243 Jubug-Ri,Yangji-Myeon, Yongin-Si, Gyeonggi-Do, Korea 449-822
Tel: +82-31-323-6008 Fax: +82-31-323-6010
http://www.ltalab.com

Dates of Tests : Nov 30 ~Dec 08 2011
Test Report S/N: LR500111112B
Test Site : LTA CO., LTD

CERTIFICATION OF COMPLIANCE

FCC ID. **SXV-Z2**

APPLICANT **COWON SYSTEMS, Inc.**

Equipment Class	**:**	**Digital Transmission System (DTS)**
Manufacturing Description	**:**	**MP3 Player**
Manufacturer	**:**	**COWON SYSTEMS, Inc**
Model name	**:**	**Z2**
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/n**
Max. Output Power	**:**	**Max 10.18dBm - Conducted (802.11b)**
	:	**Max 12.29dBm - Conducted (802.11g)**
	:	**Max 11.89dBm - Conducted (802.11n_20MHz)**
Data of issue	**:**	**December 12, 2011**

This test report is issued under the authority of:

Hyun-Chae You, Manager

The test was supervised by:

Ki-Hun Cho, 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. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

NVLAP LAB Code.: 200723-0

TABLE OF CONTENTS

1. General information's

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	2012-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2013-04-24	EMC accredited Lab.
FCC	U.S.A	610755	2014-04-27	FCC filing
FCC	U.S.A	649054	2013-04-13	FCC CAB
VCCI	JAPAN	R2133(10m), C2307	2014-06-21	VCCI registration
VCCI	JAPAN	T-2009	2013-12-23	VCCI registration
IC	CANADA	IC5799	2012-05-14	IC filing

2. Information's about test item

2-1 Applicant & Manufacturer

Company name	:	COWON SYSTEMS, Inc.
Address	:	COWON Tower, 689-3, Yeoksam-dong, Gangnam-gu, Seoul 135-080, Korea
Tel / Fax	:	+82-2-6900-0102 / +82-2-6900-0022

2-2 Equipment Under Test (EUT)

Trade name	:	MP3 Player
FCC ID	:	SXV-Z2
Model name	:	Z2
Serial number	:	Identical prototype
Date of receipt	:	Nov 29, 2011
EUT condition	:	Pre-production, not damaged
Antenna type	:	Chip antenna with Max. 2.1 dBi gain
Frequency Range	:	2412MHz ~ 2462MHz for 802.11b/g/n_20MHz
RF output power	:	Max 10.18dBm - Conducted (802.11b)
	:	Max 12.29dBm - Conducted (802.11g)
	:	Max 11.89dBm - Conducted (802.11n_20MHz)
Number of channels	:	11
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 72.2Mbps for 802.11n_20MHz
Power source (Batt.)	:	Battery : 3.7V (Li-Polymer Battery)
Power source (Adaptor.)		Input: 100-240VAC, 0.3A Output: 5.0VDC, 2A

2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2412	2442	2462

2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
PC	N/A	N/A	N/A
TV MONITOR	LE23R18(R)	63343HDP901399E	SAMSONG
KEYBOARD	PKB 1500U	018070294293	PLEOMAX
MOUSE	M056U0A	F09027AB	DELL
PRINTER	STYLUS C65	N/A	EPSON
EARPHONE	N/A	N/A	N/A
Micro SD CARD	N/A	N/A	SANDISK

2-5 Description of Test modes

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		

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	Line 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 ENSPERT Inc. FCC ID: SXV-Z2 unit complies with the requirement of §15.203.
The antenna is connected to inside of EUT. And type is Chip antenna.

The sample was tested according to the following specification:
FCC Parts 15.247; ANSI C-63.4-2003

3.2 Technical Characteristics Test

3.2.1 6 dB Bandwidth

Procedure:

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 = 100 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data:

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	7.58	Complies
	2442	7	8.34	Complies
	2462	11	7.60	Complies
802.11g	2412	1	15.63	Complies
	2442	7	15.69	Complies
	2462	11	15.69	Complies
802.11n _20MHz	2412	1	16.56	Complies
	2442	7	16.90	Complies
	2462	11	16.56	Complies

- See next pages for actual measured spectrum plots.

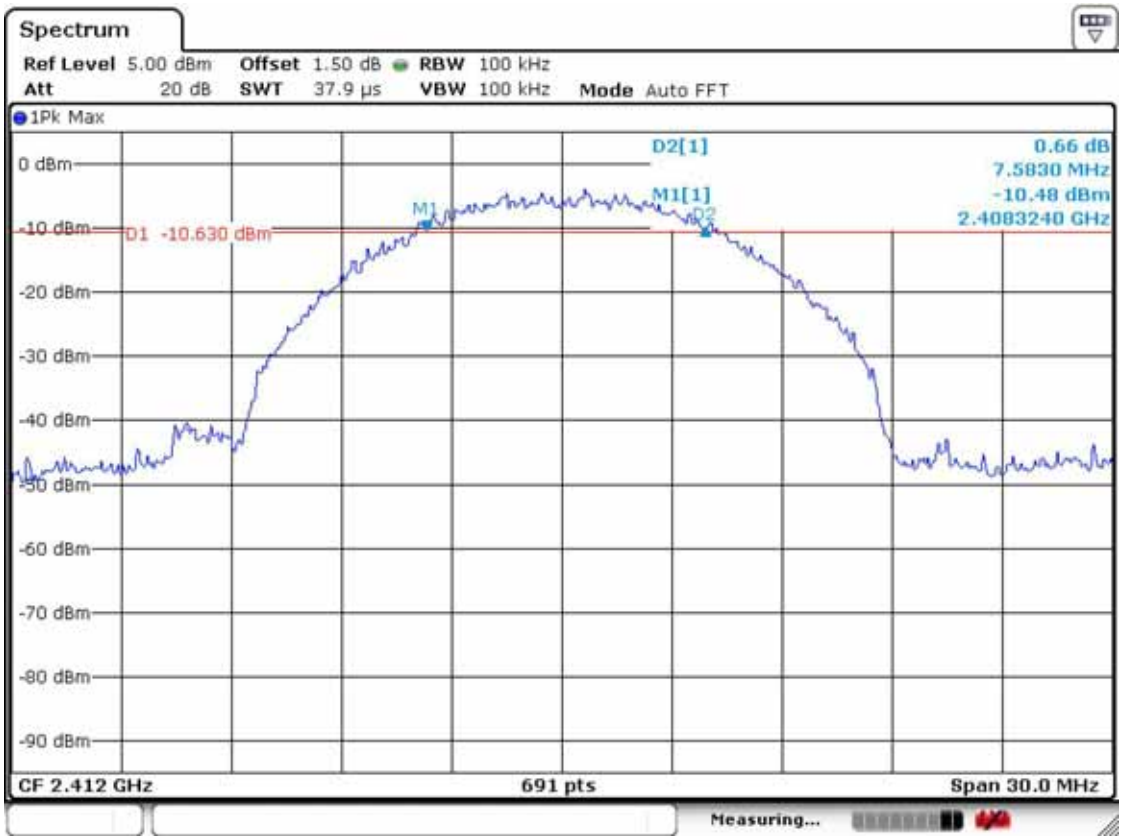
Minimum Standard:

6 dB Bandwidth > 500kHz

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

802.11b
CH 1



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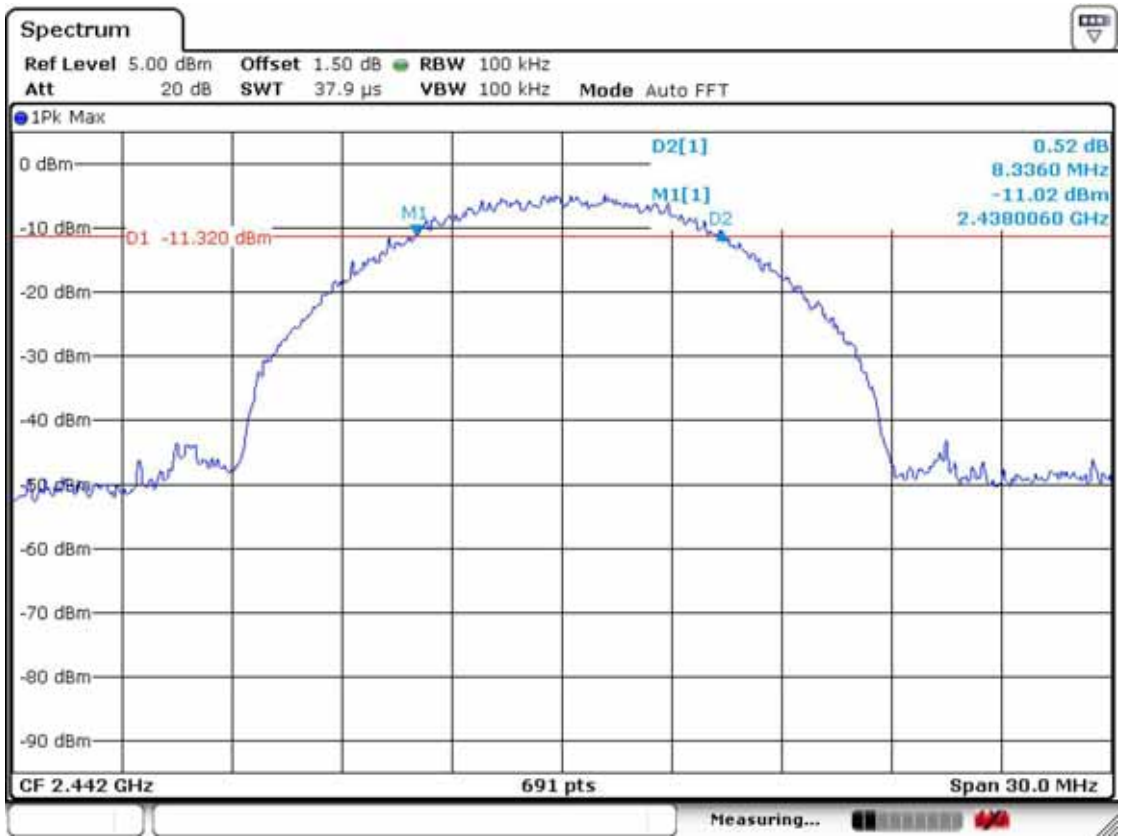
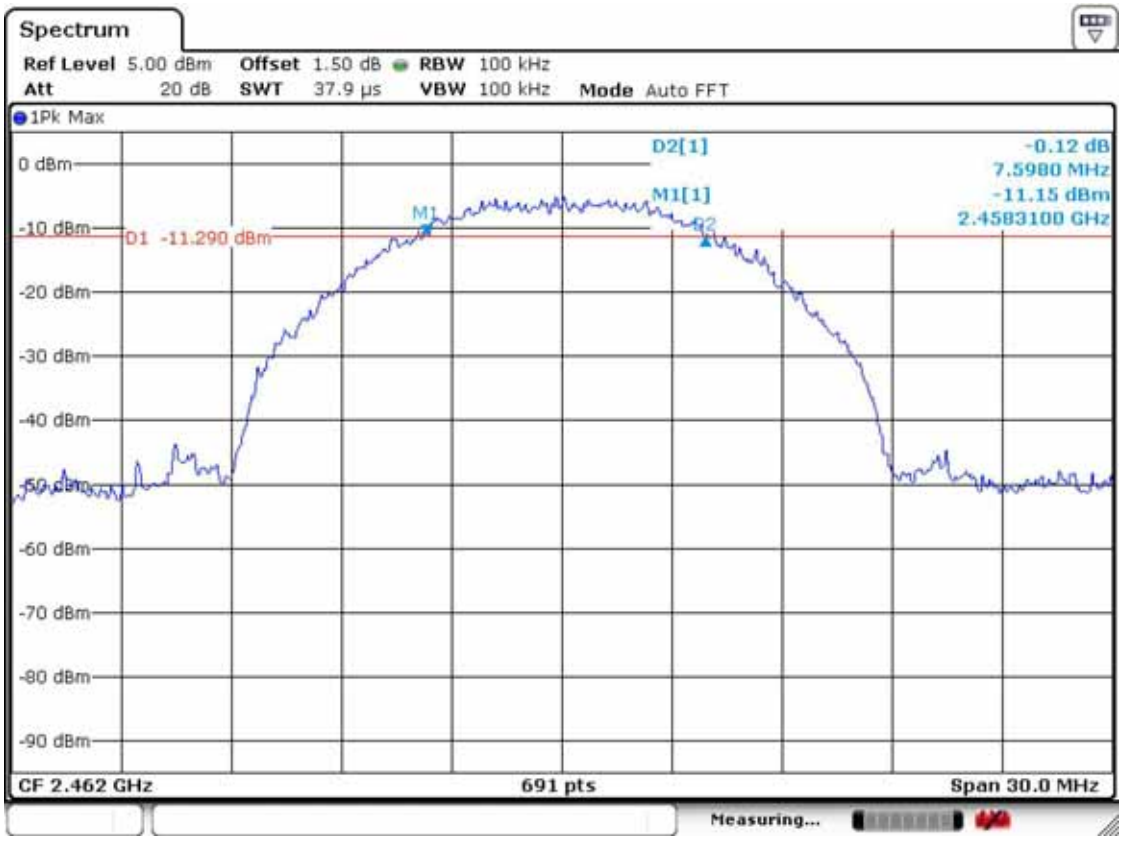
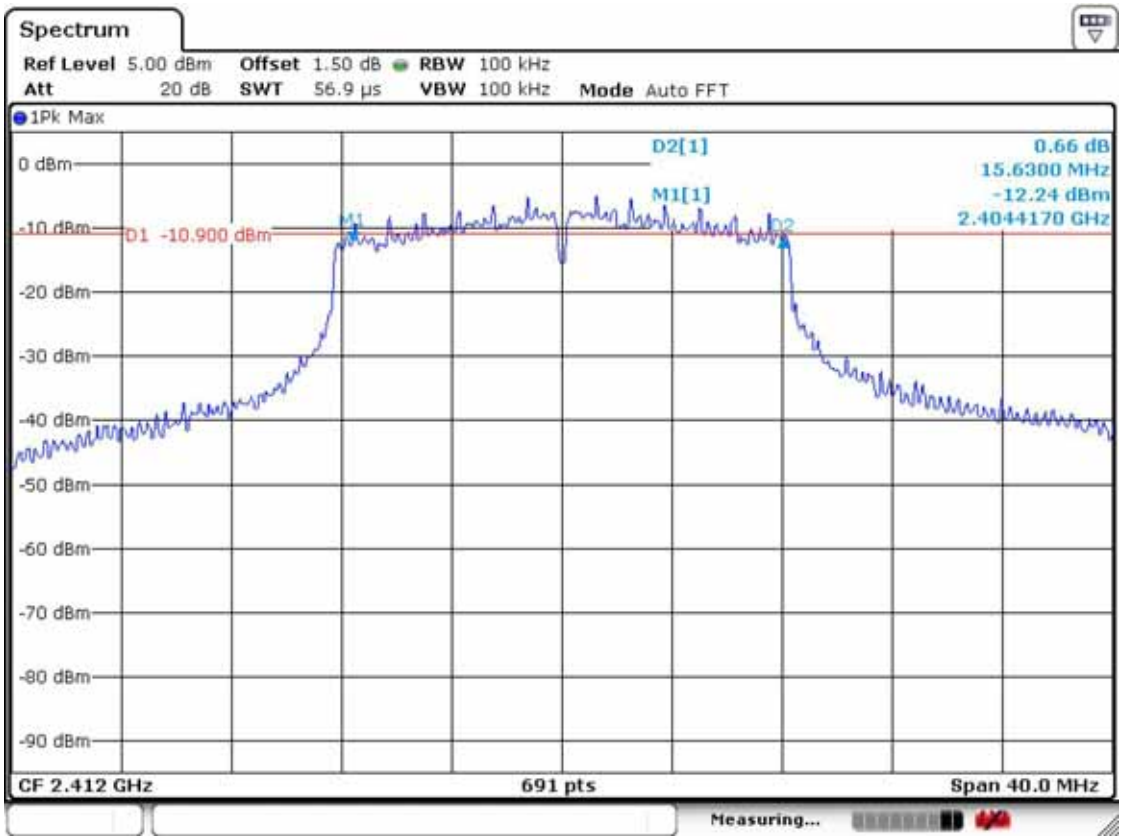


CH 11


Spectrum
Ref Level 5.00 dBm Offset 1.50 dB RBW 100 kHz
Att 20 dB SWT 37.9 µs VBW 100 kHz Mode Auto FFT
1Pk Max
D2[1] -0.12 dB
7.5980 MHz
M1[1] -11.15 dBm
2.4583100 GHz
D1 -11.290 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Measuring...

802.11g

CH 1



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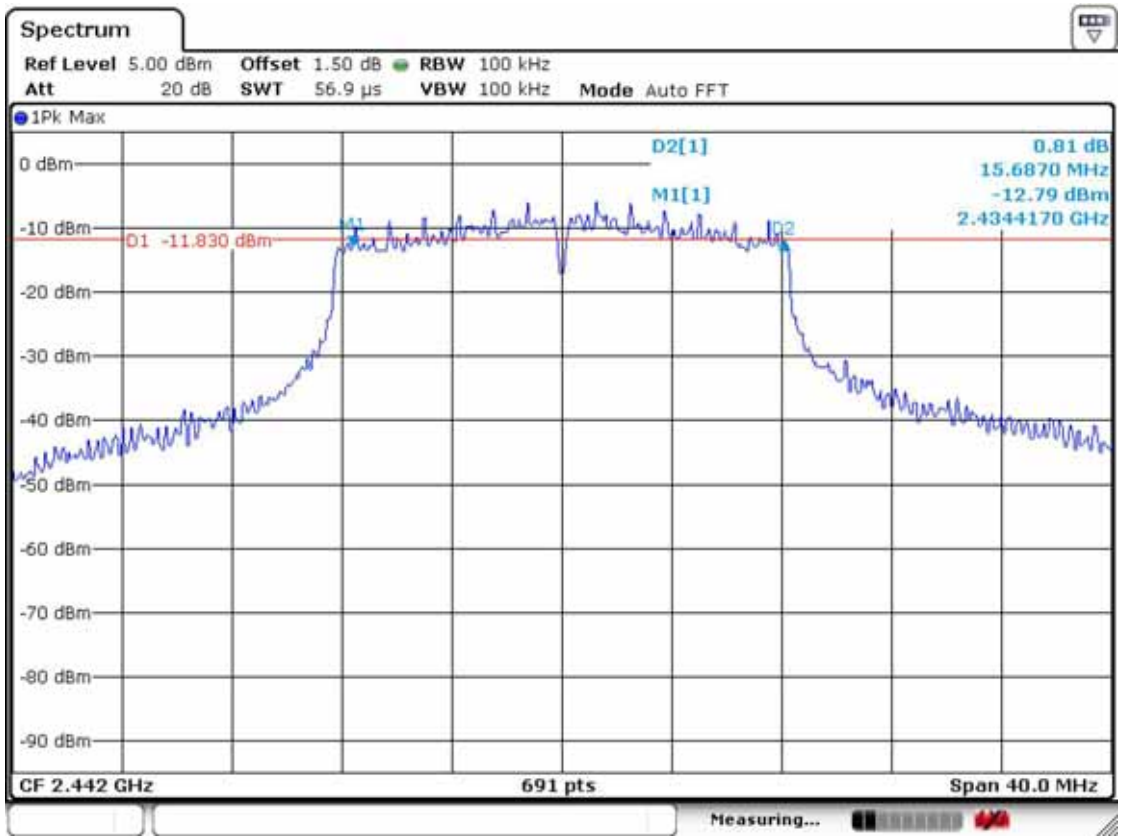

