EMC Test Report

Project Number: 3044696
Report Number: 3044696EMC24 **Revision Level:** 0
Client: Intermec

Equipment Under Test: Mobile Computer with CDMA/EVDO/GSM/UMTS/BT/WiFi
Marketing Name: Catalina
Model: CN51 (1015CP01S)
Hardware Version: P2

Applicable Standards: FCC Part 15 Subpart C, § 15.247
RSS-210, Issue 8, December 2010
ANSI C63.10: 2009

Report issued on: 2 Aug 2013
Test Result: Compliant

Tested by: Jeremy O. Pickens, Senior EMC Engineer

Reviewed by: David Schramm, EMC Manager

Remarks:
This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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1 Summary of Test Results

Test Description	Test Specification	Test Result
Occupied Bandwidth	15.247(a) (1)	Compliant
Spectral Density	15.247(f), 15.247(e)	Compliant
Peak Power Output	15.247(a) (1)	Compliant
Conducted Spurious Emissions	15.247(d)	Compliant
Band Edge	15.247(d)	Compliant
Radiated Spurious Emissions	15.247(d), 15.35(b),15.209	Compliant
6dB Bandwidth	15.247(a) (2)	Compliant
AC Powerline Conducted Emission	15.107, 15.207	Compliant

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name: Intermec
Address: 6001 36th Avenue West
City, State, Zip, Country: Everett, WA 98203 - 1264

2.1 *Test Laboratory*

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
Type of lab: Testing Laboratory
Certificate Number: 3212.01

2.2 *General Information of EUT*

Marketing Name: Catalina
Model: CN51 (1015CP01S)
Serial Number: 327X1200047 (conducted)
077X1200001 (radiated)
FCC ID: EHA-1015CP01SX1
Frequency Range: 2412 to 2462 MHz
Data Modes: 802.11bgn
Antenna: Integral

Rated Voltage: 3.8 VDC Internal Battery

Sample Received Date: May 7, 2013
Dates of testing: May 8, 2013 through July 25, 2013

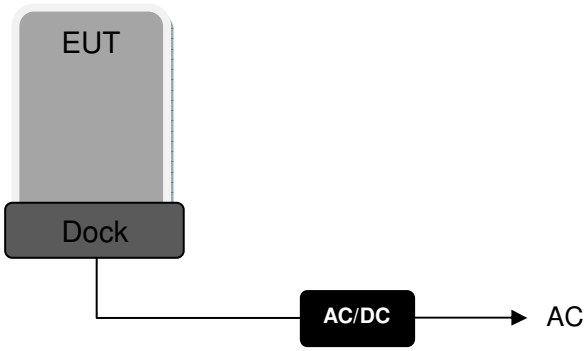
Operating Modes and Conditions

Modulations used: For fundamental and spurious measurements, the EUT was configured to operate continuously with Wi-Fi modulation enabled.

As specified in Section 5.10.5 of ANSI C63.10:2009:

- The software allowed configuration and operation on all available unlicensed wireless device channels.
- The software allowed configuration and operation using all available modulations and data rates
- The software allowed configuration and operation on all available power out levels

2.3 *EUT Connection Block Diagram*



2.4 *System Configurations*

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Intermec	EUT	1015CP01	327X1200047 (conducted) 077X1200001 (radiated)
B	Intermec	AC Adapter	AE37	000261

3 Occupied Bandwidth

3.1 *Test Result*

Test Description	Basic Standards	Test Result
6 dB bandwidth	15.247(a) (2)	Compliant

3.2 *Test Method*

The procedures from ANSI C63.10 (2009) clause 6.9 were used to determine the 20 dB bandwidth.

3.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 24.4 ℃
Relative Humidity: 47.8 %

3.4 *Test Equipment*

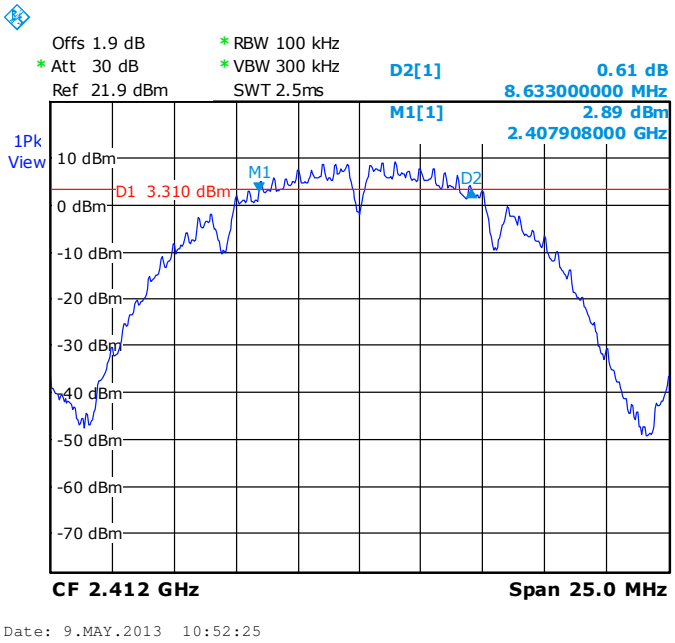
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	FSL6	Rhode & Schwarz	1257361J	08 JAN 2014

Note: The calibration period equipment is 1 year.

3.5 *Test Data*

Protocol	Channel	Data Rate	6dB Bandwidth
802.11b	1	1	8.63
802.11b	1	5.5	9.73
802.11b	1	11	8.98
802.11b	6	1	9.182
802.11b	6	5.5	10.13
802.11b	6	11	9.63
802.11b	11	1	9.53
802.11b	11	5.5	9.13
802.11b	11	11	10.13
802.11g	1	6	15.42
802.11g	1	36	15.77
802.11g	1	54	15.97
802.11g	6	6	16.37
802.11g	6	36	16.47
802.11g	6	54	16.42
802.11g	11	6	15.97
802.11g	11	36	16.42
802.11g	11	54	16.42
802.11n	1	MCS0	15.37
802.11n	1	MCS7	16.32
802.11n	6	MCS0	17.27
802.11n	6	MCS7	17.37
802.11n	11	MCS0	16.82
802.11n	11	MCS7	17.52

6 dB Bandwidth Plots, 802.11b
Channel 1
Data rates: 1, 5.5, 11Mb/s



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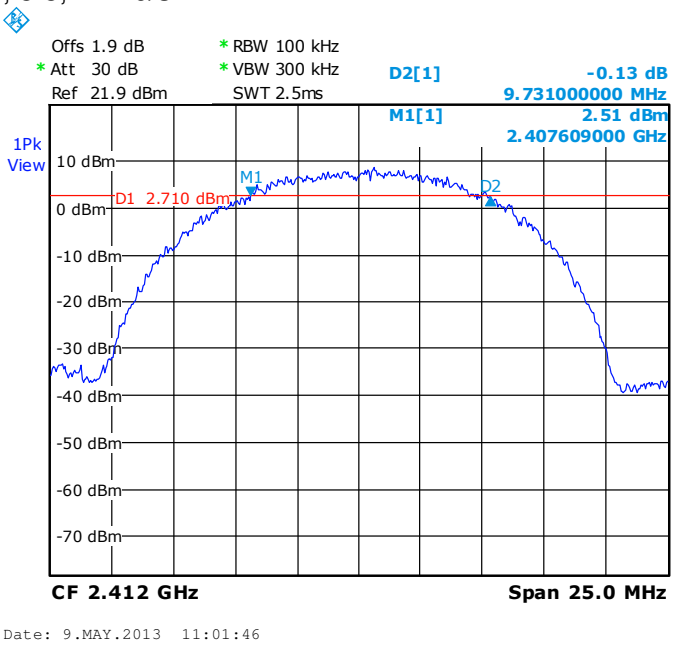

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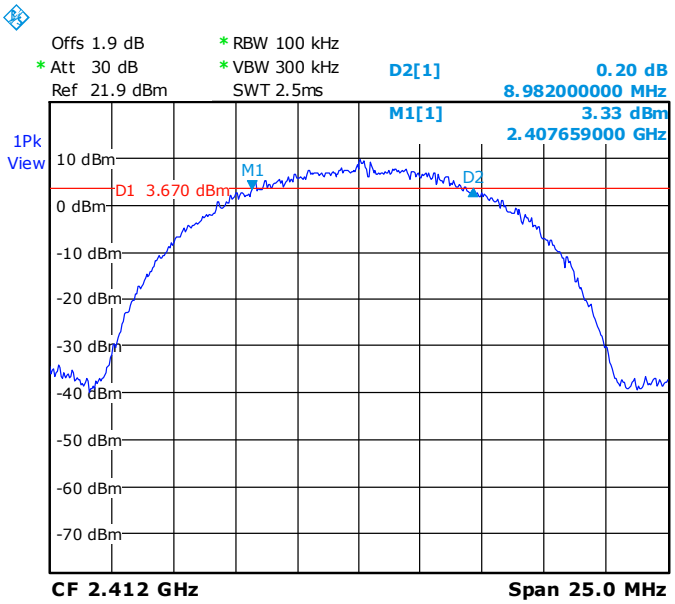

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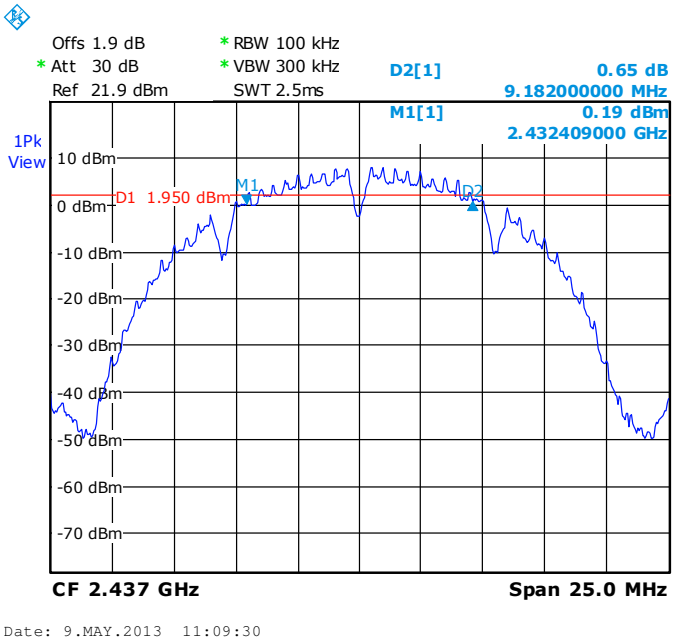
6 dB Bandwidth Plots, 802.11b
Channel 6
Data rates: 1, 5.5, 11Mb/s



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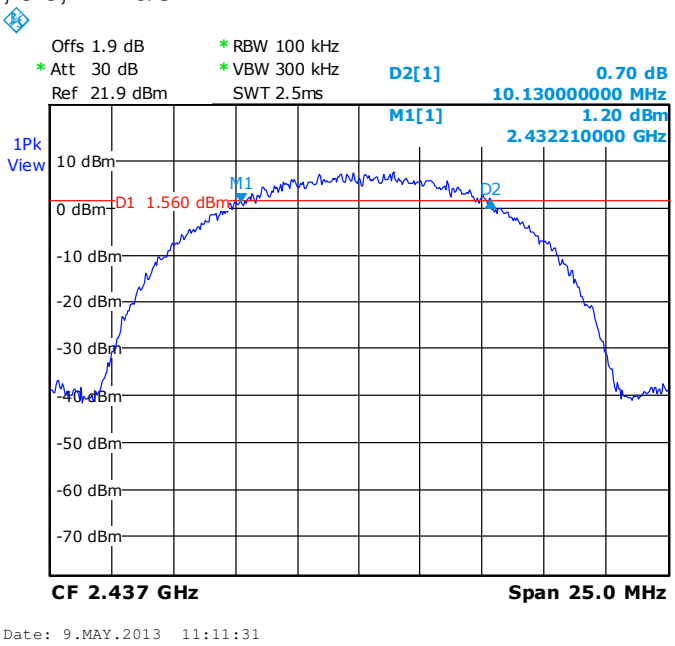

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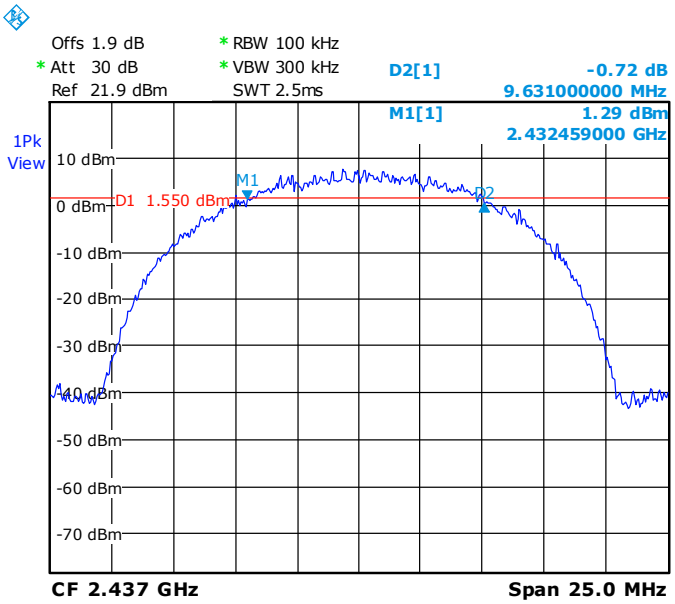

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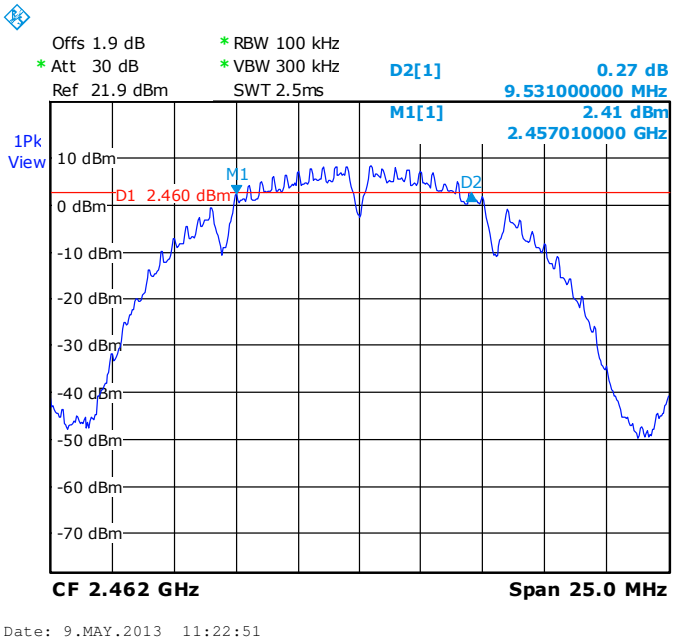
6 dB Bandwidth Plots, 802.11b
Channel 11
Data rates: 1, 5.5, 11Mb/s



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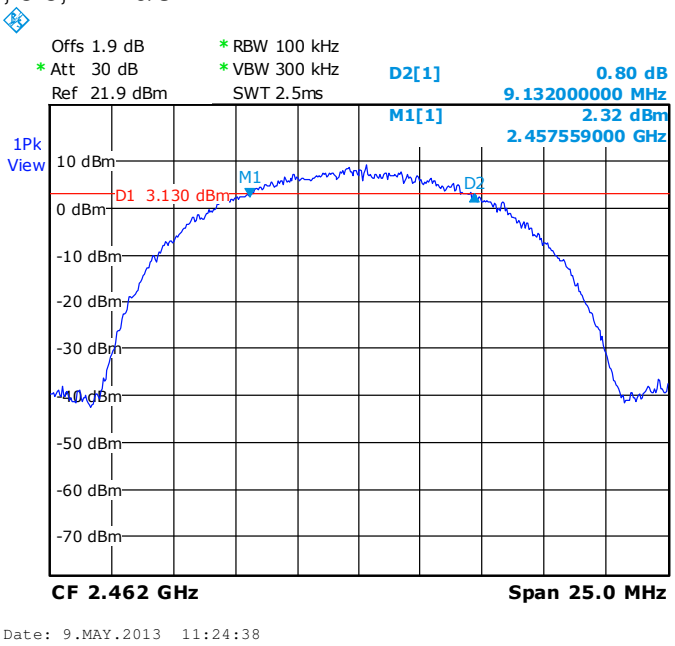

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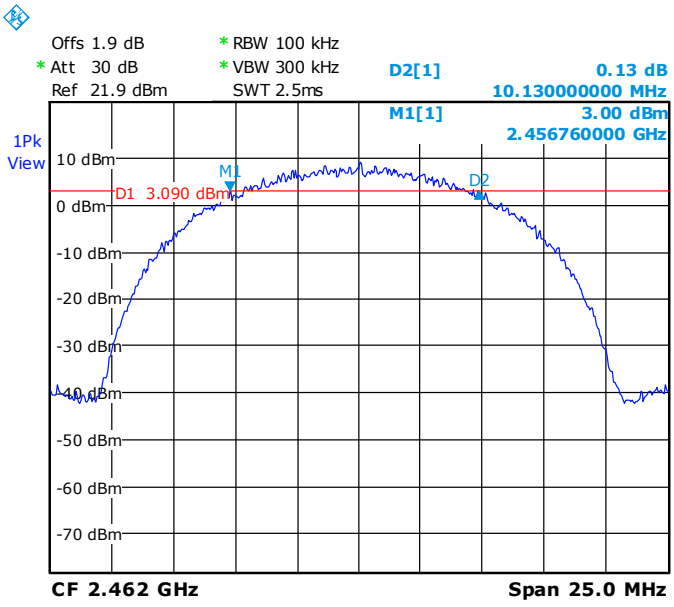

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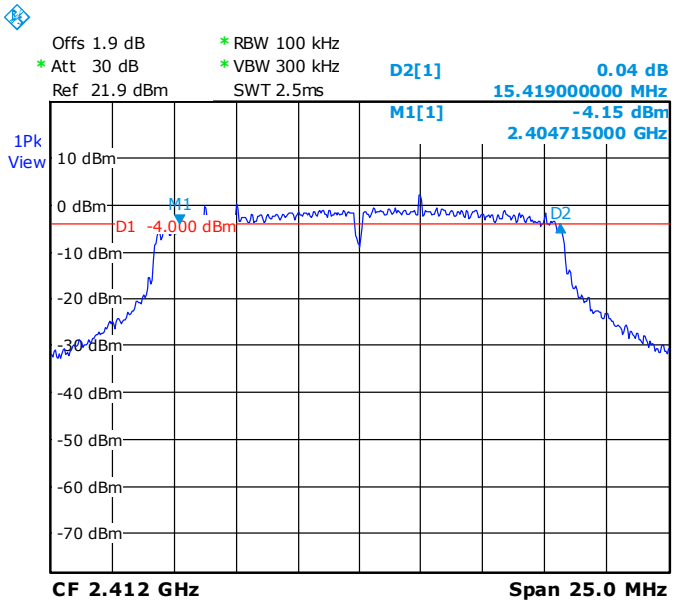
6 dB Bandwidth Plots, 802.11g
Channel 1
Data rates: 6, 36, 54Mb/s



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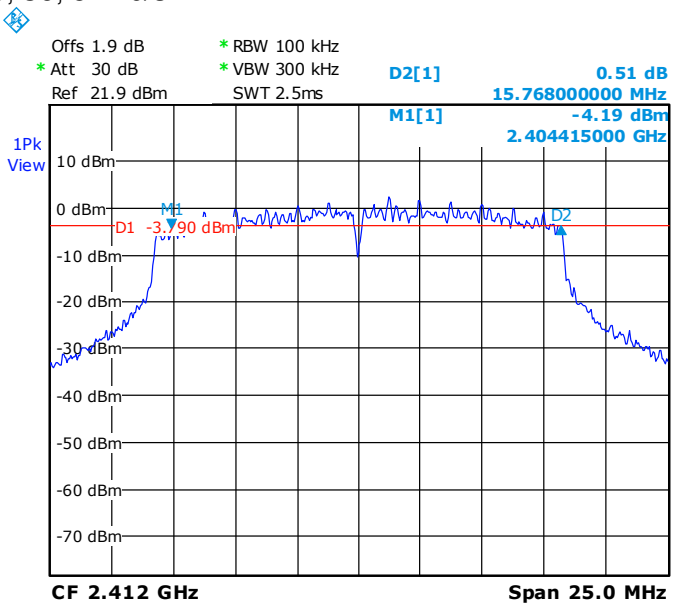

