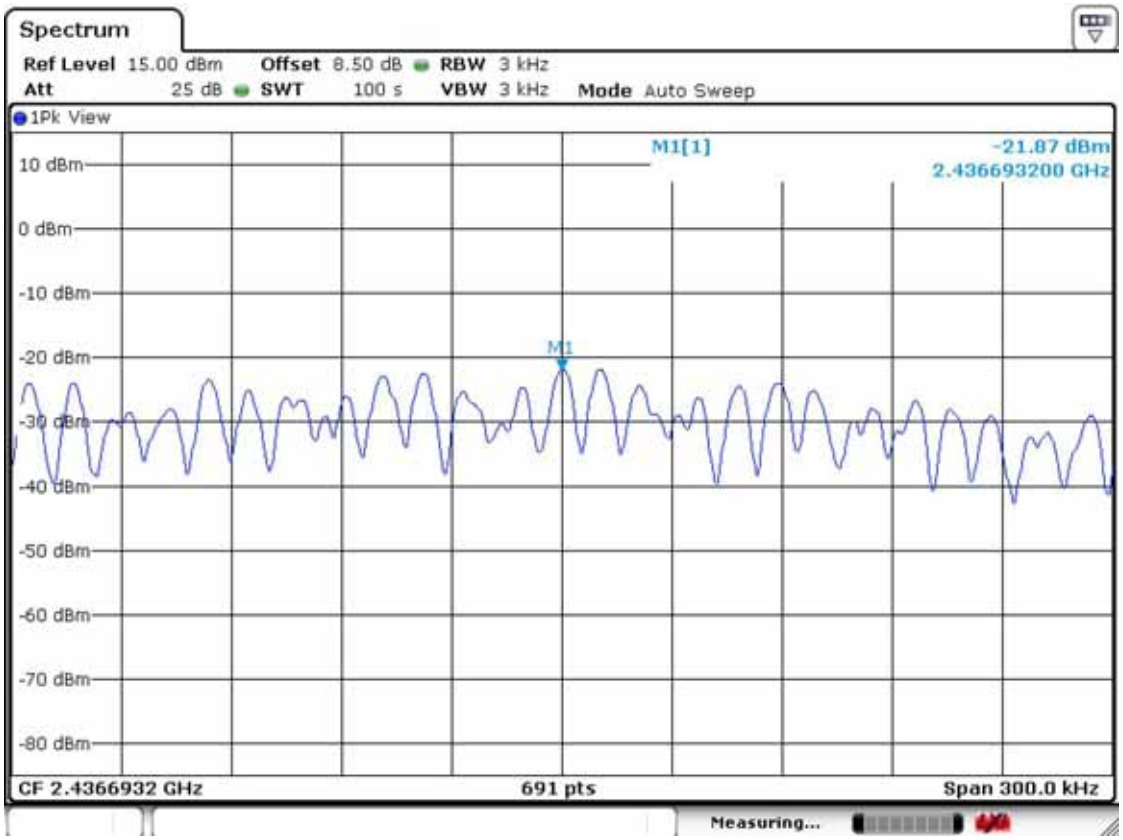

Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 3 kHz
Att 25 dB SWT 100 s VBW 3 kHz Mode Auto Sweep
1Pk View
M1[1] -16.61 dBm
2.462254700 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.4622547 GHz
691 pts
Span 300.0 kHz
Measuring...

802.11g Power Density Measurement

CH 1



CH 6



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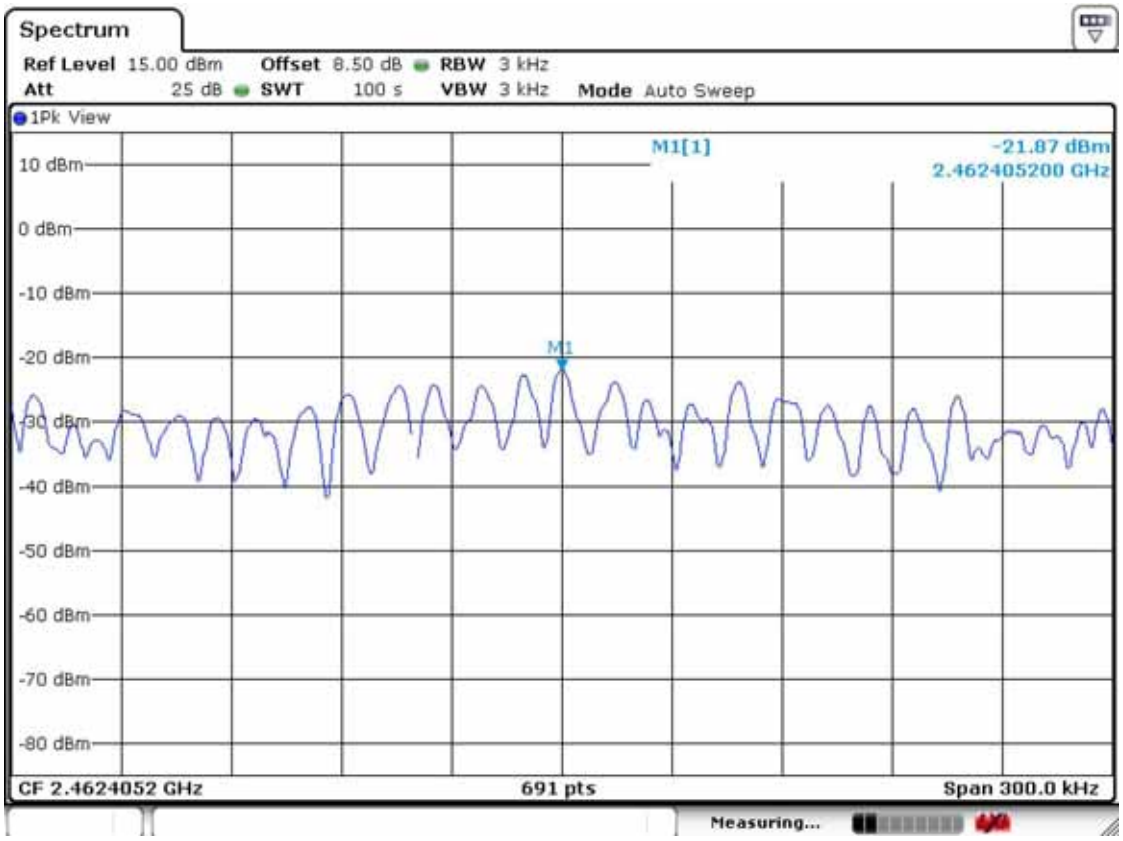
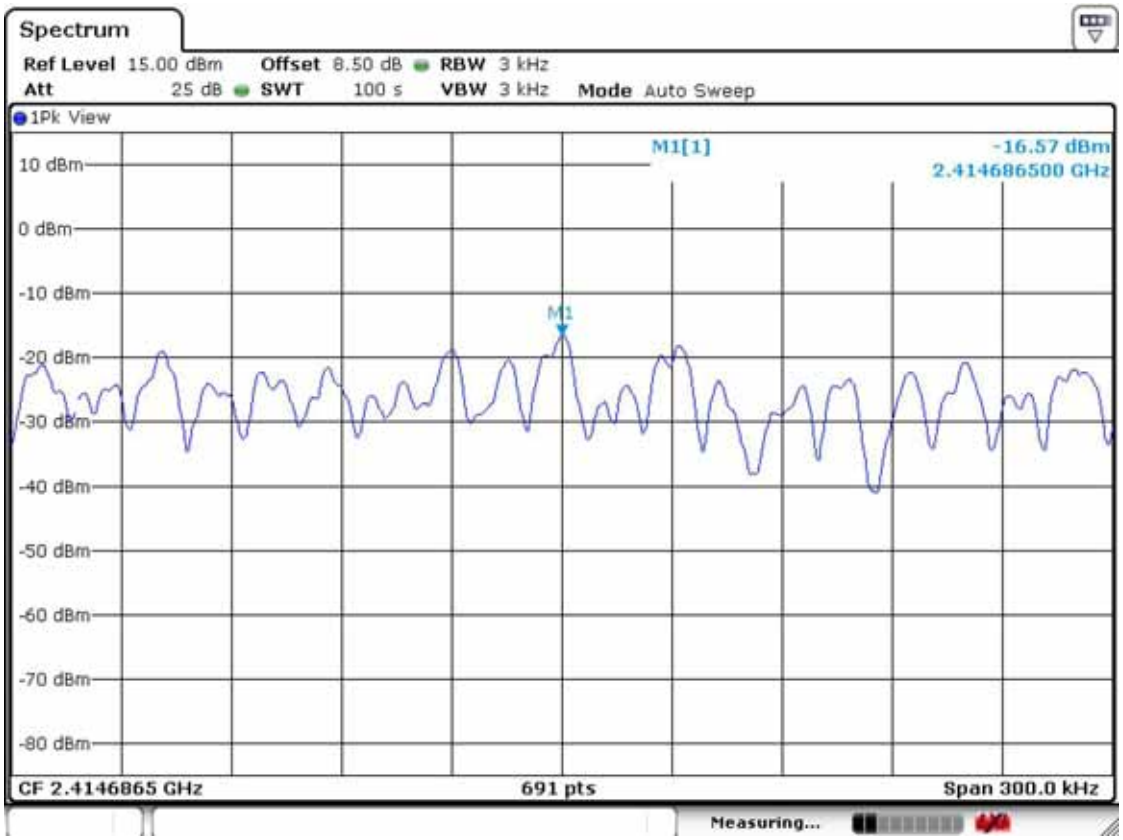
CH 11

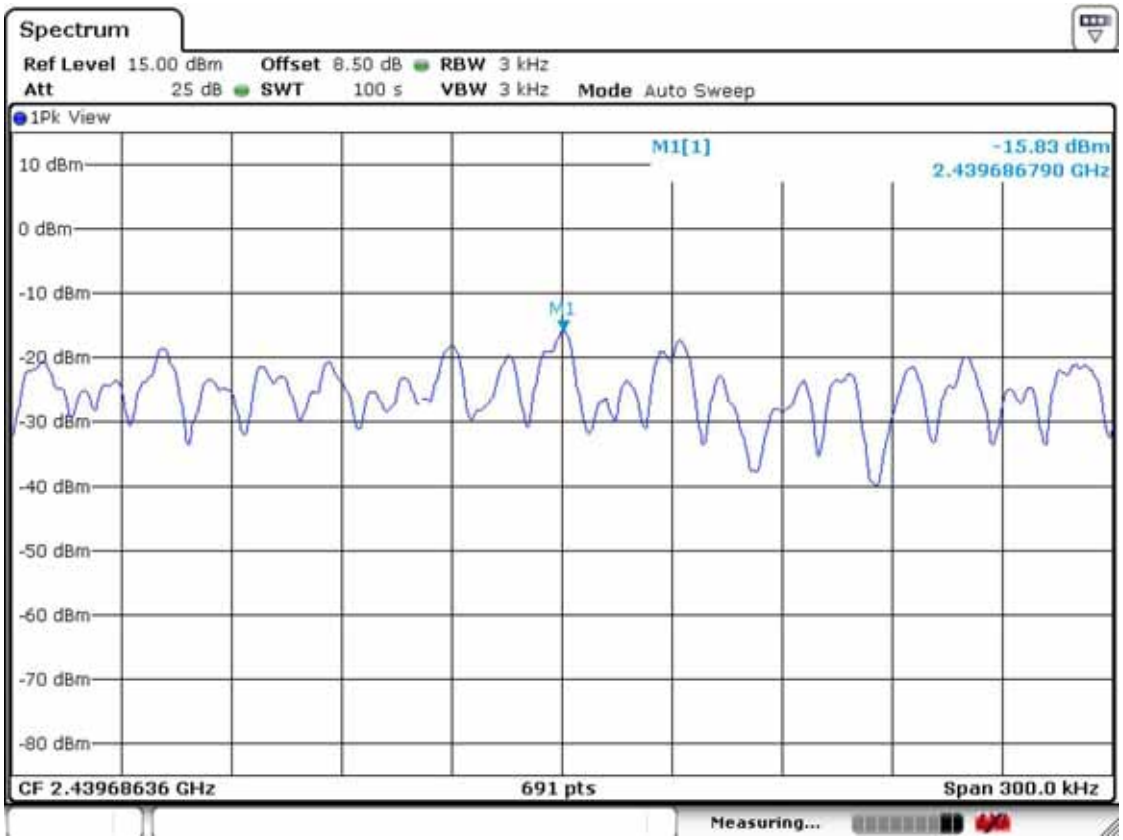

Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 3 kHz
Att 25 dB SWT 100 s VBW 3 kHz Mode Auto Sweep
1Pk View
M1[1] -21.87 dBm
2.462405200 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.4624052 GHz
691 pts
Span 300.0 kHz
Measuring...