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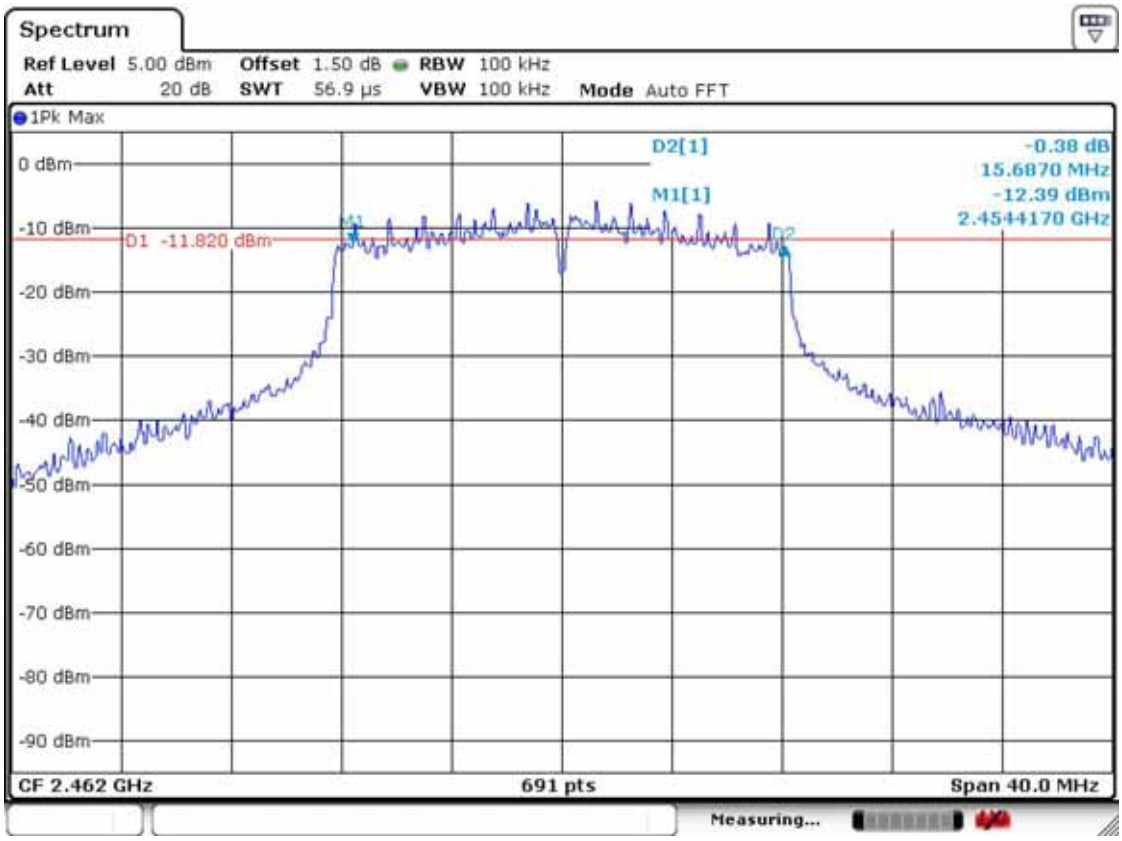
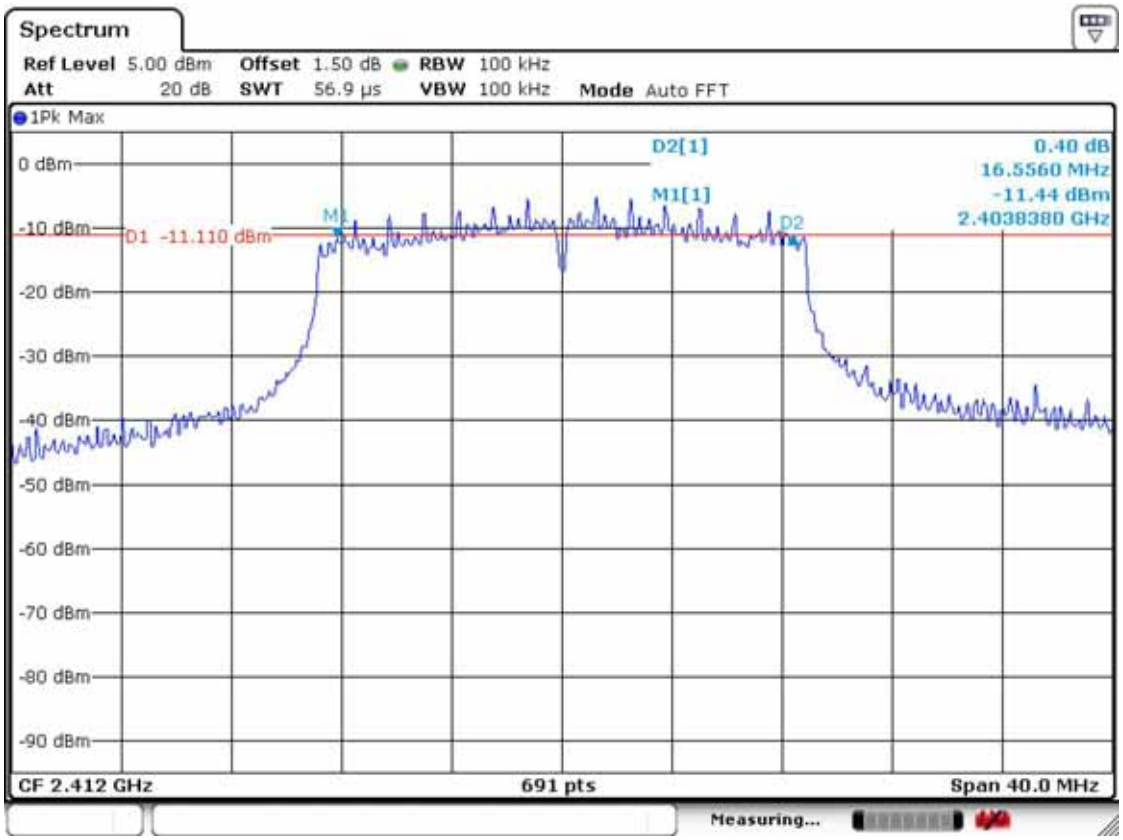

Spectrum
Ref Level 5.00 dBm Offset 1.50 dB RBW 100 kHz
Att 20 dB SWT 56.9 µs VBW 100 kHz Mode Auto FFT
1Pk Max
D2[1] -0.38 dB
15.6870 MHz
M1[1] -12.39 dBm
2.4544170 GHz
D1 -11.820 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.462 GHz
691 pts
Span 40.0 MHz
Measuring...

802.11n_20MHz
CH 1



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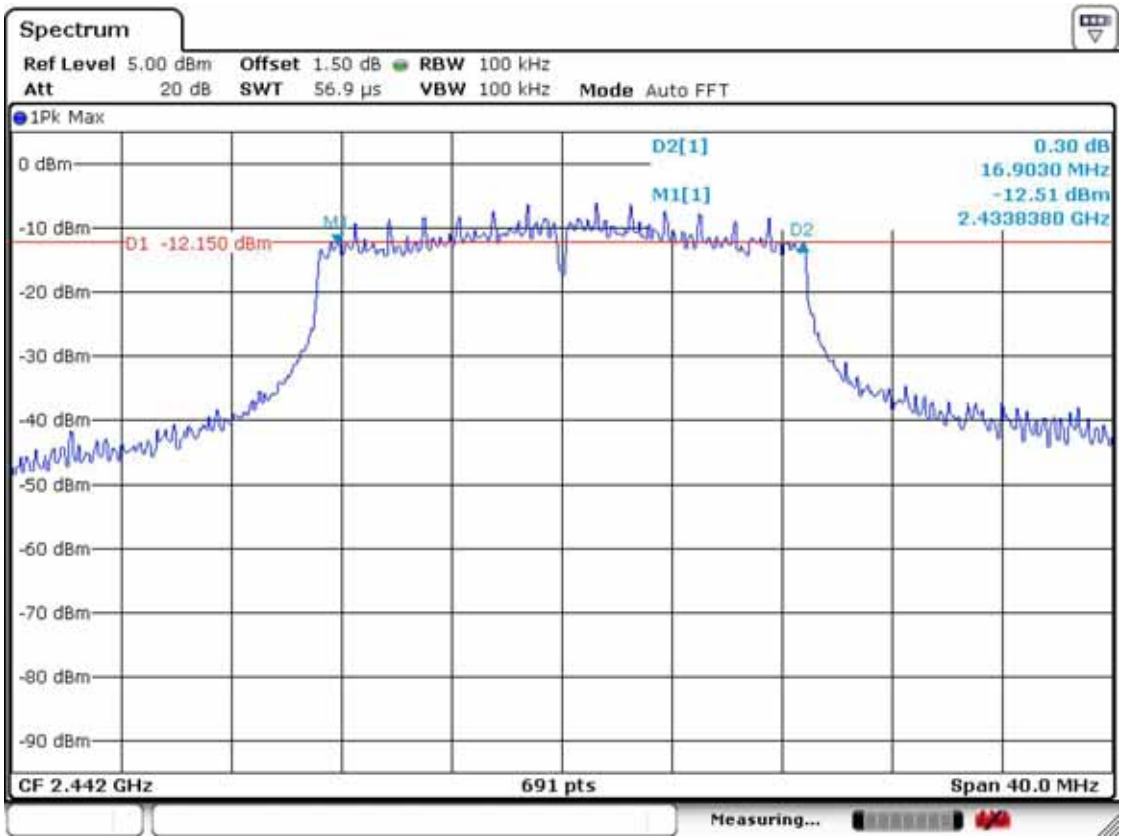

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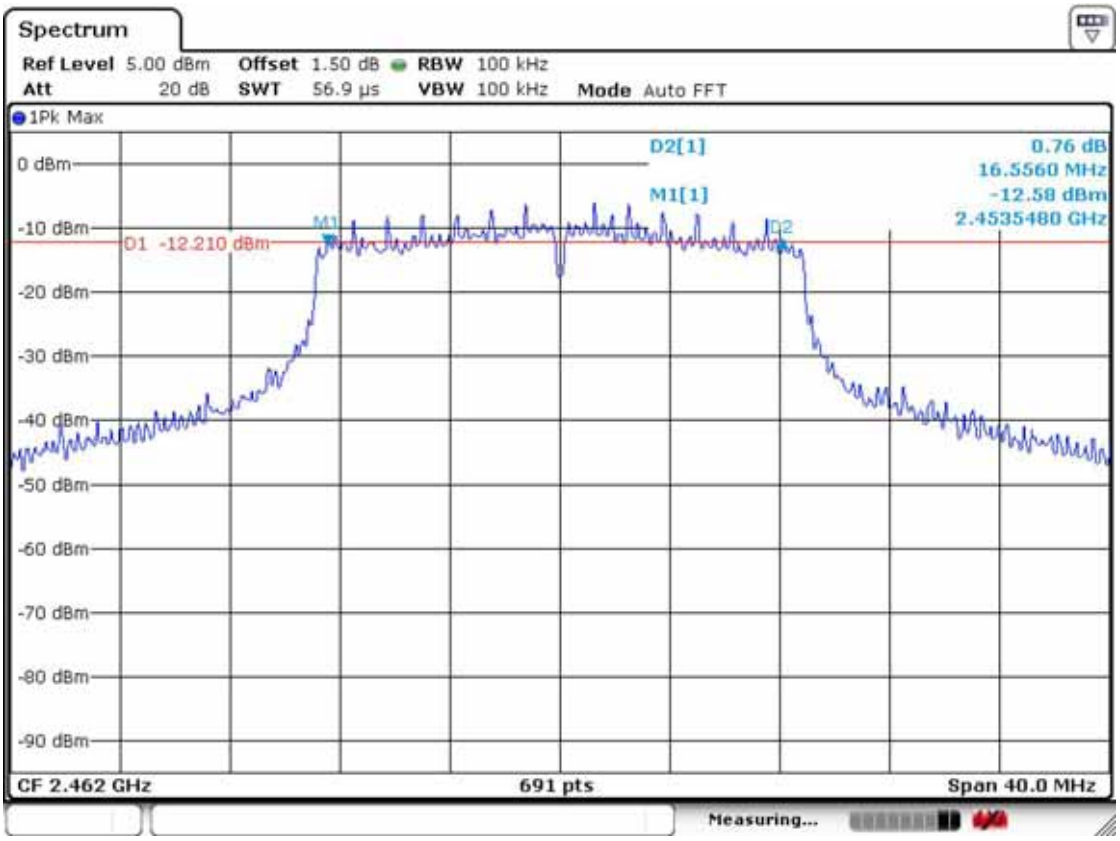

Spectrum
Ref Level 5.00 dBm Offset 1.50 dB RBW 100 kHz
Att 20 dB SWT 56.9 µs VBW 100 kHz Mode Auto FFT
1Pk Max
D2[1] 0.76 dB
16.5560 MHz
M1[1] -12.58 dBm
2.4535480 GHz
D1 -12.210 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.462 GHz
691 pts
Span 40.0 MHz
Measuring...

3.2.2 Peak Output Power Measurement

Procedure:

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 = 1MHz (VBW ≥ RBW) Sweep = auto

Detector function = peak

Measurement Data:

Mode	Frequency (MHz)	Channel No.	Test Results	
			Peak Output Power (dBm)	Result
802.11b	2412	1	10.18	Complies
	2442	7	9.72	Complies
	2462	11	9.62	Complies
802.11g	2412	1	12.29	Complies
	2442	7	11.93	Complies
	2462	11	11.46	Complies
802.11n _20MHz	2412	1	11.89	Complies
	2442	7	11.49	Complies
	2462	11	11.35	Complies

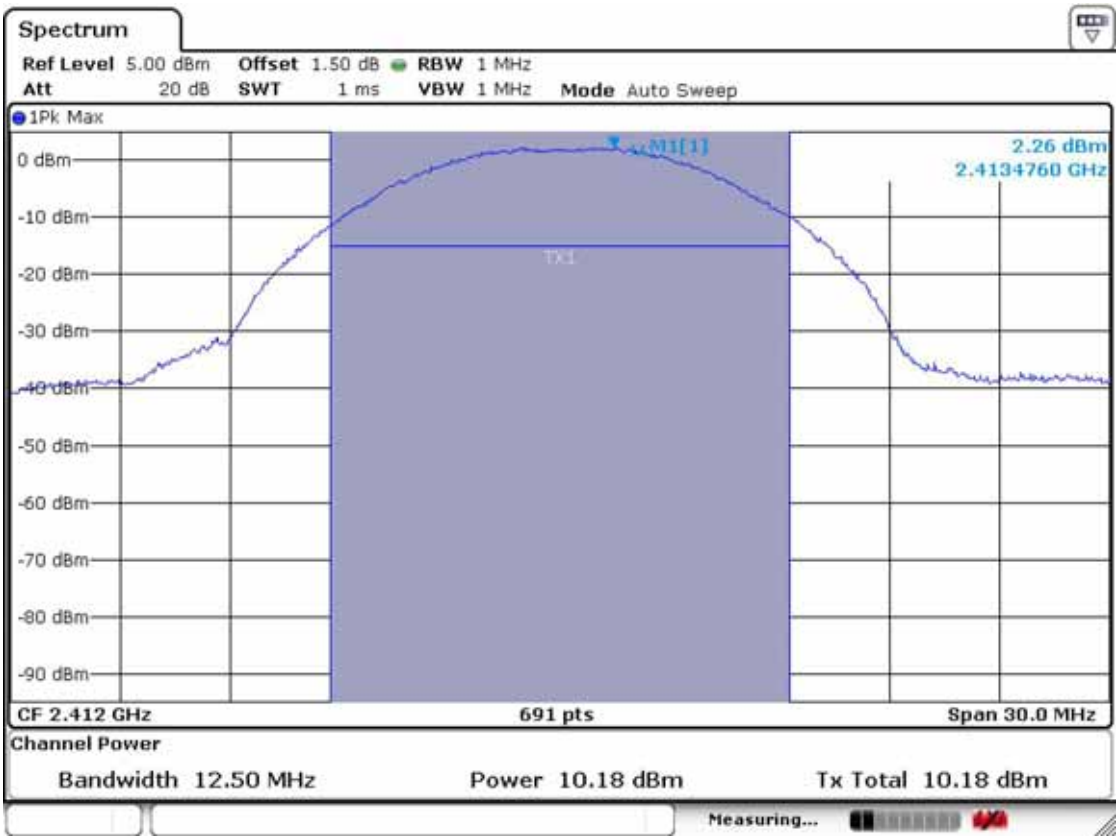
- See next pages for actual measured spectrum plots.

Minimum Standard:

Peak output power	< 1W

802.11b

CH 1



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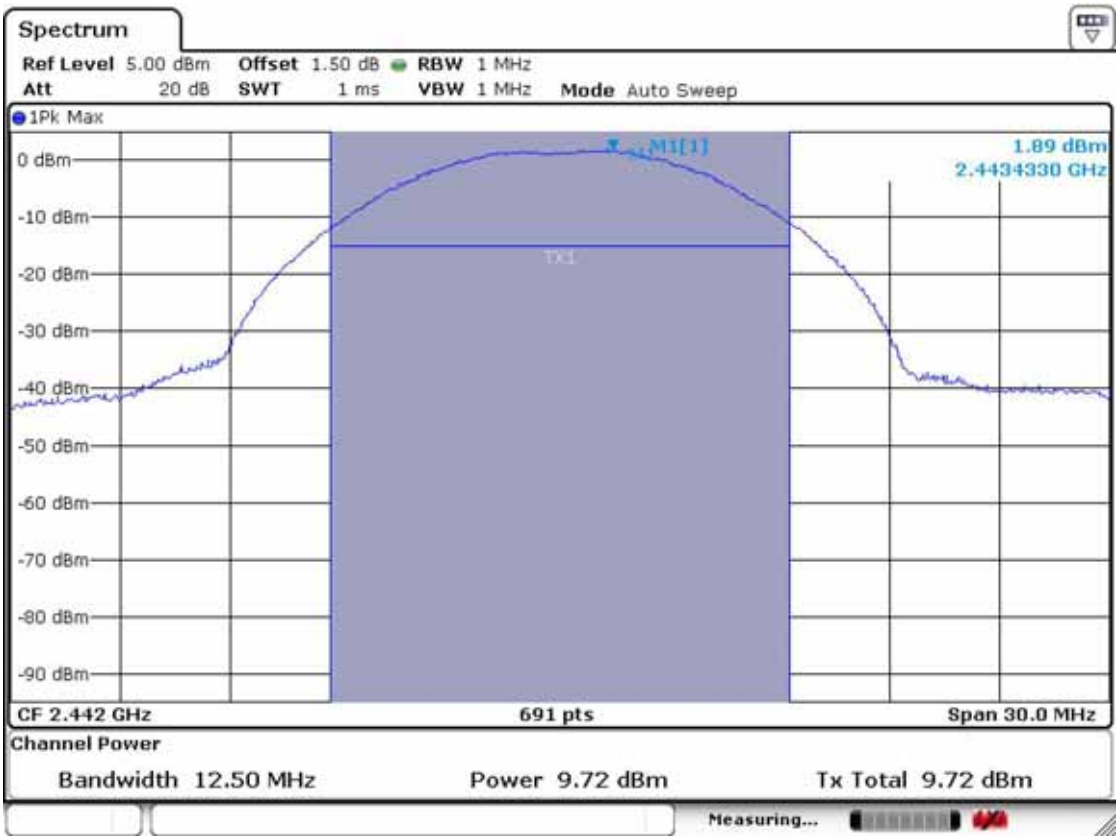

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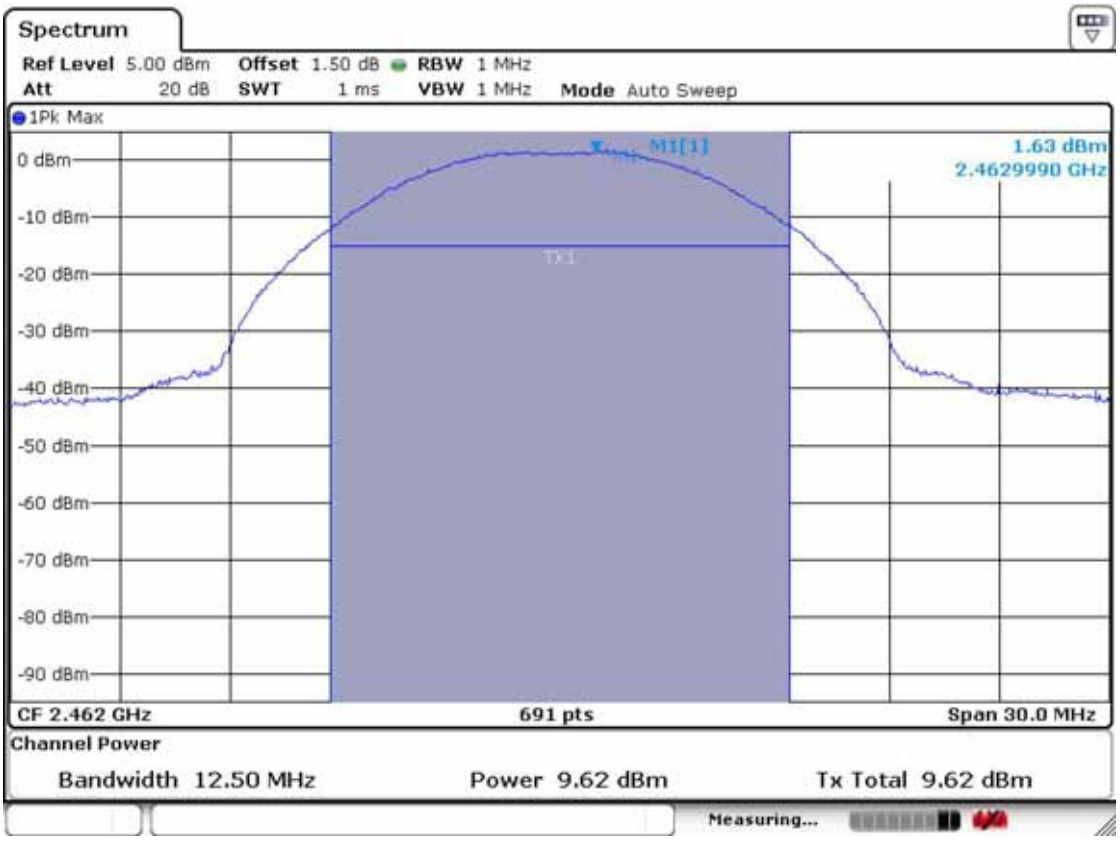
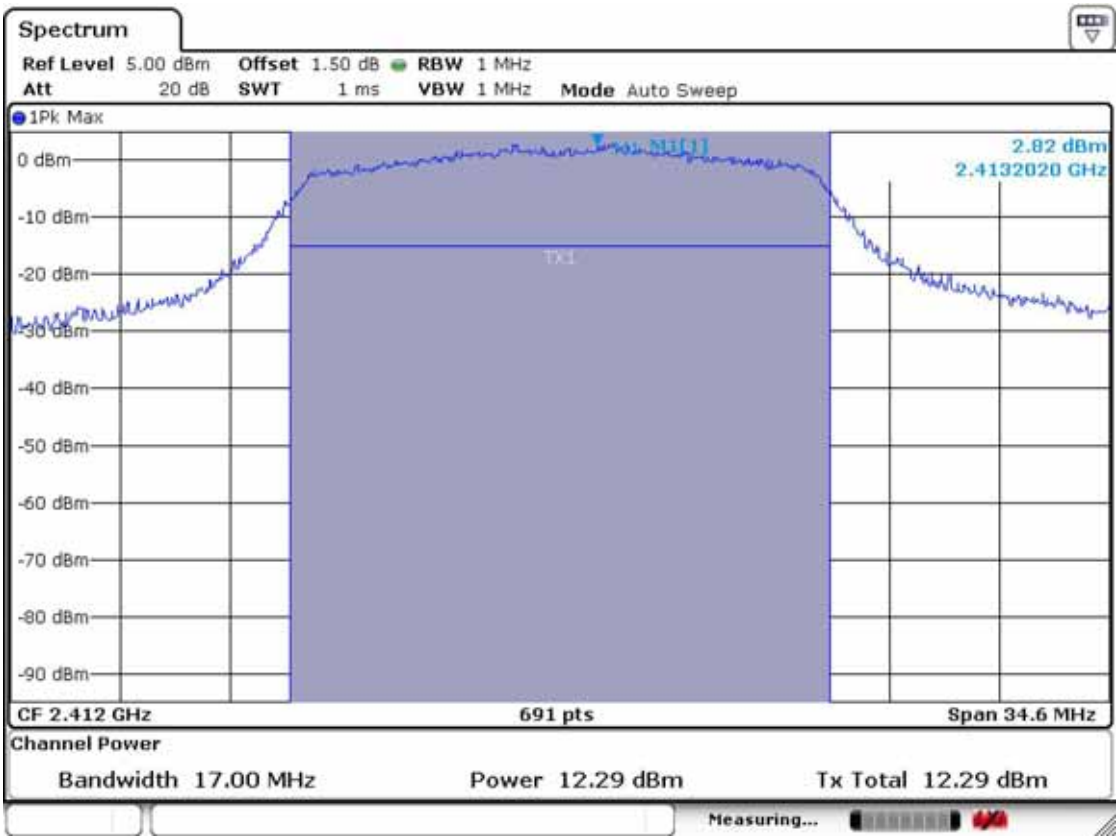

Spectrum
Ref Level 5.00 dBm Offset 1.50 dB RBW 1 MHz
Att 20 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Pk Max
M1[1]
1.63 dBm
2.4629990 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Channel Power
Bandwidth 12.50 MHz
Power 9.62 dBm
Tx Total 9.62 dBm
Measuring...