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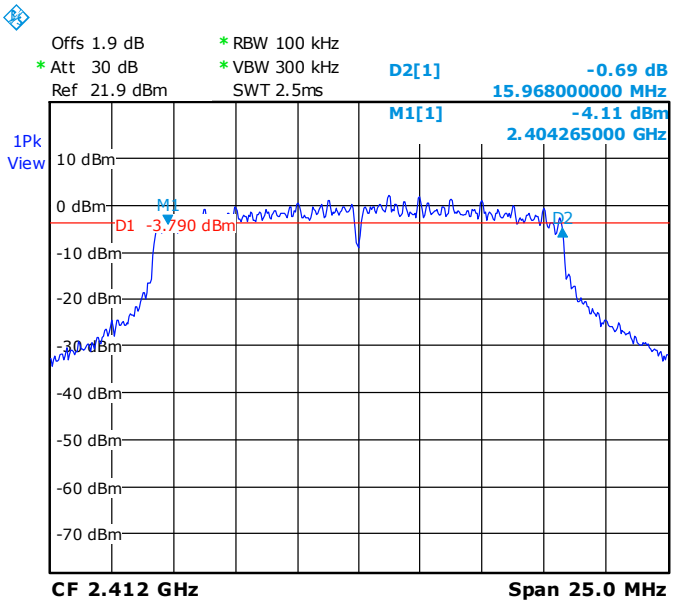

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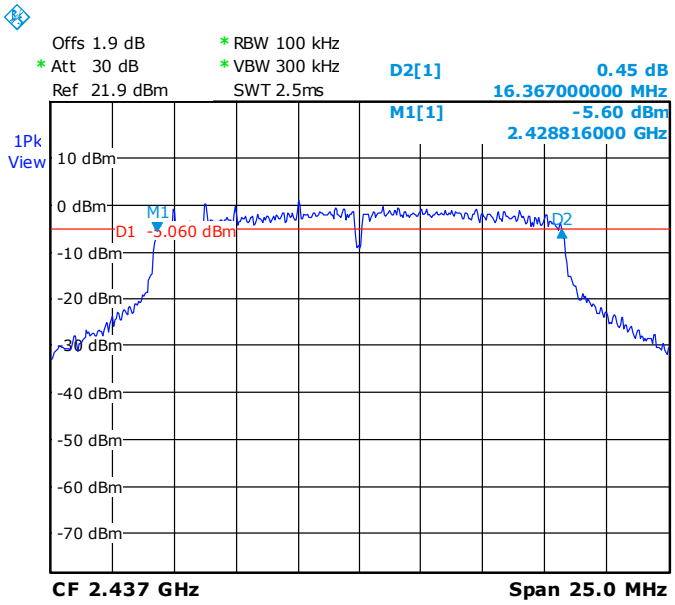
6 dB Bandwidth Plots, 802.11g
Channel 6
Data rates: 6, 36, 54Mb/s



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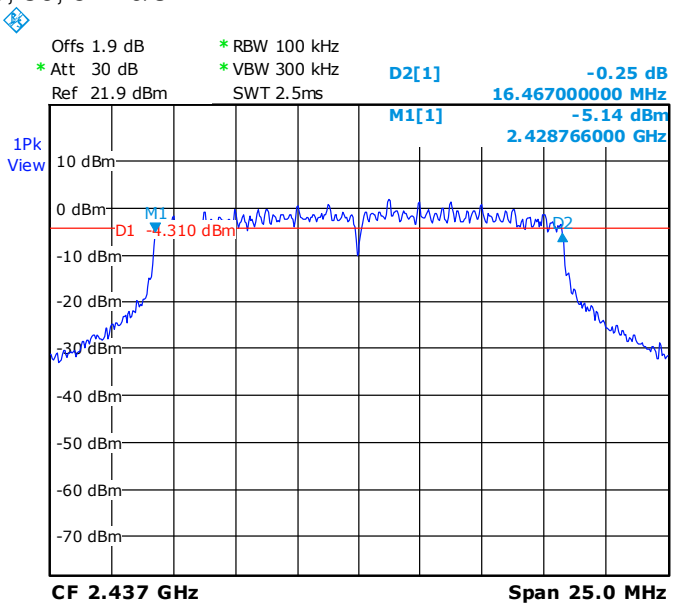

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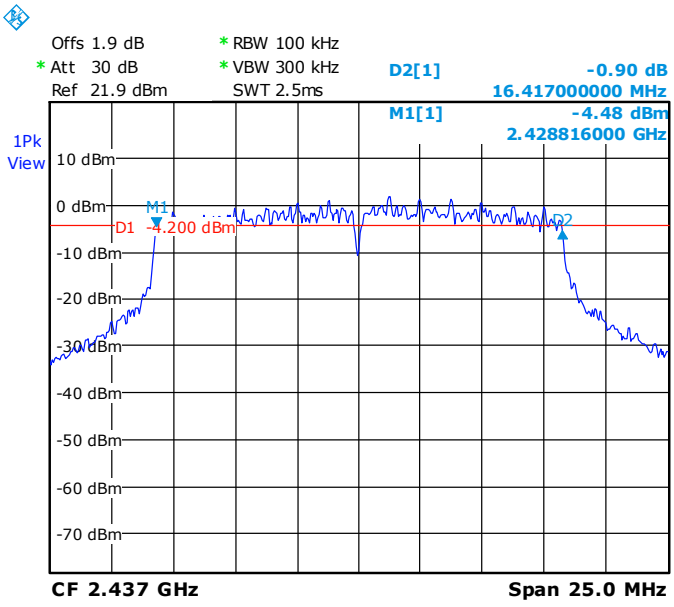

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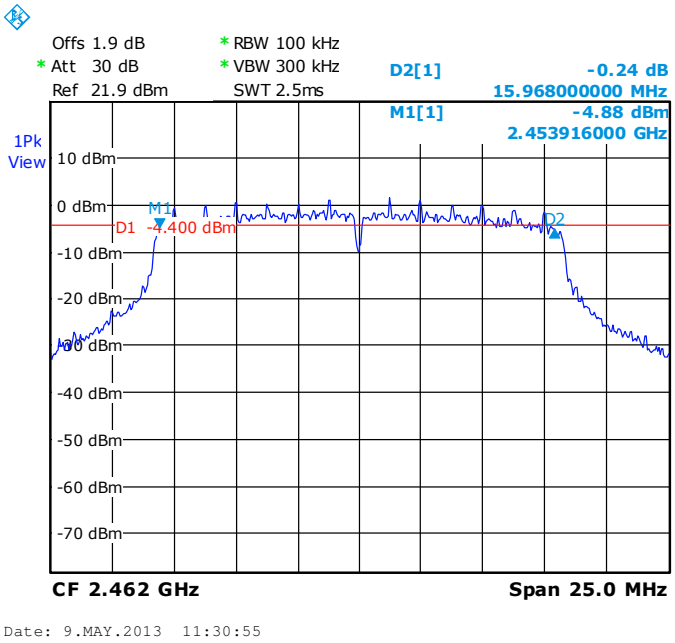
6 dB Bandwidth Plots, 802.11g
Channel 11
Data rates: 6, 36, 54Mb/s



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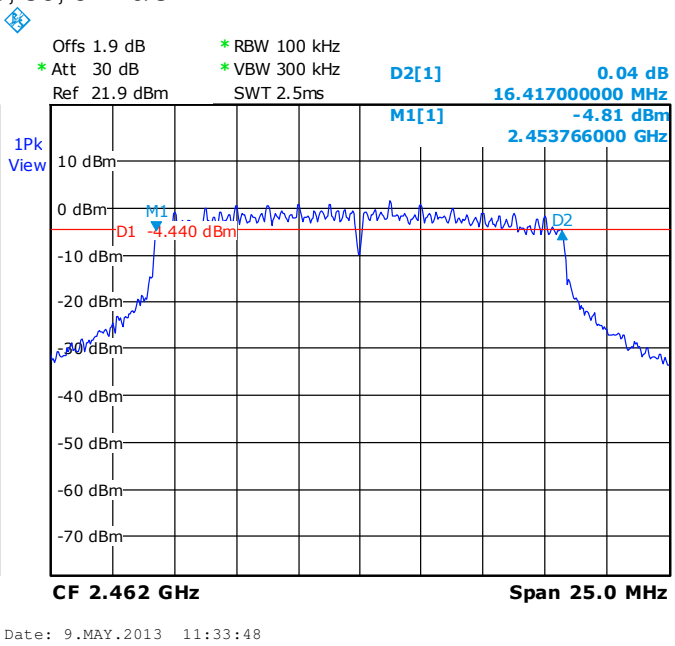

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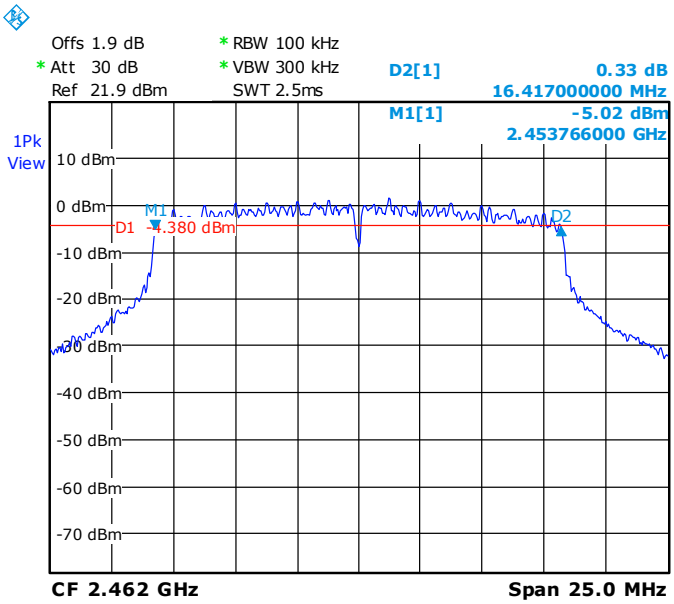

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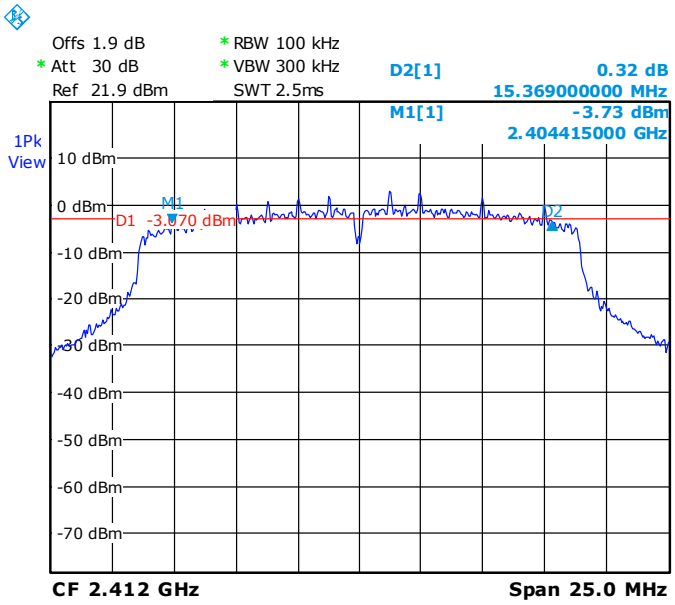
6 dB Bandwidth Plots, 802.11n
Channel 1
Data rates: MCS0, MCS7



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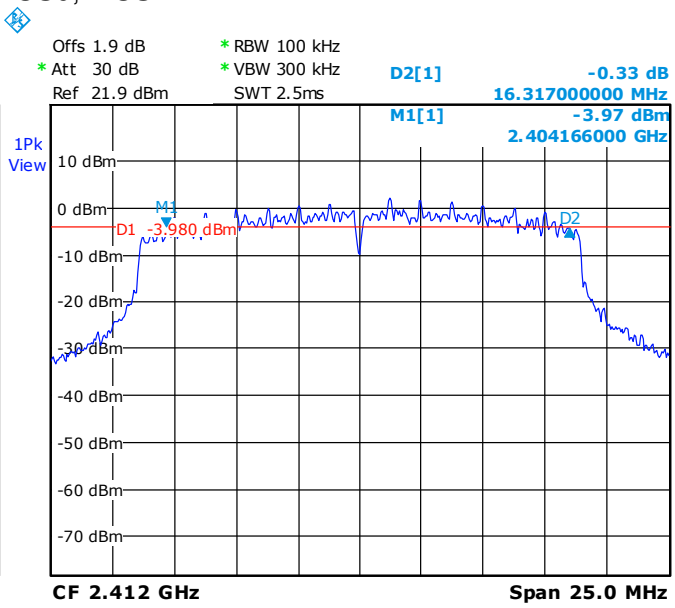

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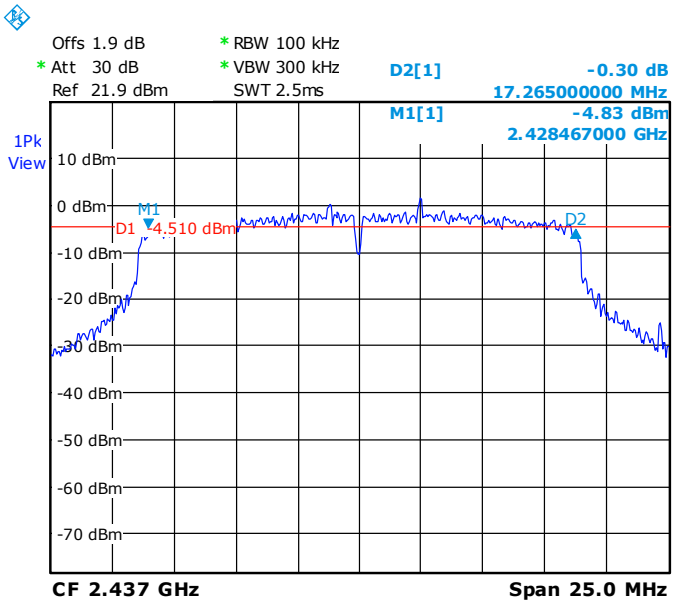
6 dB Bandwidth Plots, 802.11n
Channel 6
Data rates: MCS0, MCS7



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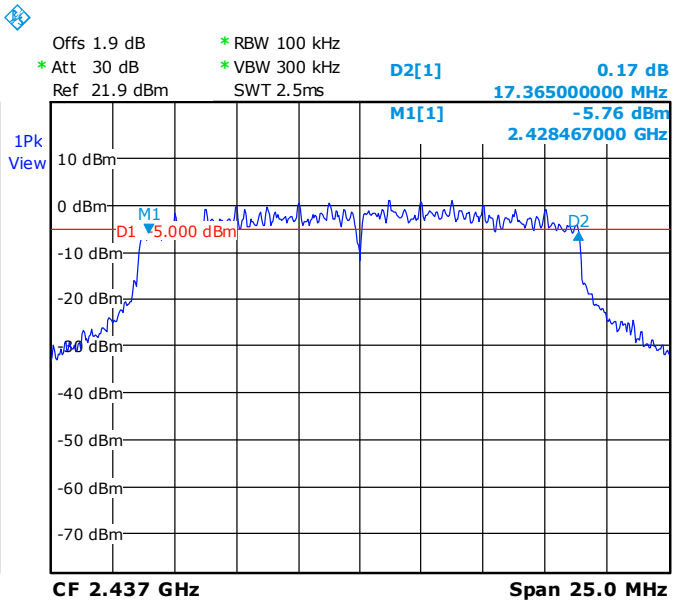

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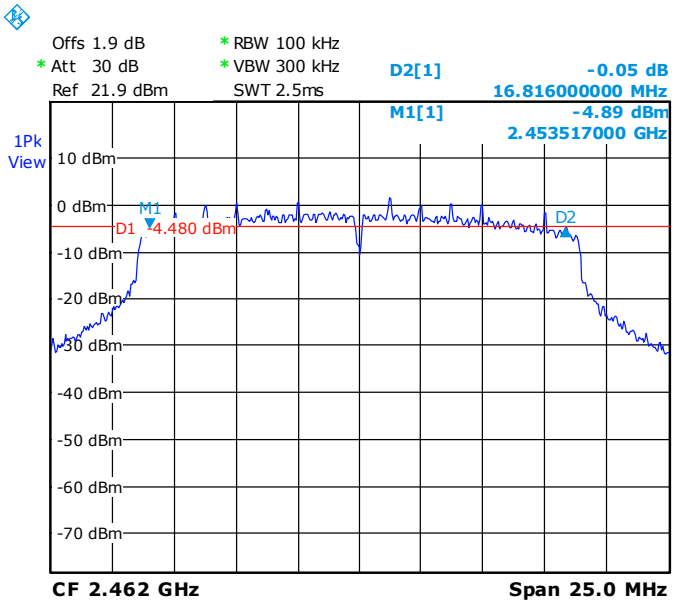
6 dB Bandwidth Plots, 802.11n
Channel 11
Data rates: MCS0, MCS7



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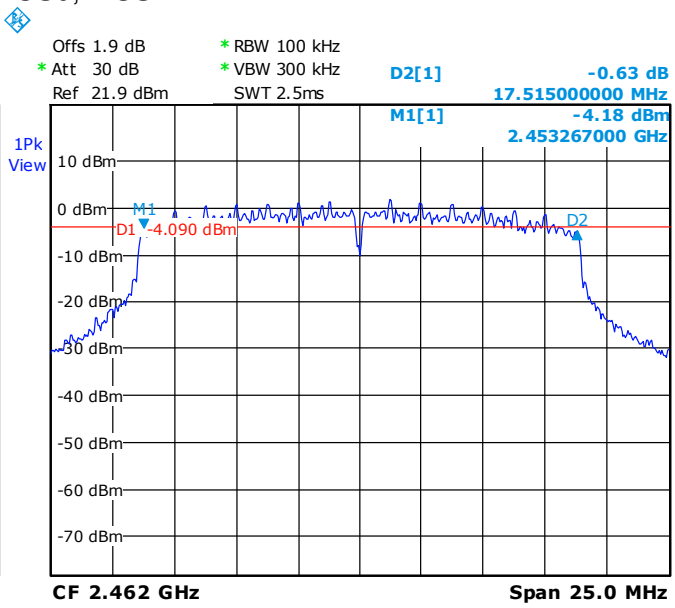


Date: 9.MAY.2013 12:01:15

4 Peak Output Power

4.1 *Test Result*

Test Description	Test Specification	Test Result
Peak Output Power	15.247(a) (1)	Compliant

4.2 *Test Method*

The test data was measured using a power meter and power sensor.

Limit
(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

4.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 21.9 ℃
Relative Humidity: 28.9 %

4.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Power Meter	E4419B	Agilent	B079628	13 AUG 2013
Power Sensor	8481A	Agilent	B086132	13 AUG 2013

Note: The calibration period equipment is 1 year.

4.5 *Test Data*

Protocol	Channel	Data Rate	Channel Power
802.11b	1	1	17.6
802.11b	1	11	17.2
802.11b	6	1	17.1
802.11b	6	11	16.8
802.11b	11	1	17.9
802.11b	11	11	17.7
802.11g	1	6	12.5
802.11g	1	36	11.8
802.11g	1	54	11.7
802.11g	6	6	12.9
802.11g	6	36	12.2
802.11g	6	54	12.1
802.11g	11	6	12.7
802.11g	11	36	12.5
802.11g	11	54	12.4
802.11n	1	MCS0	12.5
802.11n	1	MCS7	11.2
802.11n	6	MCS0	12.8
802.11n	6	MCS7	11.7
802.11n	11	MCS0	12.7
802.11n	11	MCS7	12.5

5 Conducted Spurious Emissions

5.1 *Test Result*

Test Description	Test Specification	Test Result
Conducted Spurious Emissions	15.247(d)	Compliant

5.2 *Test Method*

The test data was measured using a spectrum analyzer with

- Peak detector, max hold
- Resolution bandwidth of at least 100 kHz
- Video bandwidth at least 3x RBW
- Frequency range: 30 MHz to 25 GHz

The limit is 20 dB below the measured peak power.