802.11n_20MHz Power Density Measurement

CH 1



CH 6



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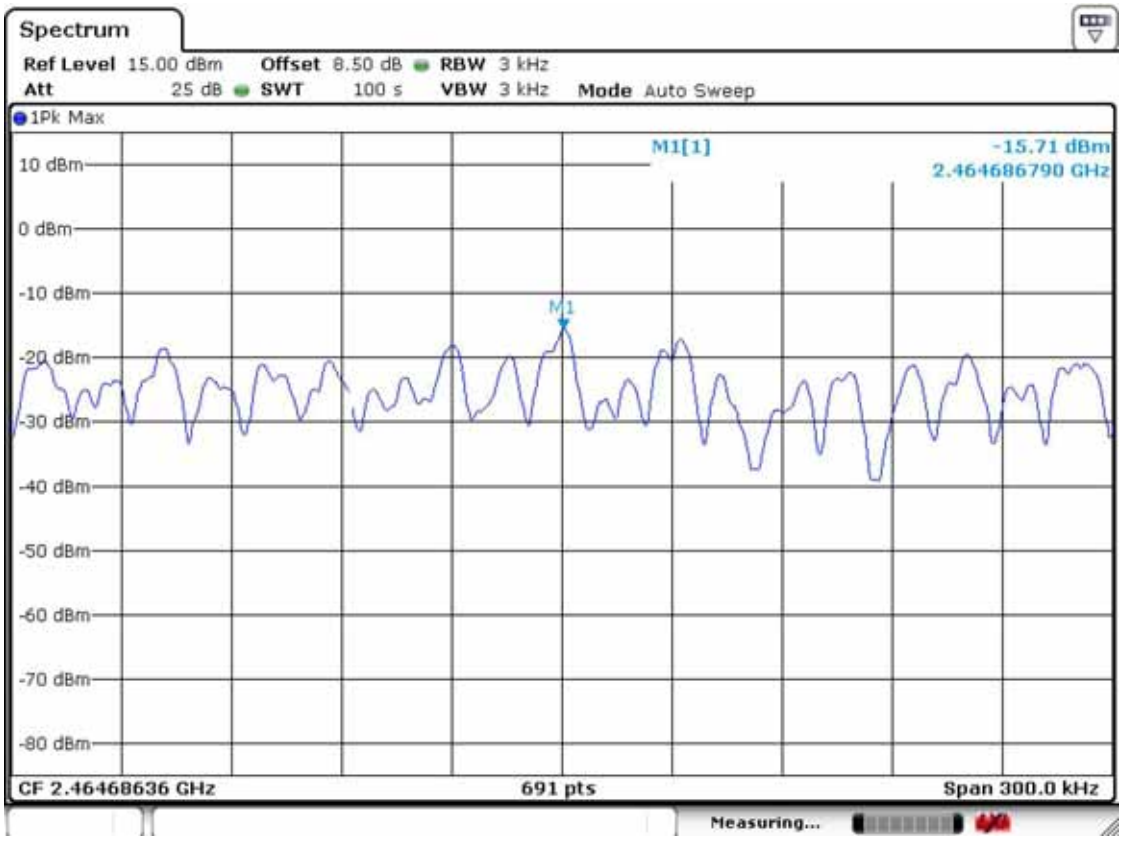
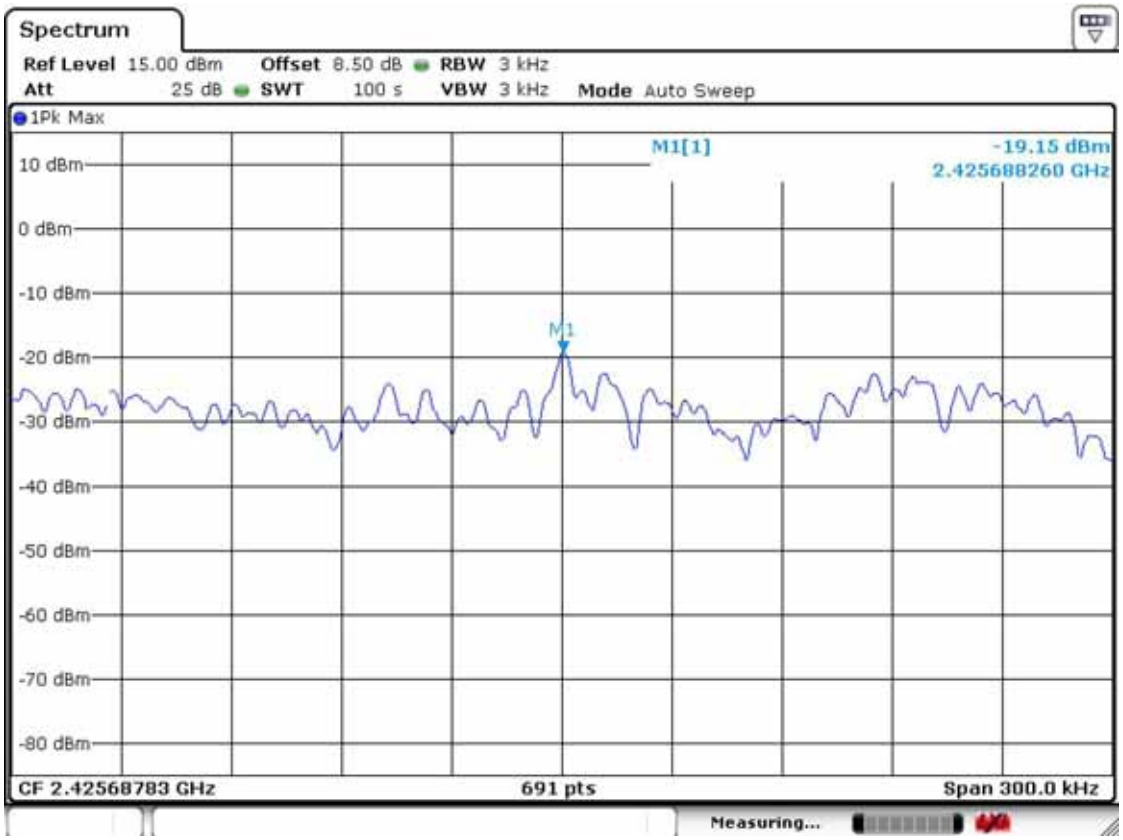
CH 11

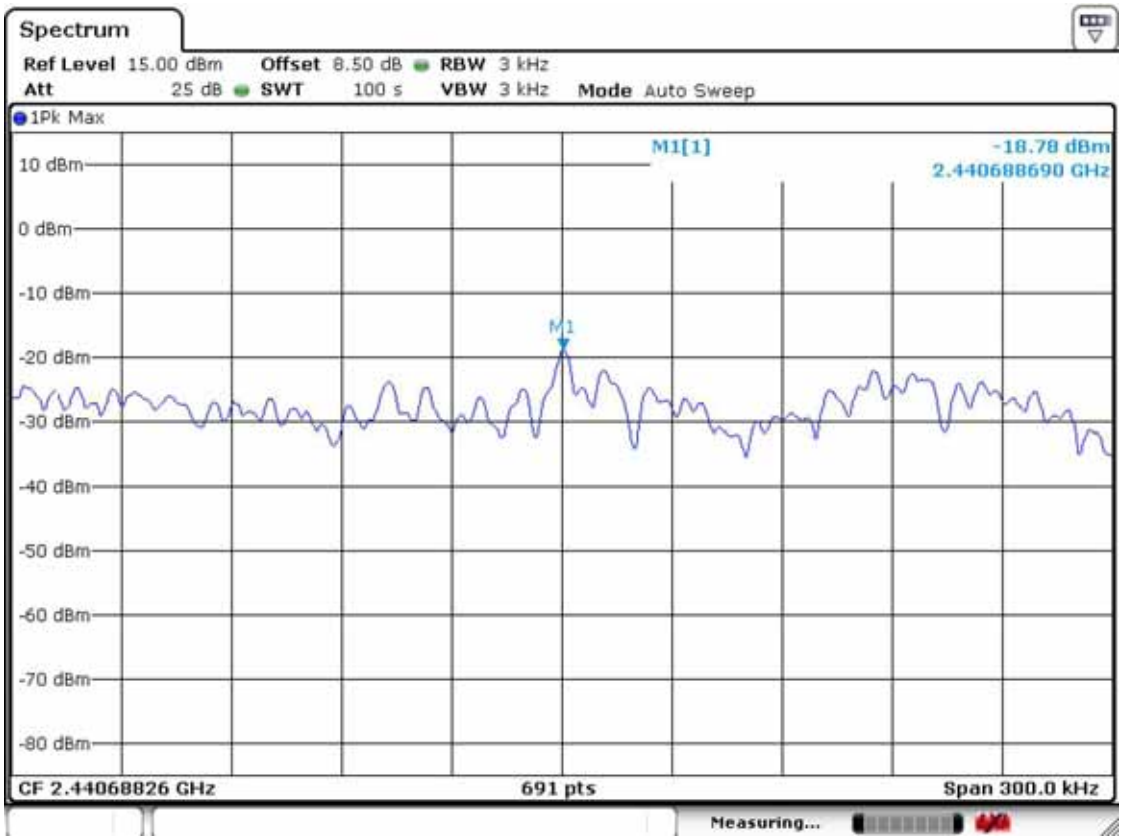

Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 3 kHz
Att 25 dB SWT 100 s VBW 3 kHz Mode Auto Sweep
1Pk Max
M1[1] -15.71 dBm
2.464686790 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.46468636 GHz
691 pts
Span 300.0 kHz
Measuring...

802.11n 40MHz Power Density Measurement

CH 3



CH 6



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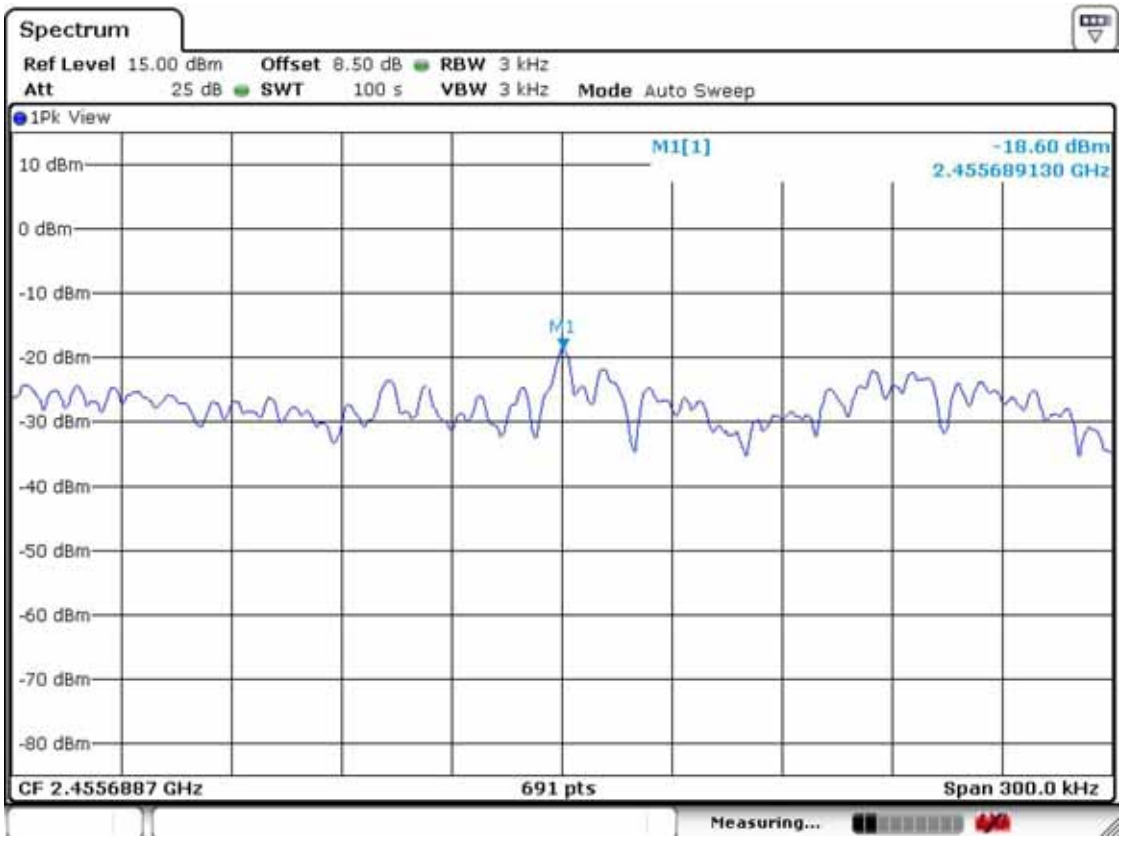
CH 9


Spectrum
Ref Level 15.00 dBm Offset 8.50 dB RBW 3 kHz
Att 25 dB SWT 100 s VBW 3 kHz Mode Auto Sweep
1Pk View
M1[1] -18.60 dBm
2.455689130 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.4556887 GHz
691 pts
Span 300.0 kHz
Measuring...