802.11g

CH 1



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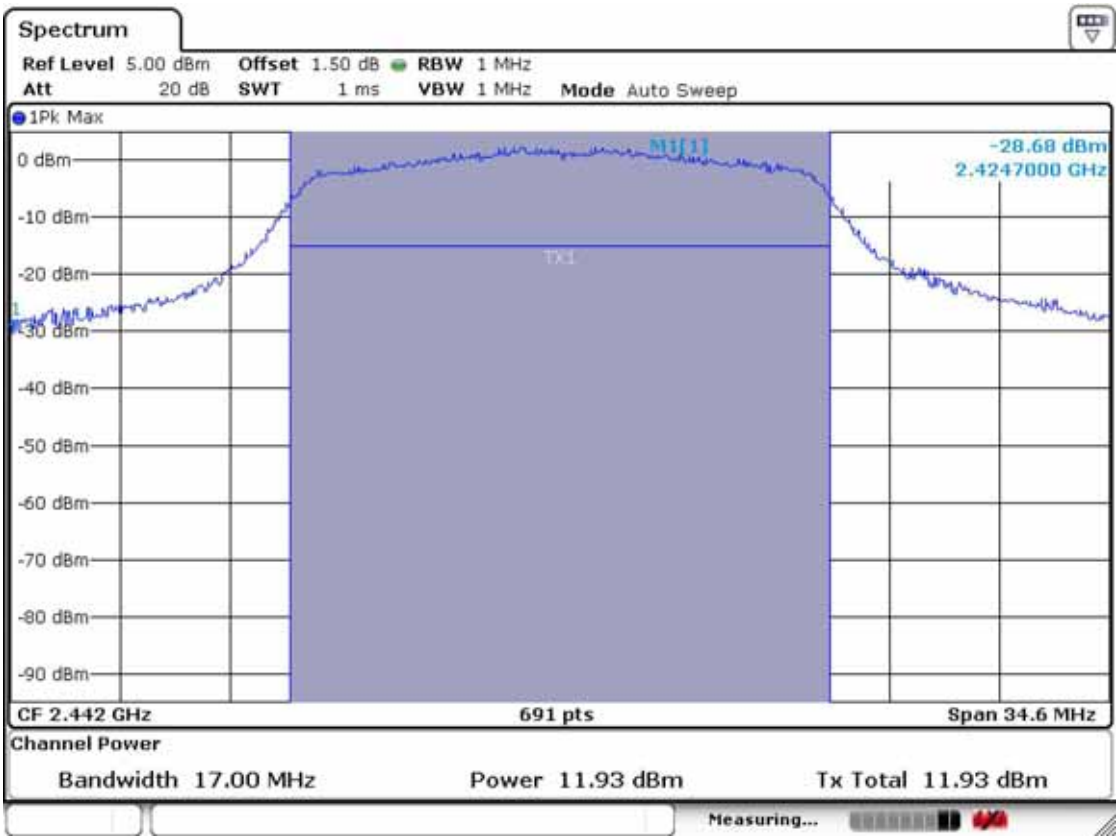
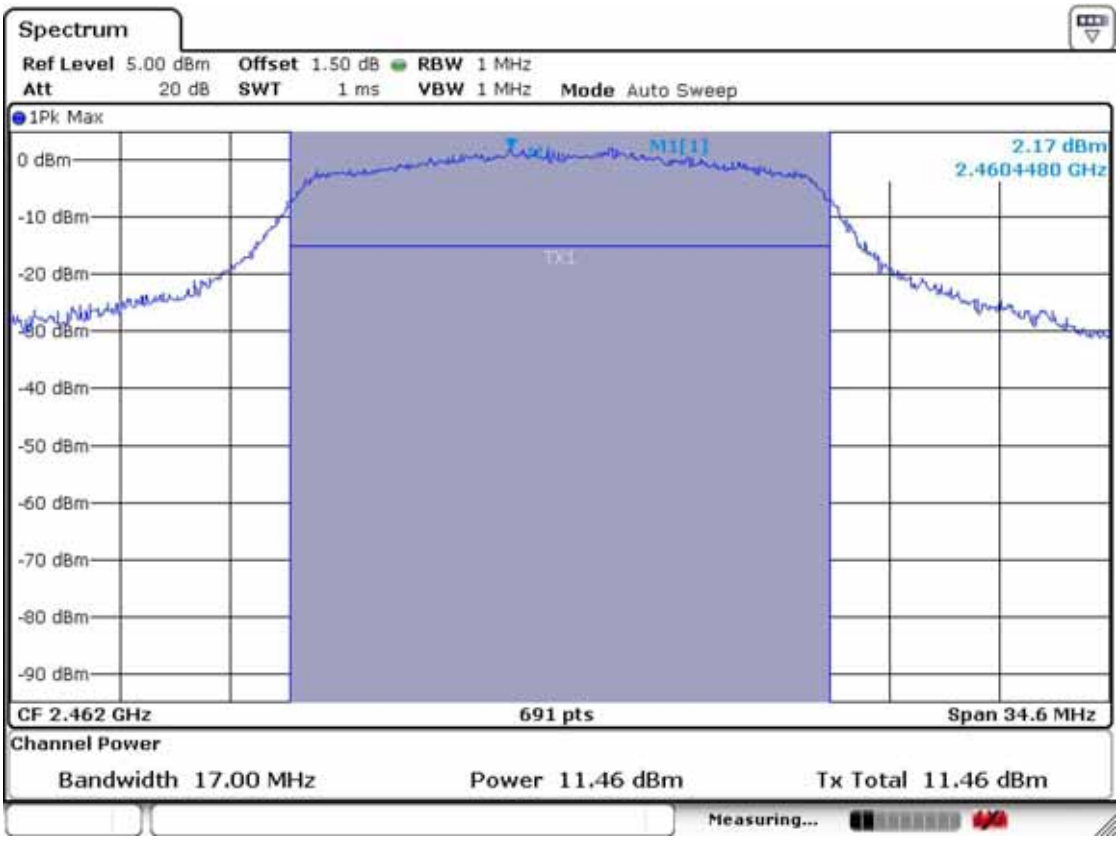
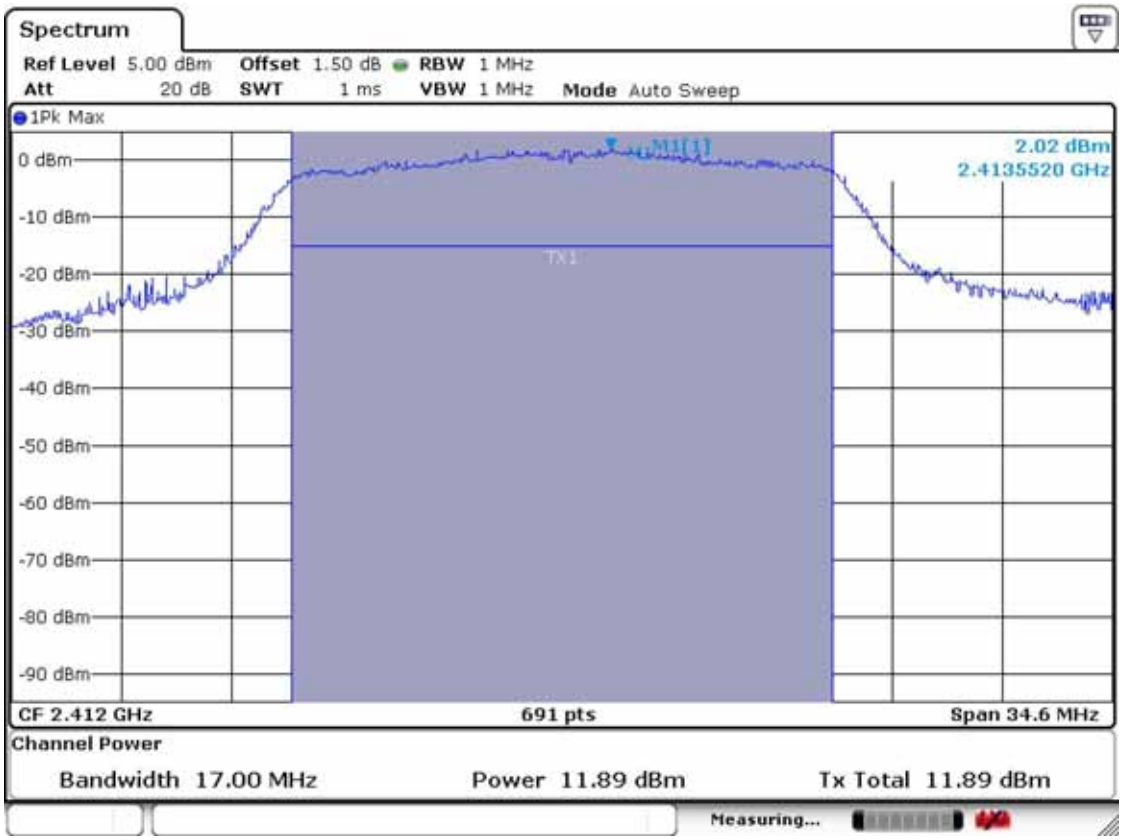


CH 11


Spectrum
Ref Level 5.00 dBm Offset 1.50 dB RBW 1 MHz
Att 20 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Pk Max
M1[1]
2.17 dBm
2.4604480 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.462 GHz
691 pts
Span 34.6 MHz
Channel Power
Bandwidth 17.00 MHz
Power 11.46 dBm
Tx Total 11.46 dBm
Measuring...

802.11n_20MHz
CH 1



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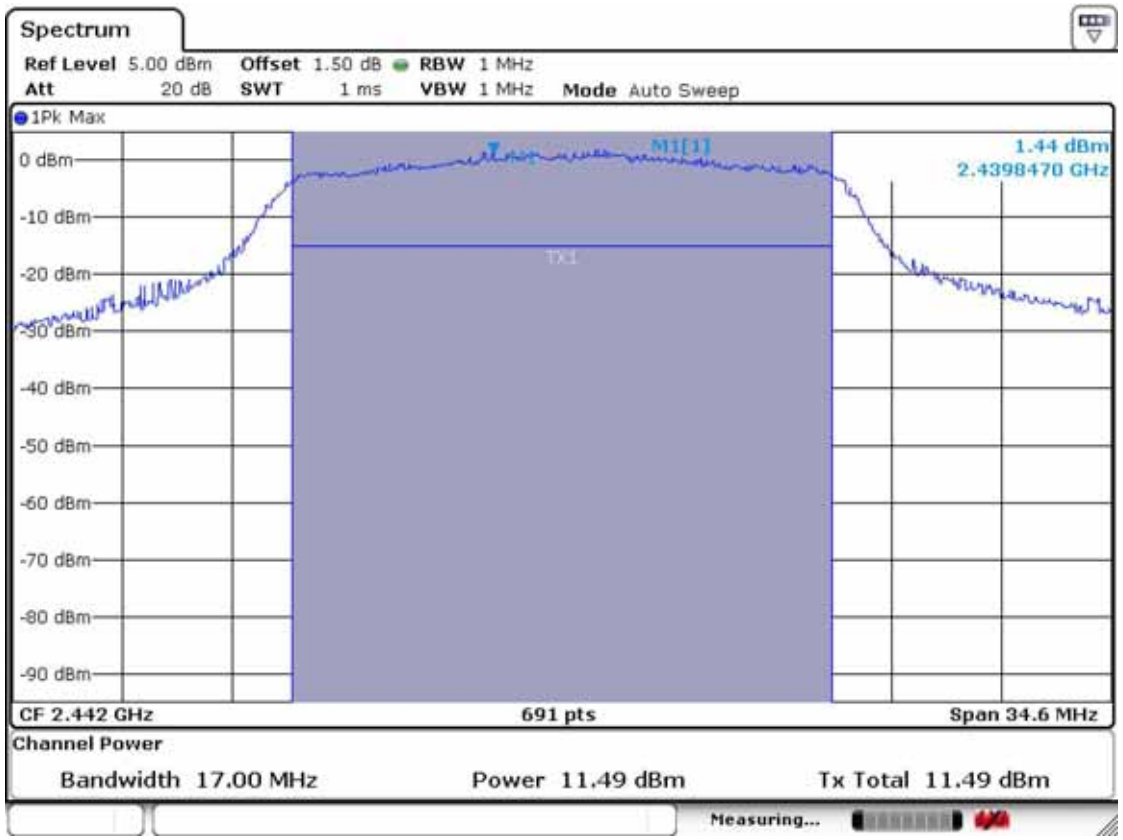

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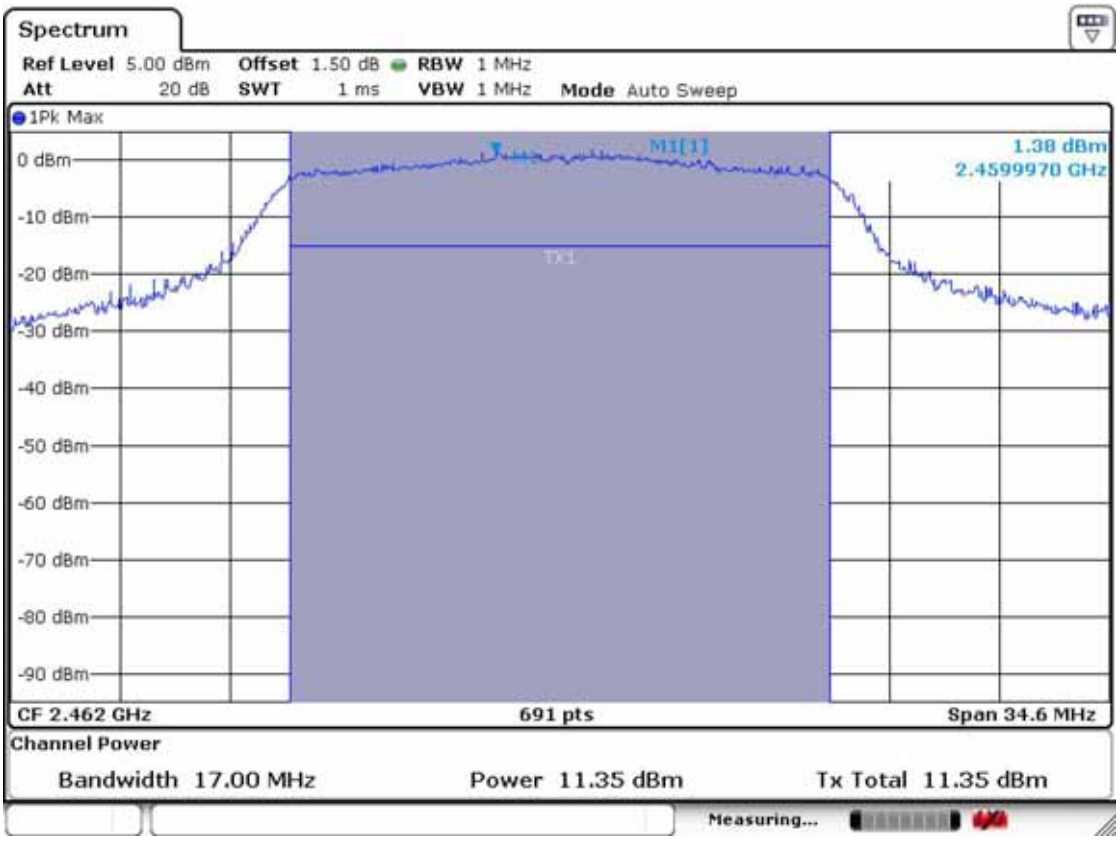

Spectrum
Ref Level 5.00 dBm Offset 1.50 dB RBW 1 MHz
Att 20 dB SWT 1 ms VBW 1 MHz Mode Auto Sweep
1Pk Max
M1[1]
1.38 dBm
2.4599970 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.462 GHz
691 pts
Span 34.6 MHz
Channel Power
Bandwidth 17.00 MHz
Power 11.35 dBm
Tx Total 11.35 dBm
Measuring...