5.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.1 ℃
Relative Humidity: 37.8 %

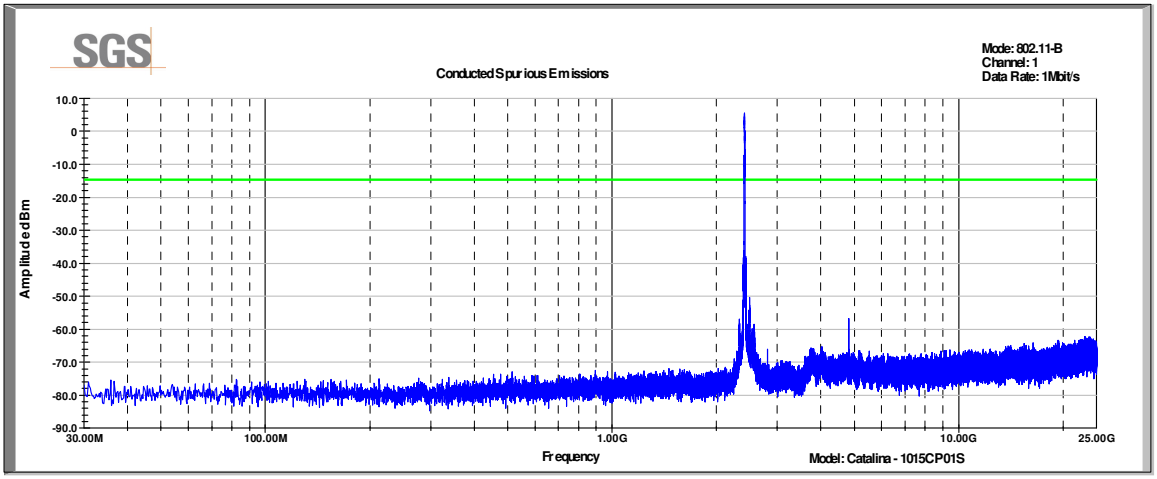
5.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
PXA Signal Analyzer	N9030A	Agilent	1114339	28 Feb 2014
Spectrum Analyzer	FSL6	Rhode & Schwarz	1257361J	08 JAN 2014

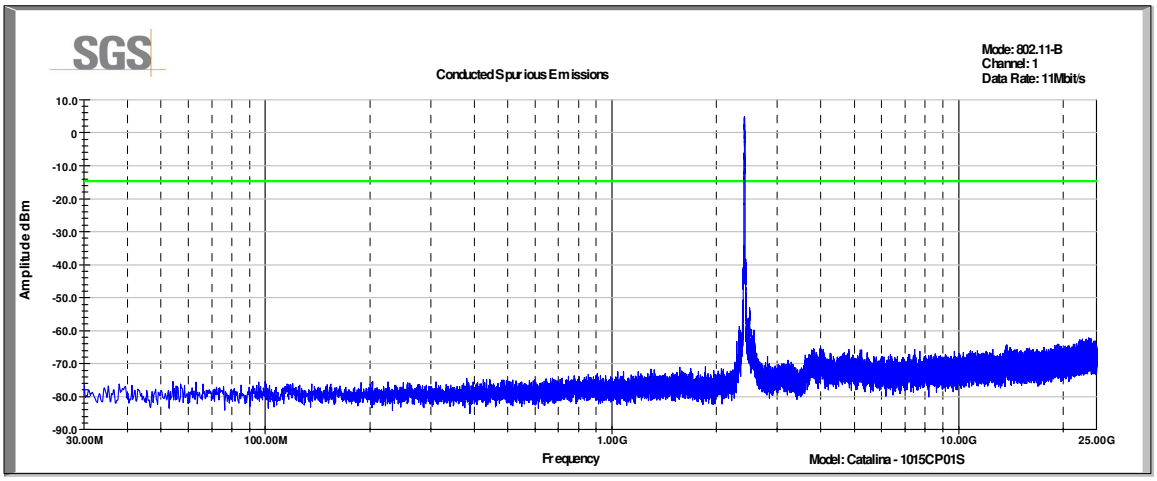
Note: The calibration period equipment is 1 year.