3.2.4 Band Edge

Procedure:

*The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz	VBW = 100 kHz
Span = 40 MHz	Detector function = peak
Trace = max hold	Sweep = auto

Measurement Data: Complies

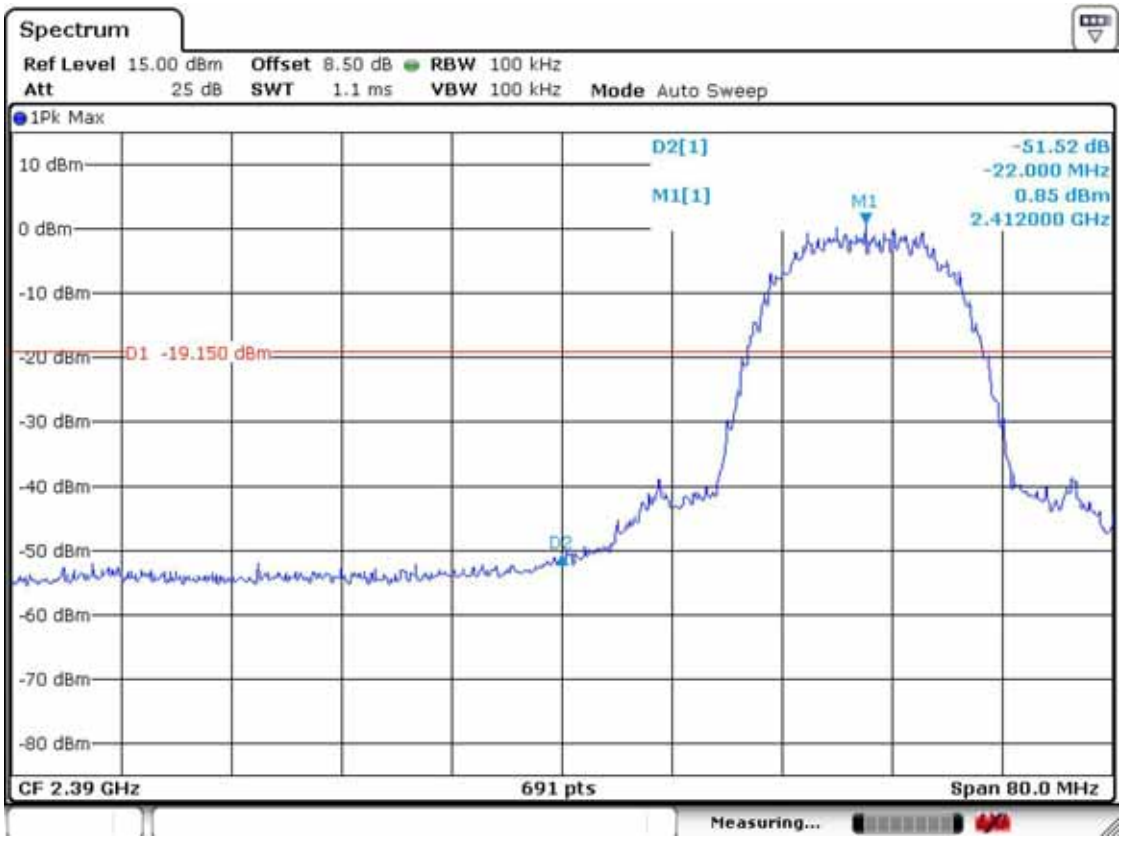
- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

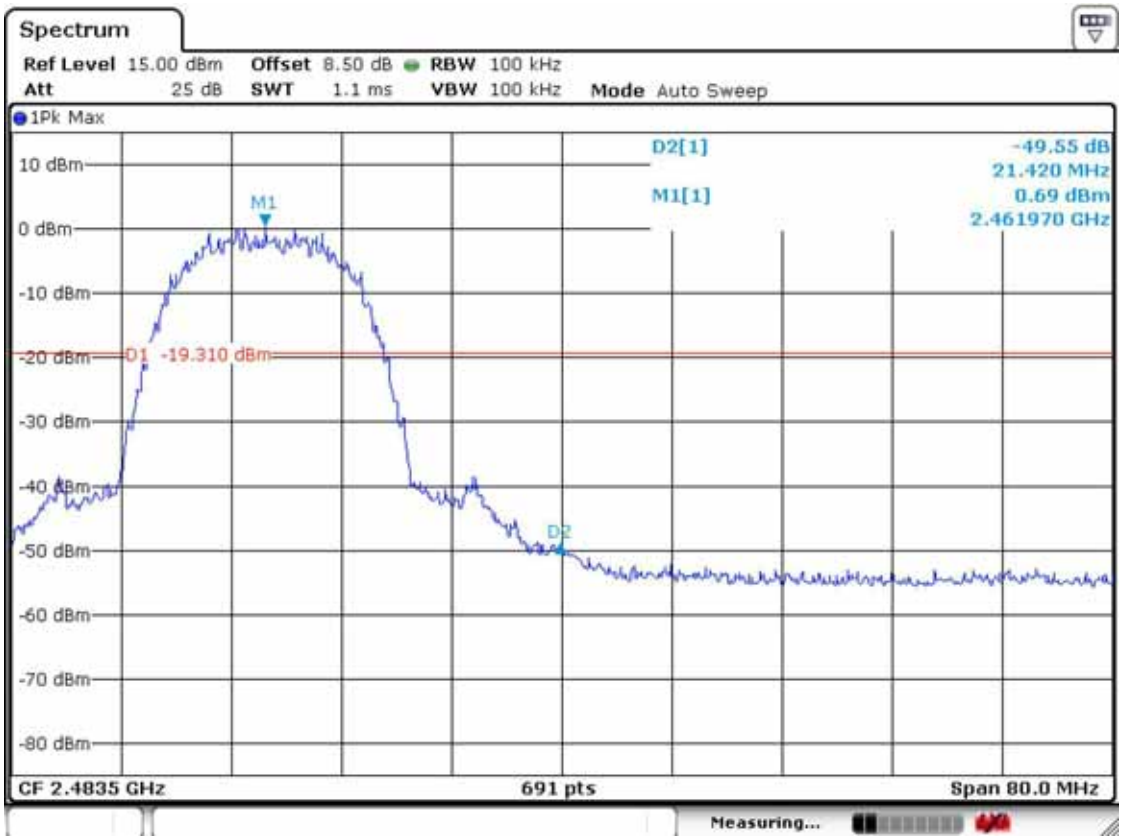
Minimum Standard:	> 20 dBc

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

802.11b Band Edge : Conducted Measurements





Radiated Band edges in the restricted band 2310-2390 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2390.0	40.1	52.2	V	25.4	33.1	54.0	74.0	32.4	44.5	21.6	29.5

Radiated Band-edges in the restricted band 2483.5-2500 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2483.5	45.3	58.5	V	25.4	33.1	54.0	74.0	37.6	50.8	16.4	23.2

Note : This EUT was tested in 3 orthogonal positions and the worst-case data was presented

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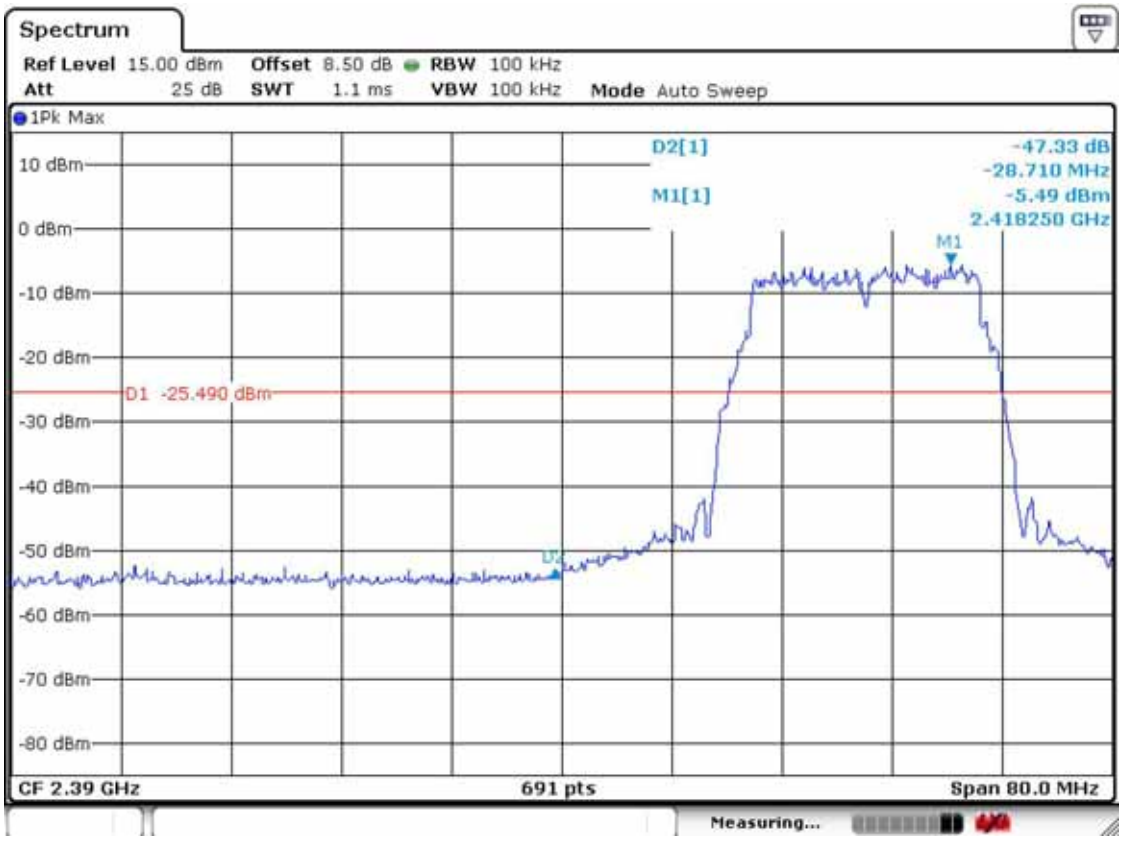
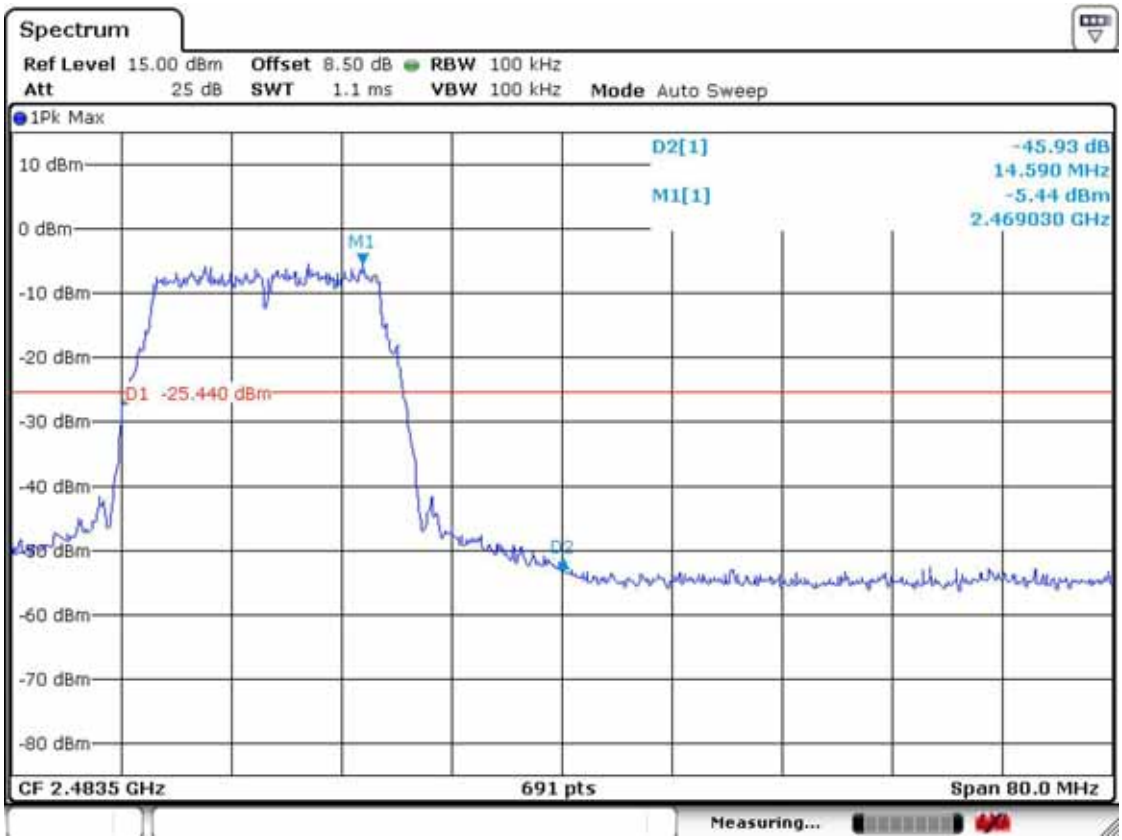
802.11g Band Edge : Conducted Measurements





Radiated Band edges in the restricted band 2310-2390 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2389.4	41.1	55.0	V	25.4	33.1	54.0	74.0	33.4	47.3	20.6	26.7

Radiated Band edges in the restricted band 2483.5-2500 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2484.0	46.8	58.6	V	25.4	33.1	54.0	74.0	39.1	50.9	14.9	23.1

Note : This EUT was tested in 3 orthogonal positions and the worst-case data was presented