3.2.3 Power Spectral Density

Procedure:

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 = 10 kHz Sweep = 100 sec

Detector function = peak Trace = max hold

Measurement Data:

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	-18.30	Complies
	2442	7	-18.92	Complies
	2462	11	-18.88	Complies
802.11g	2412	1	-27.89	Complies
	2442	7	-28.28	Complies
	2462	11	-28.41	Complies
802.11n _20MHz	2412	1	-28.87	Complies
	2442	7	-29.46	Complies
	2462	11	-29.87	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

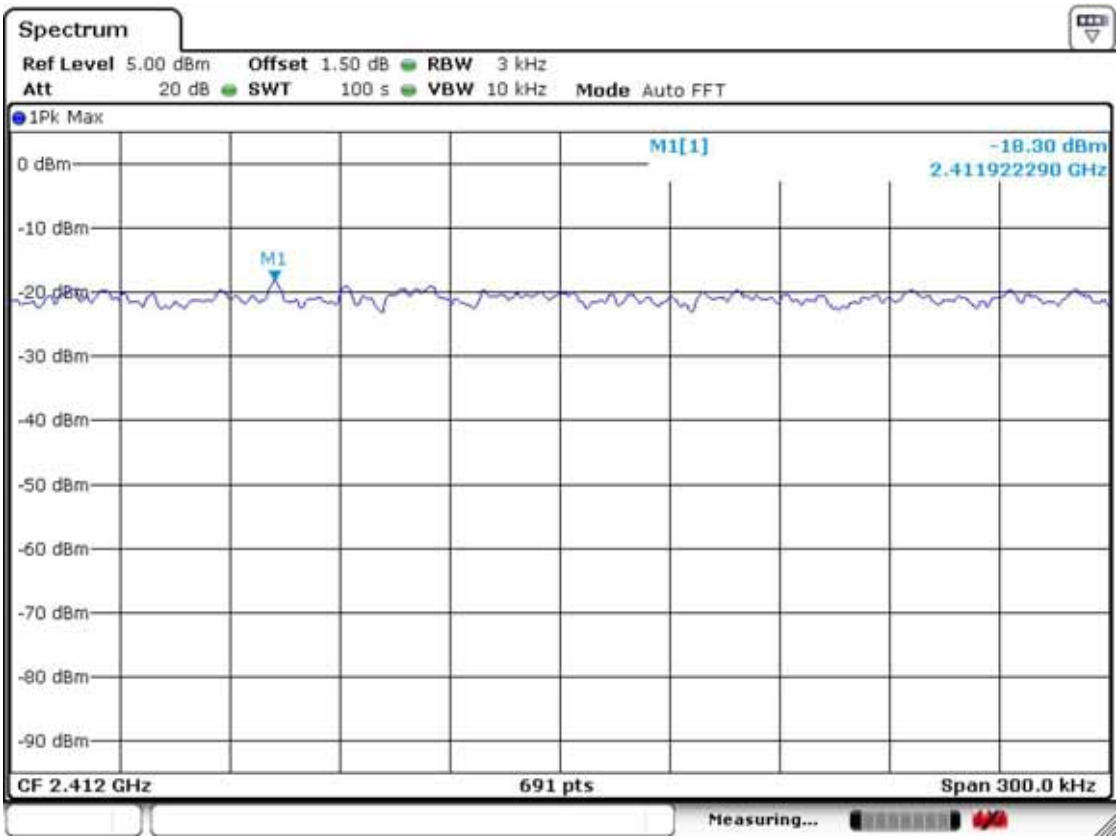
Power Spectral Density	< 8dBm @ 3kHz BW

Measurement Setup

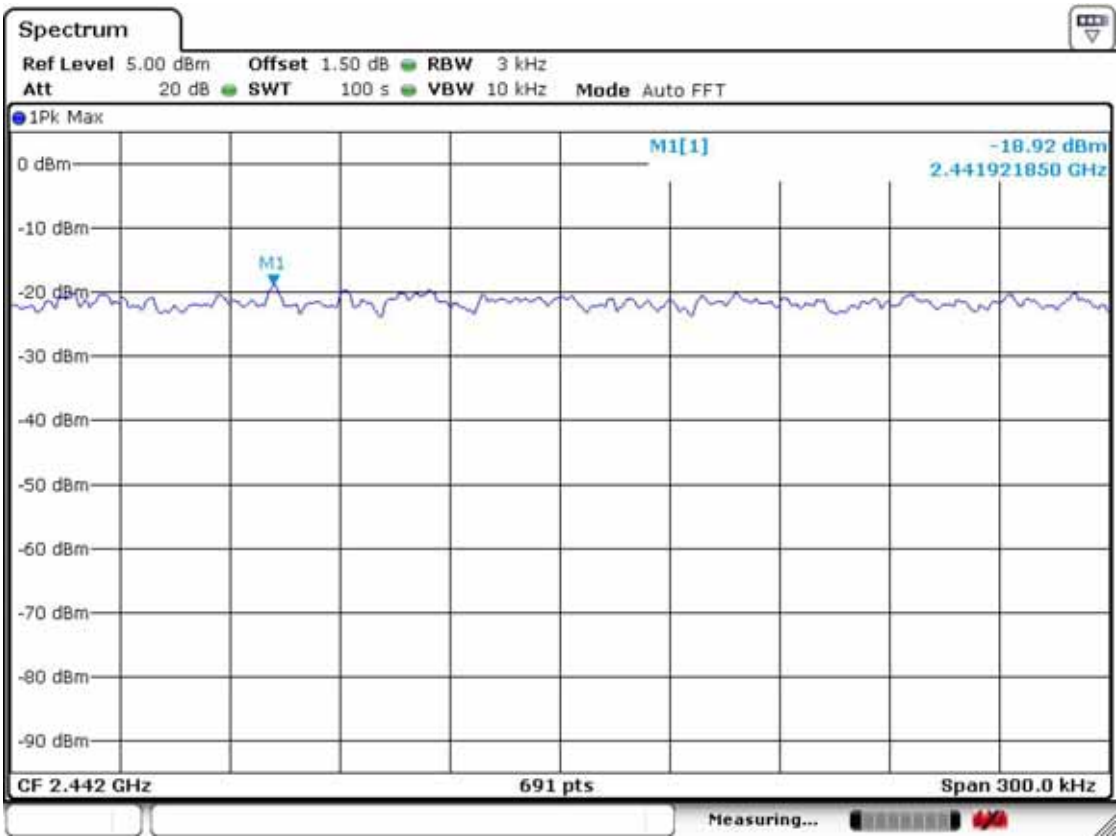
Same as the Chapter 3.2.1 (Figure 1)

802.11b Power Density Measurement

CH 1



CH 7



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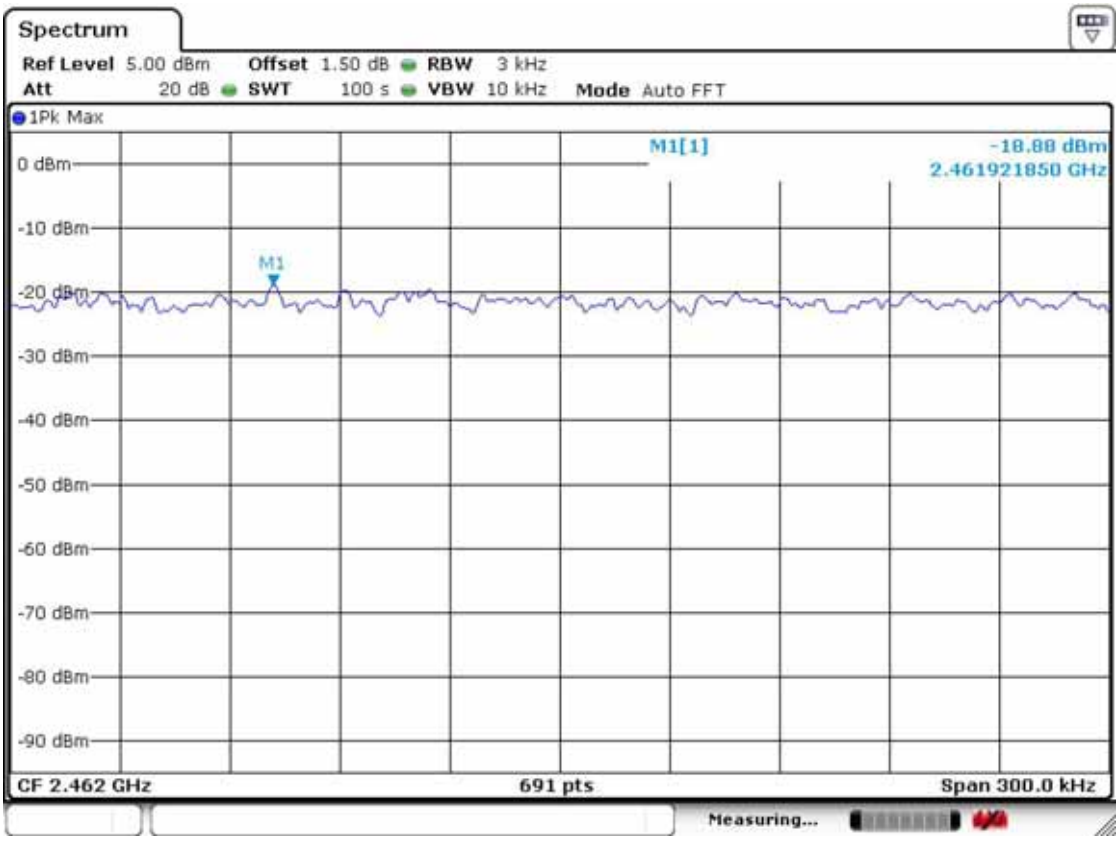
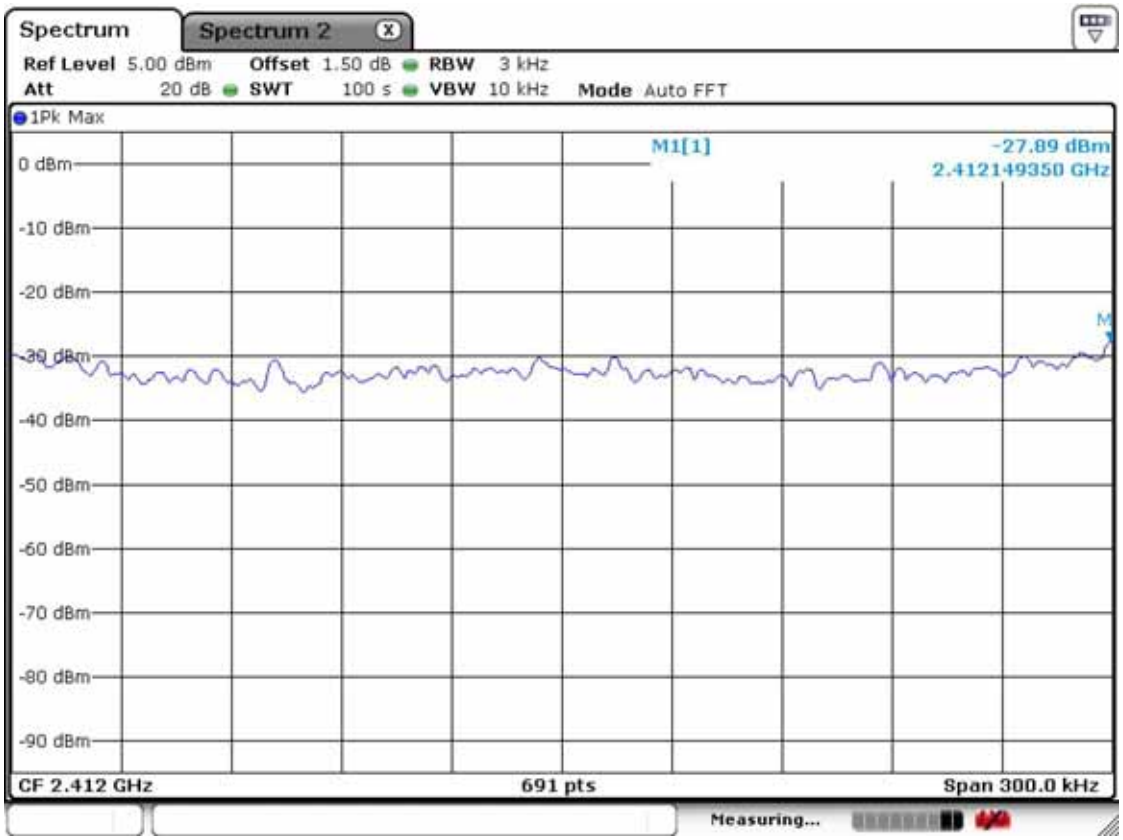
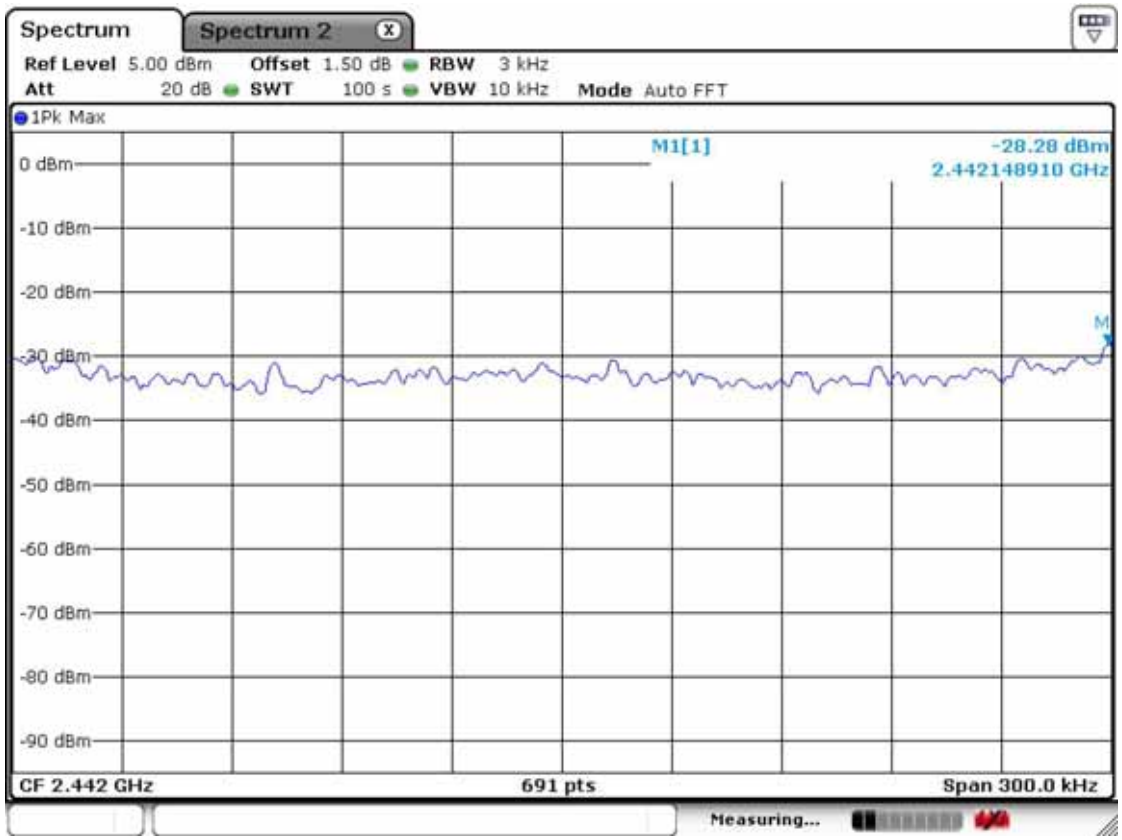

Spectrum
Ref Level 5.00 dBm Offset 1.50 dB RBW 3 kHz
Att 20 dB SWT 100 s VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1]
-18.88 dBm
2.461921850 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
M1
CF 2.462 GHz
691 pts
Span 300.0 kHz
Measuring...

802.11g Power Density Measurement

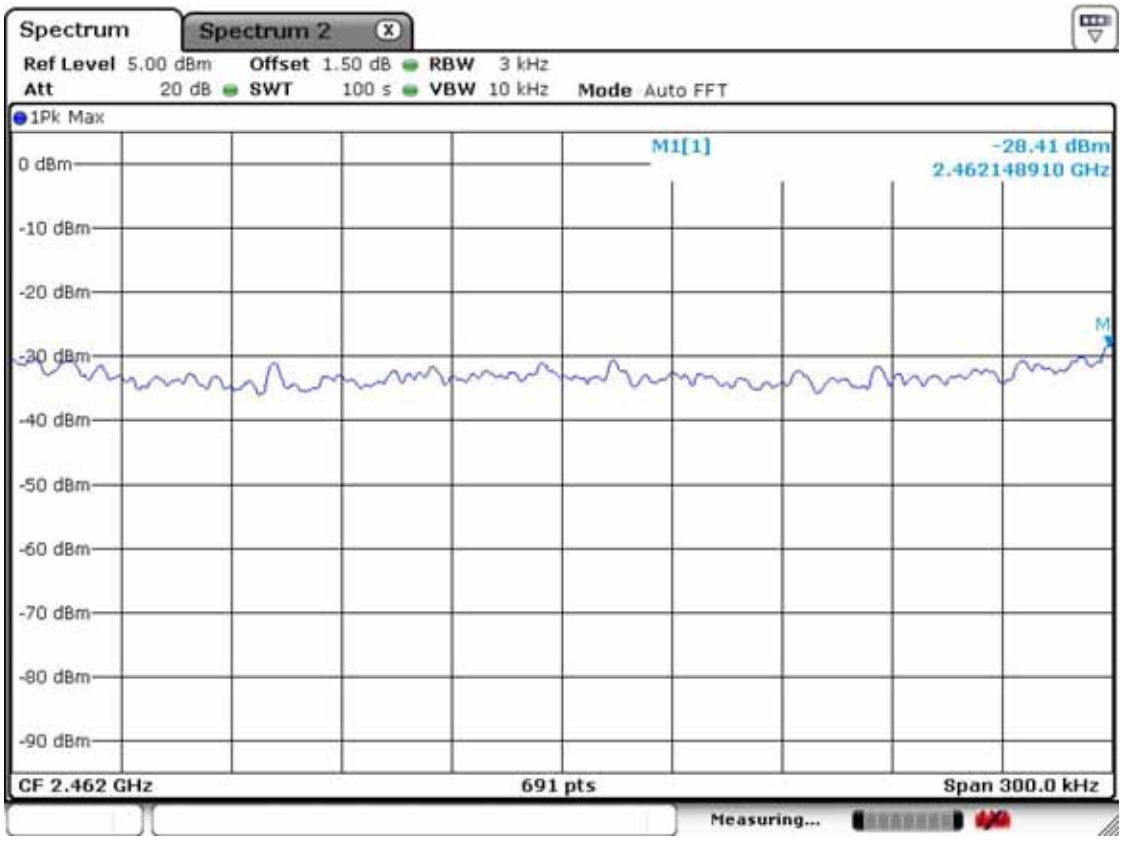
CH 1



CH 7

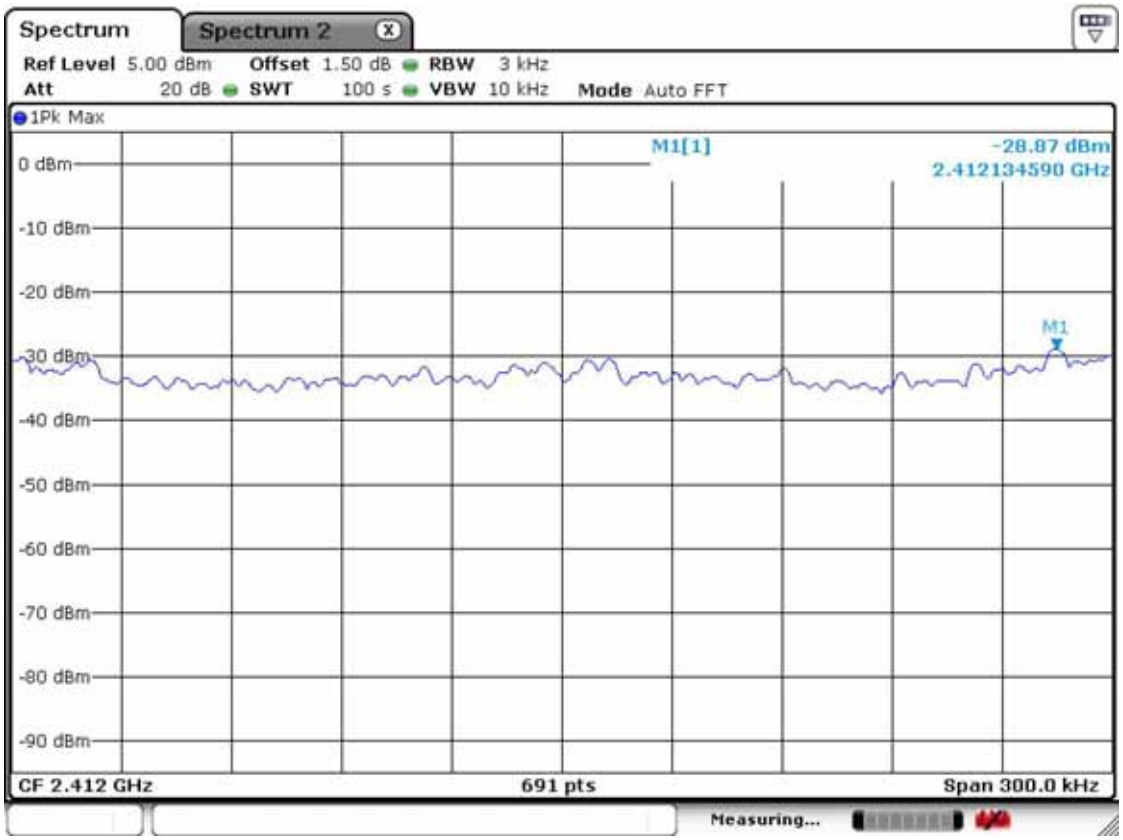


CH 11

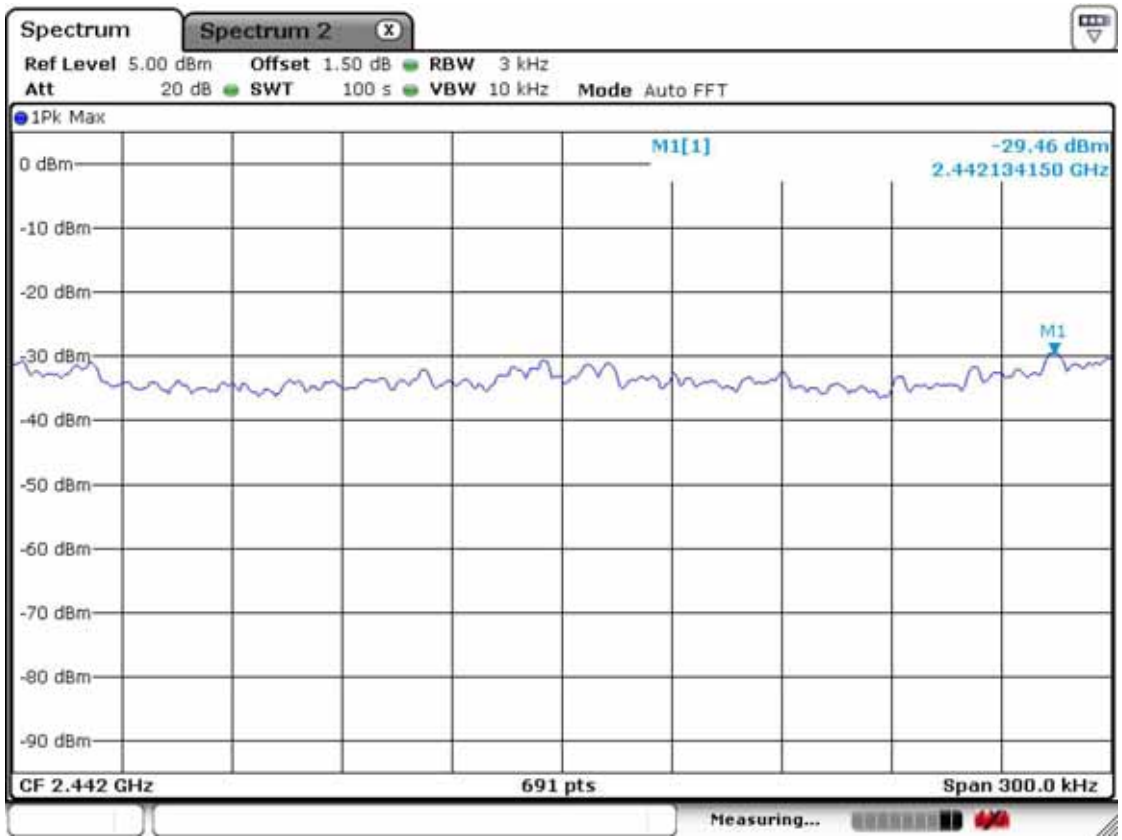

Spectrum
Spectrum 2
Ref Level 5.00 dBm Offset 1.50 dB RBW 3 kHz
Att 20 dB SWT 100 s VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1]
-28.41 dBm
2.462148910 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.462 GHz
691 pts
Span 300.0 kHz
Measuring...