5.5 *Test Data*

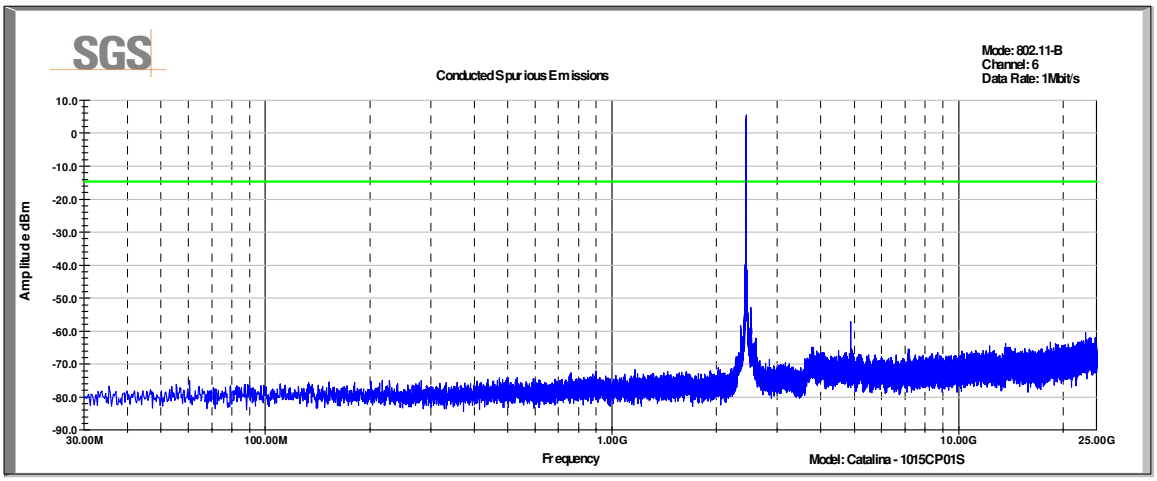
802.11b: CH1 1MB



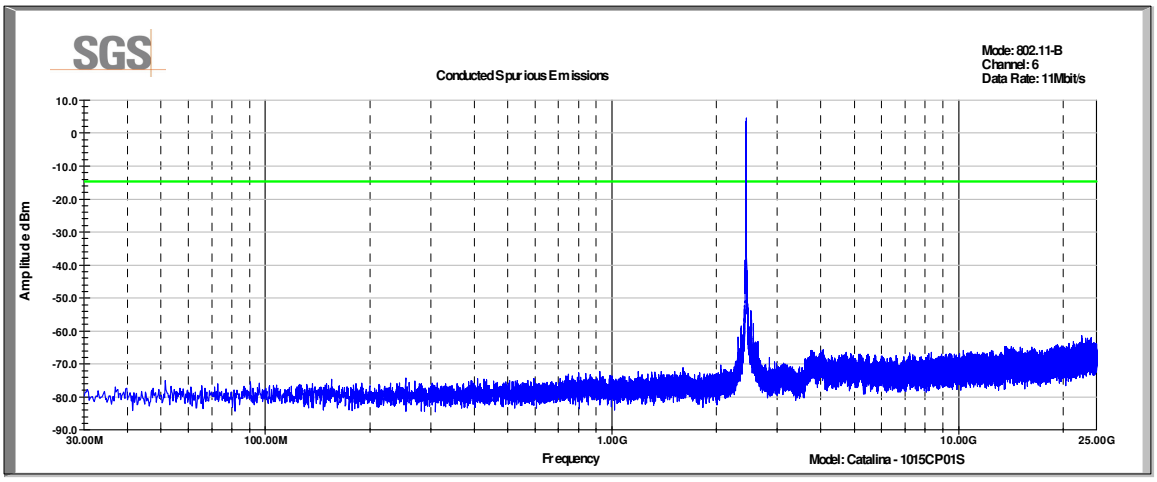
802.11b: CH1 11MB



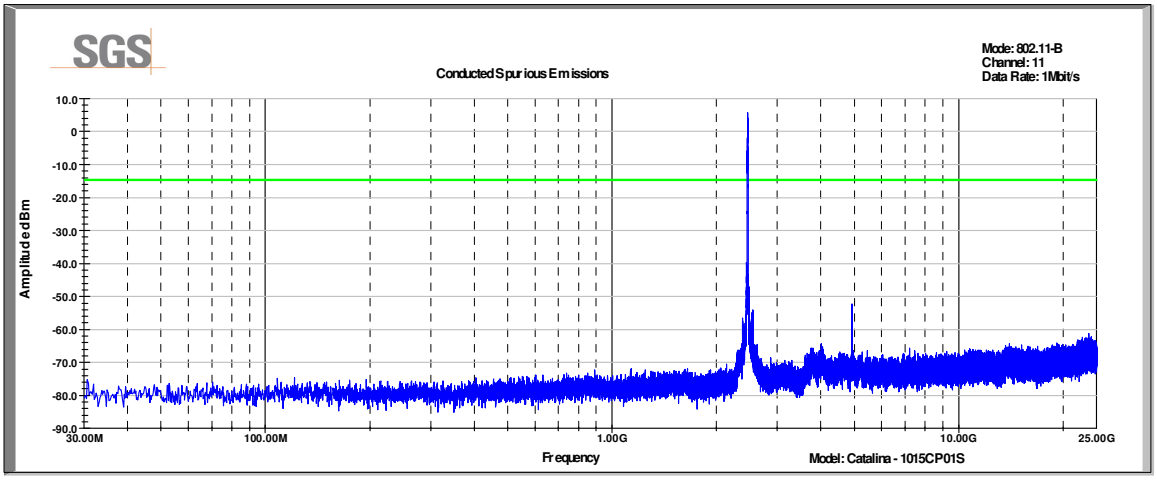
802.11b: CH6 1MB



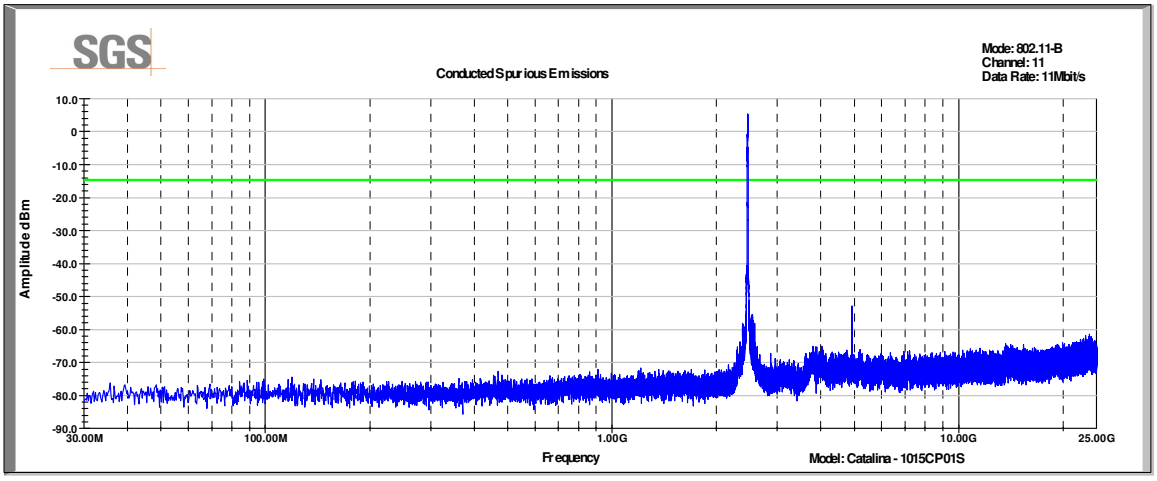
802.11b: CH6 11MB



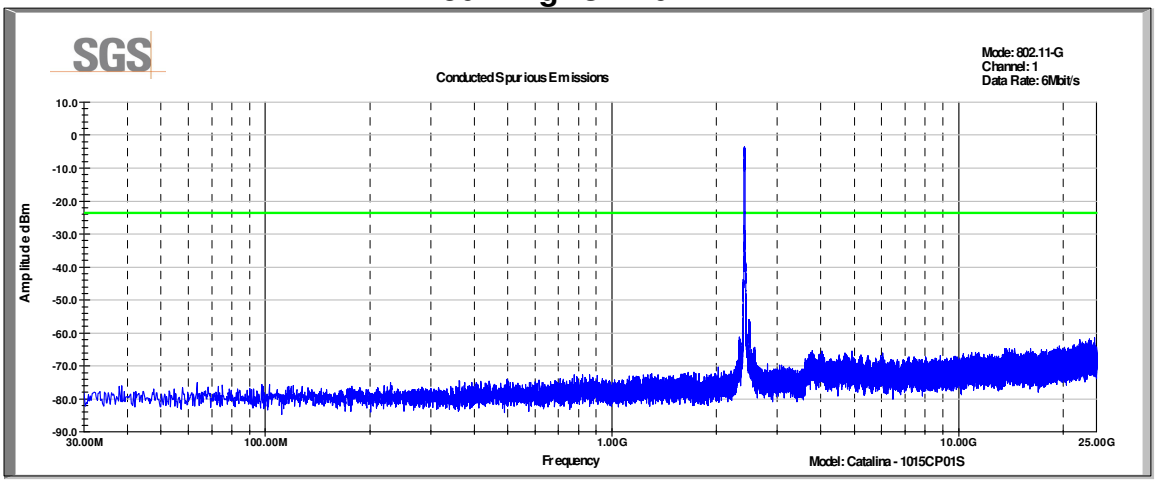
802.11b: CH11 1MB



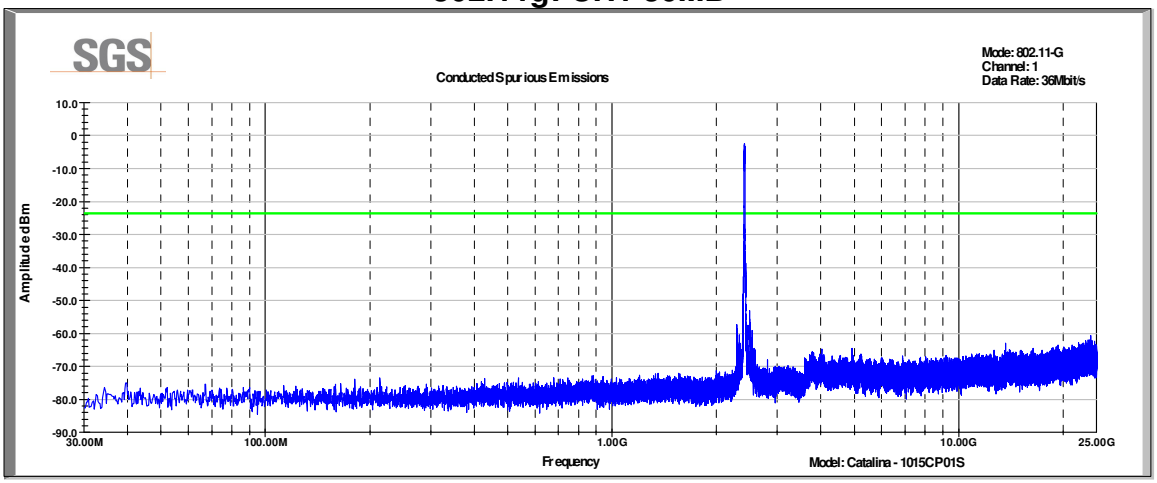
802.11b: CH11 11MB



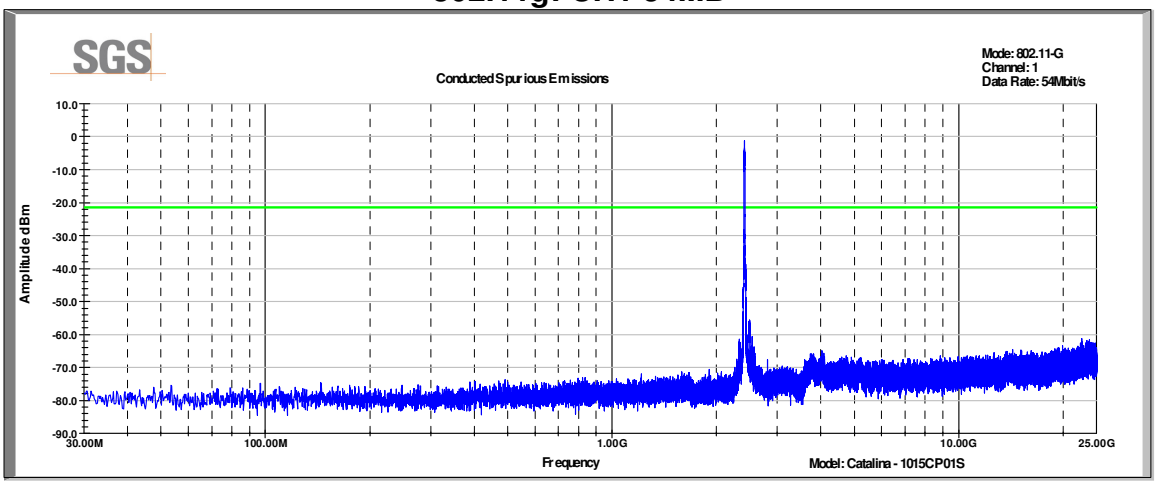
802.11g: CH1 6MB



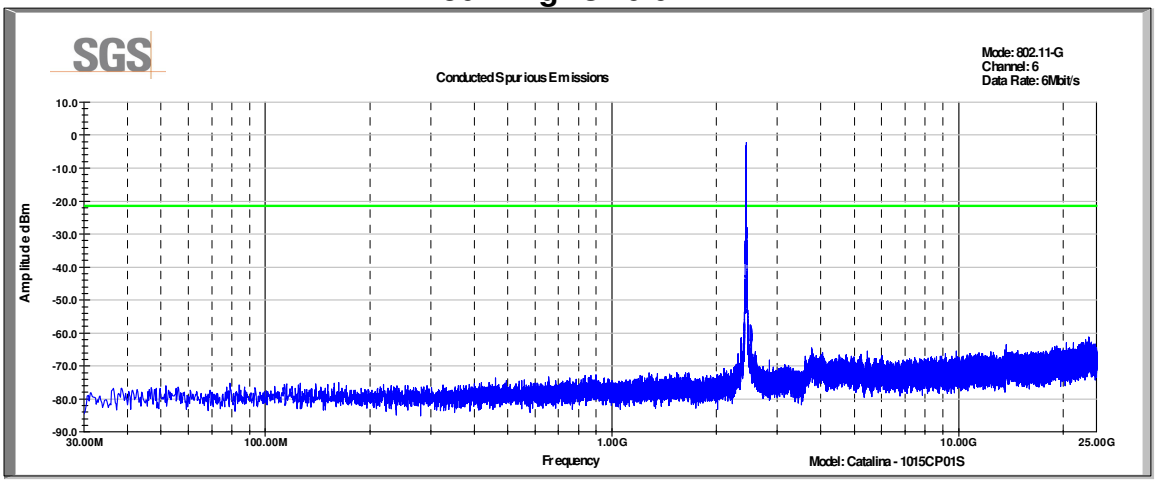
802.11g: CH1 36MB



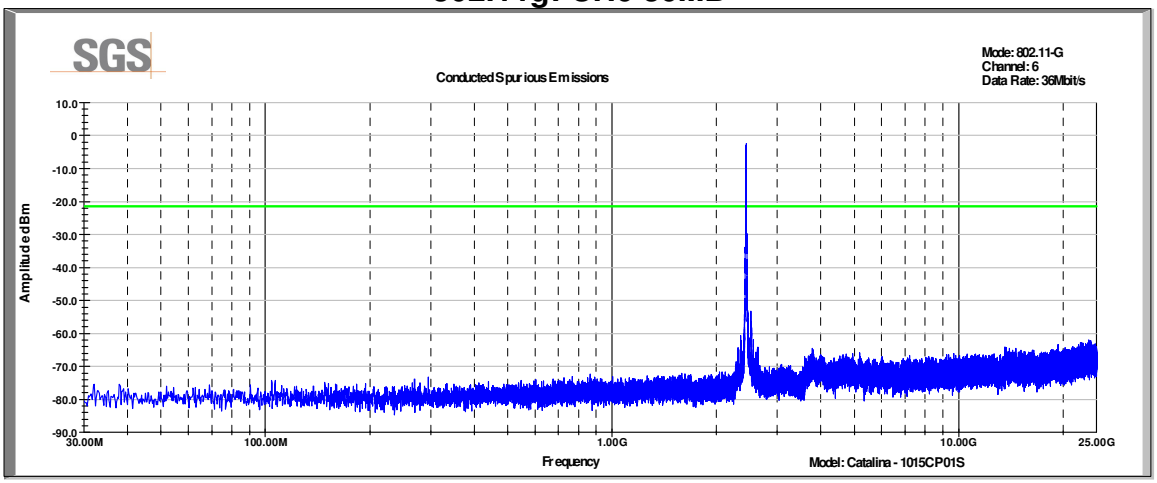
802.11g: CH1 54MB



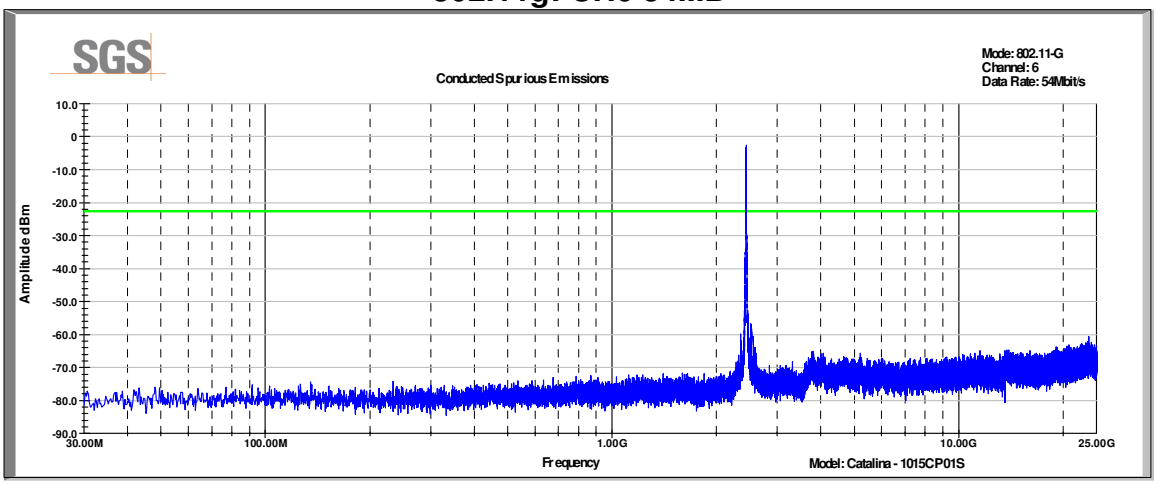
802.11g: CH6 6MB



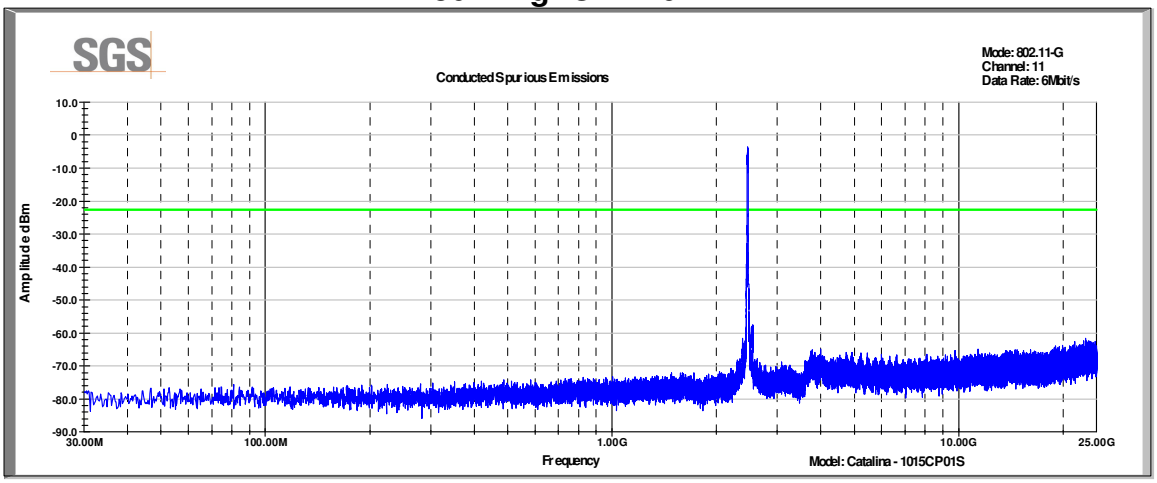
802.11g: CH6 36MB



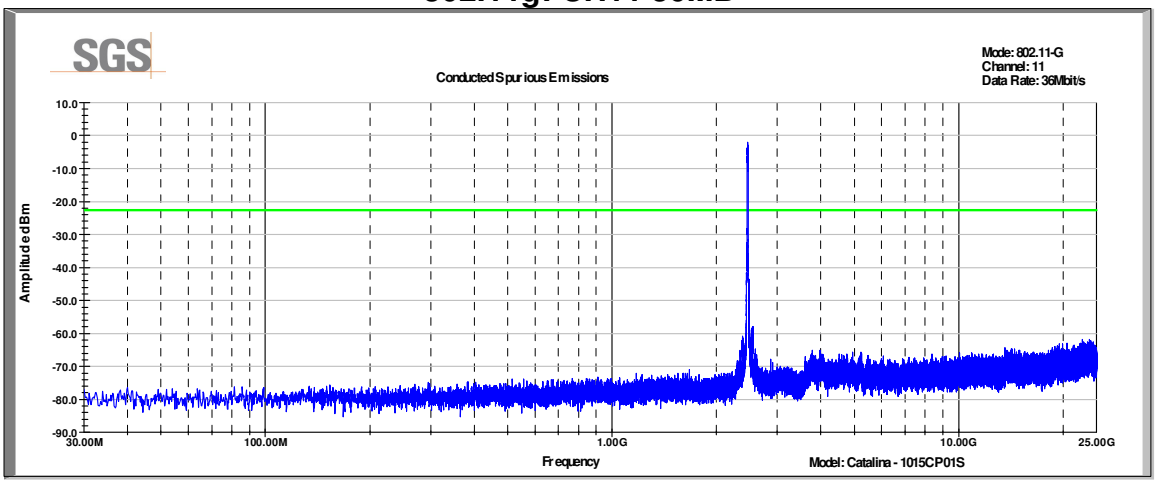
802.11g: CH6 54MB



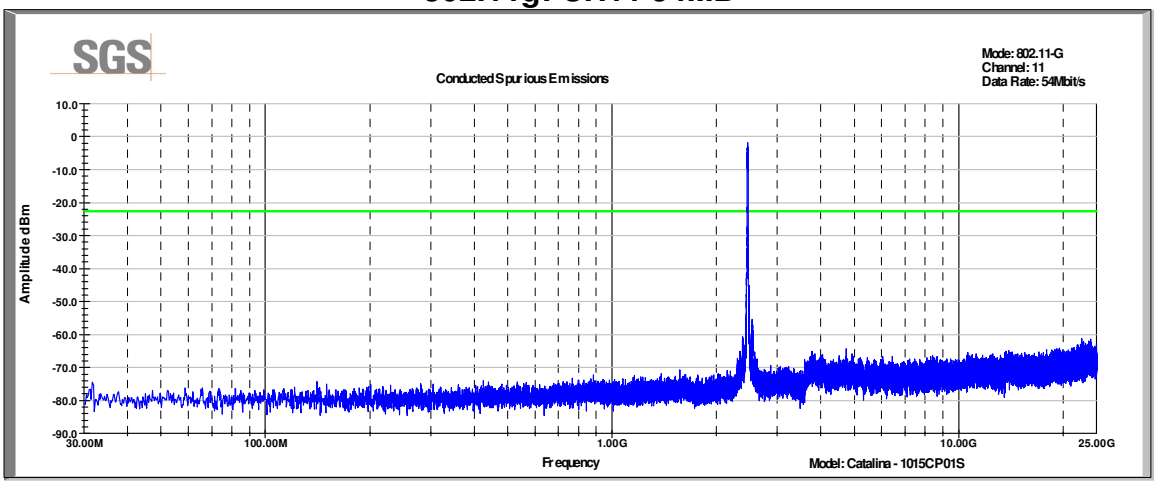
802.11g: CH11 6MB



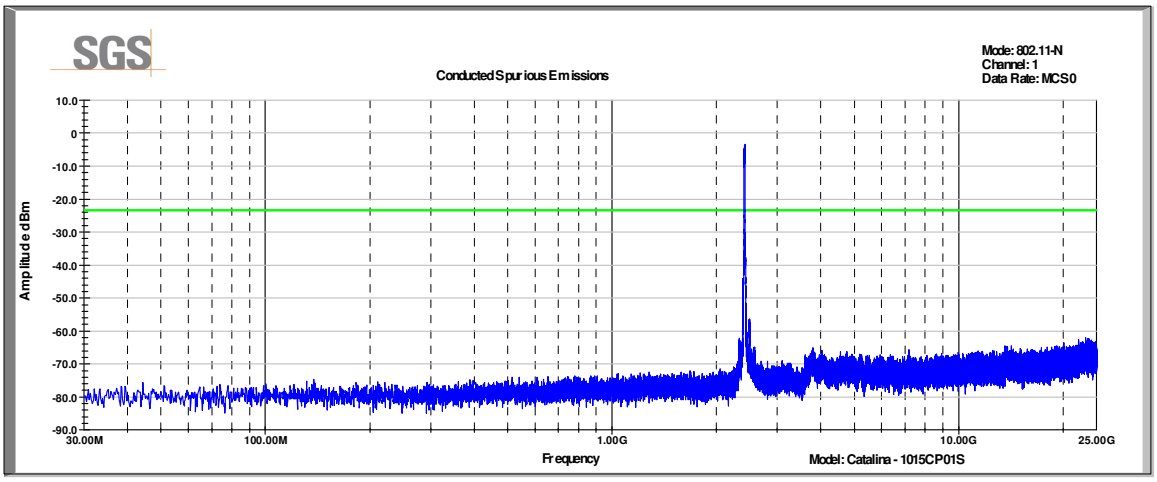
802.11g: CH11 36MB



802.11g: CH11 54MB



802.11n: CH1 MSC0



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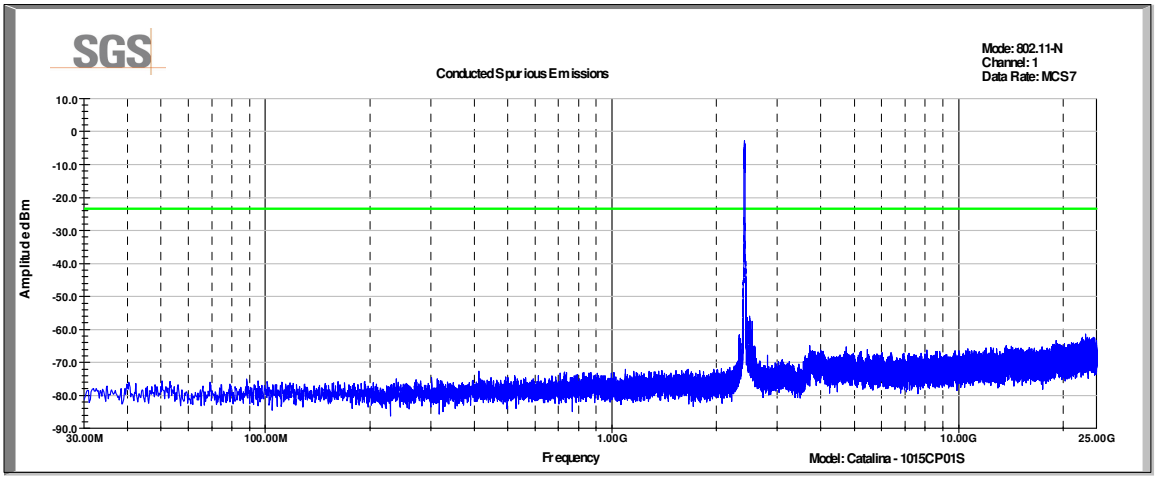
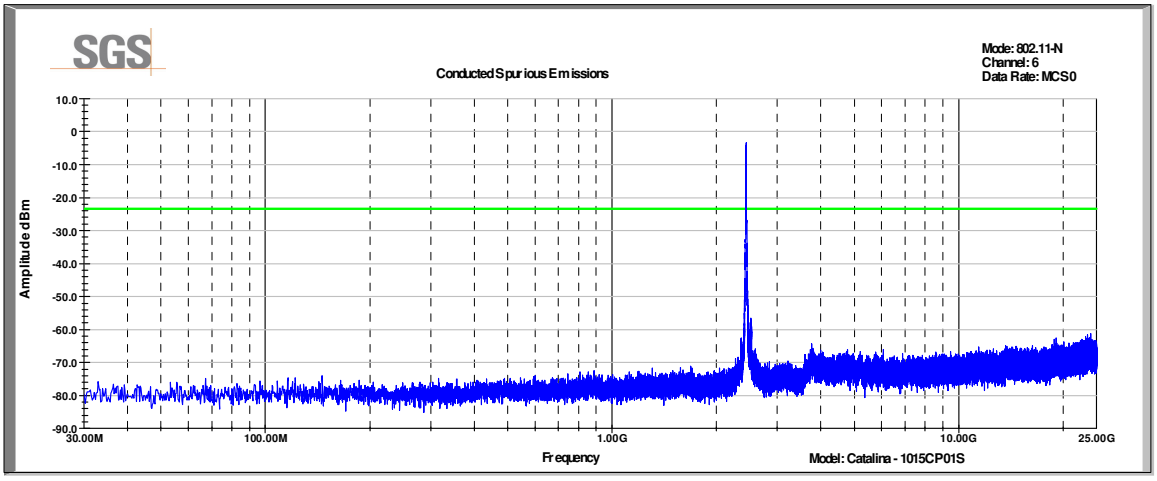


802.11n: CH6 MSC0



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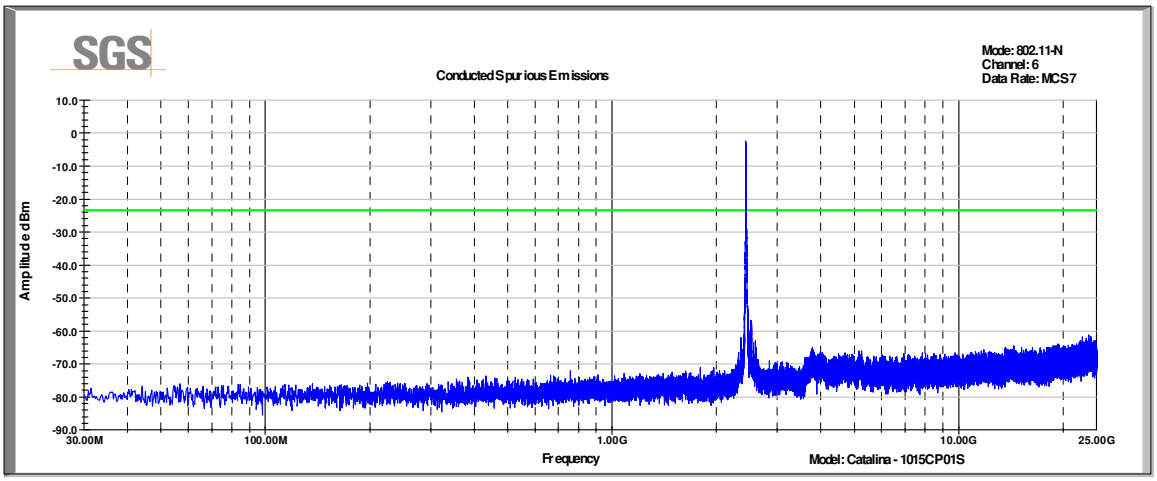

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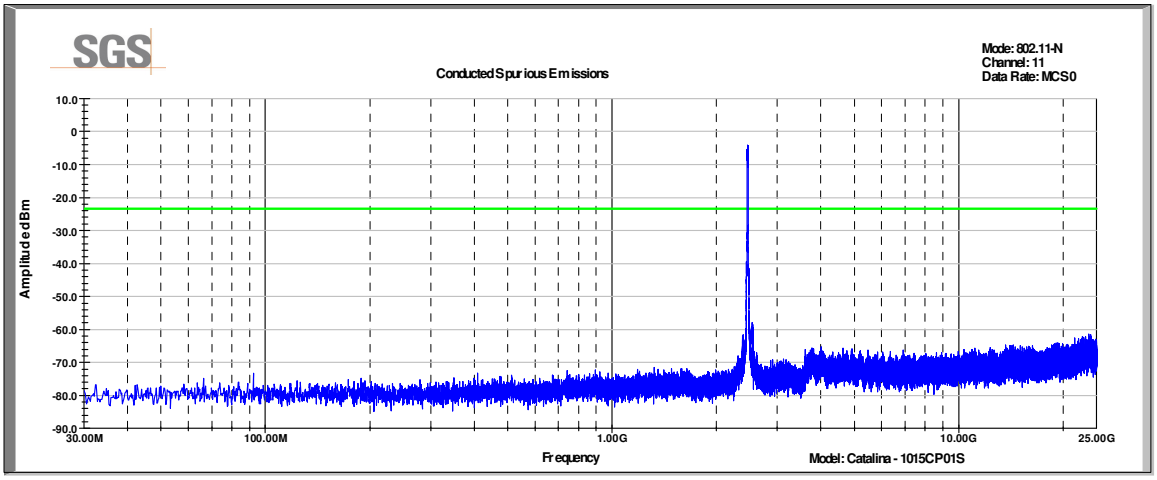

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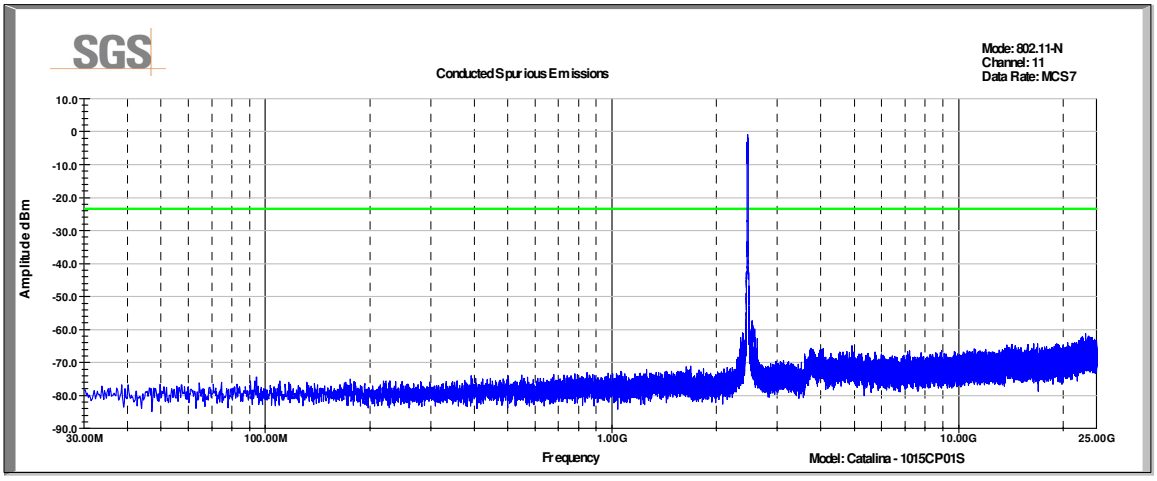
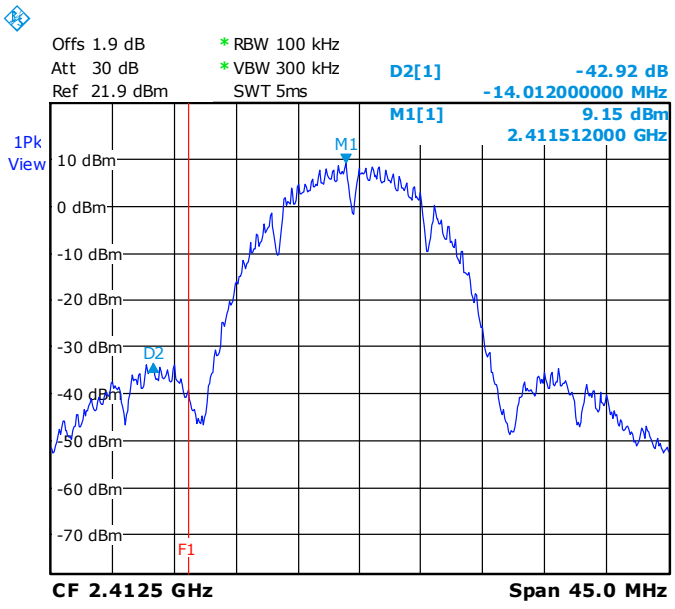