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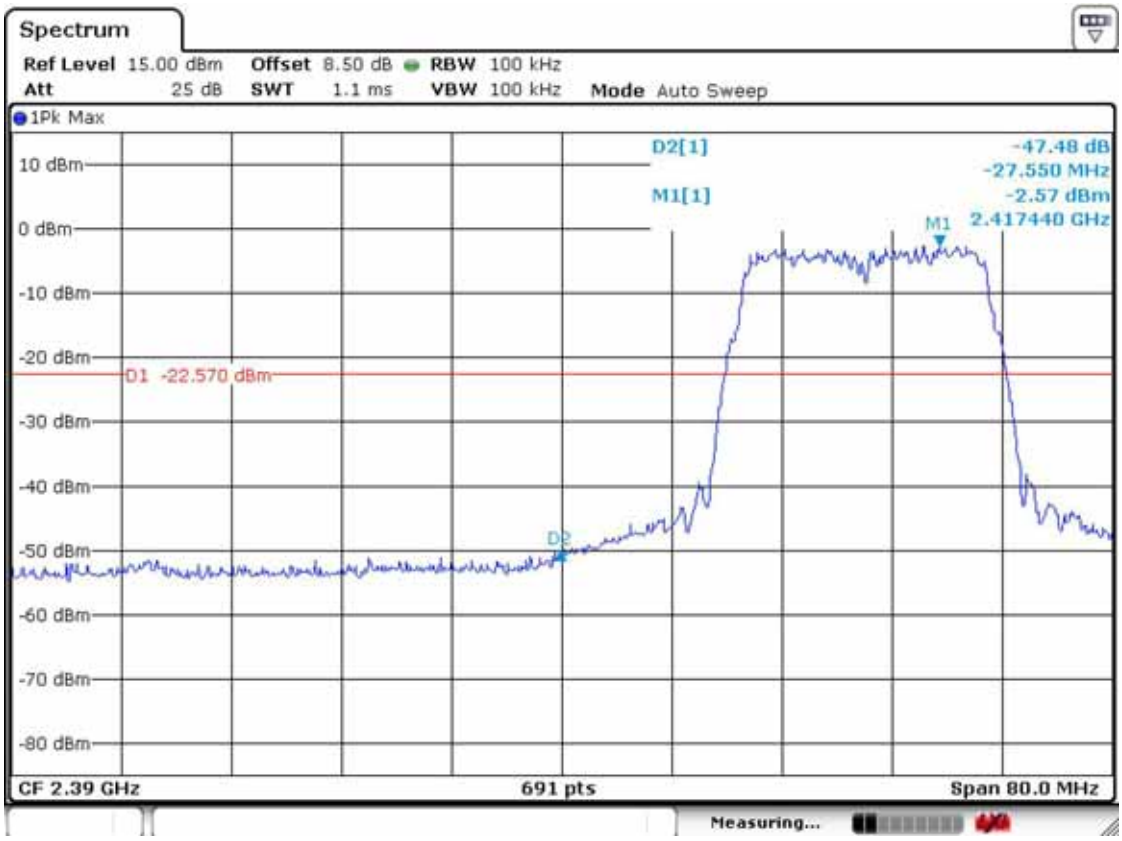
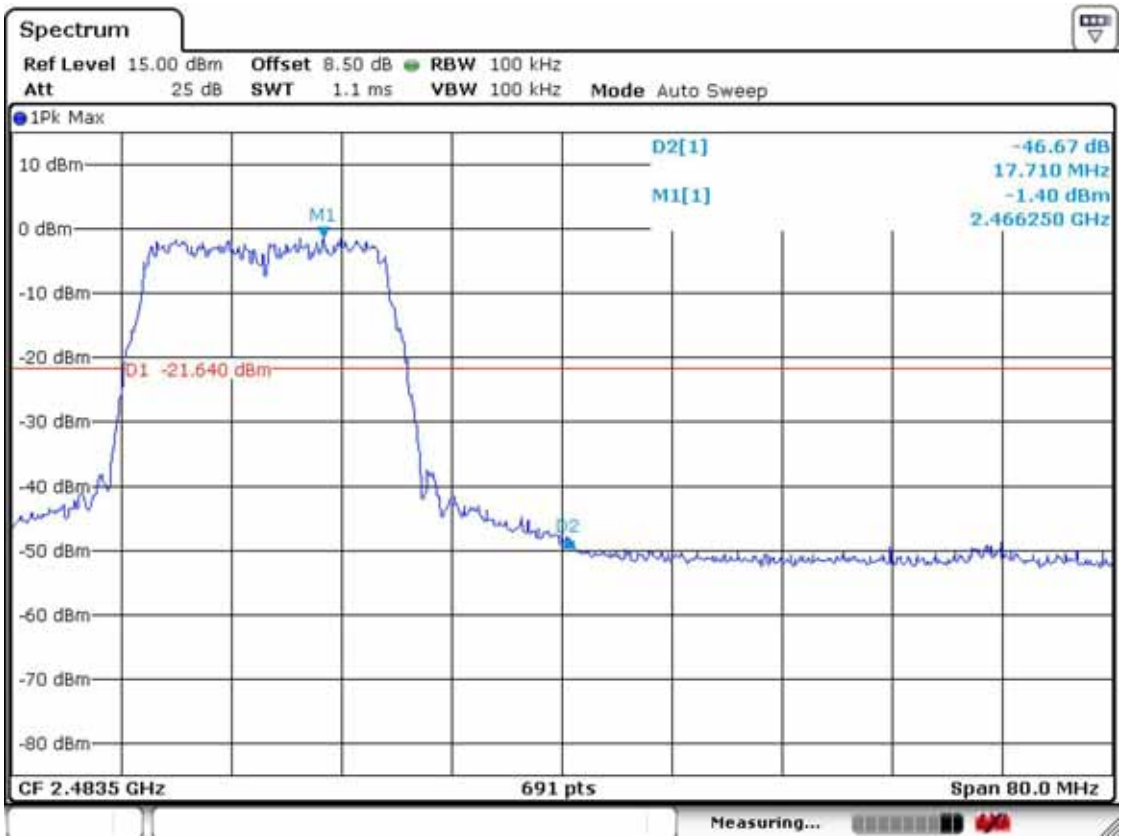
802.11n_20MHz Band Edge : Conducted Measurements





Radiated Band edges in the restricted band 2310-2390 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2389.4	45.9	59.4	V	25.4	33.1	54.0	74.0	38.2	51.7	15.8	22.3

Radiated Band edges in the restricted band 2483.5-2500 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2484.0	45.4	57.8	H	25.4	33.1	54.0	74.0	37.7	50.1	16.3	23.9

Note : This EUT was tested in 3 orthogonal positions and the worst-case data was presented

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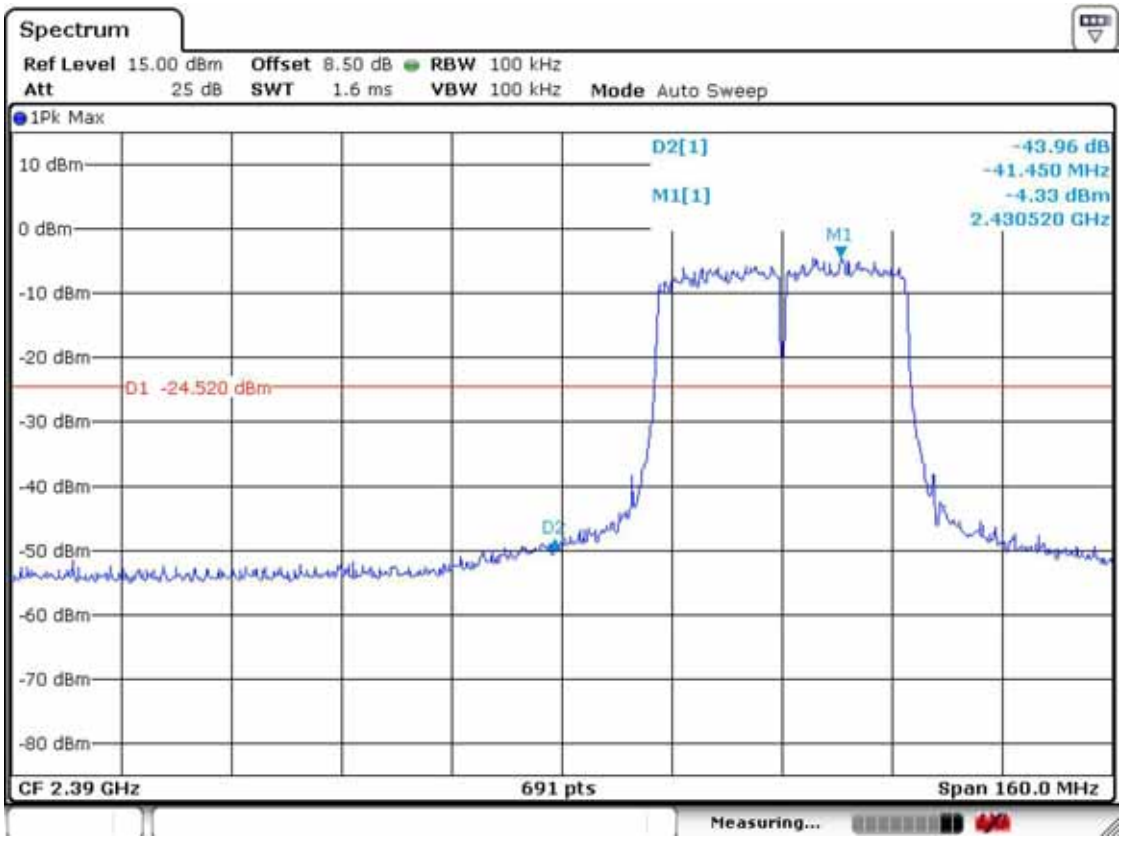
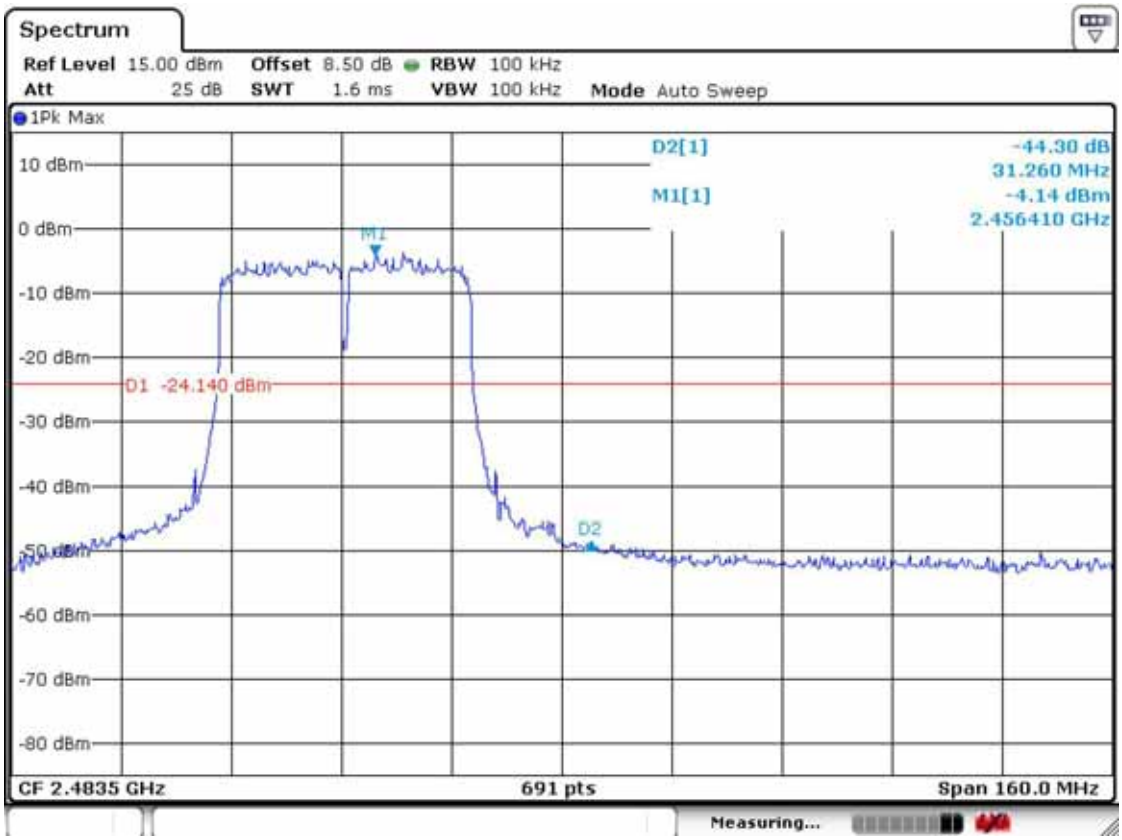
802.11n 40MHz Band Edge : Conducted Measurements





Radiated Band edges in the restricted band 2310-2390 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2389.9	38.5	50.8	V	25.4	33.1	54.0	74.0	30.8	43.1	23.2	30.9

Radiated Band edges in the restricted band 2483.5-2500 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain + Cable Loss	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
2483.7	32.8	43.7	H	25.4	33.1	54.0	74.0	25.1	36.0	28.9	38.0

Note : This EUT was tested in 3 orthogonal positions and the worst-case data was presented

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3.3.5 Conducted Spurious Emissions

Procedure:

The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance. The conducted spurious emissions were measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, set the marker on the peak of any spurious emission recorded.

The spectrum analyzer is set to:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions

RBW = 100 kHz Sweep = auto

VBW = 100 kHz Detector function = peak

Trace = max hold

Measurement Data: Complies

- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

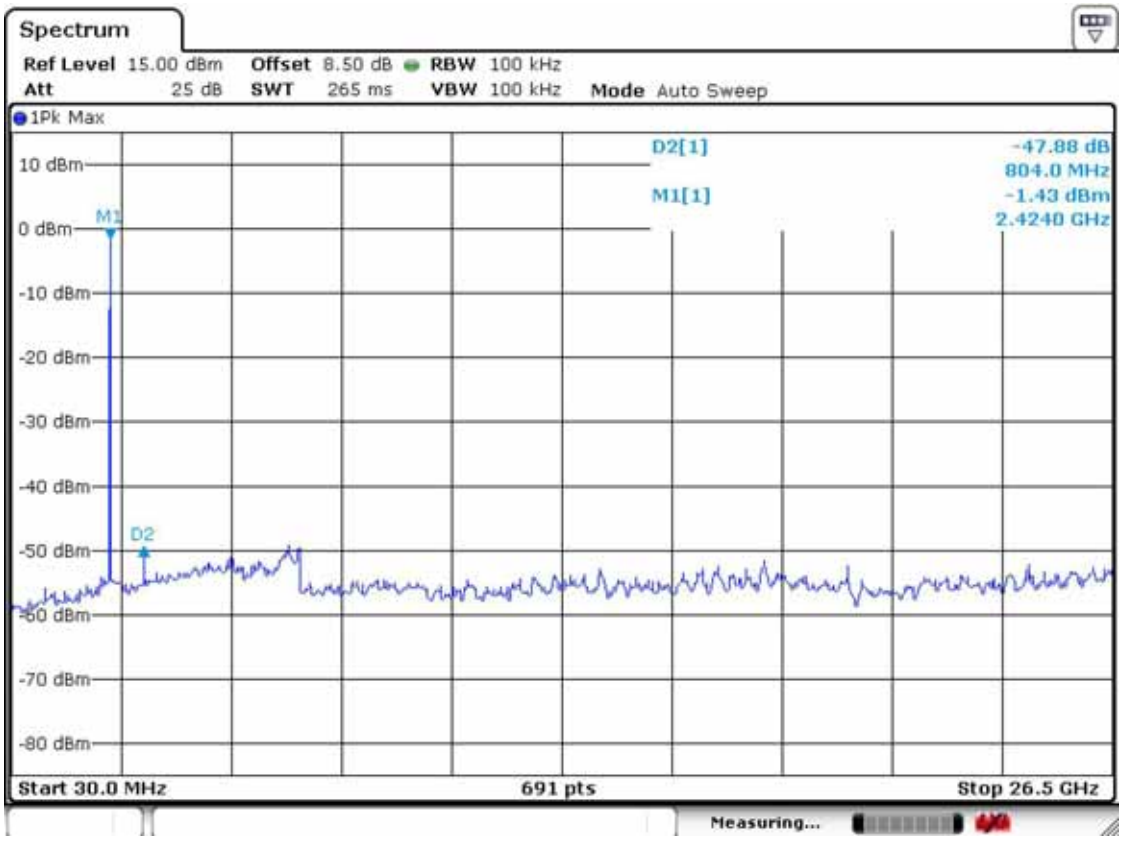
Minimum Standard:	> 20 dBc

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

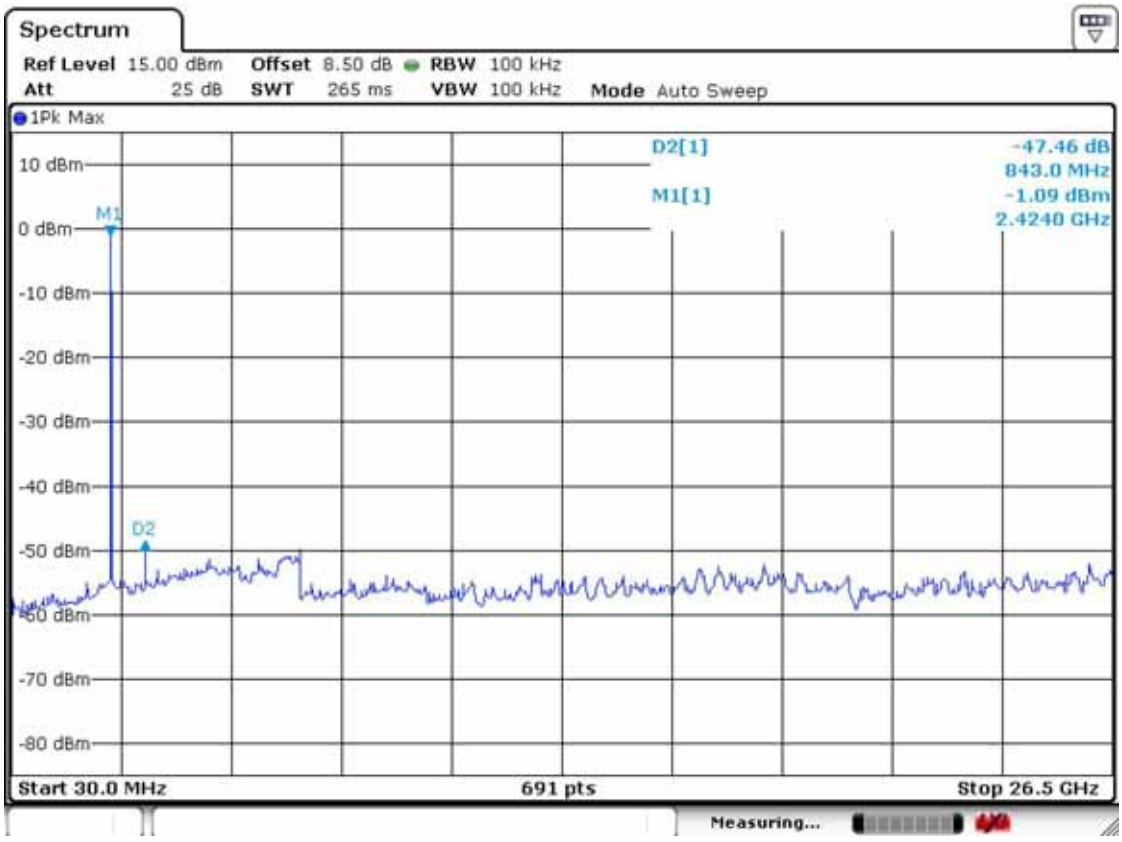
802.11b – channel 1

Frequency Range = 30 MHz ~ 10th harmonic.



802.11b – channel 6

Frequency Range = 30 MHz ~ 10th harmonic.



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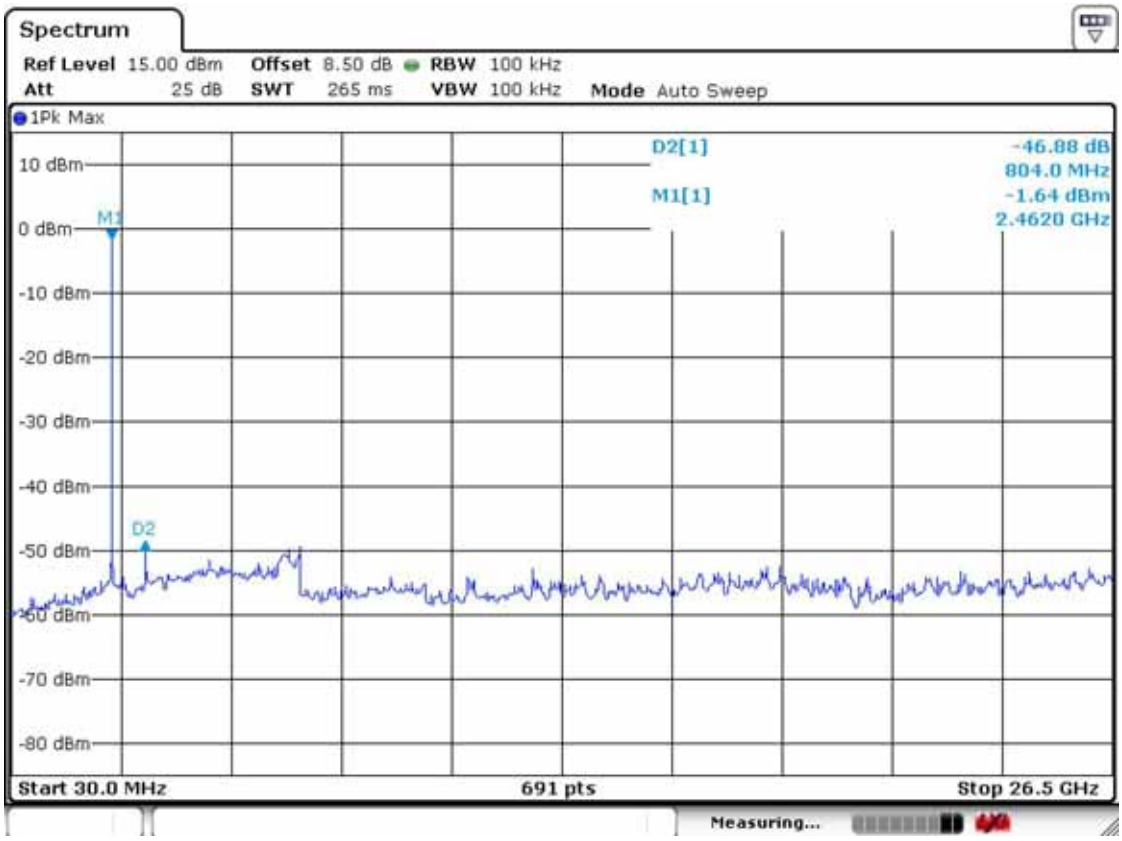
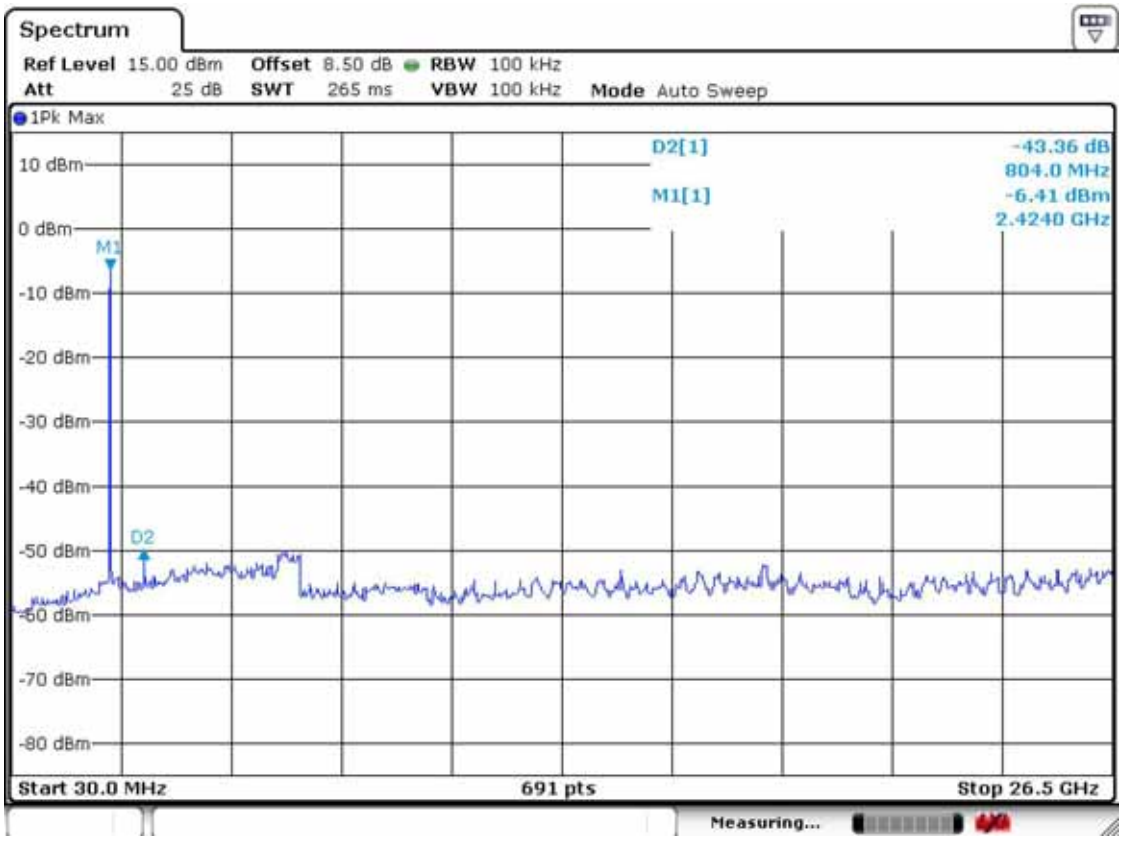
802.11b –channel 11

Frequency Range = 30 MHz ~ 10th harmonic.



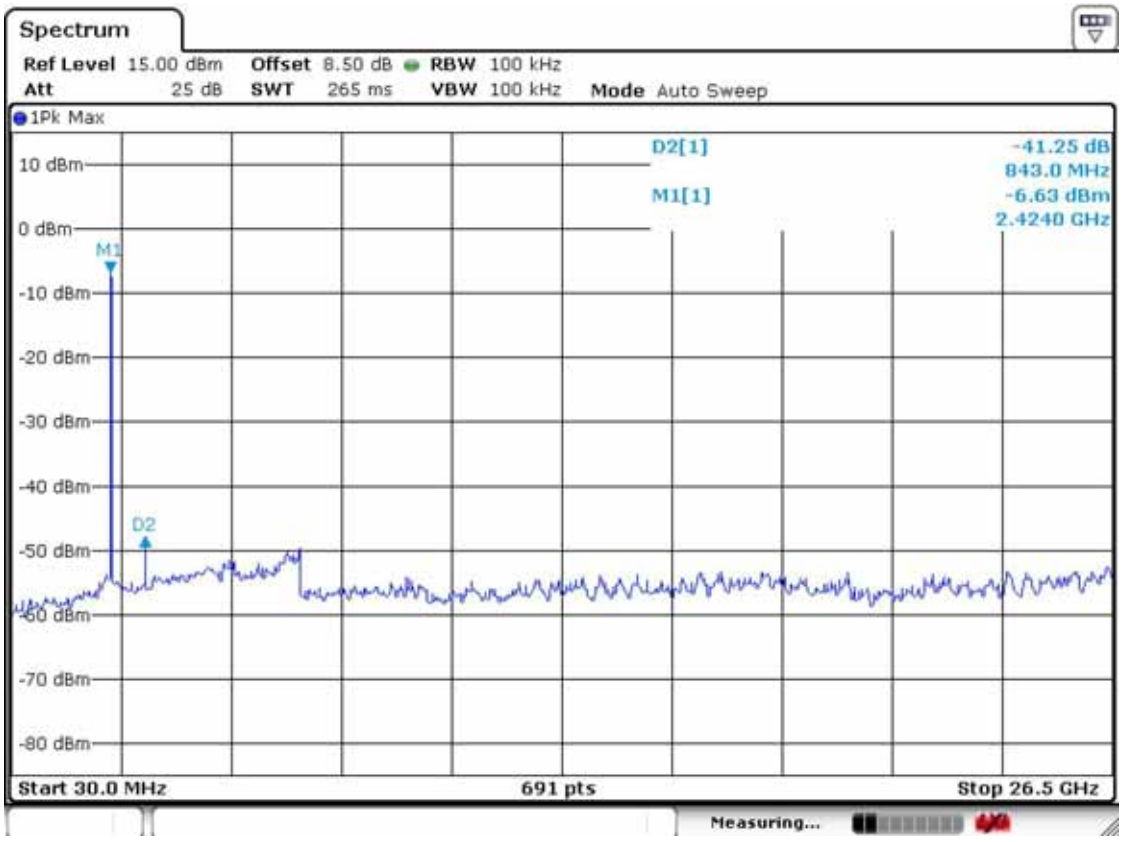
802.11g – channel 1

Frequency Range = 30 MHz ~ 10th harmonic.