802.11n_20MHz Power Density Measurement

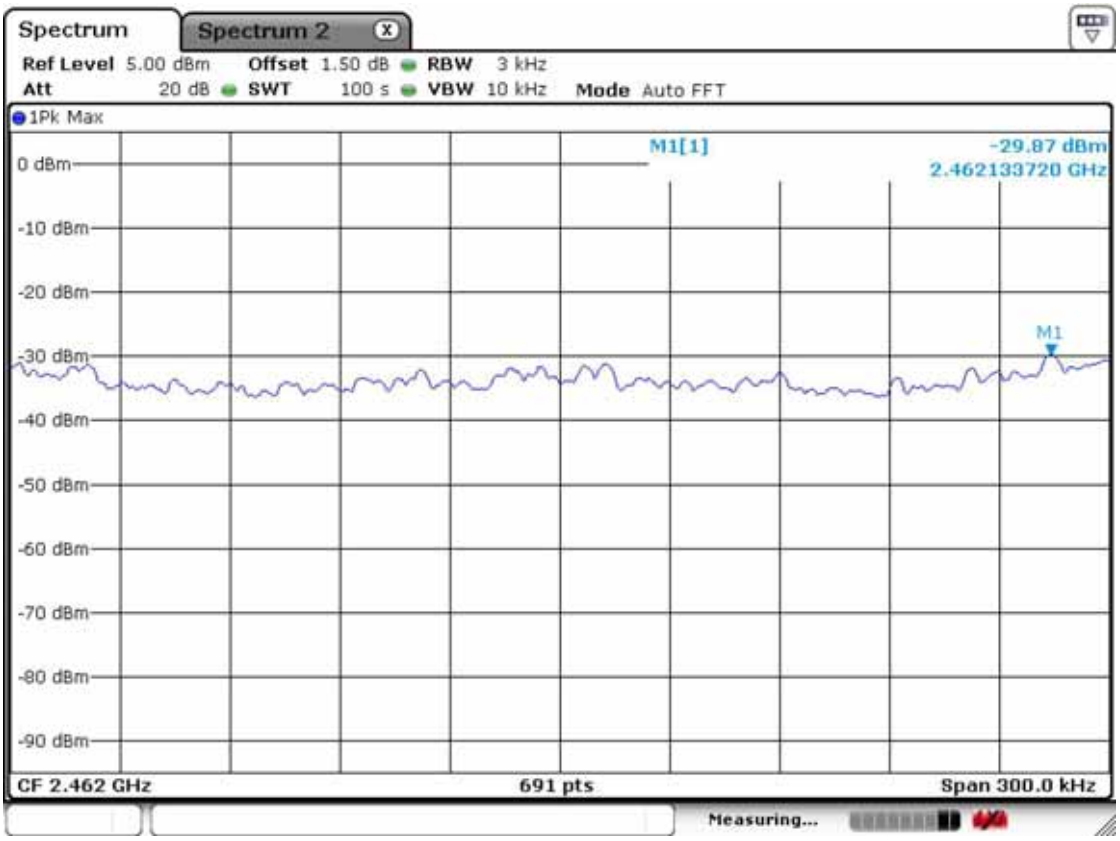
CH 1



CH 7



CH 11


Spectrum
Spectrum 2
Ref Level 5.00 dBm Offset 1.50 dB RBW 3 kHz
Att 20 dB SWT 100 s VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1]
-29.87 dBm
2.462133720 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
M1
CF 2.462 GHz
691 pts
Span 300.0 kHz
Measuring...

3.2.4 Band - edge

Procedure:

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 = 80 MHz	Detector function = peak
Trace = max hold	Sweep = auto

Measurement Data: Complies

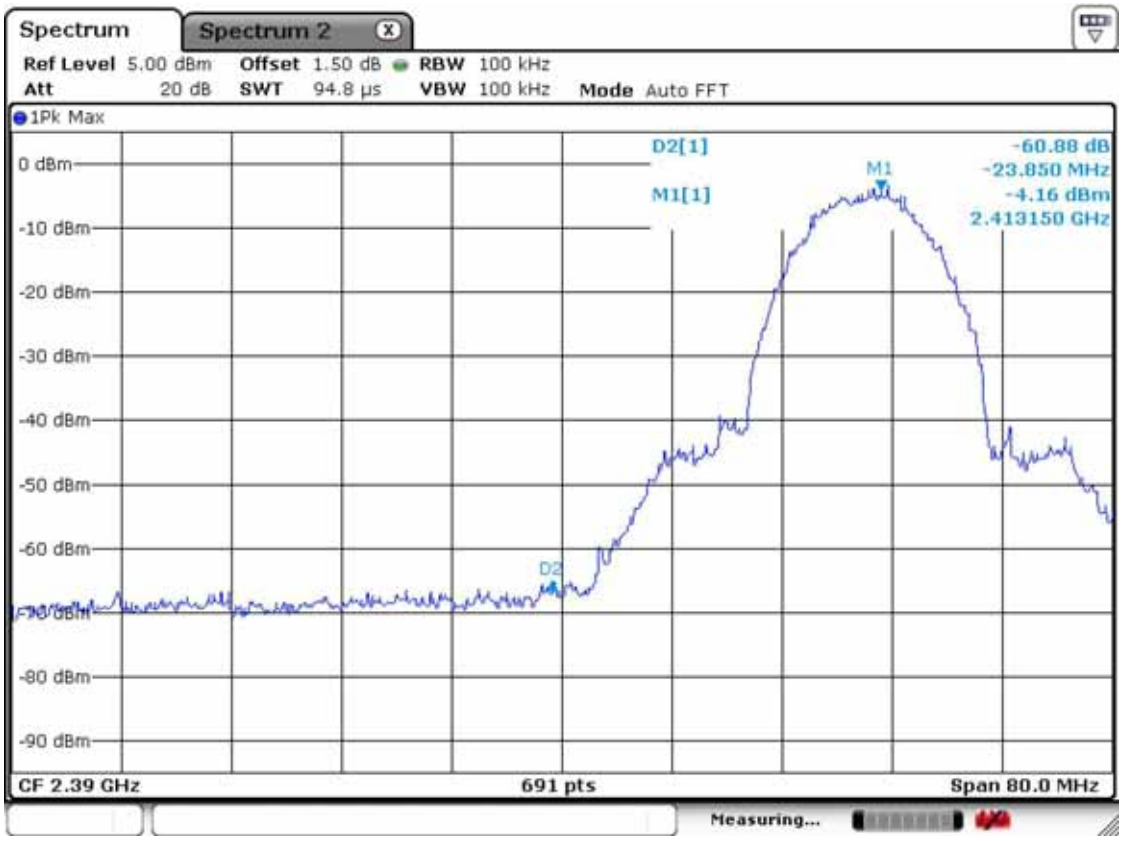
- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

802.11b Band–edge : Conducted Measurements



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

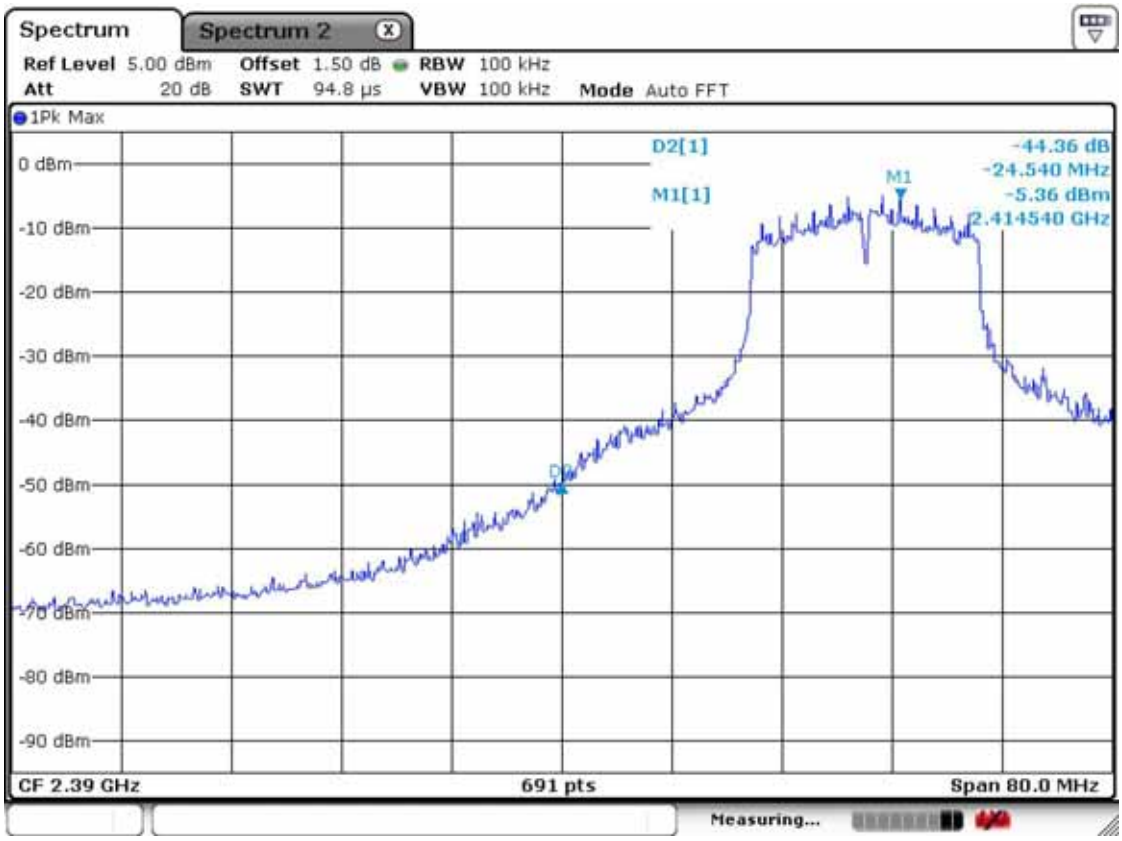
Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable						
2390.0	45.8	56.0	H	25.4	37.1	4.0	54.0	74.0	38.0	48.2	16.0	25.8

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

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable						
2483.5	45.3	58.5	H	25.4	37.1	4.0	54.0	74.0	37.6	50.8	16.5	23.3

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

802.11g Band–edge : Conducted Measurements



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

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable						
2390.0	50.7	68.8	H	25.4	37.1	4.0	54.0	74.0	43.0	61.1	11.0	12.9

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

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable						
2483.5	50.0	66.3	H	25.4	37.1	4.0	54.0	74.0	42.3	58.5	11.8	15.5

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

802.11n_20MHz Band–edge : Conducted Measurements

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

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable						
2390.0	52.4	69.7	H	25.4	37.1	4.0	54.0	74.0	44.7	62.0	9.4	12.0

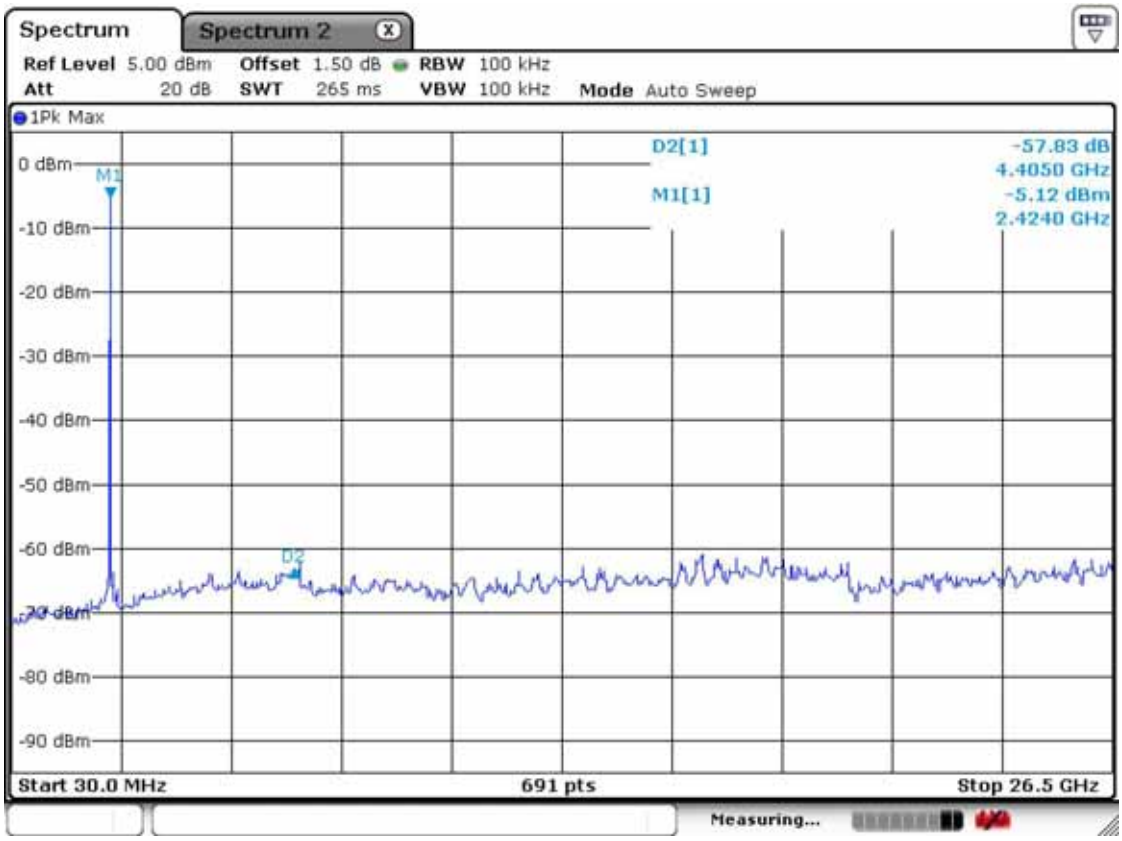
Band-edges in the restricted band 2483.5-2500 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable						
2483.5	52.0	70.6	H	25.4	37.1	4.0	54.0	74.0	44.3	62.8	9.8	11.2

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

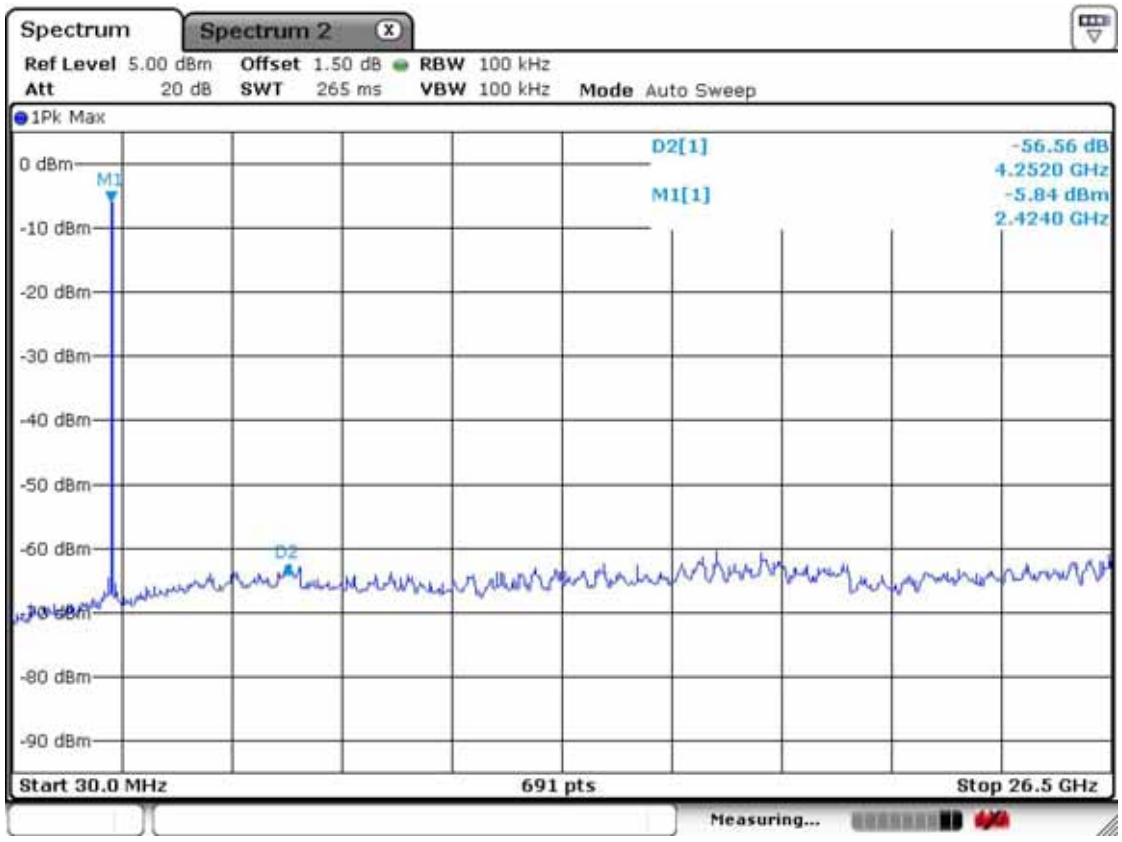
802.11b – channel 1

Frequency Range = 30 MHz ~ 10th harmonic.



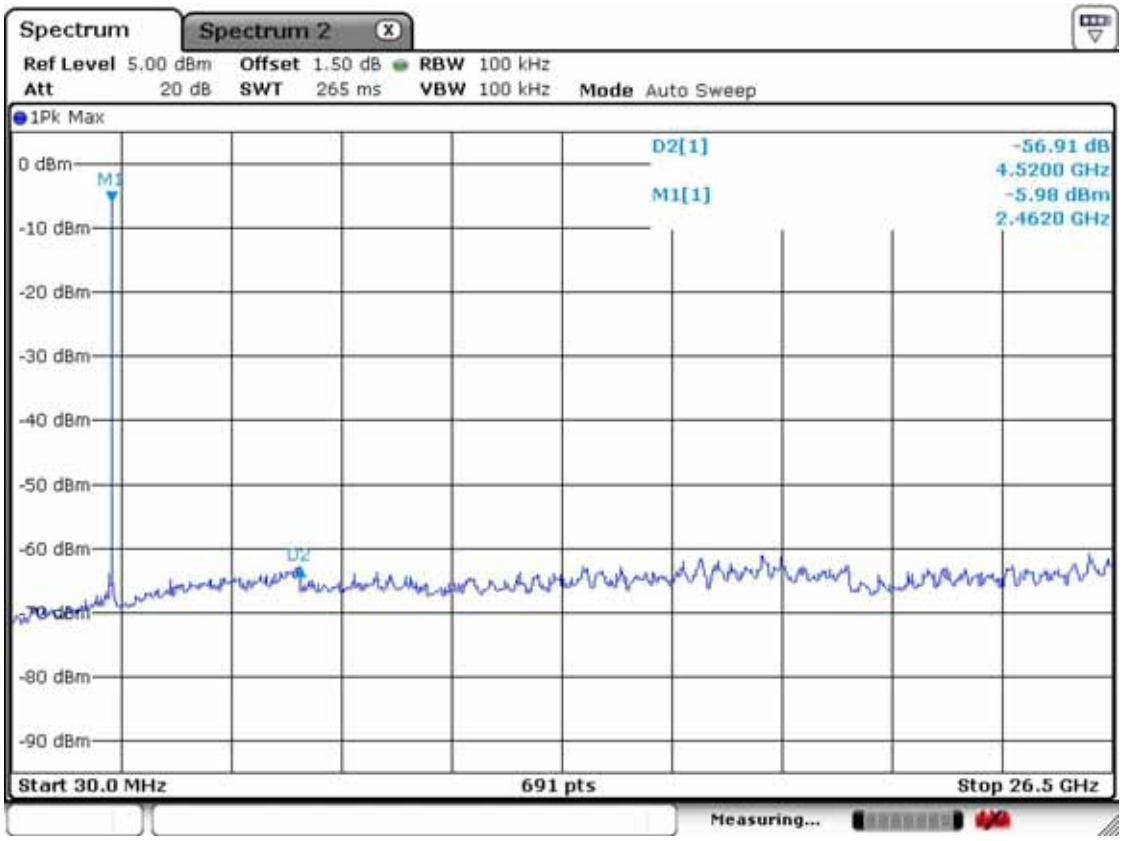
802.11b – channel 7

Frequency Range = 30 MHz ~ 10th harmonic.