802.11b
Lower band edge / Upper band edge
Channel 1 / Channel 11
1MB



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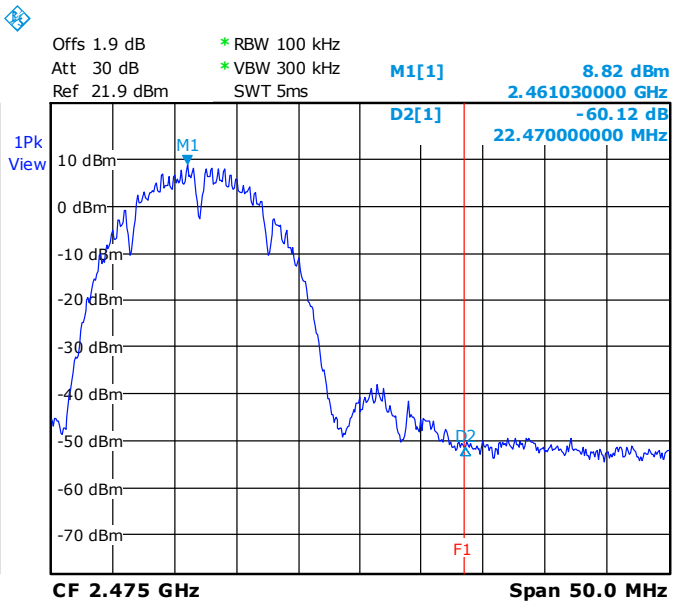

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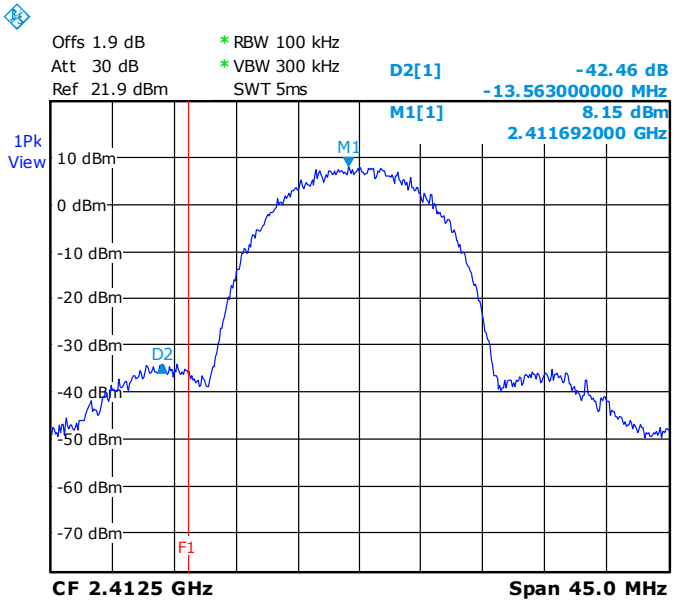
11MB



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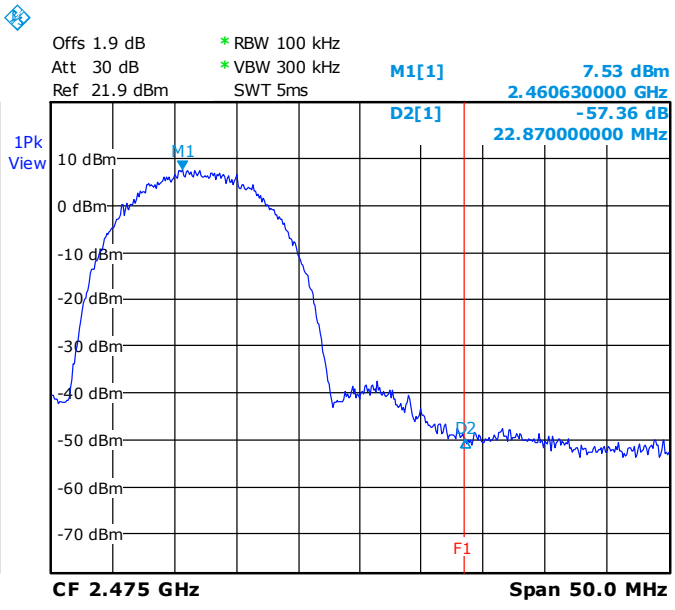

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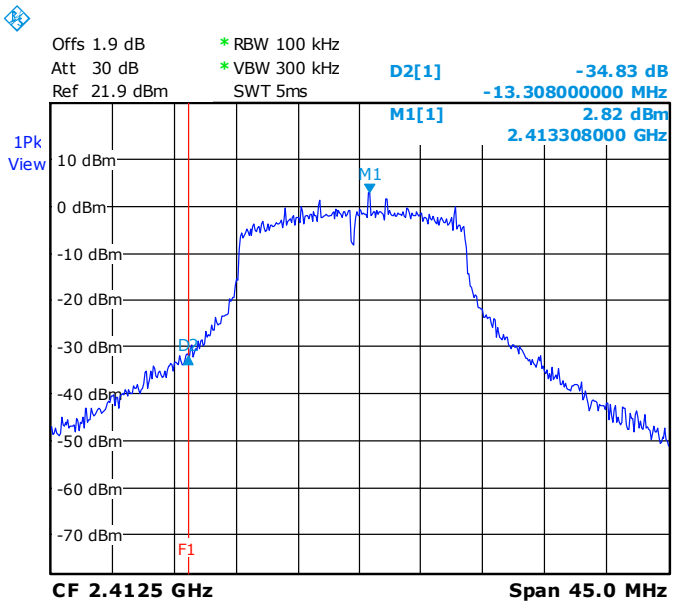
802.11g
Lower band edge / Upper band edge
Channel 1 / Channel 11
6MB



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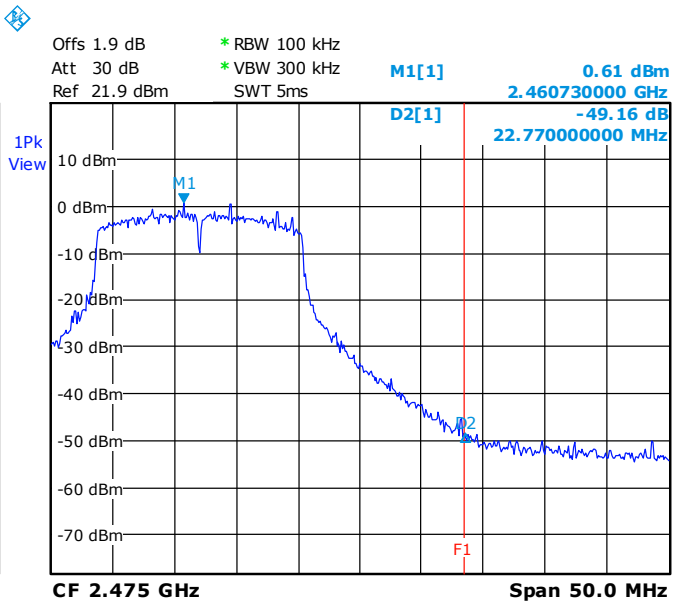

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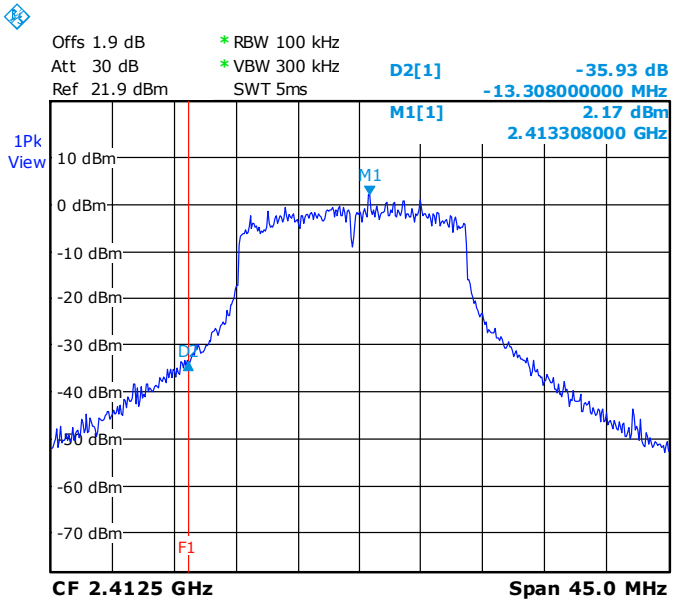
36MB



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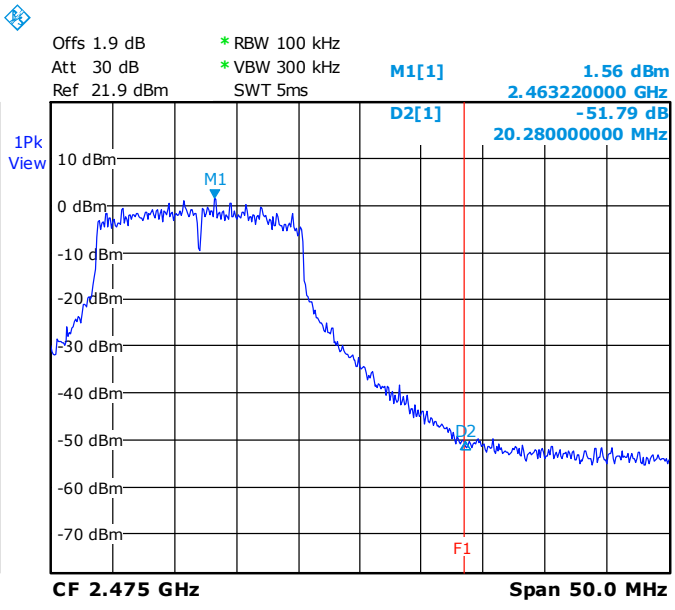

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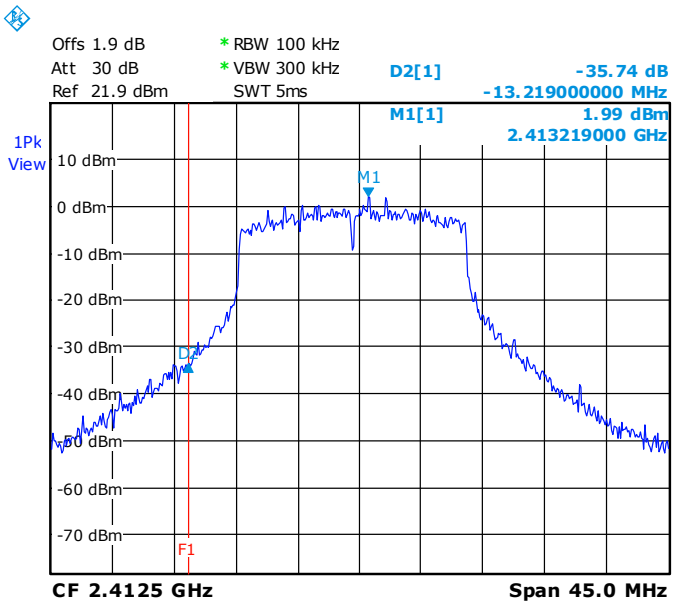
802.11g
Lower band edge / Upper band edge
Channel 1 / Channel 11
54MB



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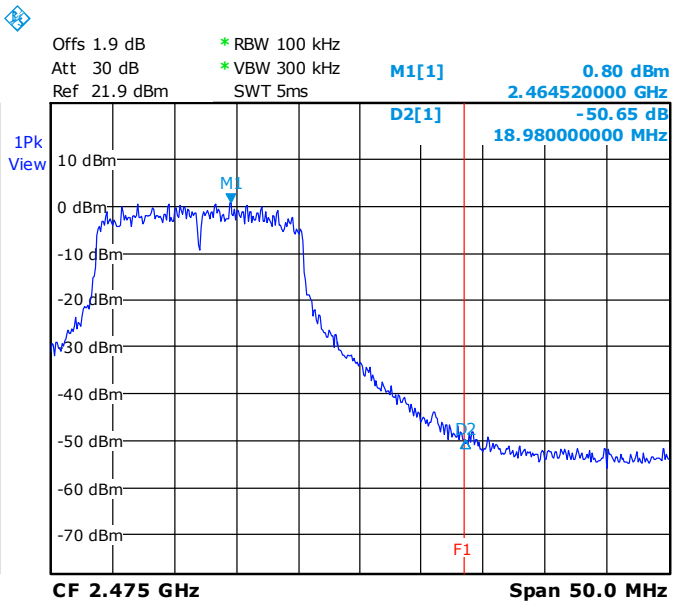

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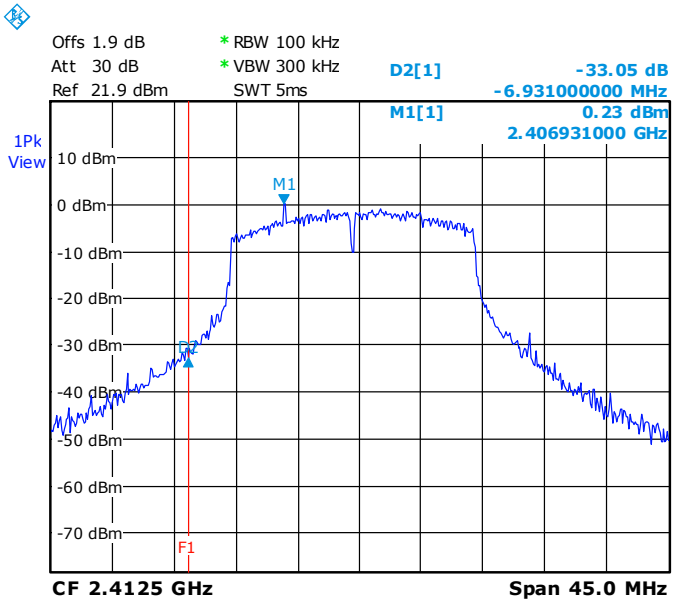
802.11n
Lower band edge / Upper band edge
Channel 1 / Channel 11
MCS0



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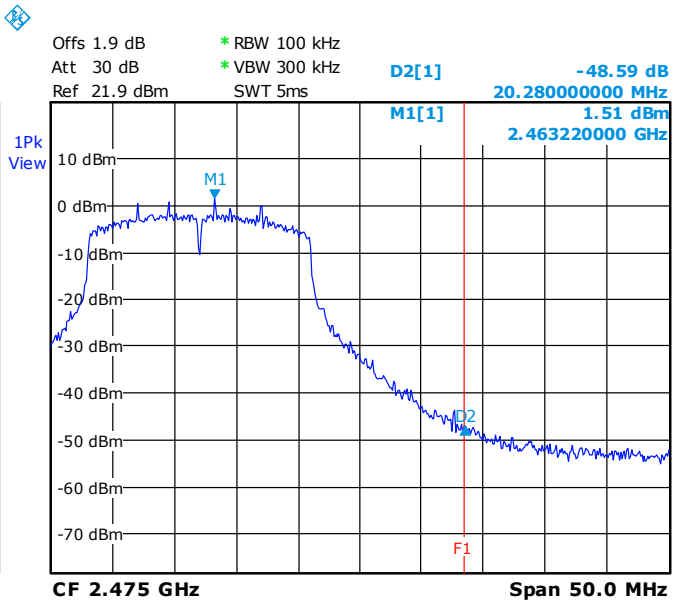
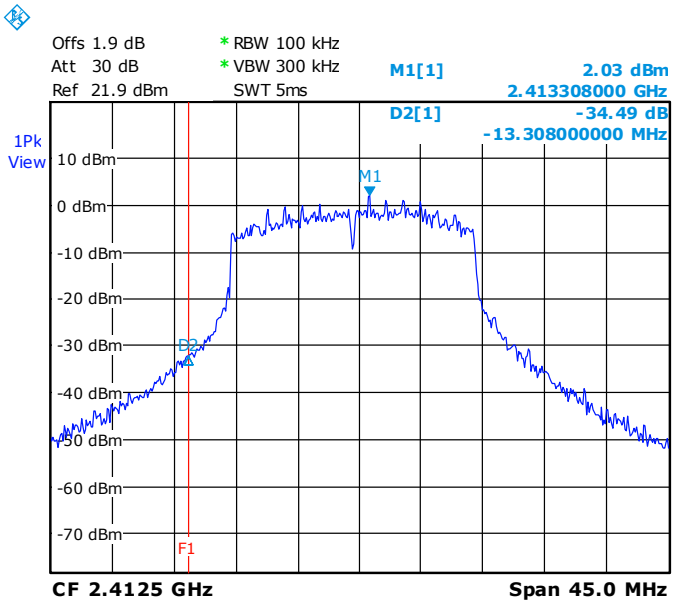


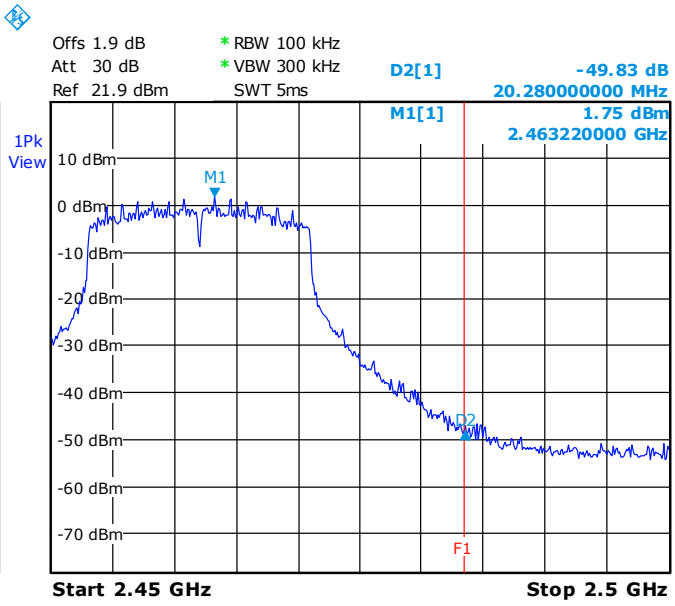
Date: 9.MAY.2013 12:39:23

802.11n
Lower band edge / Upper band edge
Channel 1 / Channel 11

MCS7



Date: 9.MAY.2013 12:34:34



Date: 9.MAY.2013 12:36:31

6 Power Spectral Density

6.1 *Test Result*

Test Description	Test Specification	Test Result
Power Spectral Density	15.247(e)	Compliant

6.2 *Test Method*

- RMS detector, trace averaging over 100 sweeps
- Resolution bandwidth of 3 kHz < RBW < 100 kHz
- Video bandwidth at 3xRBW

The limit is 8 dBm.