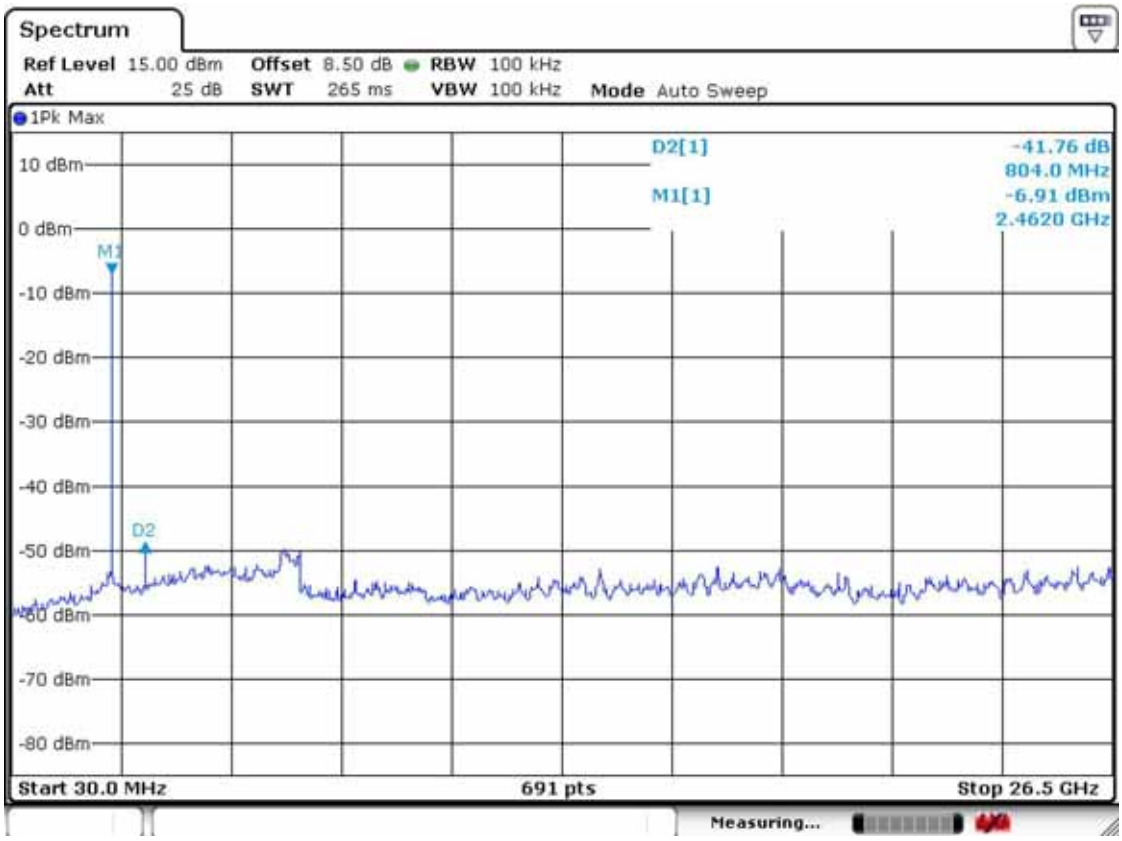
802.11g – channel 6

Frequency Range = 30 MHz ~ 10th harmonic.



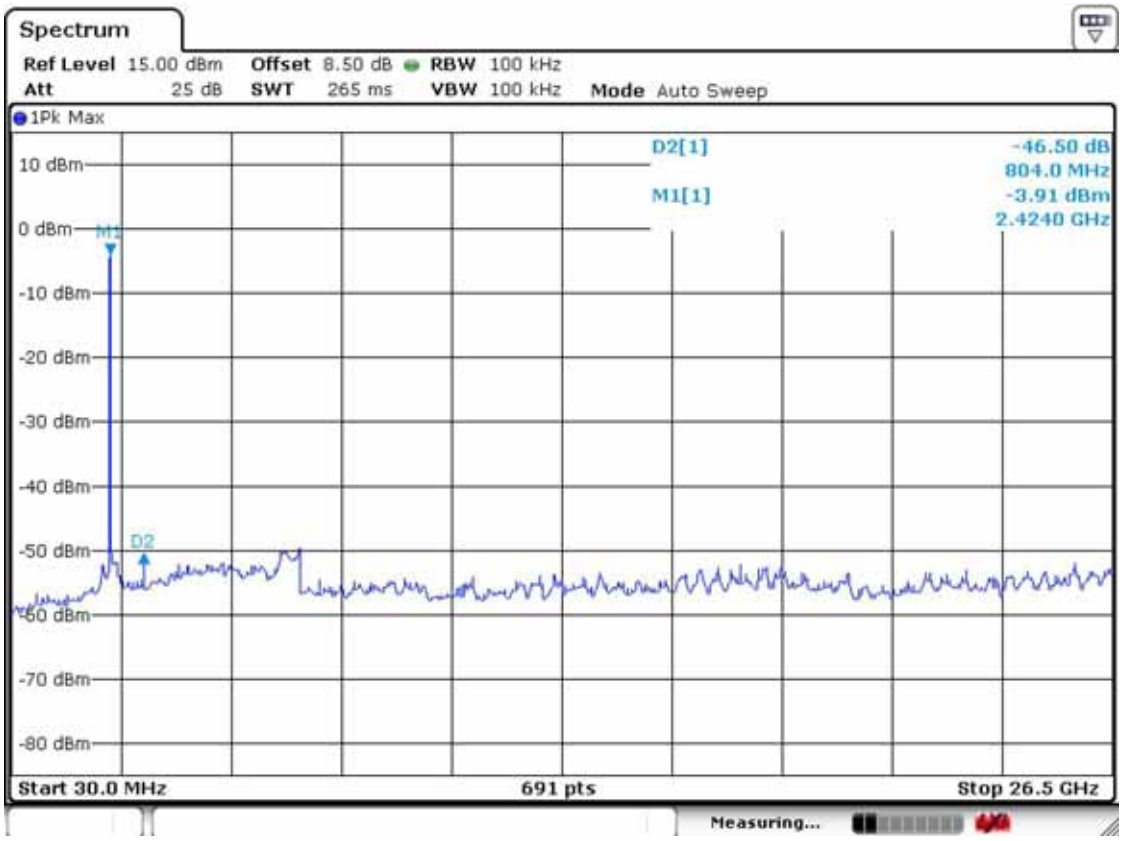
802.11g –channel 11

Frequency Range = 30 MHz ~ 10th harmonic.



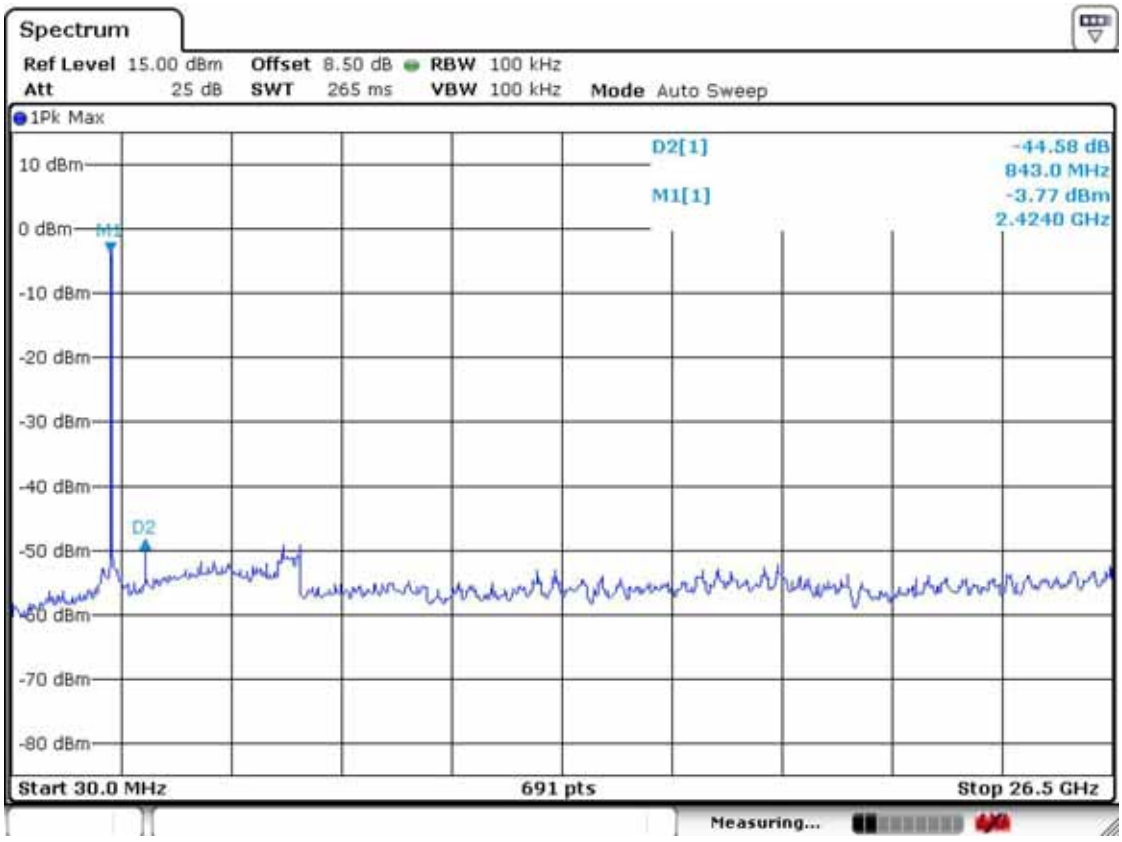
802.11n_20MHz – channel 1

Frequency Range = 30 MHz ~ 10th harmonic.



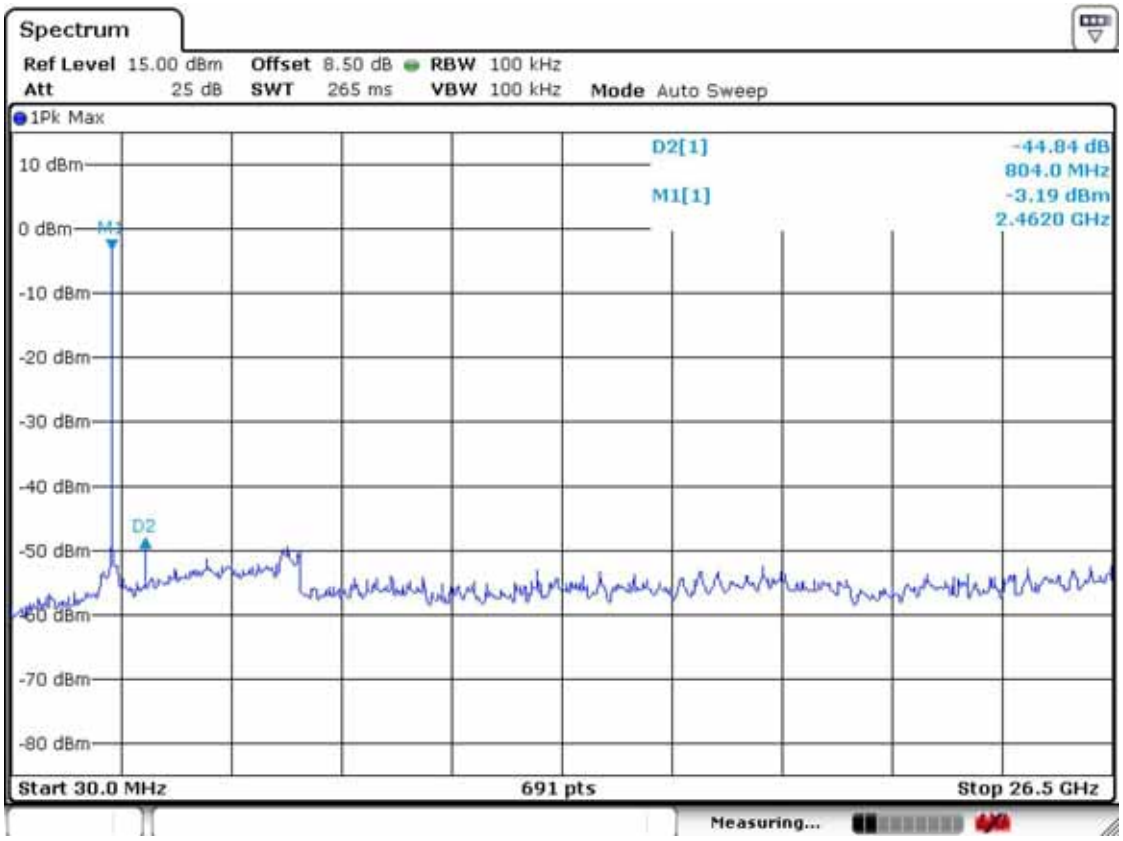
802.11n_20MHz – channel 6

Frequency Range = 30 MHz ~ 10th harmonic.