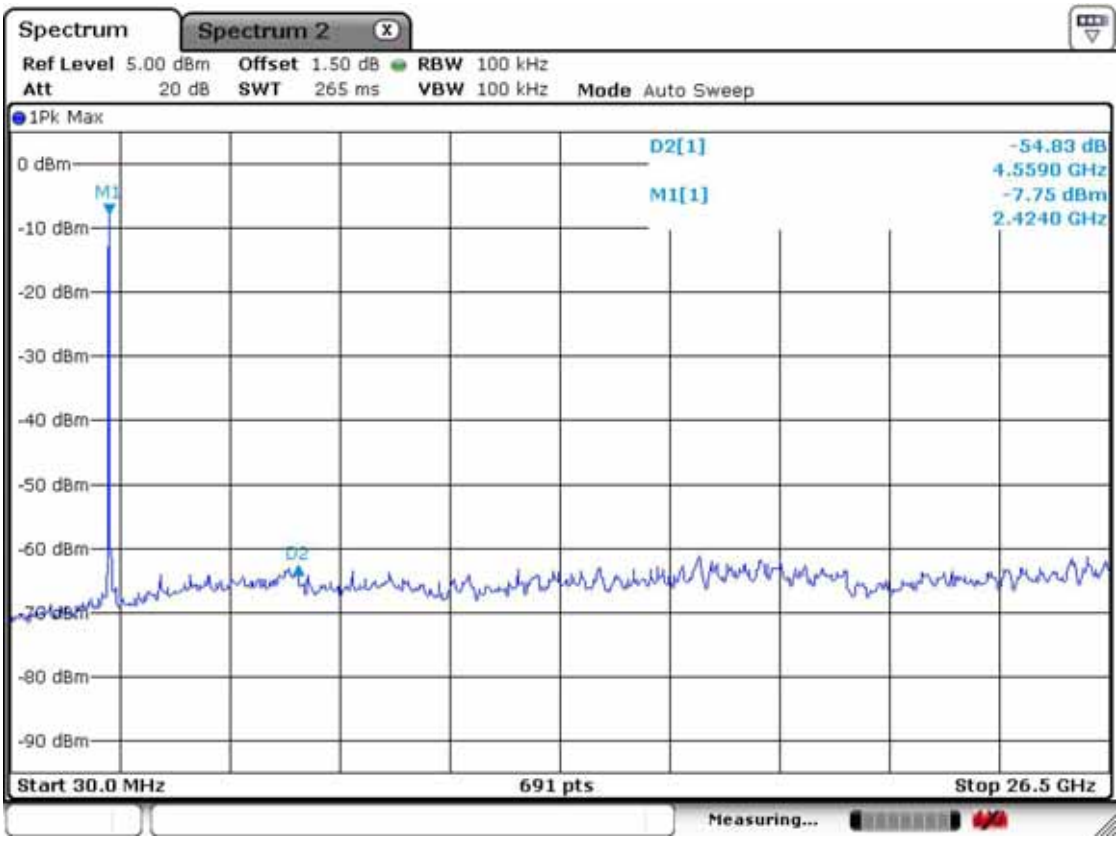
802.11b –channel 11

Frequency Range = 30 MHz ~ 10th harmonic.



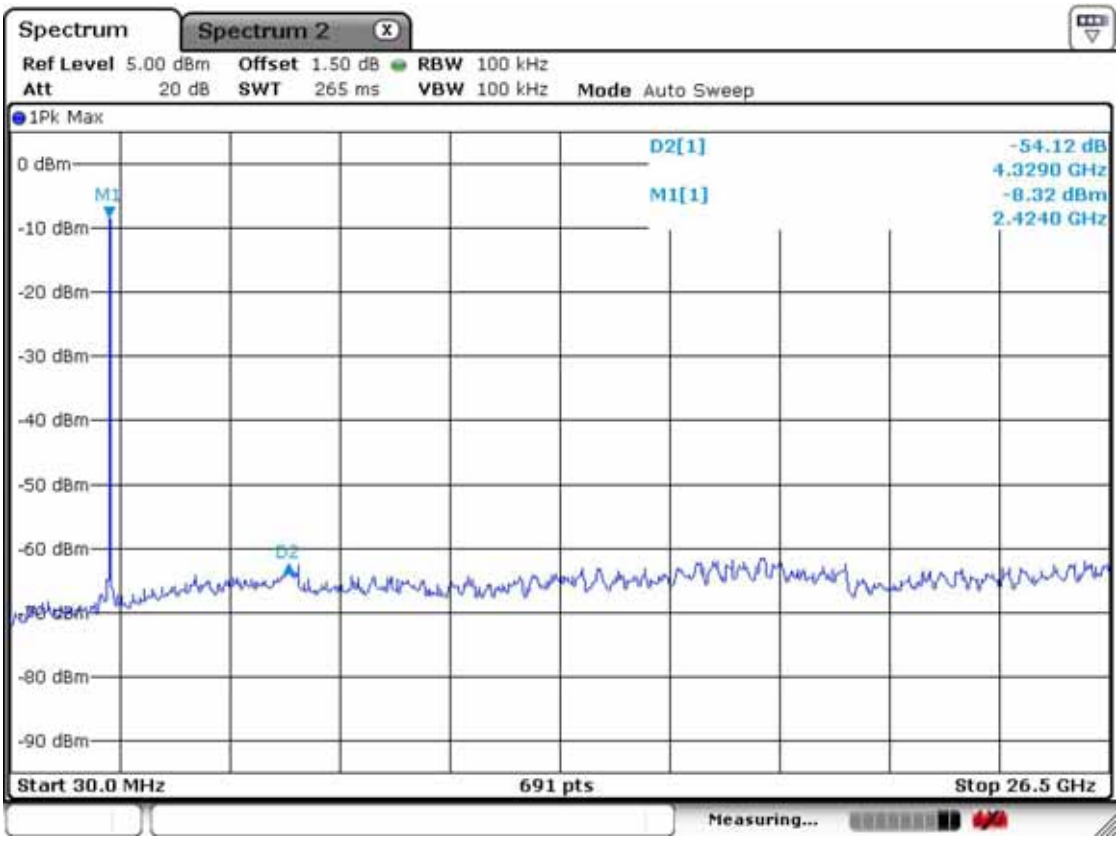
802.11g – channel 1

Frequency Range = 30 MHz ~ 10th harmonic.



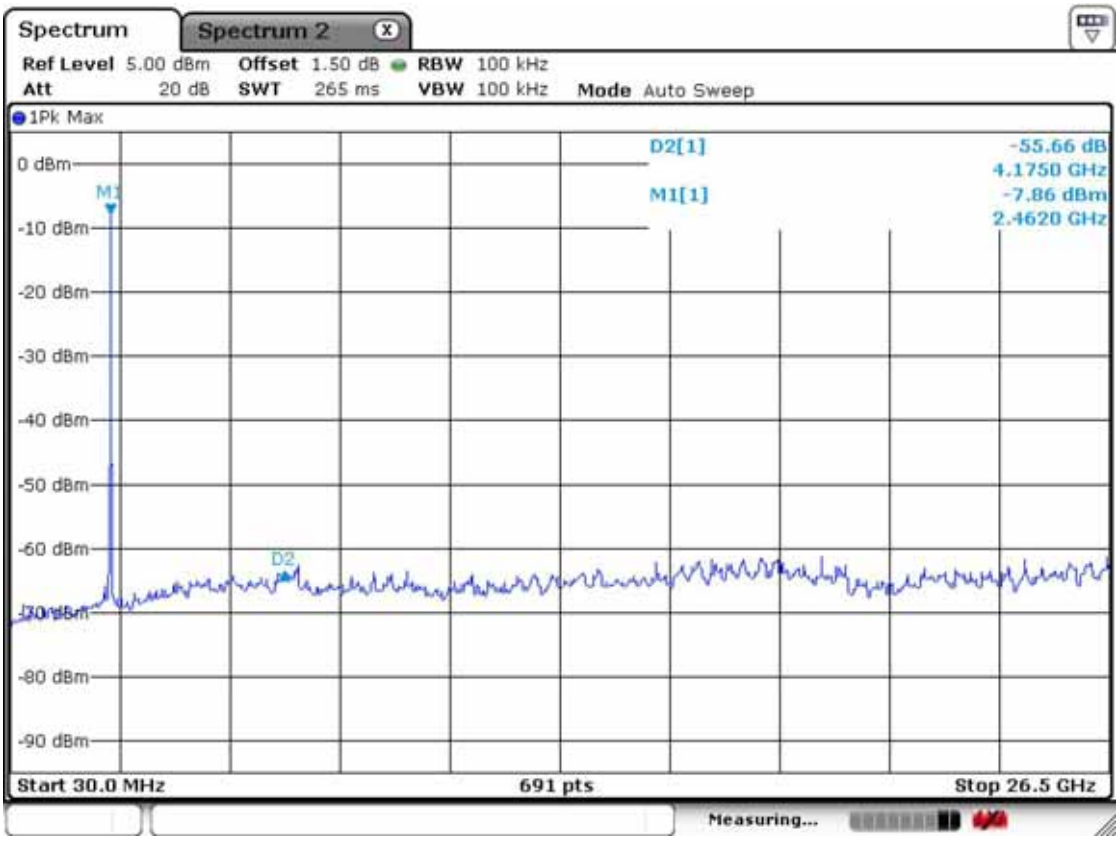
802.11g – channel 7

Frequency Range = 30 MHz ~ 10th harmonic.



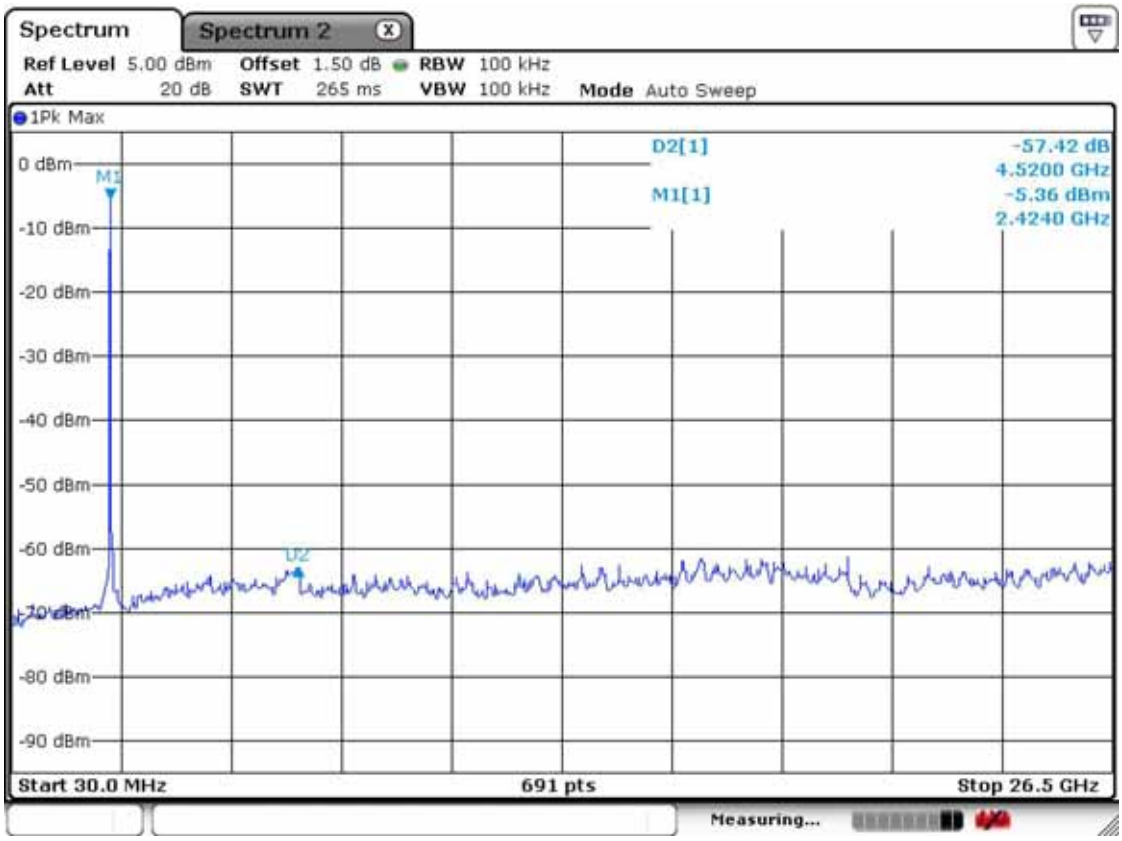
802.11g –channel 11

Frequency Range = 30 MHz ~ 10th harmonic.



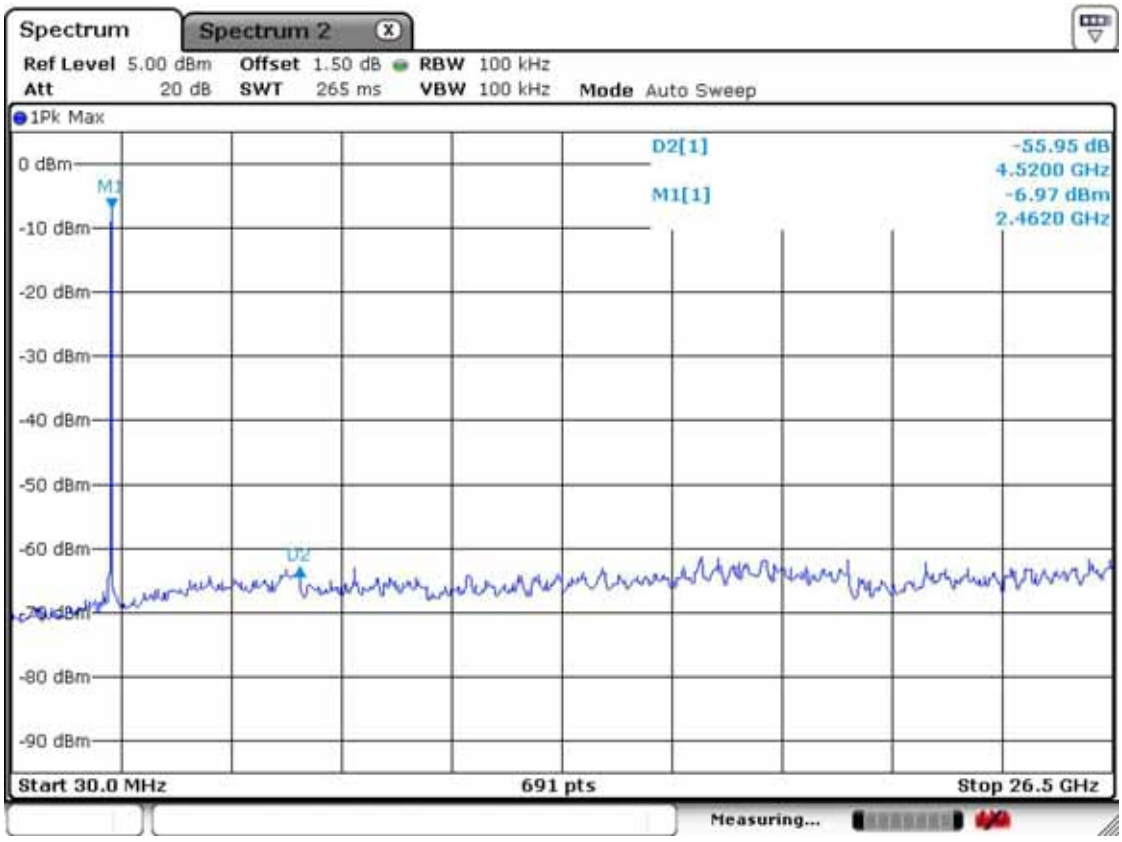
802.11n_20MHz – channel 1

Frequency Range = 30 MHz ~ 10th harmonic.



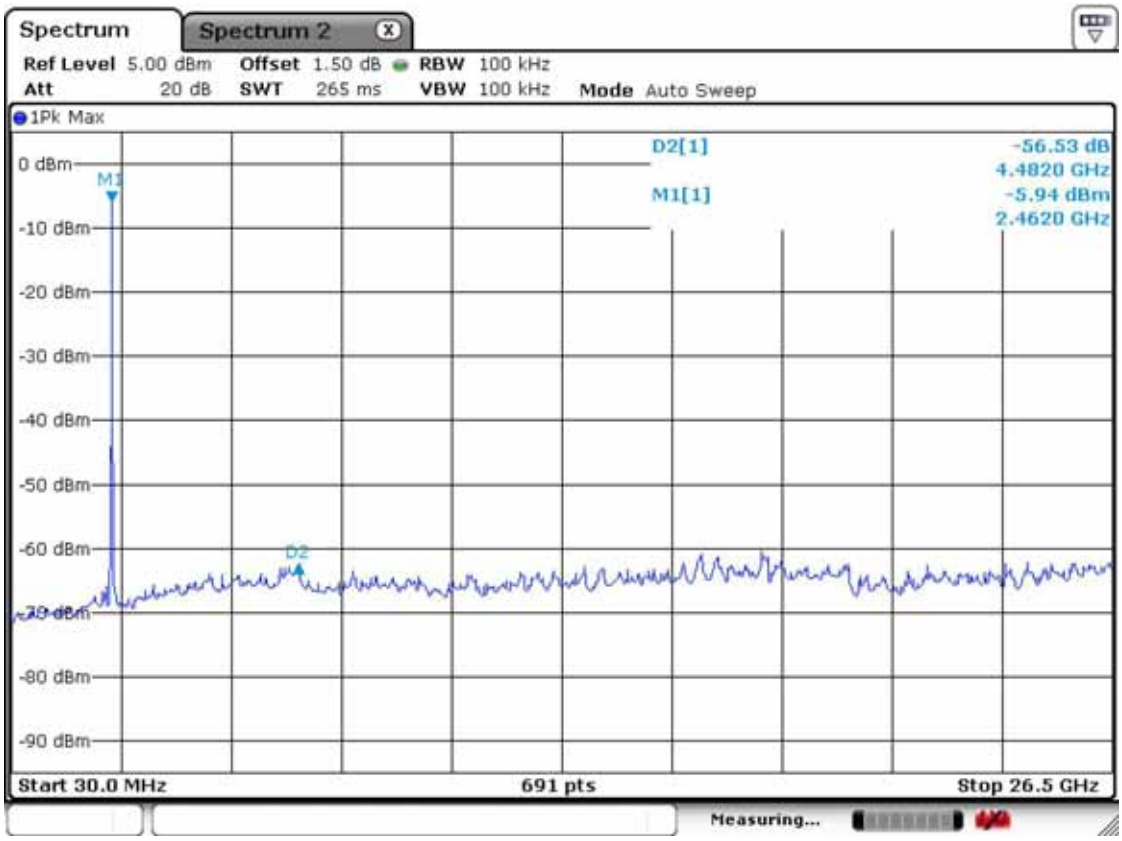
802.11n_20MHz – channel 7

Frequency Range = 30 MHz ~ 10th harmonic.



802.11n_20MHz –channel 11

Frequency Range = 30 MHz ~ 10th harmonic.



3.2.5 Field Strength of Harmonics

Procedure:

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 1m 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.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 10 MHz ~ 10th harmonic.