6.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.4 ℃
Relative Humidity: 47.8 %

6.4 *Test Equipment*

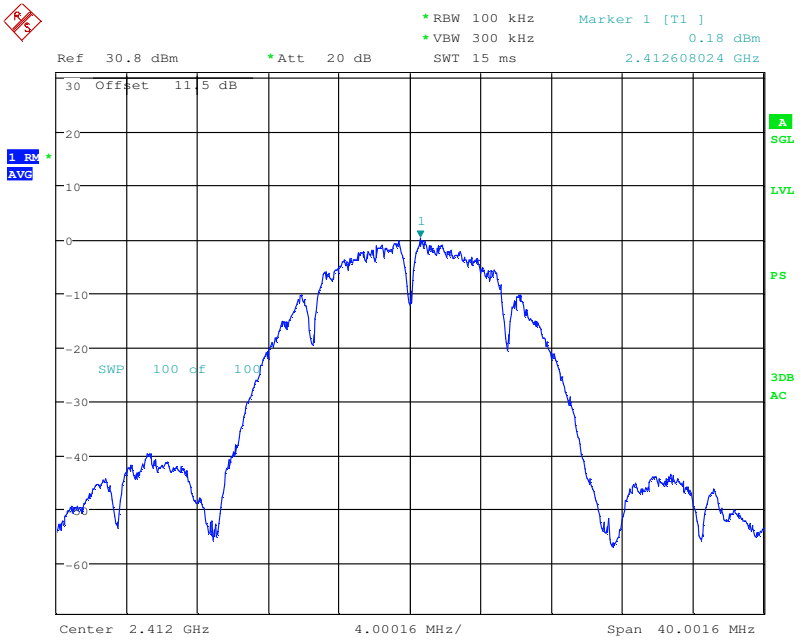
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	FSL6	Rhode & Schwarz	1257361J	08 JAN 2014

Note: The calibration period equipment is 1 year.

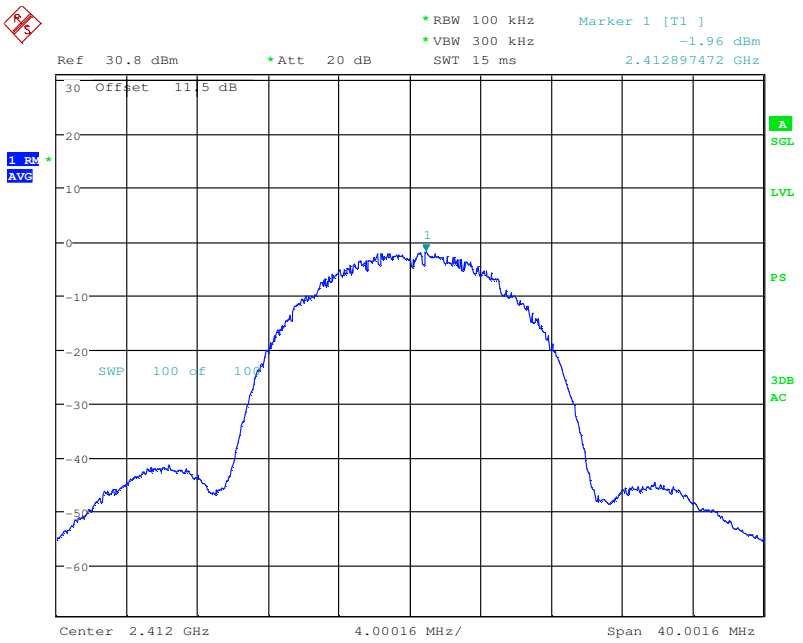
6.5 *Test Data*

Protocol	Channel	Data Rate	PSD (dBm)
802.11b	1	1	0.18
802.11b	1	11	-1.96
802.11b	6	1	-0.35
802.11b	6	11	-2.03
802.11b	11	1	1.72
802.11b	11	11	-1.48
802.11g	1	6	-7.49
802.11g	1	36	-8.77
802.11g	1	54	-8.95
802.11g	6	6	-6.81
802.11g	6	36	-7.84
802.11g	6	54	-8.09
802.11g	11	6	-7.83
802.11g	11	36	-8.83
802.11g	11	54	-8.89
802.11n	1	MCS0	-7.40
802.11n	1	MCS7	-10.00
802.11n	6	MCS0	-7.32
802.11n	6	MCS7	-9.96
802.11n	11	MCS0	-7.99
802.11n	11	MCS7	-9.11

802.11b
Channel 1
Data Rates: 1 and 11 MB

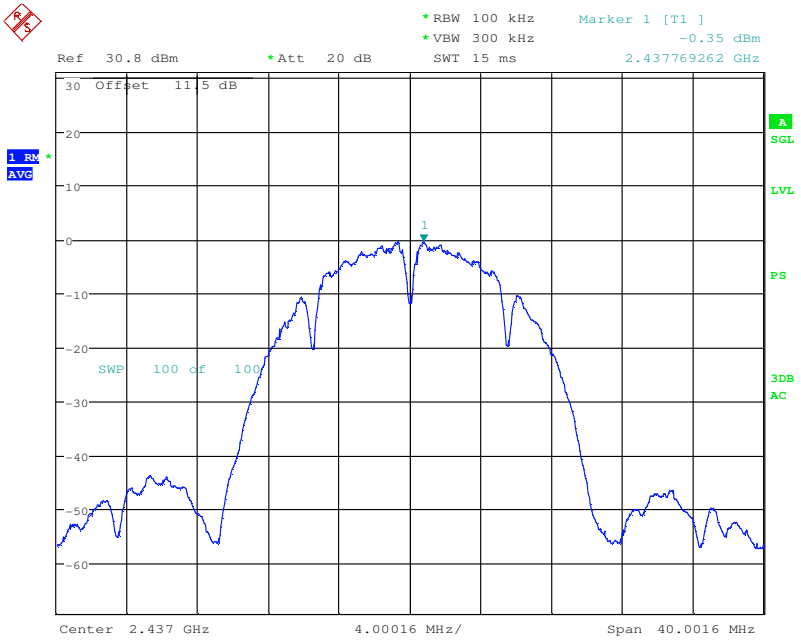


Date: 12.JUL.2013 18:15:55

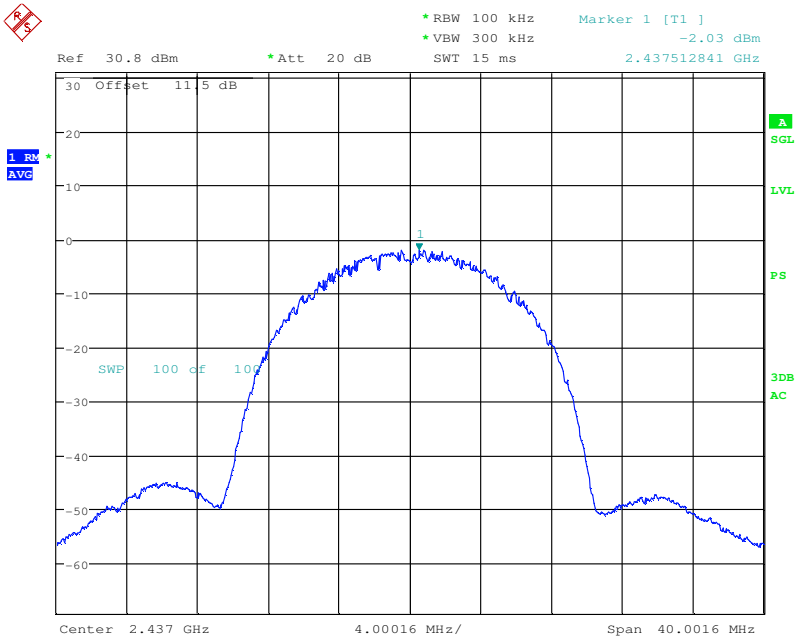


Date: 12.JUL.2013 18:04:50

802.11b
Channel 6
Data Rates: 1 and 11 MB



Date: 12.JUL.2013 18:08:08



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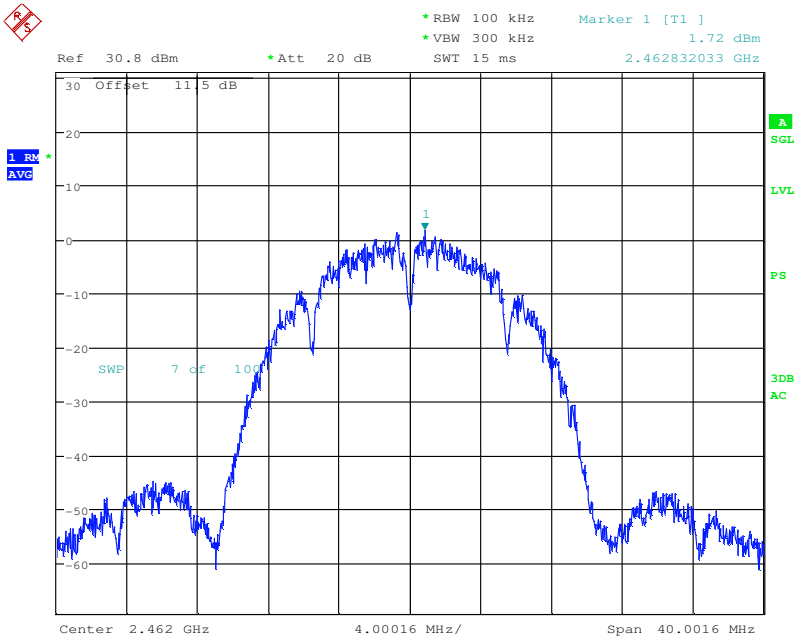
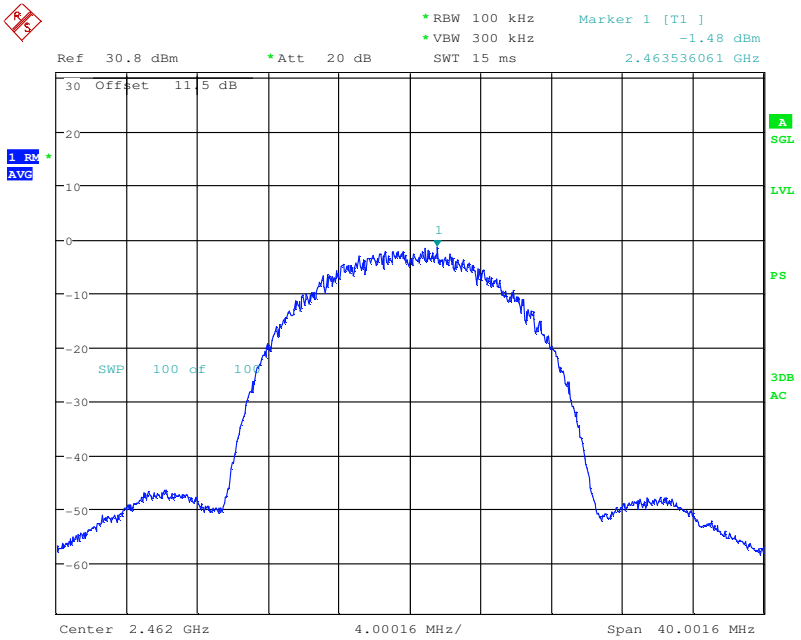
802.11b
Channel 11
Data Rates: 1 and 11 MB



Date: 12.JUL.2013 18:12:11

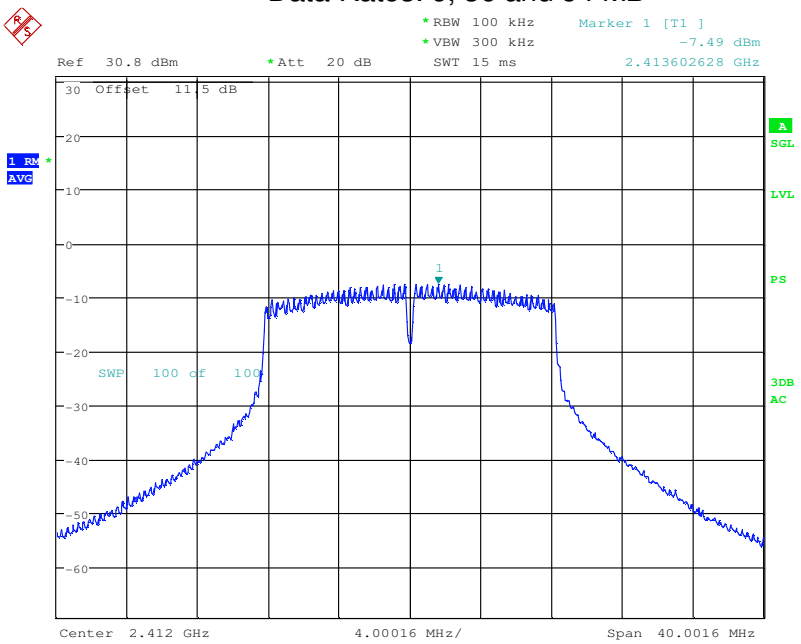


Date: 12.JUL.2013 18:12:51

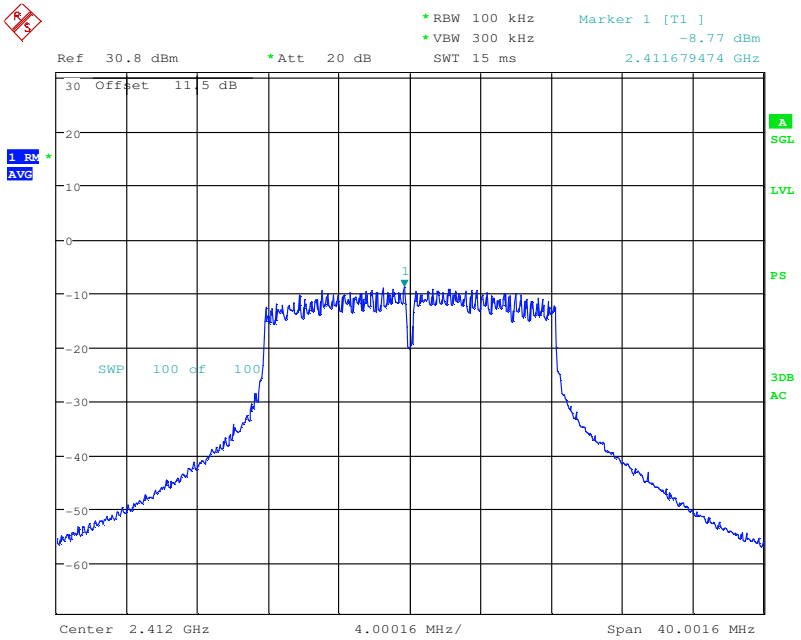
802.11g

Channel 1

Data Rates: 6, 36 and 54 MB



Date: 12.JUL.2013 18:05:29



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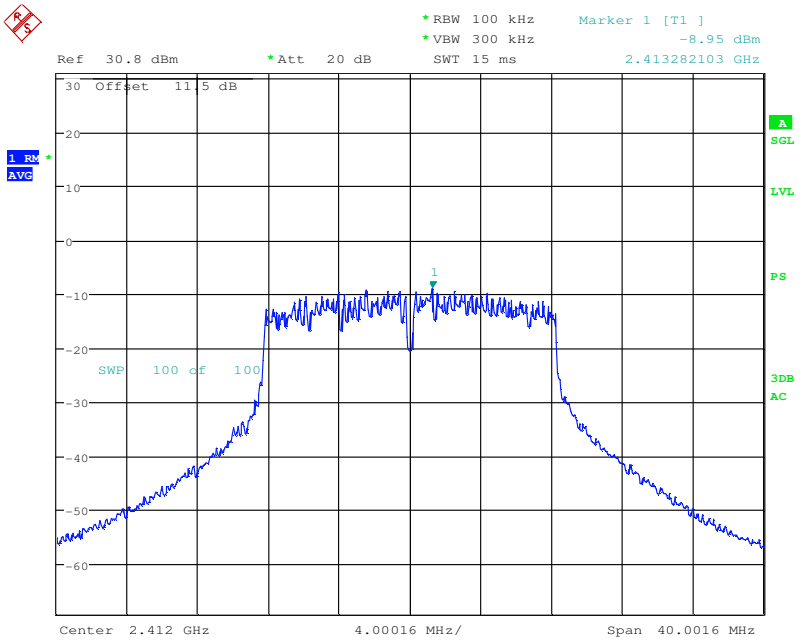
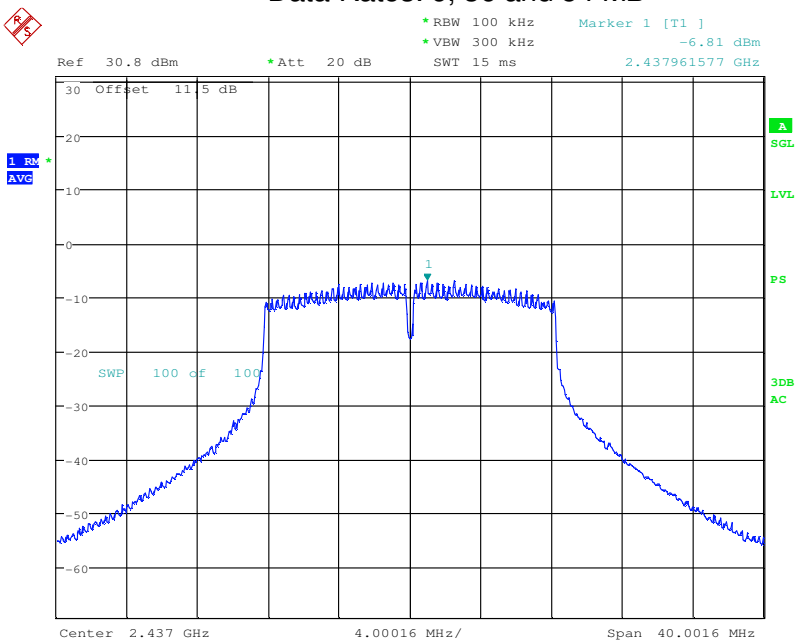


Date: 12.JUL.2013 18:06:24

802.11g

Channel 6

Data Rates: 6, 36 and 54 MB



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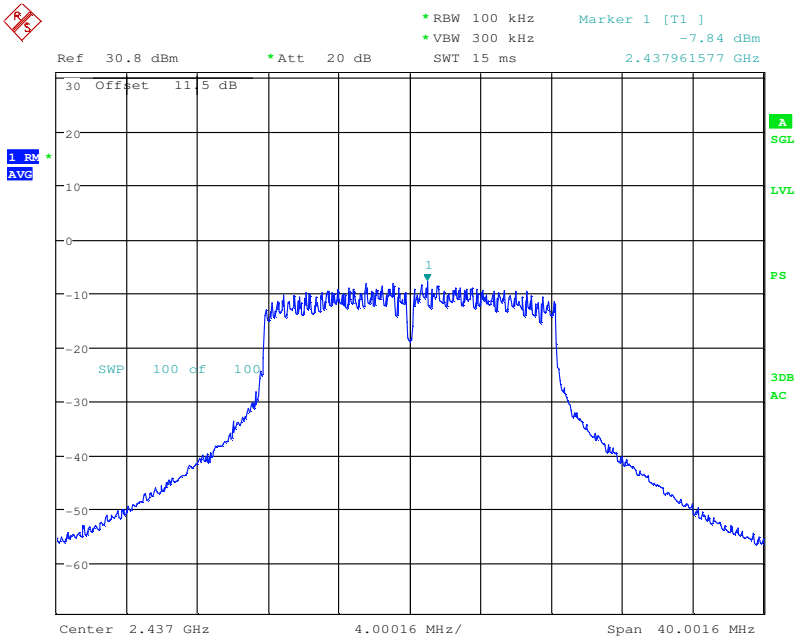
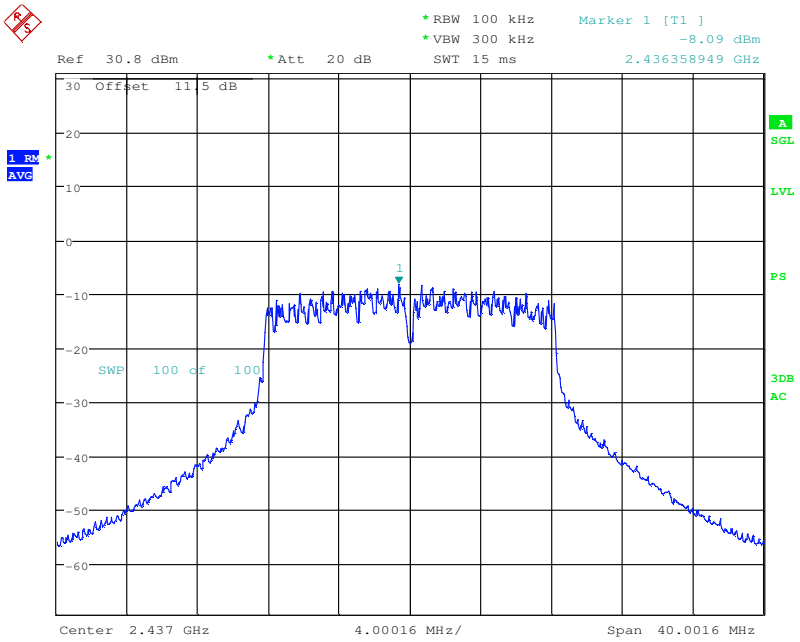