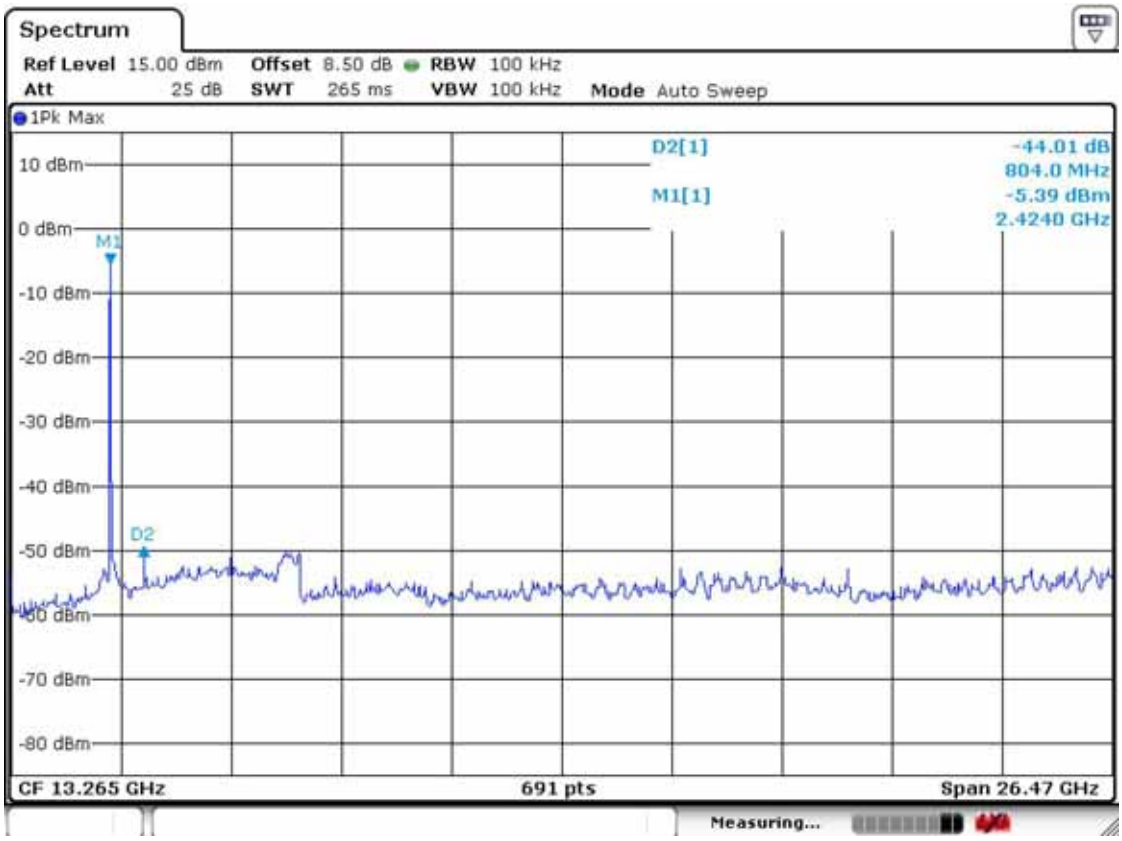
802.11n_20MHz –channel 11

Frequency Range = 30 MHz ~ 10th harmonic.



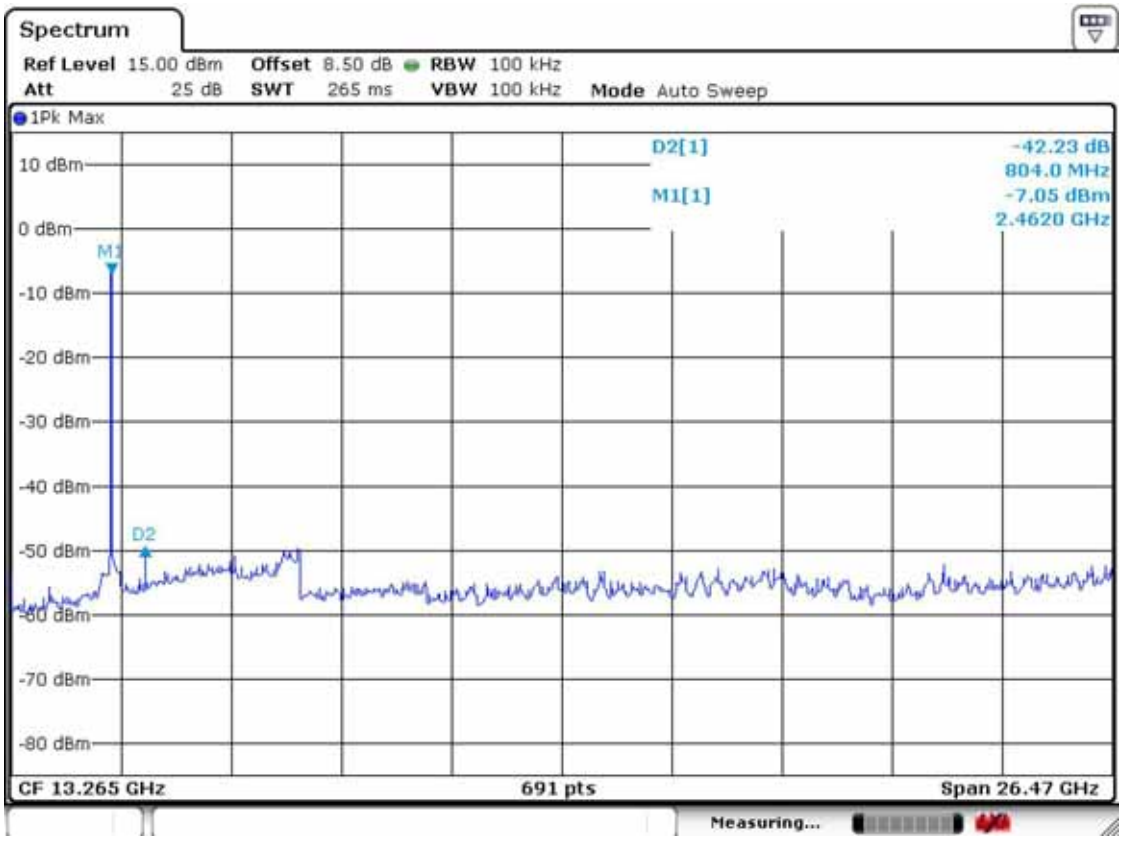
802.11n_40MHz –channel 3

Frequency Range = 30 MHz ~ 10th harmonic.



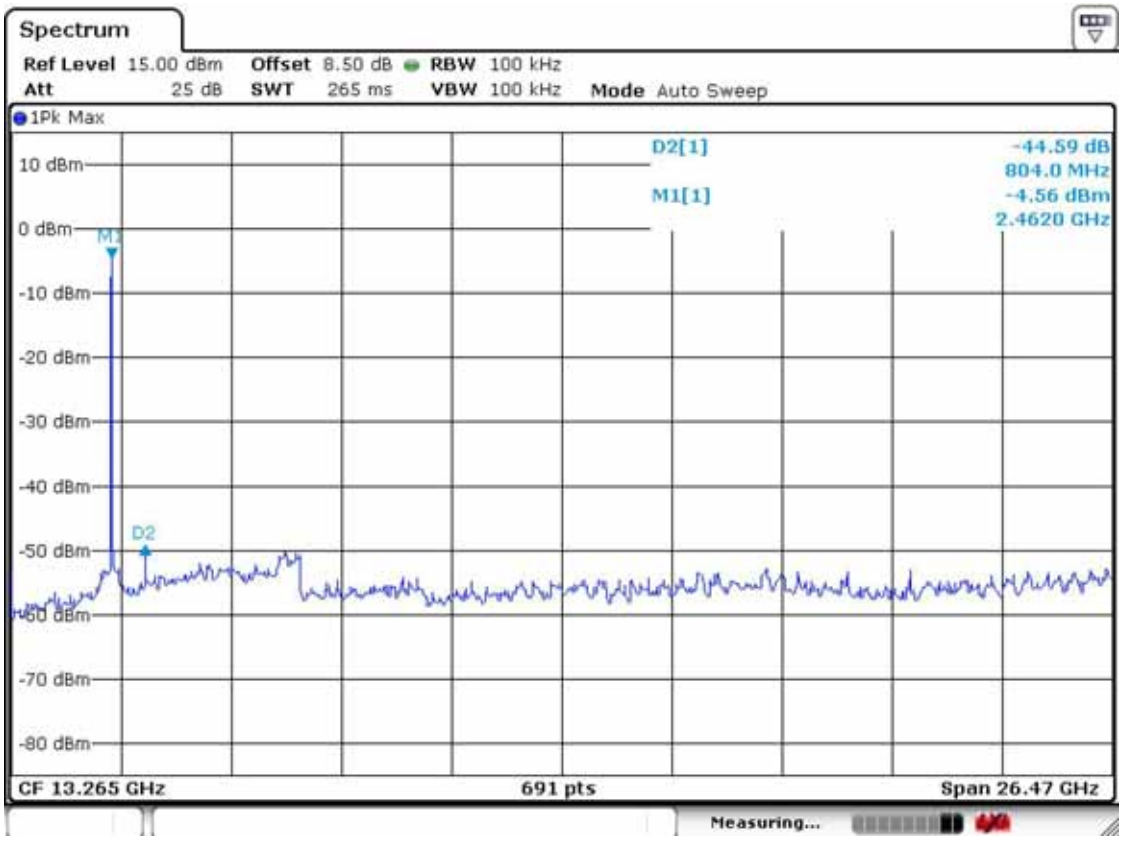
802.11n_40MHz –channel 6

Frequency Range = 30 MHz ~ 10th harmonic.



802.11n_40MHz –channel 9

Frequency Range = 30 MHz ~ 10th harmonic.



3.2.6 Radiated Spurious Emissions

Procedure:

* The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test requirement. The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

(a) In the frequency range of 9kHz to 30 MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 3m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

<u>The spectrum analyzer is set to:</u>

Center frequency = the worst channel

Frequency Range = 9 KHz ~ 10th harmonic.

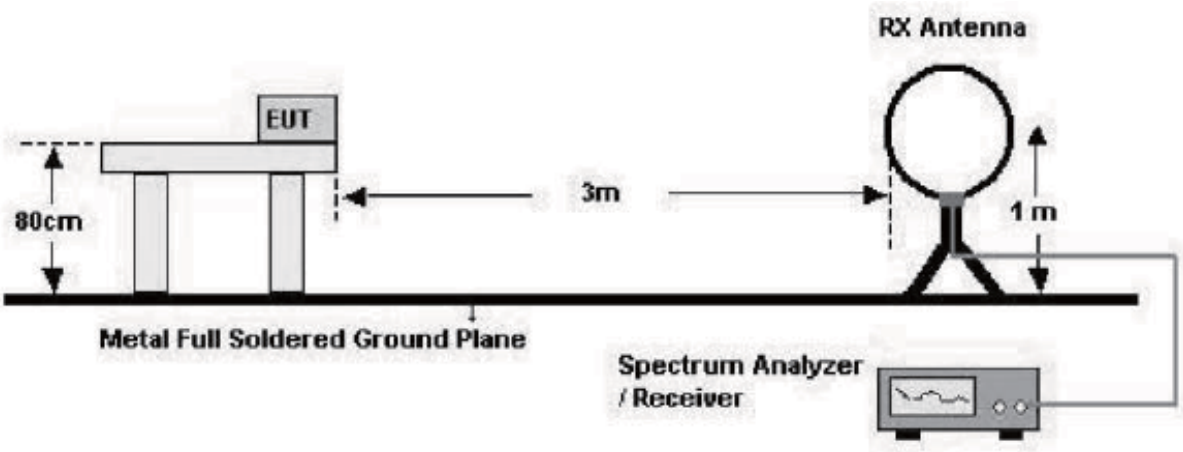
RBW = 120 kHz (9 KHz ~ 1 GHz) VBW $\geq$ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

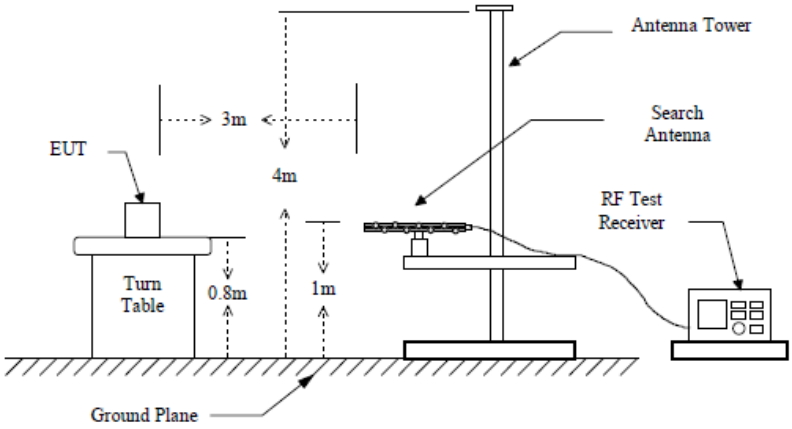
Span = 100 MHz Detector function = peak

Trace = max hold Sweep = auto

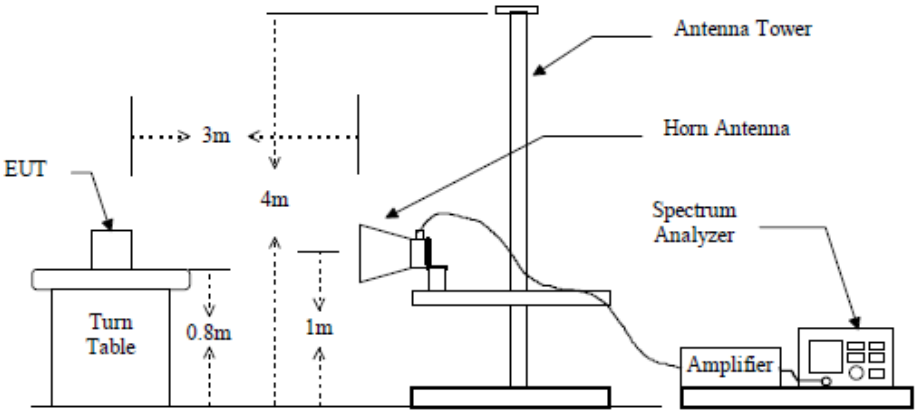
below 30MHz



below 1GHz (30MHz to 1GHz)



above 1GHz



Measurement Data: Complies

- See next pages for actual measured data.
- No other emissions were detected at a level greater than 20dB below limit include from 9KHz to 30MHz.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
0.009 ~ 0.490	2400/F(kHz) **(@ 300m)**
0.490 ~ 1.705	24000/F(kHz) **(@ 30m)**
1.705 ~ 30	30**(@ 30m)**
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

802.11b Measurement Data: (Above 1GHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4824.0	43.5	54.0	V	31.4	30.8	54.0	74.0	44.1	54.6	9.9	19.4
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
Frequency [MHz]	**Reading [dBuV/m] AV**	**Reading [dBuV/m] Peak**	**Pol.**	**Correction Factor Antenna**	**Correction Factor Amp.Gain+Cable**	**Limits [dBuV/m] AV**	**Limits [dBuV/m] Peak**	**Result [dBuV/m] AV**	**Result [dBuV/m] Peak**	**Margin [dB] AV**	**Margin [dB] Peak**
4883.0	38.7	51.5	V	31.4	30.8	54.0	74.0	39.3	52.1	14.7	21.9
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
Frequency [MHz]	**Reading [dBuV/m] AV**	**Reading [dBuV/m] Peak**	**Pol.**	**Correction Factor Antenna**	**Correction Factor Amp.Gain+Cable**	**Limits [dBuV/m] AV**	**Limits [dBuV/m] Peak**	**Result [dBuV/m] AV**	**Result [dBuV/m] Peak**	**Margin [dB] AV**	**Margin [dB] Peak**
4924.0	40.3	53.4	V	31.4	30.8	40.9	74.0	40.9	54.0	13.1	20.0
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

Measurement Data: (9kHz - 30MHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
No emissions were detected at a level greater than 20dB below limit.											
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

*No emissions were detected at a level greater than 20dB below limit.