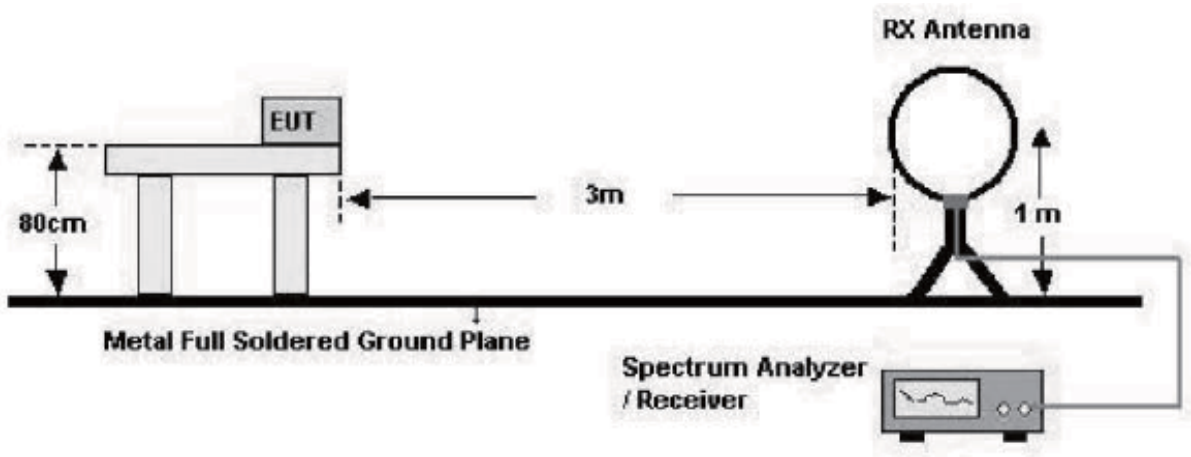
RBW = 100 kHz (10MHz ~ 1 GHz) VBW $\geq$ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

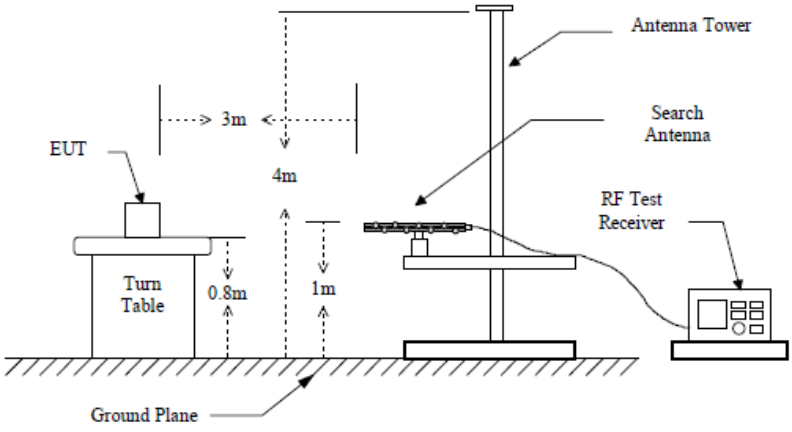
Span = 100 MHz Detector function = peak

Trace = max hold Sweep = auto

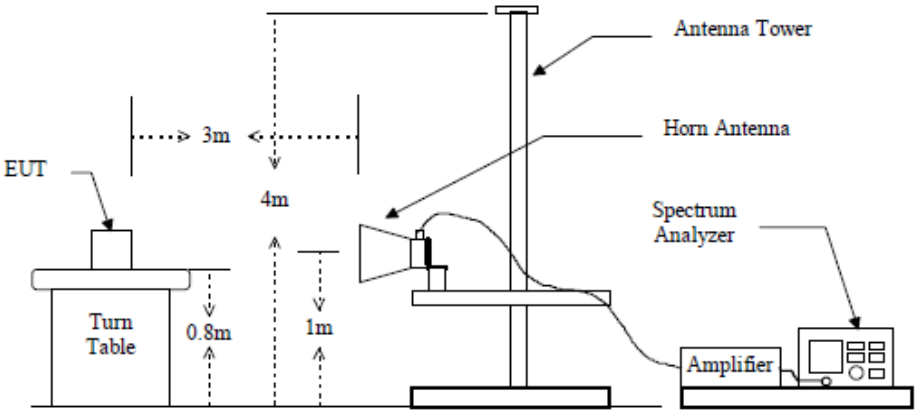
below 30MHz



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

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:

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4823.0	38.2	50.8	H	31.4	36.5	5.7	54.0	74.0	38.9	51.5	15.1	22.5
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4874.0	40.0	52.5	H	31.4	36.5	5.7	54.0	74.0	40.7	53.2	13.3	20.8
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor 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	41.8	54.5	H	31.4	36.5	5.7	54.0	74.0	42.5	55.2	11.6	18.8
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

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

802.11g Measurement Data:

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4823.0	35.8	50.1	H	31.4	36.5	5.7	54.0	74.0	36.5	50.8	17.5	23.2
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4874.0	37.1	51.7	H	31.4	36.5	5.7	54.0	74.0	37.8	52.3	16.2	21.7
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor 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	37.9	52.1	H	31.4	36.5	5.7	54.0	74.0	38.5	52.7	15.5	21.3
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

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

802.11n_20MHz Measurement Data:

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4823.0	35.7	48.7	H	31.4	36.5	5.7	54.0	74.0	36.4	49.4	17.6	24.6
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor Cable	Limits [dBuV/m] AV	Limits [dBuV/m] Peak	Result [dBuV/m] AV	Result [dBuV/m] Peak	Margin [dB] AV	Margin [dB] Peak
4874.0	36.9	50.4	H	31.4	36.5	5.7	54.0	74.0	37.6	51.1	16.4	22.9
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m] AV	Reading [dBuV/m] Peak	Pol.	Correction Factor Antenna	Correction Factor Amp. Gain	Correction Factor 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	37.6	51.5	H	31.4	36.5	5.7	54.0	74.0	38.3	52.2	15.7	21.8
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

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

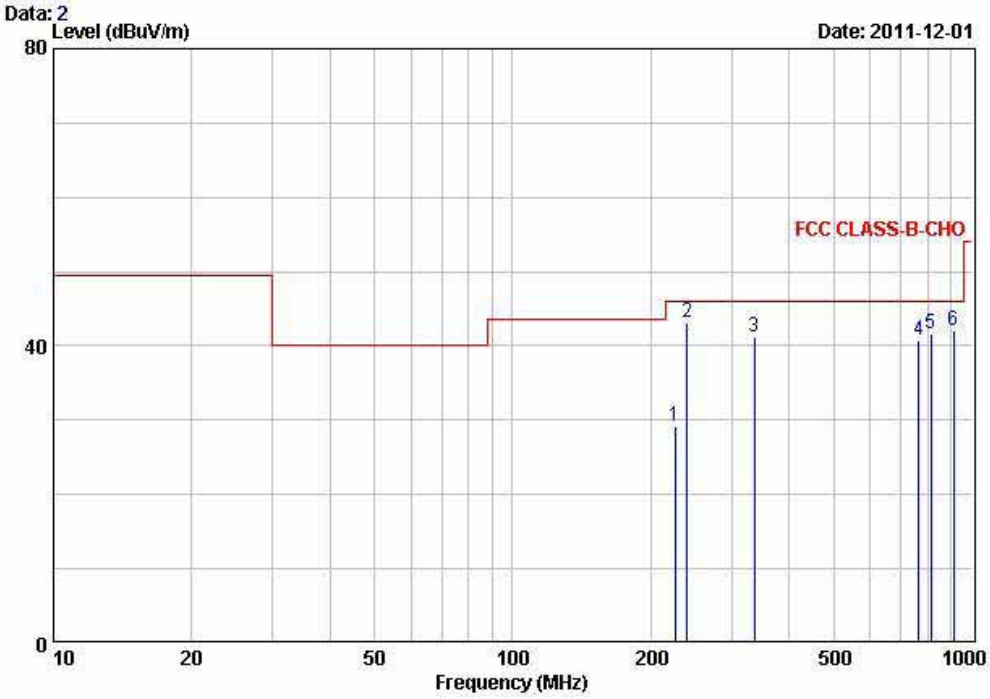
Radiated Emissions – Below 1GHz WORST-CASE DATA : Charging + Play Mode

LTA
Laboratory for Test & Approval Co.,Ltd.

243 Jubug-ri, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
Tel :+82-31-3236008,9
Fax:+82-31-3236010

EUT/Model No.: Z2 TEST MODE: Charging+Play mode

Temp Humi : 9 / 38 Tested by: PARK.H.W



	Freq	Reading	C.F	Result	Limit QP	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	225.50	39.50	-10.24	29.26	46.00	16.74	192	105	HORIZONTAL
2	240.00	52.70	-9.54	43.16	46.00	2.84	174	107	HORIZONTAL
3	335.98	47.70	-6.40	41.30	46.00	4.70	115	125	HORIZONTAL
4	767.97	38.00	2.77	40.77	46.00	5.23	244	71	HORIZONTAL
5	815.98	38.20	3.44	41.64	46.00	4.36	116	89	HORIZONTAL
6	911.98	37.60	4.43	42.03	46.00	3.97	192	36	HORIZONTAL

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

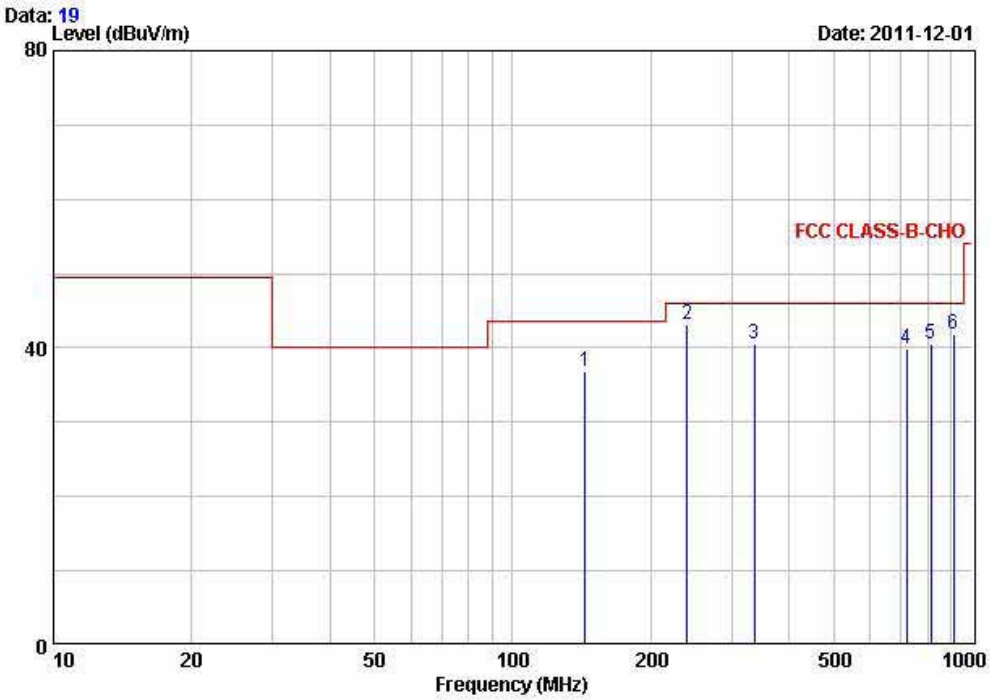
Radiated Emissions – Below 1GHz WORST-CASE DATA : Charging+Wifi Mode

LTA
Laboratory for Test & Approval Co.,Ltd.

243 Jubug-ri, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
Tel :+82-31-3236008,9
Fax:+82-31-3236010

EUT/Model No.: Z2 TEST MODE: Charging+WiFi mode

Temp Humi : 9 / 38 Tested by: PARK.H.W



	Freq	Reading	C.F	Result	Limit QP	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	144.00	45.90	-9.07	36.83	43.50	6.67	216	27	HORIZONTAL
2	240.01	52.80	-9.54	43.26	46.00	2.74	177	49	HORIZONTAL
3	335.98	47.00	-6.40	40.60	46.00	5.40	120	175	HORIZONTAL
4	720.00	37.90	2.07	39.97	46.00	6.03	123	169	HORIZONTAL
5	816.00	37.10	3.44	40.54	46.00	5.46	122	114	HORIZONTAL
6	911.99	37.40	4.43	41.83	46.00	4.17	194	135	HORIZONTAL

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

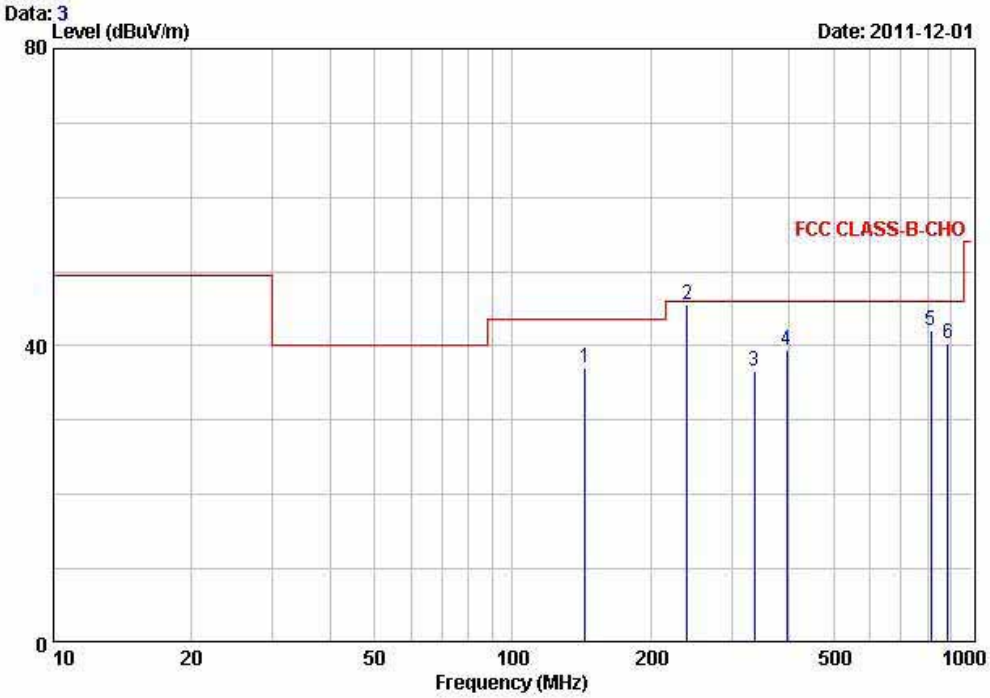
Radiated Emissions – Below 1GHz WORST-CASE DATA : PC Mode

LTA
Laboratory for Test & Approval Co.,Ltd.

243 Jubug-ri, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
Tel :+82-31-3236008,9
Fax:+82-31-3236010

EUT/Model No.: Z2 TEST MODE: PC mode

Temp Humi : 9 / 38 Tested by: PARK.H.W



	Freq	Reading	C.F	Result	Limit QP	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	144.00	46.10	-9.07	37.03	43.50	6.47	400	125	HORIZONTAL
2	240.00	55.00	-9.54	45.46	46.00	0.54	400	162	HORIZONTAL
3	336.00	43.00	-6.40	36.60	46.00	9.40	139	120	HORIZONTAL
4	396.00	44.80	-5.42	39.38	46.00	6.62	105	76	VERTICAL
5	816.00	38.70	3.44	42.14	46.00	3.86	135	169	HORIZONTAL
6	888.00	36.40	3.91	40.31	46.00	5.69	143	248	HORIZONTAL

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

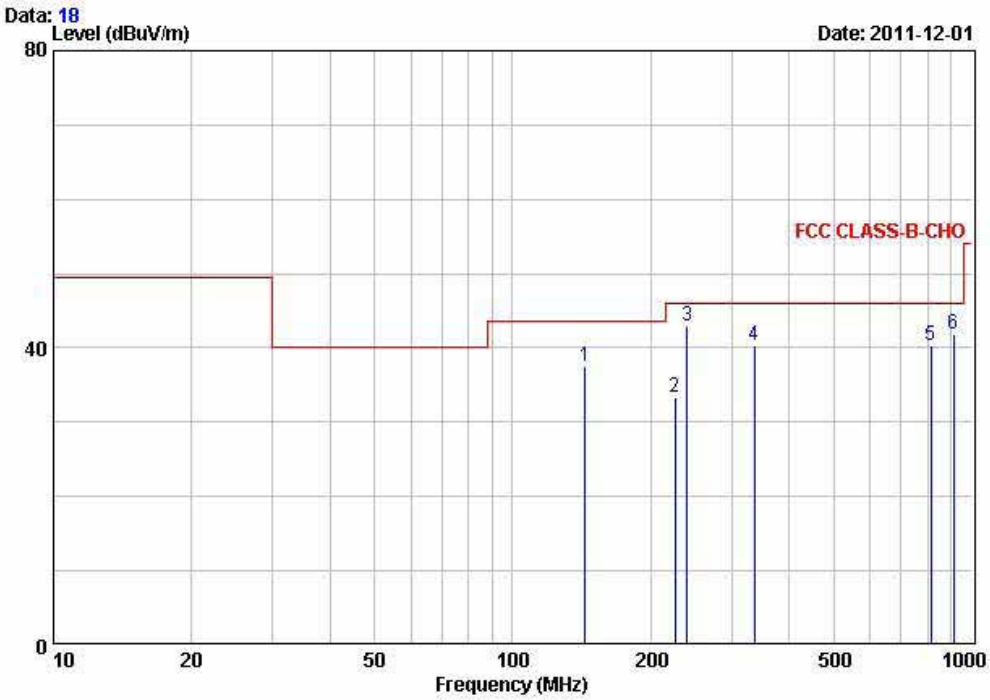
Radiated Emissions – Below 1GHz WORST-CASE DATA : Charging+REC Mode

LTA
Laboratory for Test & Approval Co.,Ltd.

243 Jubug-ri, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
Tel :+82-31-3236008,9
Fax:+82-31-3236010

EUT/Model No.: Z2 TEST MODE: Charging+Rec mode

Temp Humi : 9 / 38 Tested by: PARK.H.W



	Freq	Reading	C.F	Result	Limit QP	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	144.01	46.50	-9.07	37.43	43.50	6.07	244	71	HORIZONTAL
2	225.51	43.60	-10.24	33.36	46.00	12.64	194	127	HORIZONTAL
3	240.00	52.50	-9.54	42.96	46.00	3.04	176	123	HORIZONTAL
4	336.00	46.80	-6.40	40.40	46.00	5.60	113	167	HORIZONTAL
5	815.97	36.90	3.44	40.34	46.00	5.66	124	103	HORIZONTAL
6	912.00	37.40	4.43	41.83	46.00	4.17	201	159	HORIZONTAL

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

3.2.8 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

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 20dB below limit.

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

AC Conducted Emissions at Charging+Play mode – Line

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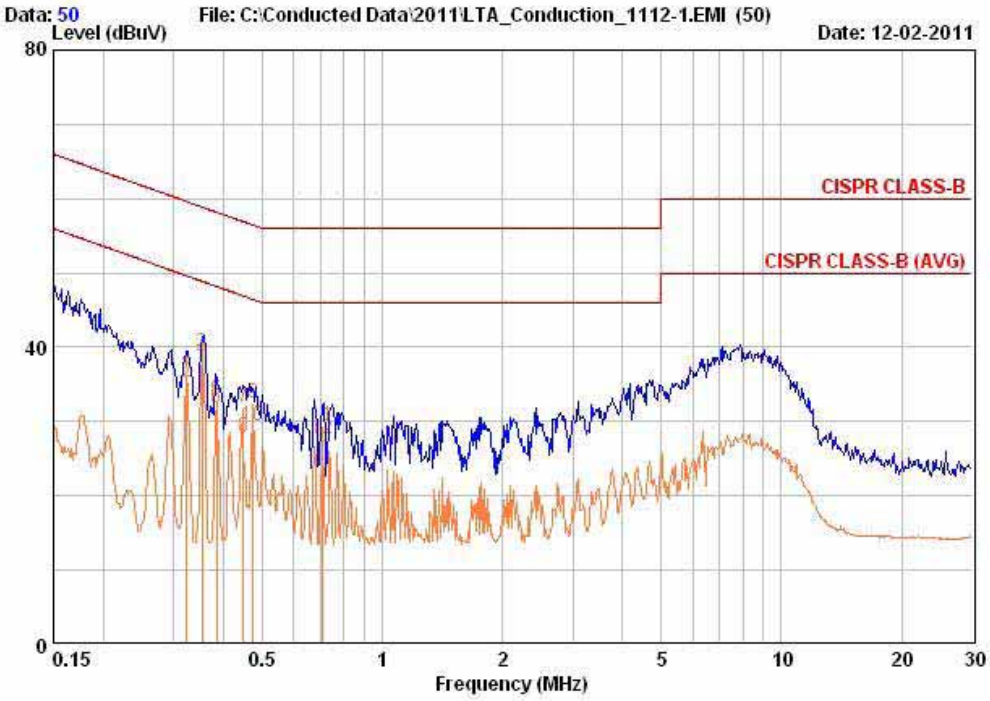
EUT / Model No.	: Z2	Phase	: LINE
Test Mode	: Charging+Play mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.324	26.83	25.73	9.63	36.46	35.36	59.60	49.60	23.15	14.25
0.354	29.53	28.63	9.63	39.16	38.26	58.87	48.87	19.71	10.61
0.385	23.33	22.23	9.64	32.97	31.87	58.17	48.17	25.20	16.30
0.449	22.22	18.22	9.62	31.85	27.85	56.89	46.89	25.04	19.04
0.474	22.92	19.72	9.62	32.54	29.34	56.44	46.44	23.90	17.10
0.709	19.82	18.02	9.71	29.53	27.73	56.00	46.00	26.47	18.27

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

AC Conducted Emissions at Charging+Play mode – Neutral

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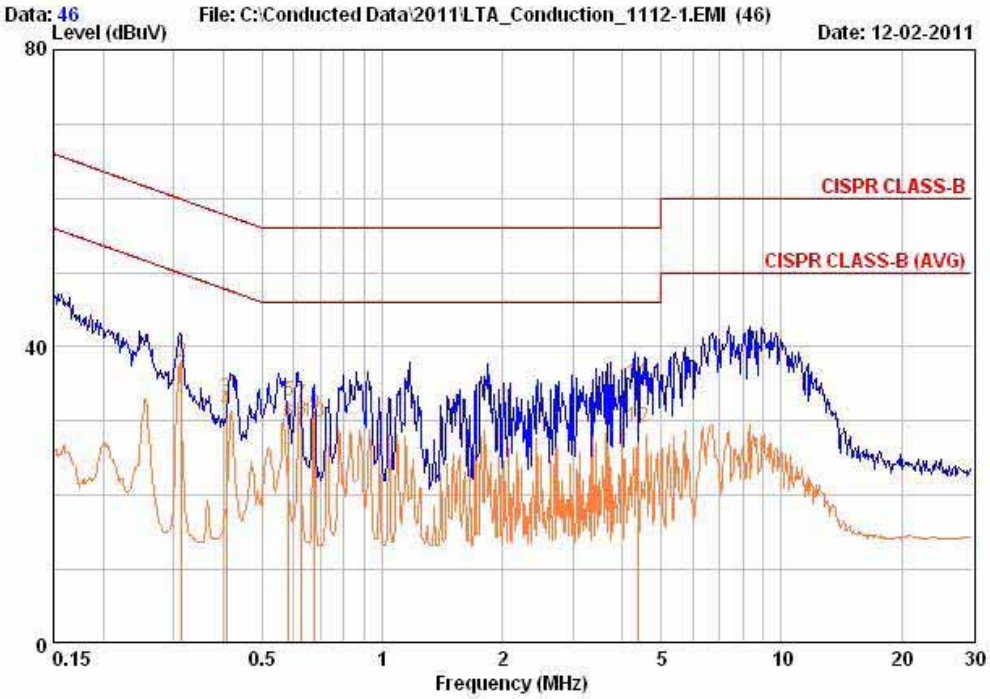
EUT / Model No.	: Z2	Phase	: NEUTRAL
Test Mode	: Charging+Play mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.314	28.83	28.33	9.59	38.42	37.92	59.86	49.86	21.44	11.94
0.406	23.43	21.73	9.67	33.10	31.40	57.73	47.73	24.63	16.33
0.584	23.12	20.02	9.67	32.79	29.69	56.00	46.00	23.21	16.31
0.627	22.62	20.42	9.65	32.27	30.07	56.00	46.00	23.73	15.93
0.676	21.42	20.22	9.64	31.06	29.86	56.00	46.00	24.94	16.14
4.373	25.34	19.44	9.72	35.06	29.16	56.00	46.00	20.94	16.84