Date: 12.JUL.2013 18:09:25

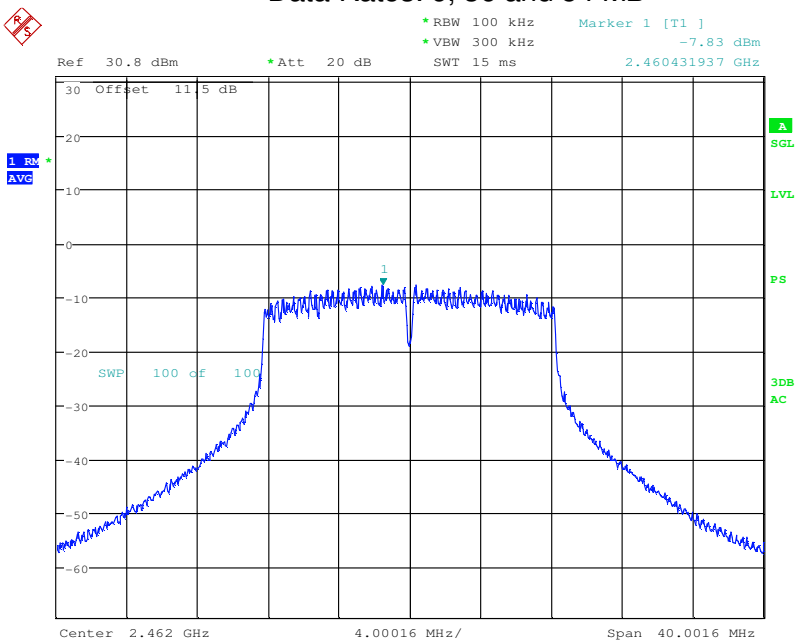


Date: 12.JUL.2013 18:09:42

802.11g

Channel 11

Data Rates: 6, 36 and 54 MB



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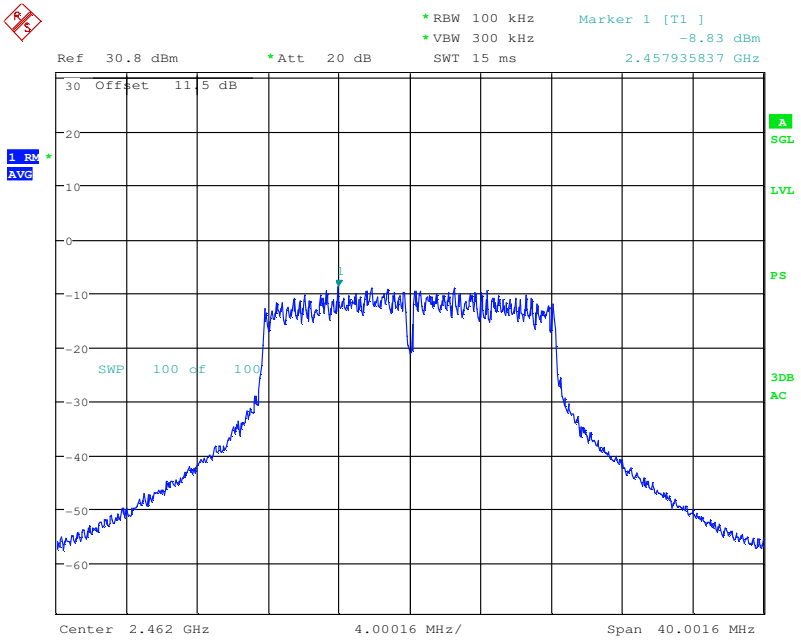

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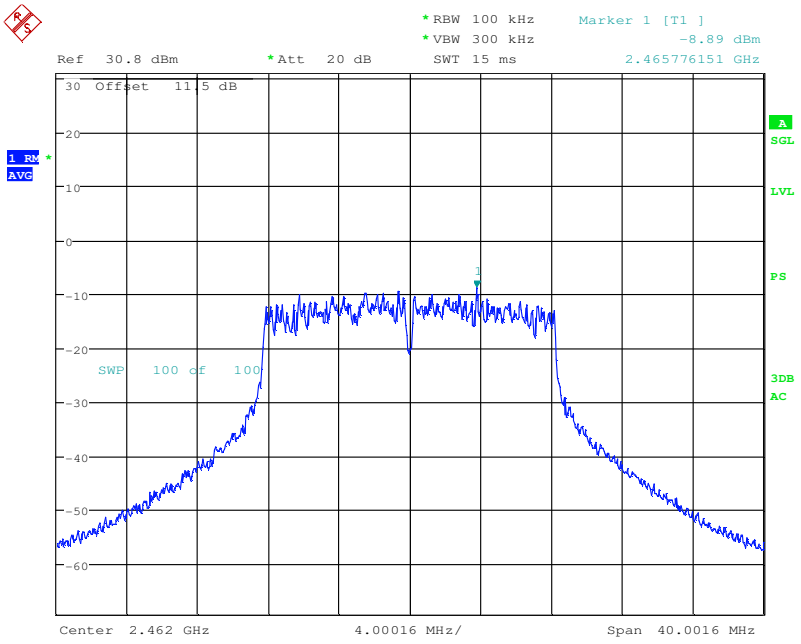
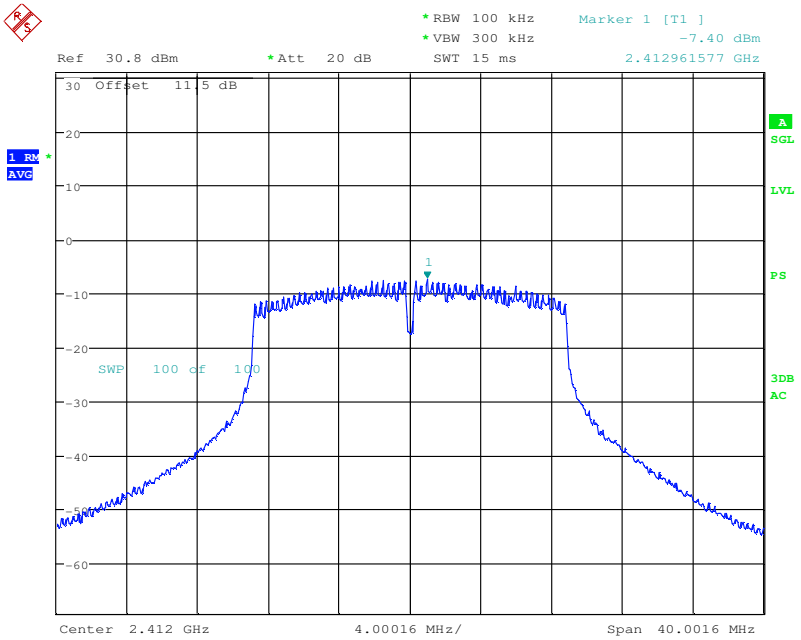


Date: 12.JUL.2013 18:14:15

802.11n
Channel 1
Data Rates: MCS0 and MCS7



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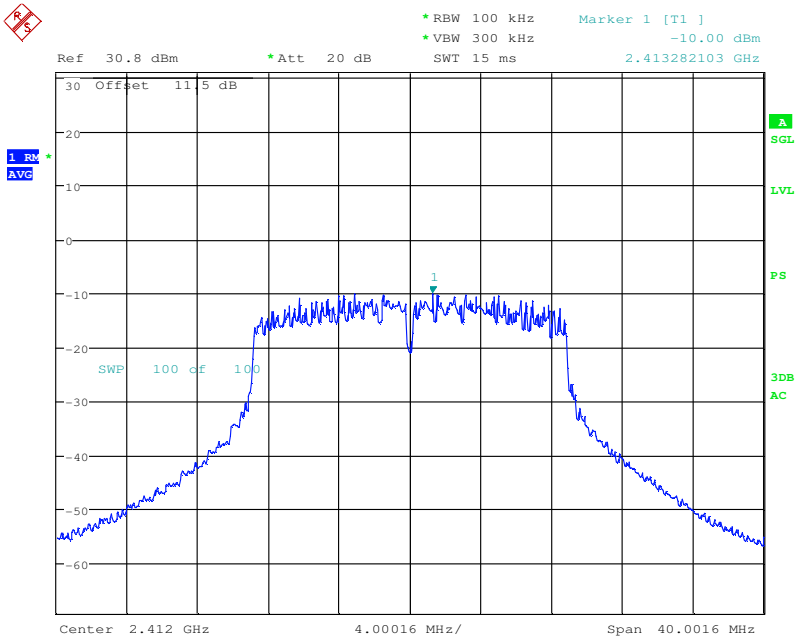
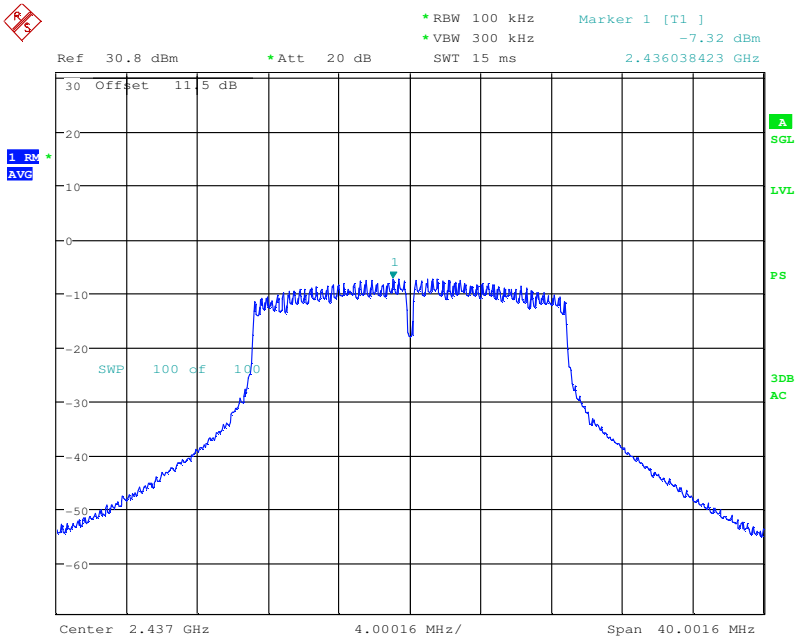


Date: 12.JUL.2013 18:07:25

802.11n
Channel 6
Data Rates: MCS0 and MCS7



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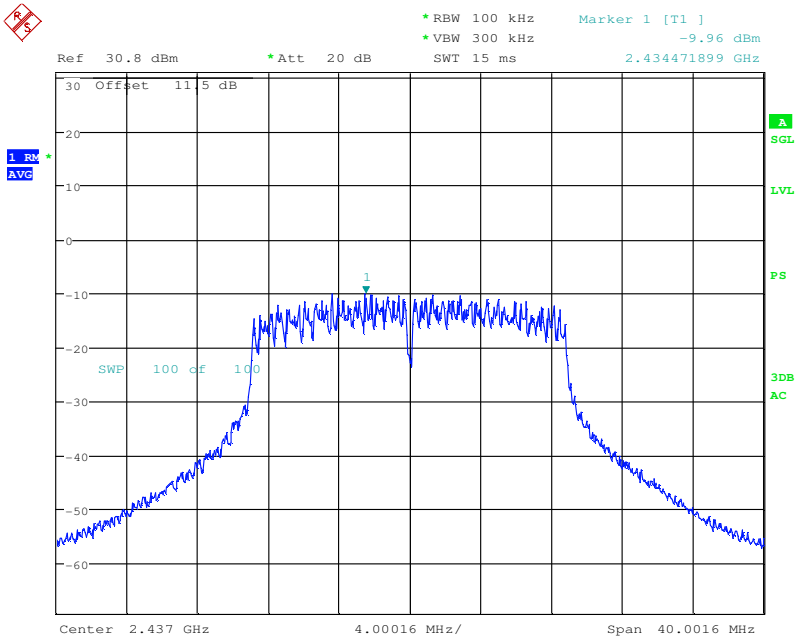
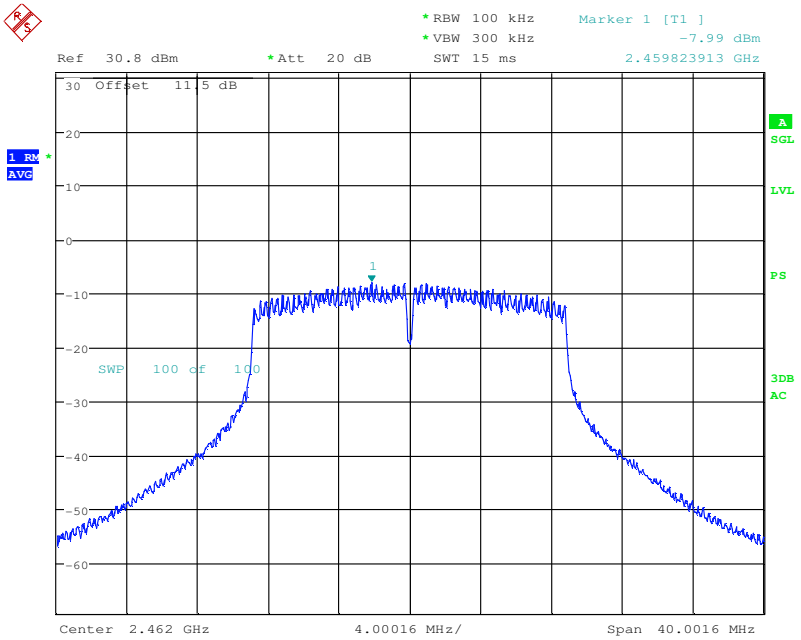


Date: 12.JUL.2013 18:10:51

802.11n

Channel 11

Data Rates: MCS0 and MCS7



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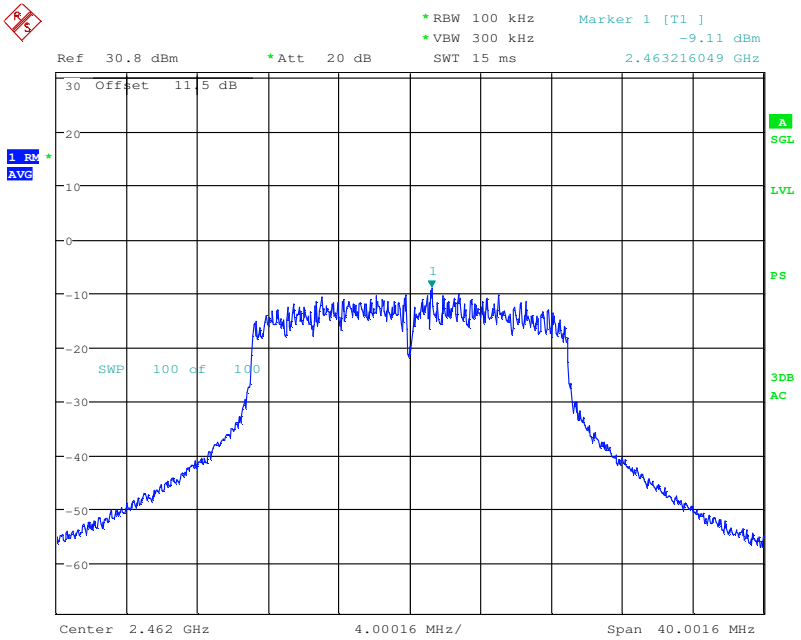


Date: 12.JUL.2013 18:15:03

7 Field Strength of Spurious Radiation

7.1 *Test Result*

Test Description	Test Specification	Test Result
Field strength of spurious radiation	15.247 (d) and 15.209	Compliant

7.2 *Test Method*

The initial preliminary exploratory scans were performed over the frequency range as indicated in the tables below using the max hold function and incorporating a Peak detector and using TILE! software. The final test data was measured using a Quasi-Peak detector below 1GHz and a Peak detector above 1GHz. For harmonics of the fundamental, Average measurements were made by correcting the peak value with the duty cycle correction factor. For emissions other than harmonics of the fundamental, the Average measurements were made using the Average detector. The receivers resolution bandwidth was set to 120 kHz for measurements taken in the 30MHz to 1GHz frequency range and 1MHz for measurements for 1GHz and higher. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.
There is a limit on spurious emissions produced by an intentional radiator in any 100 kHz Bandwidth outside the intentional emission band of -20dBc provided the radiator complies with the limits specified in 15.205© and 15.209(a).

Measurements were made in the following modes of operation: 802.11b,g,n at high, mid and low channels at the lowest data rate for each. No spurious emissions were detected in any mode of operation in the range 30 MHz to 26 GHz. The Prescan plots for the 802.11b are reported as the worst case mode of operation.