802.11g Measurement Data: (Above 1GHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4824.0	37.8	50.6	V	31.4	30.8	54.0	74.0	38.4	51.2	15.6	22.8
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

Measurement Data: (9kHz - 30MHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
No emissions were detected at a level greater than 20dB below limit.											
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

*No emissions were detected at a level greater than 20dB below limit.

802.11n_20MHz Measurement Data: (Above 1GHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

Measurement Data: (9kHz - 30MHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
No emissions were detected at a level greater than 20dB below limit.											
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

*No emissions were detected at a level greater than 20dB below limit.

802.11n_40MHz Measurement Data: (Above 1GHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

Measurement Data: (9kHz - 30MHz)

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp.Gain+Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
-	-	-	-	-	-	-	-	-	-	-	-
No emissions were detected at a level greater than 20dB below limit.											
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

*No emissions were detected at a level greater than 20dB below limit.

Radiated Emissions – Wi-Fi 2.4 GHz mode

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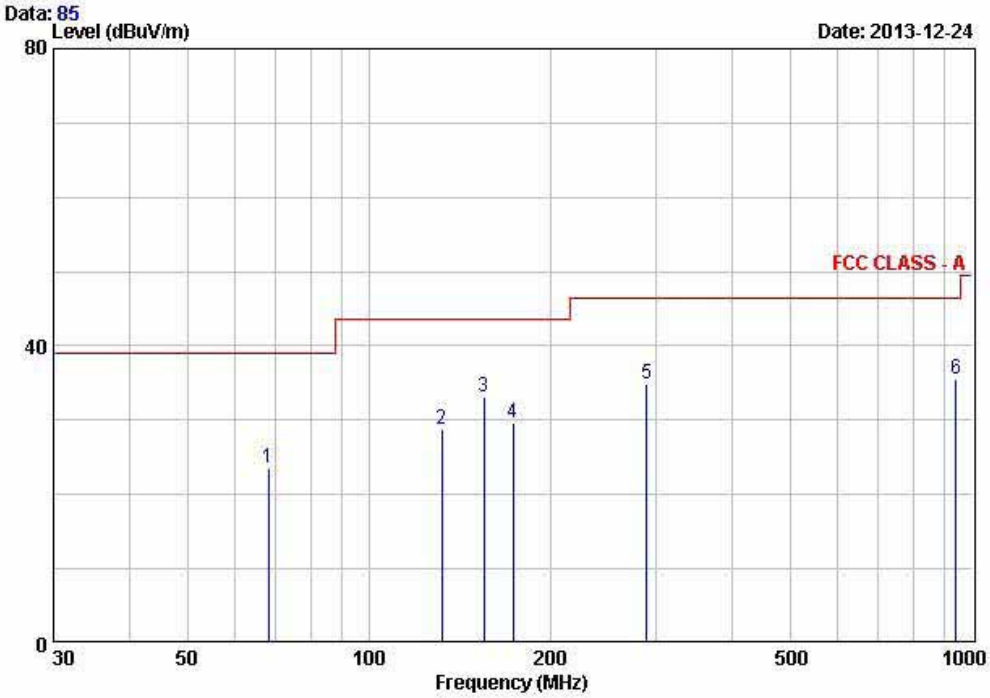
Fax:+82-31-3236010

EUT/Model No.: N9000 TEST MODE: WIFI + BT mode

Temp Humi : 20 / 51 Tested by: Y00 B C



	Freq MHz	Reading dBuV/m	C.F dB/m	Result dBuV/m	Limit QP dBuV/m	Margin dB	Height cm	Angle deg	Polarity
1	68.12	41.85	-18.33	23.52	39.00	15.48	128	176	VERTICAL
2	131.96	44.87	-16.04	28.83	43.50	14.67	304	198	HORIZONTAL
3	155.27	48.23	-15.03	33.20	43.50	10.30	147	159	VERTICAL
4	173.74	45.65	-15.99	29.66	43.50	13.84	262	221	HORIZONTAL
5	288.74	49.11	-14.25	34.86	46.40	11.54	378	185	HORIZONTAL
6	941.85	35.17	0.27	35.44	46.40	10.96	400	312	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

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3.2.7 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: Complies

- Refer to the next page.
- No other emissions were detected at a level greater than 20dB below limit
- It gave the worse case emissions

Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

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Radiated Emissions – Wi-Fi 2.4 GHz mode - LINE

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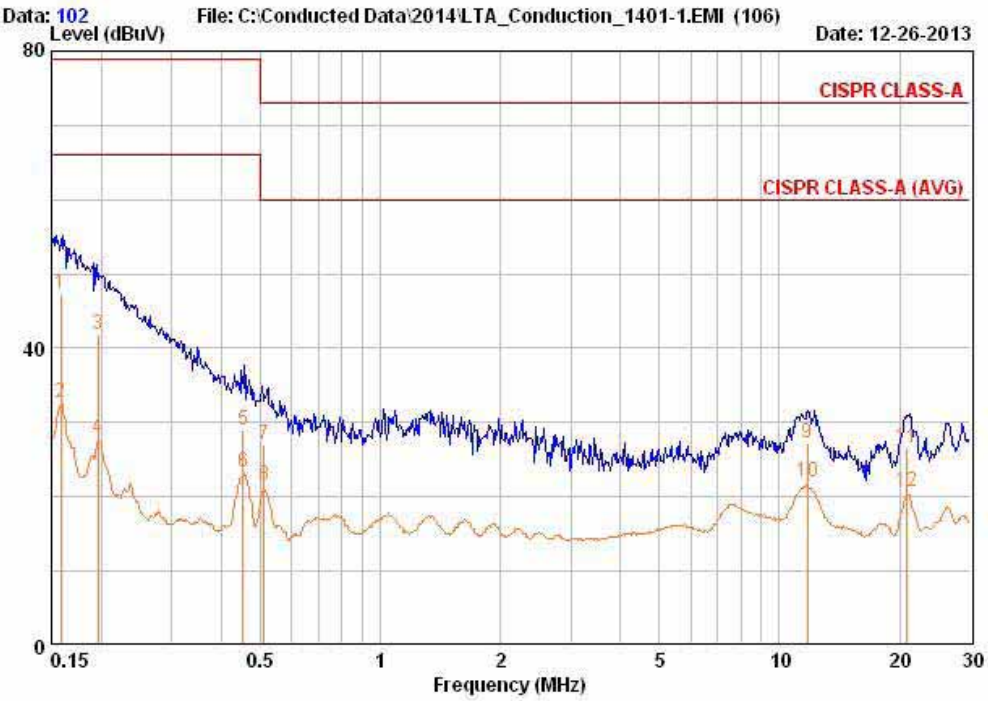
EUT / Model No.	: N9000	Phase	: LINE
Test Mode	: WI-FI + BT mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 50	Test Engineer	: Y00 B C



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.158	37.74	23.24	9.55	47.30	32.80	79.00	66.00	31.70	33.20
0.196	32.35	18.45	9.56	41.91	28.01	79.00	66.00	37.09	37.99
0.452	19.35	13.65	9.57	28.92	23.22	79.00	66.00	50.08	42.78
0.512	17.35	11.95	9.58	26.93	21.53	73.00	60.00	46.07	38.47
11.744	17.49	12.19	9.83	27.32	22.02	73.00	60.00	45.68	37.98
20.924	16.74	10.84	9.89	26.63	20.73	73.00	60.00	46.37	39.27

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

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Radiated Emissions – Wi-Fi 2.4 GHz mode - NEUTRAL

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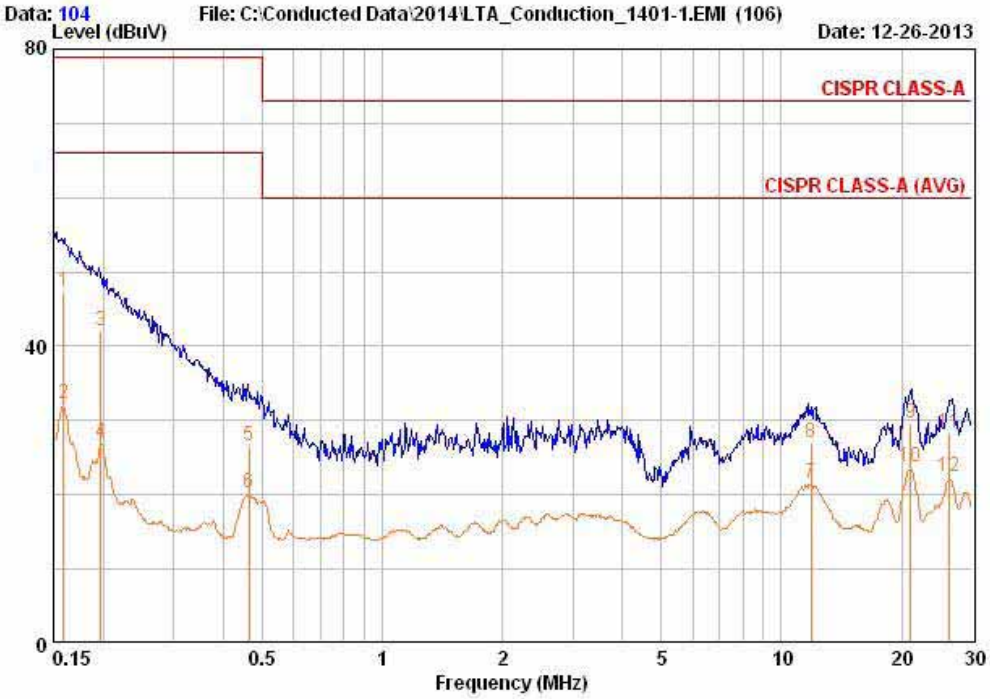
EUT / Model No.	: N9000	Phase	: NEUTRAL
Test Mode	: WI-FI + BT mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 50	Test Engineer	: Y00 B C



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.159	37.84	22.64	9.56	47.40	32.20	79.00	66.00	31.60	33.80
0.197	32.55	17.45	9.56	42.11	27.01	79.00	66.00	36.89	38.99
0.463	16.95	10.75	9.57	26.52	20.32	79.00	66.00	52.48	45.68
11.869	17.19	11.79	9.83	27.02	21.62	73.00	60.00	45.98	38.38
21.035	19.64	13.94	9.92	29.56	23.86	73.00	60.00	43.44	36.14
26.417	18.27	12.47	10.03	28.30	22.50	73.00	60.00	44.70	37.50

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

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APPENDIX

TEST EQUIPMENT USED FOR TESTS

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	Description	Model No.	Serial No.	Manufacturer	Interval	Last Cal. Date
1	Signal Analyzer (9kHz~30GHz)	FSV-30	100757	R&S	1 year	2014-01-16
2	Spectrum Analyzer (9kHz~2.9GHz)	8594E	3649A03649	HP	2 year	2012-03-26
3	Signal Generator (~3.2GHz)	8648C	3623A02597	HP	1 year	2013-03-25
4	SYNTHESIZED CW GENERATOR	83711B	US34490456	HP	1 year	2013-03-25
5	Attenuator (3dB)	8491A	37822	HP	2 year	2012-09-22
6	Attenuator (10dB)	8491A	63196	HP	2 year	2012-09-22
7	Test Receiver (~30MHz)	ESHS10	828404/009	R&S	1 year	2013-03-25
8	EMI Test Receiver (~7GHz)	ESCI7	100722	R&S	1 year	2013-09-16
9	RF Amplifier (~1.3GHz)	8447D OPT 010	2944A07684	HP	1 year	2013-09-16
10	RF Amplifier (1~26.5GHz)	8449B	3008A02126	HP	1 year	2013-03-25
11	Horn Antenna (1~18GHz)	3115	00114105	ETS	2 year	2013-05-13
12	Horn Antenna (18GHz~26.5GHz)	SAS-572	269	A.H. SYSTEM	2 year	2013-09-06
13	TRILOG Antenna	VULB 9160	9160-3237	SCHWARZBECK	2 year	2013-05-03
14	Temp.Humidity Data Logger	SK-L200TH II A	00801	SATO	1 year	2013-03-14
15	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
16	Power Divider	11636A	06243	HP	2 year	2012-09-22
17	DC Power Supply	6674A	3637A01657	Agilent	-	-
18	Frequency Counter	5342A	2826A12411	HP	1 year	2013-03-25
19	Power Meter	EPM-441A	GB32481702	HP	1 year	2013-03-25
20	Power Sensor	8481A	US41030291	HP	1 year	2014-01-17
21	Audio Analyzer	8903B	3729A18901	HP	1 year	2013-09-16
22	Modulation Analyzer	8901B	3749A05878	HP	1 year	2013-09-16
23	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2013-09-16
24	Stop Watch	HS-3	601Q09R	CASIO	1 year	2013-03-15
25	LISN	KNW-407	8-1430-1	Kyoritsu	1 year	2013-09-16
26	Two-Lime V-Network	ESH3-Z5	893045/017	R&S	1 year	2013-04-25
27	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	1 year	2013-07-25
28	Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	-	-
29	Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	-	-
30	Active Loop Antenna	FMZB 1519	1519-031	SCHWARZBECK	1 year	2014-01-07

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