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

AC Conducted Emissions at Charging+Wifi mode – Line

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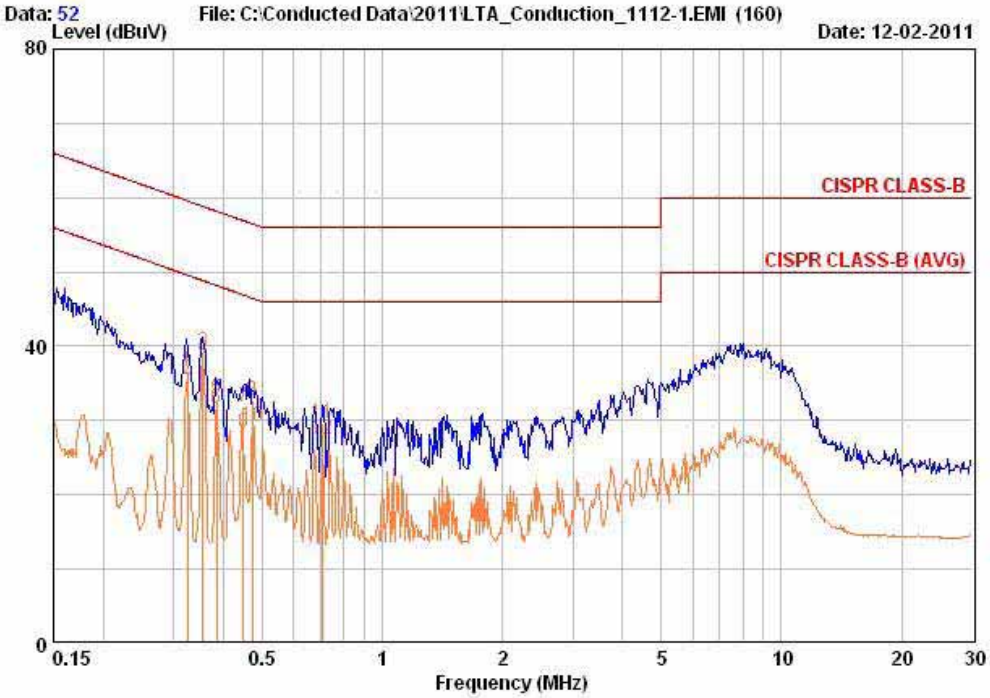
EUT / Model No.	: Z2	Phase	: LINE
Test Mode	: Charging+WiFi mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.325	26.93	25.83	9.63	36.56	35.46	59.58	49.58	23.02	14.12
0.355	29.63	28.63	9.63	39.26	38.26	58.84	48.84	19.58	10.58
0.384	23.33	21.93	9.64	32.97	31.57	58.19	48.19	25.23	16.63
0.449	22.12	18.62	9.62	31.75	28.25	56.89	46.89	25.14	18.64
0.473	23.02	19.62	9.62	32.64	29.24	56.46	46.46	23.82	17.22
0.708	19.92	17.82	9.71	29.63	27.53	56.00	46.00	26.37	18.47

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

AC Conducted Emissions at Charging+Wifi mode – Neutral

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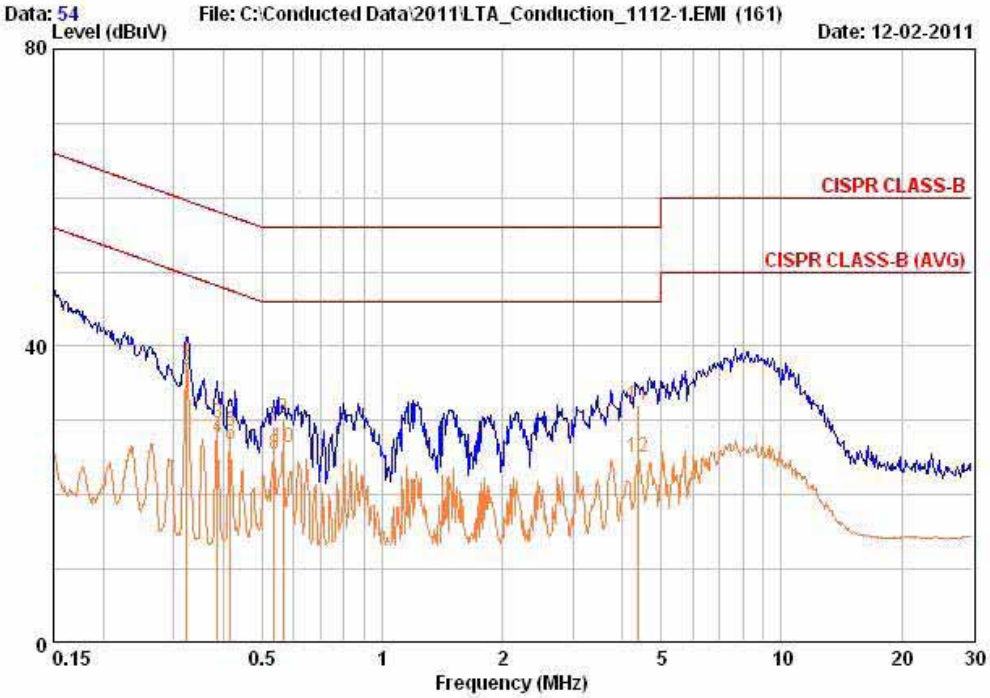
EUT / Model No.	: Z2	Phase	: NEUTRAL
Test Mode	: Charging+WiFi mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



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
0.324	28.23	27.23	9.60	37.83	36.83	59.60	49.60	21.77	12.77
0.386	20.03	17.93	9.66	29.69	27.59	58.15	48.15	28.46	20.56
0.417	18.93	17.03	9.68	28.60	26.70	57.51	47.51	28.90	20.80
0.536	19.62	15.72	9.69	29.31	25.41	56.00	46.00	26.69	20.59
0.563	20.62	16.72	9.68	30.30	26.40	56.00	46.00	25.70	19.60
4.393	22.34	15.44	9.72	32.06	25.16	56.00	46.00	23.94	20.84

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

AC Conducted Emissions at PC mode – Line

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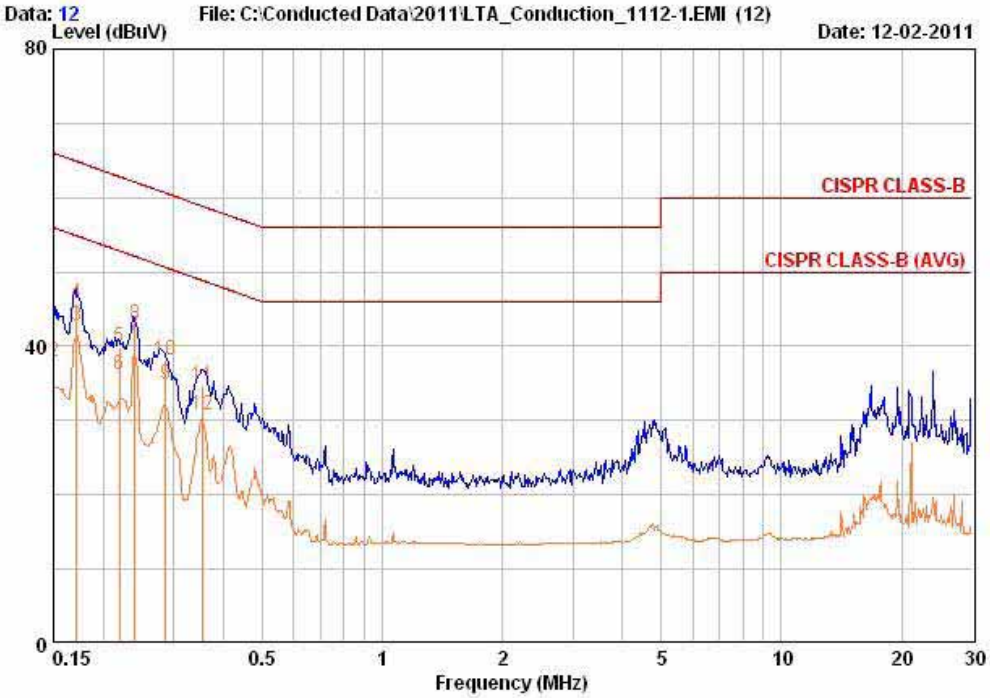
EUT / Model No.	: Z2	Phase	: LINE
Test Mode	: PC mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.150	32.54	28.24	9.72	42.26	37.96	66.00	56.00	23.74	18.04
0.171	36.04	32.94	9.69	45.73	42.63	64.91	54.91	19.18	12.28
0.220	30.24	26.54	9.64	39.87	36.17	62.82	52.82	22.94	16.64
0.240	33.43	31.73	9.62	43.05	41.35	62.10	52.10	19.05	10.75
0.286	28.53	25.23	9.62	38.15	34.85	60.64	50.64	22.49	15.79
0.354	24.93	21.03	9.63	34.56	30.66	58.87	48.87	24.31	18.21

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

AC Conducted Emissions at PC mode – Neutral

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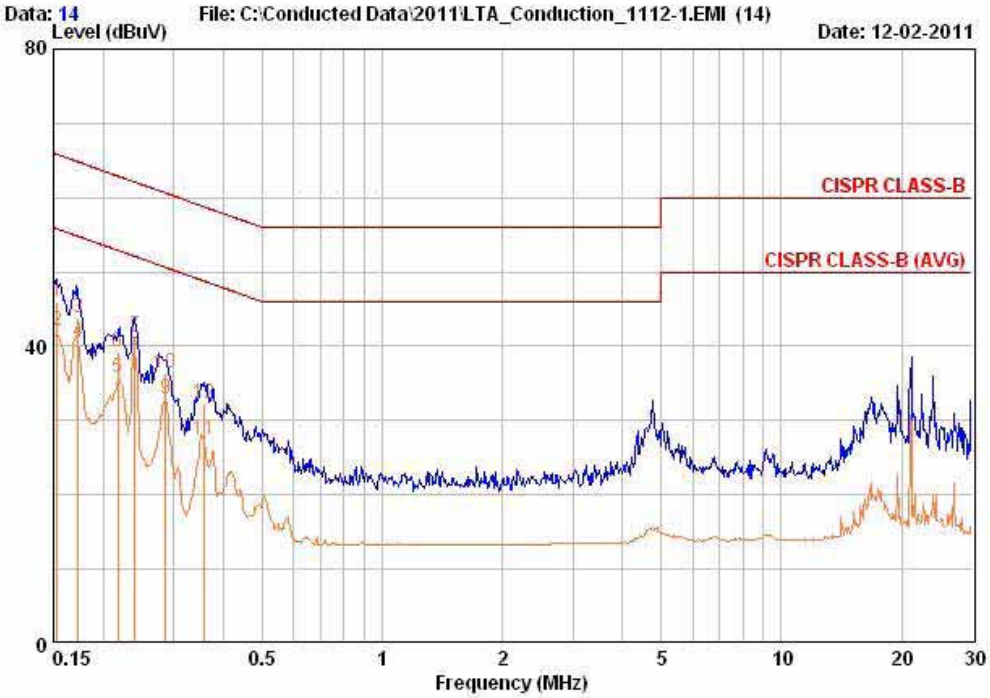
EUT / Model No.	: Z2	Phase	: NEUTRAL
Test Mode	: PC mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.153	36.34	32.44	9.64	45.98	42.08	65.84	55.84	19.85	13.75
0.173	34.24	30.94	9.61	43.85	40.55	64.82	54.82	20.97	14.27
0.217	29.64	26.04	9.61	39.25	35.65	62.93	52.93	23.69	17.29
0.240	31.73	29.73	9.67	41.41	39.41	62.10	52.10	20.69	12.69
0.286	26.73	23.23	9.61	36.34	32.84	60.64	50.64	24.30	17.80
0.357	22.53	17.93	9.63	32.16	27.56	58.80	48.80	26.63	21.23

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

AC Conducted Emissions at Charging+REC mode – Line

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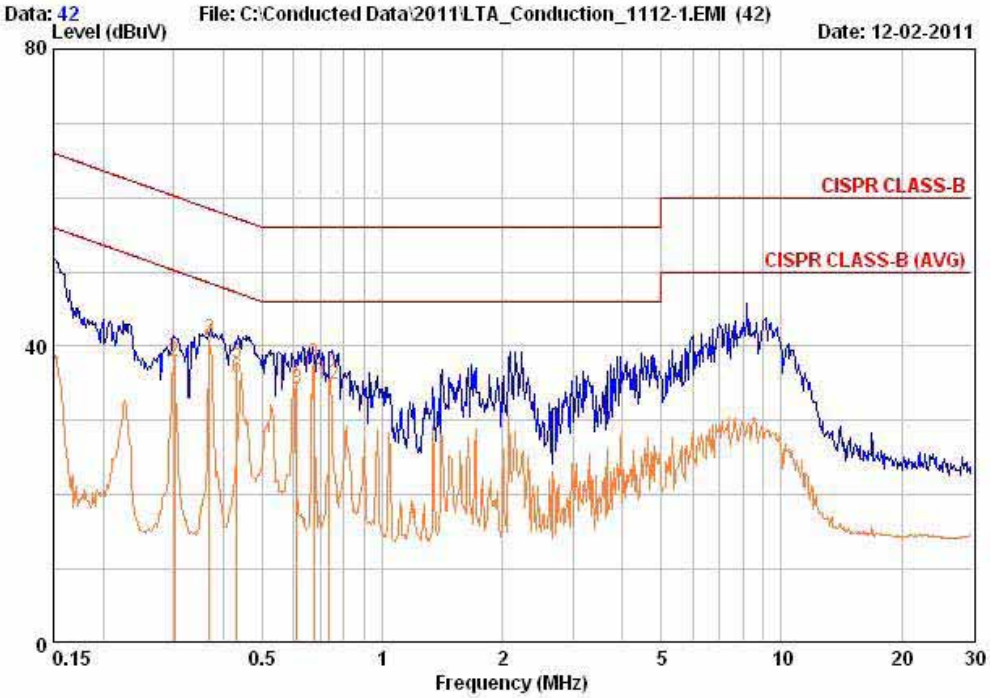
EUT / Model No.	: Z2	Phase	: LINE
Test Mode	: Charging+Rec mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.302	29.13	28.33	9.62	38.75	37.95	60.19	50.19	21.44	12.24
0.368	31.43	30.73	9.63	41.06	40.36	58.55	48.55	17.48	8.18
0.432	28.13	26.03	9.63	37.76	35.66	57.21	47.21	19.46	11.56
0.610	25.92	24.62	9.67	35.59	34.29	56.00	46.00	20.41	11.71
0.673	28.02	27.12	9.70	37.72	36.82	56.00	46.00	18.28	9.18
0.732	26.82	25.22	9.72	36.54	34.94	56.00	46.00	19.46	11.06

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

AC Conducted Emissions at Charging+REC mode – Neutral

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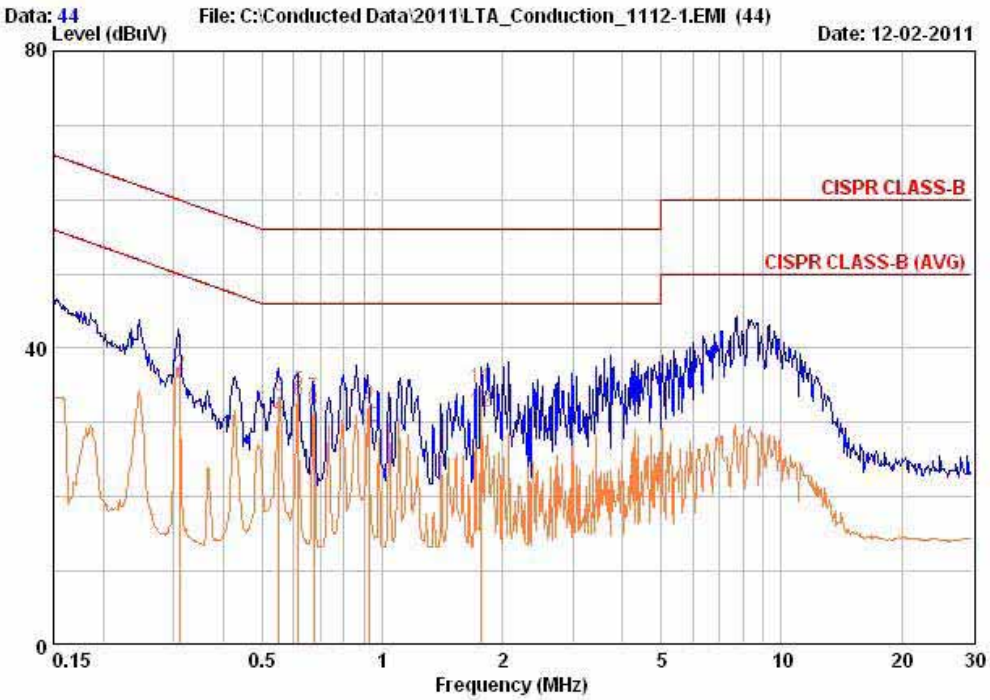
EUT / Model No.	: Z2	Phase	: NEUTRAL
Test Mode	: Charging+Rec mode	Test Power	: 120 / 60
Temp./Humi.	: 21 / 33	Test Engineer	: PARK.H.W



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.311	28.53	26.73	9.59	38.12	36.32	59.94	49.94	21.82	13.62
0.551	23.82	21.02	9.68	33.50	30.70	56.00	46.00	22.50	15.30
0.616	24.62	23.22	9.66	34.28	32.88	56.00	46.00	21.72	13.12
0.675	23.72	22.02	9.64	33.36	31.66	56.00	46.00	22.64	14.34
0.925	22.73	19.73	9.68	32.40	29.40	56.00	46.00	23.60	16.60
1.770	24.95	21.85	9.65	34.59	31.49	56.00	46.00	21.41	14.51

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

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Interval	Last Cal. Date
1	Spectrum Analyzer (~30GHz)	FSV-30	100757	R&S	1 year	2011-01-24
2	Signal Generator (~3.2GHz)	8648C	3623A02597	HP	1 year	2011-03-30
3	Signal Generator (1~20GHz)	83711B	US34490456	HP	1 year	2011-03-30
4	Attenuator (3dB)	8491A	37822	HP	2 year	2010-10-08
5	Attenuator (10dB)	8491A	63196	HP	2 year	2010-10-08
6	Attenuator (30dB)	8498A	3318A10929	HP	2 year	2011-01-05
7	Test Receiver (~30MHz)	ESHS10	828404/009	R&S	1 year	2011-03-30
8	EMI Test Receiver (~1GHz)	ESCI7	100722	R&S	1 year	2011-10-07
9	RF Amplifier (~1.3GHz)	8447D	2439A09058	HP	2 year	2010-10-08
10	RF Amplifier (1~18GHz)	8449B	3008A02126	HP	2 year	2010-03-29
11	Horn Antenna (1~18GHz)	BBHA 9120D	9120D122	SCHWARZBECK	2 year	2010-12-24
12	Horn Antenna (18 ~ 40GHz)	SAS-574	154	Schwarzbeck	2 year	2010-11-25
13	Horn Antenna (18 ~ 40GHz)	SAS-574	155	Schwarzbeck	2 year	2010-11-25
14	TRILOG Antenna	VULB 9160	9160-3172	SCHWARZBECK	2 year	2010-10-07
15	Dipole Antenna	VHA9103	2116	SCHWARZBECK	2 year	2010-11-25
16	Dipole Antenna	VHA9103	2117	SCHWARZBECK	2 year	2010-11-25
17	Dipole Antenna	VHA9105	2261	SCHWARZBECK	2 year	2010-11-25
18	Dipole Antenna	VHA9105	2262	SCHWARZBECK	2 year	2010-11-25
19	Hygro-Thermograph	THB-36	0041557-01	ISUZU	2 year	2010-04-12
20	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
21	Power Divider	11636A	6243	HP	2 year	2010-10-08
22	DC Power Supply	6622A	3448A03079	HP	-	-
23	Frequency Counter	5342A	2826A12411	HP	1 year	2011-03-30
24	Power Meter	EPM-441A	GB32481702	HP	1 year	2011-03-30
25	Power Sensor	8481A	US41030291	HP	1 year	2011-10-07
26	Audio Analyzer	8903B	3729A18901	HP	1 year	2011-10-07
27	Modulation Analyzer	8901B	3749A05878	HP	1 year	2011-10-07
28	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2011-10-07
29	Stop Watch	HS-3	601Q09R	CASIO	2 year	2010-03-31
30	LISN	ENV216	100408	R&S	1 year	2011-10-07
31	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	2 year	2010-05-13
32	Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	-	-
33	Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	-	-
34	Loop Antenna	FMZB 1516	151602/94	SCHWARZBECK	2 year	2011-04-05