Test distance:

30 MHz to 1 GHz - The EUT to measurement antenna distance is 3 meters
1 to 18 GHz - The EUT to measurement antenna distance is 3 meters
18 to 40 GHz - The EUT to measurement antenna distance is 1 meter

Frequency	Limits(1)		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 (2)	--
88 - 216 MHz	150	43.5 (2)	--
216 - 960 MHz	200	46 (2)	--
960 - 1000 MHz	500	54 (2)	--
1 - 40 GHz	500	54 (3)	74

(1) These limits are applicable to emissions outside of the intentional transmit frequency band.
(2) Quasi-peak limit
(3) Average limit

7.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

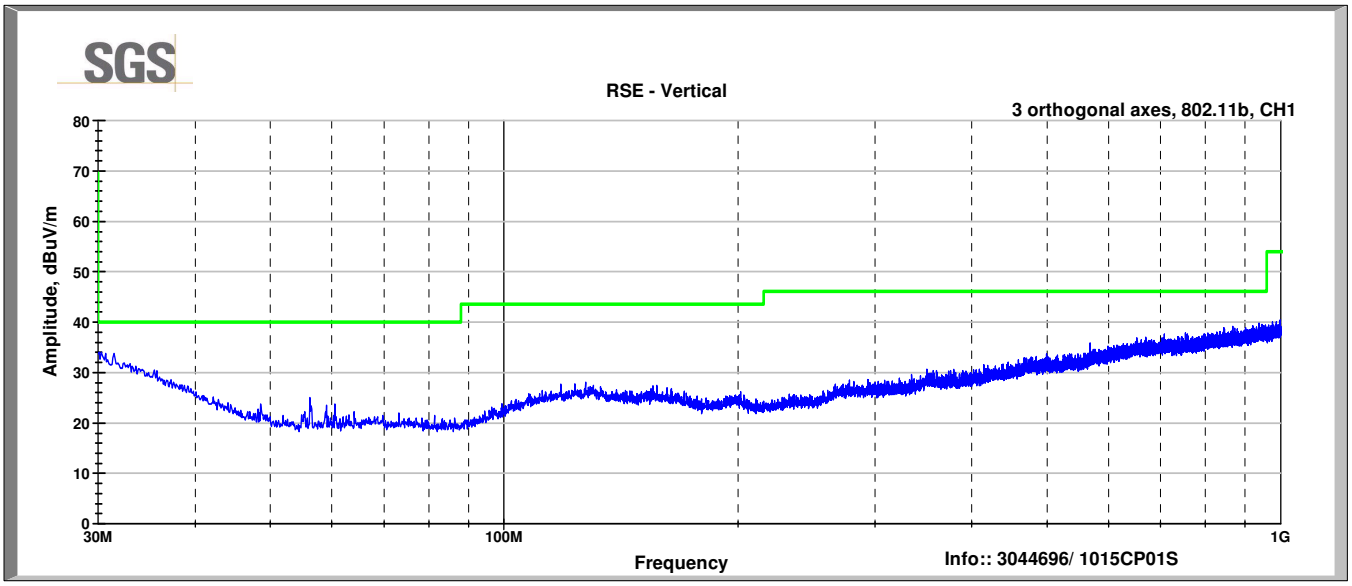
Environmental Conditions
Temperature: 23.8 ℃
Relative Humidity: 46.6 %

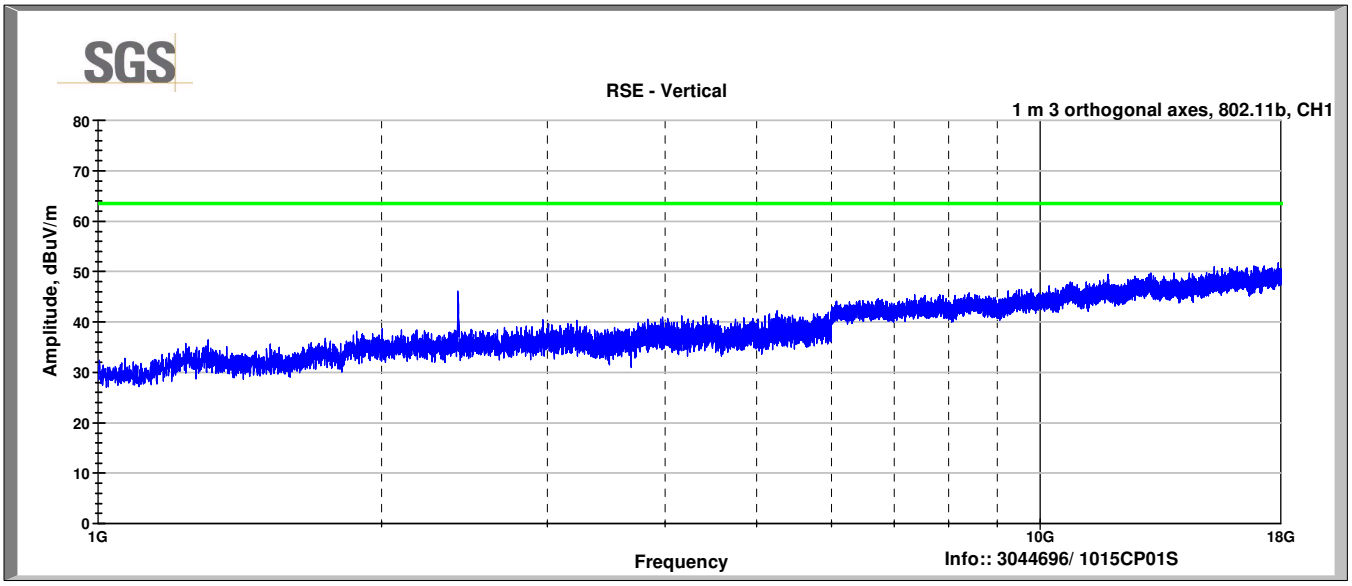
7.4 *Test Equipment*

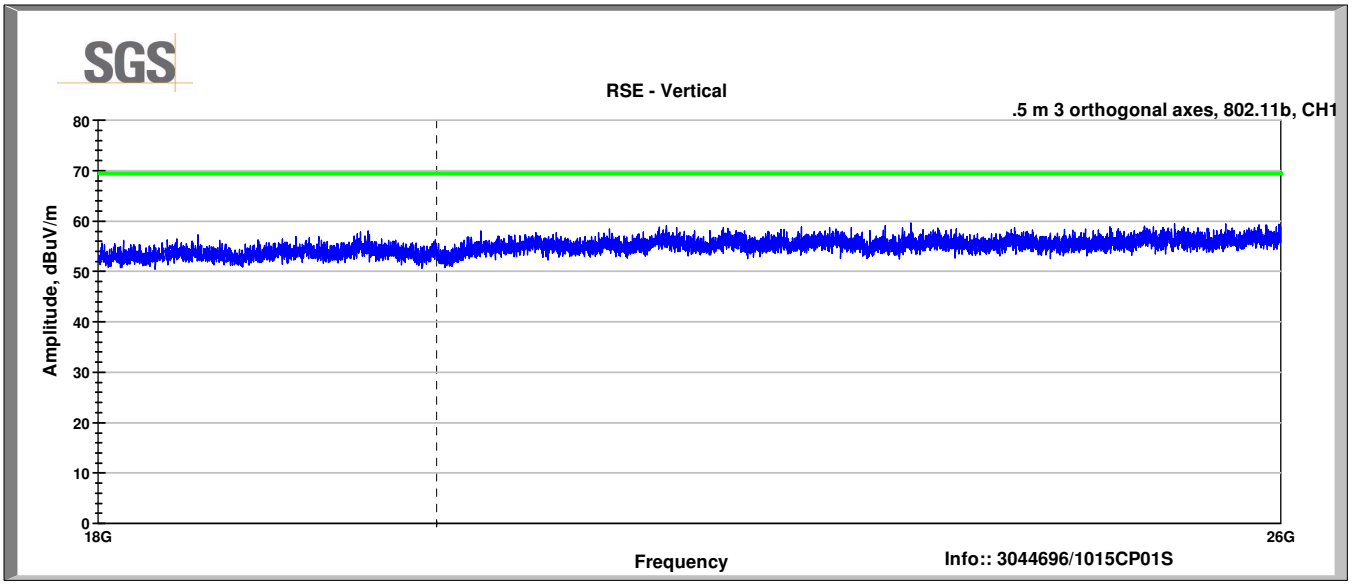
Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ANTENNA, BILOG	JB6	SUNOL	B079690	12-Sep-12	12-Sep-13
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	24-Sep-12	24-Sep-13
10 FT N TYPE COAX	HS 84133215	HUBER&SUHNER	B079660	13-Aug-12	13-Aug-13
RF CABLE	SF106	HUBER&SUHNER	B085888	22-Oct-12	22-Oct-13
COAXIAL CABLE	SUCOFLEX 102	HUBER&SUHNER	B079824	12-Dec-12	12-Dec-13
COAXIAL CABLE	SUCOFLEX 102	HUBER&SUHNER	B079822	12-Dec-12	12-Dec-13
DRG HORN (MEDIUM)	3117	ETS-LINDGREN	B079691	10-Jun-13	10-Jun-14
Signal Generator	HMC T2240	Hittite	B079813	NA	VBU
PREAMPLIFIER-ANTENNA SYS	TS-PR18	ROHDE & SCHWARZ	B094463	12-Feb-13	12-Feb-14
FIXED GAIN AMPLIFIER	NSP1840-HG	MITEQ	B087572	22-Oct-12	22-Oct-13

7.5 *Test Data*

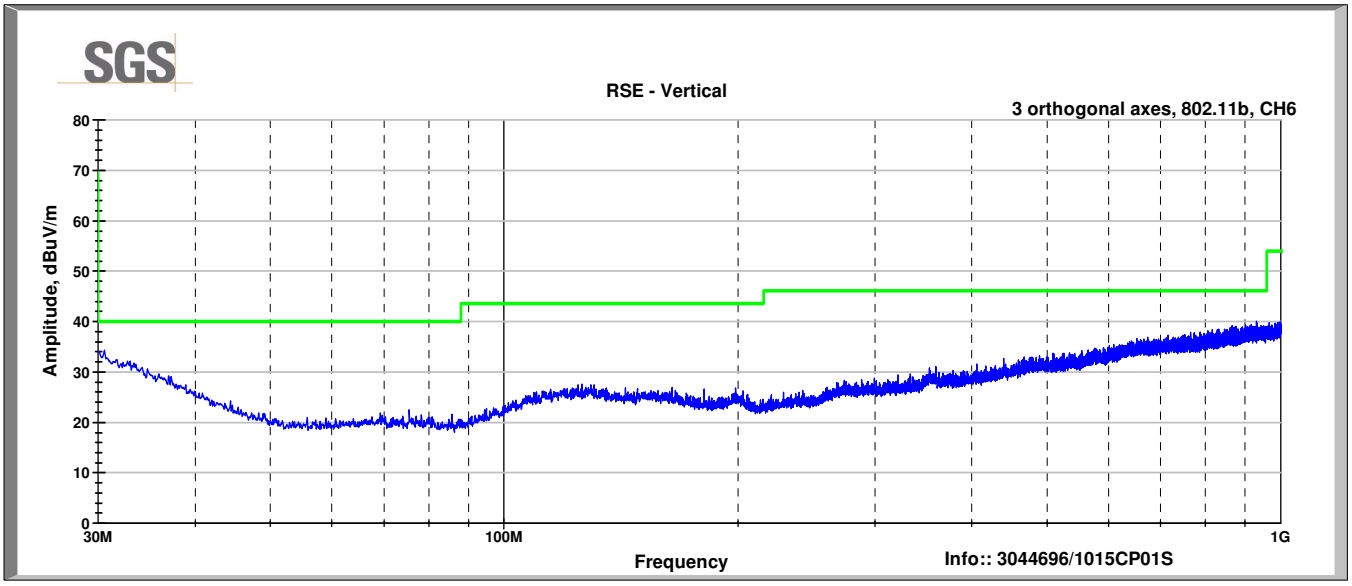
802.11b CH1 1MB
Vertical






SGS
RSE - Vertical
.5 m 3 orthogonal axes, 802.11b, CH1
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
18G
26G
Frequency
Info:: 3044696/1015CP01S

Mid Channel


SGS
RSE - Vertical
3 orthogonal axes, 802.11b, CH6
Amplitude, dBuV/m
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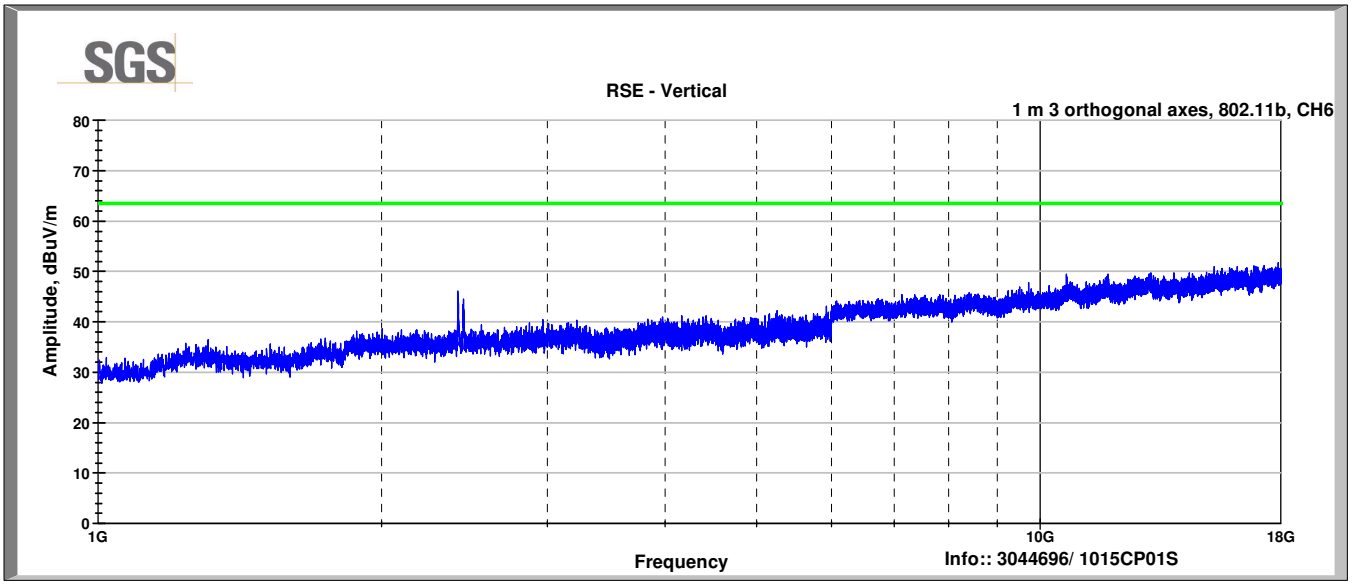
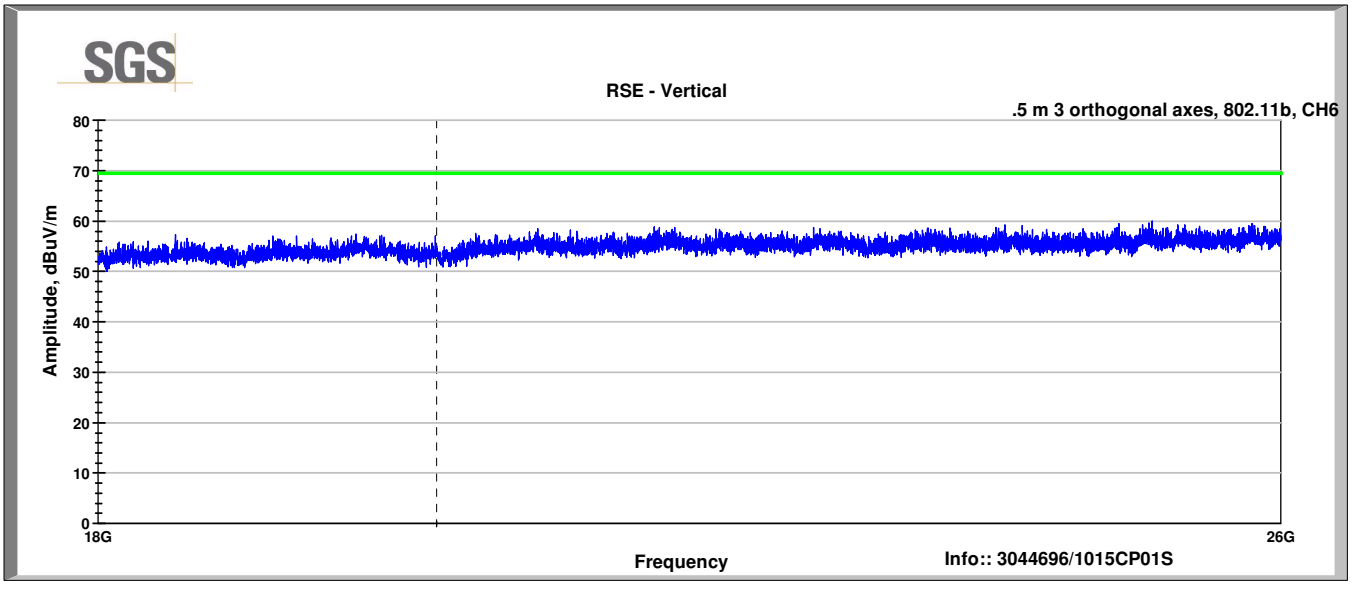
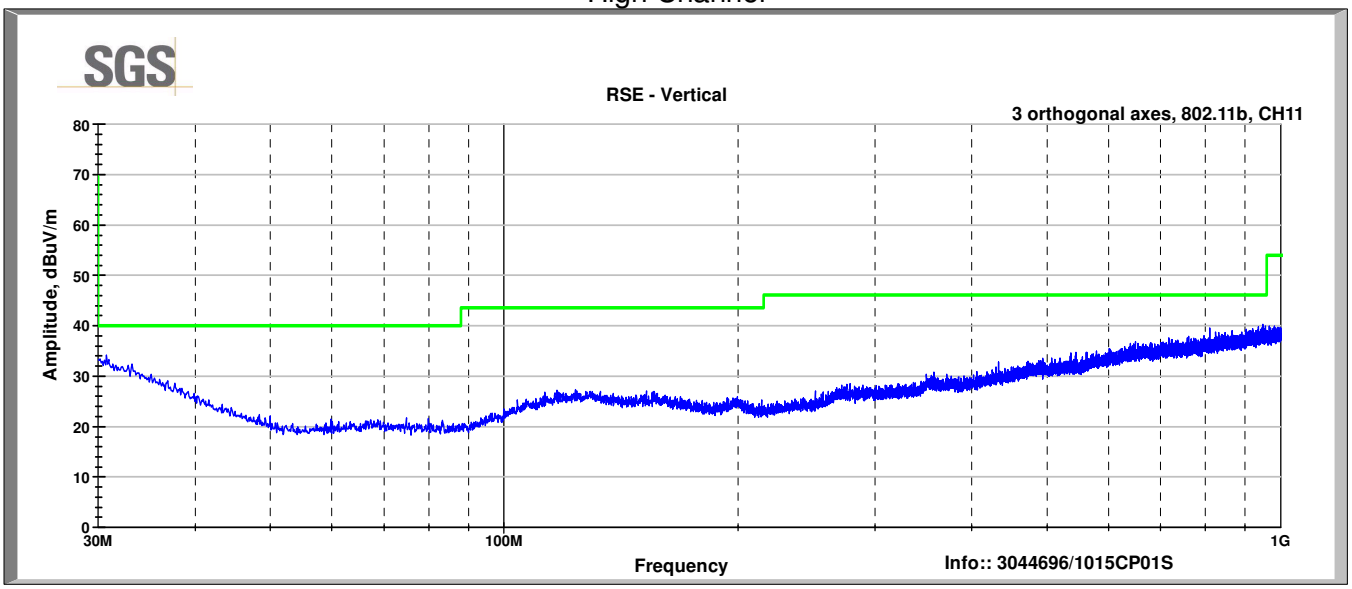
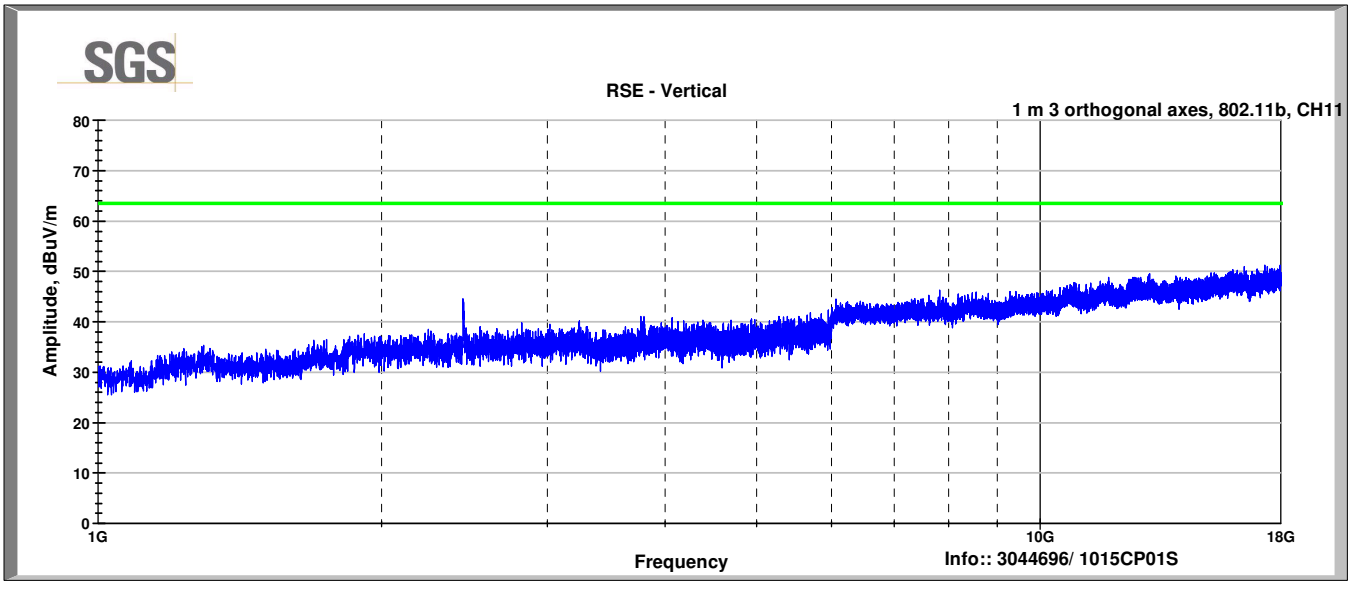
70
60
50
40
30
20
10
0
30M
100M
1G
Frequency
Info:: 3044696/1015CP01S

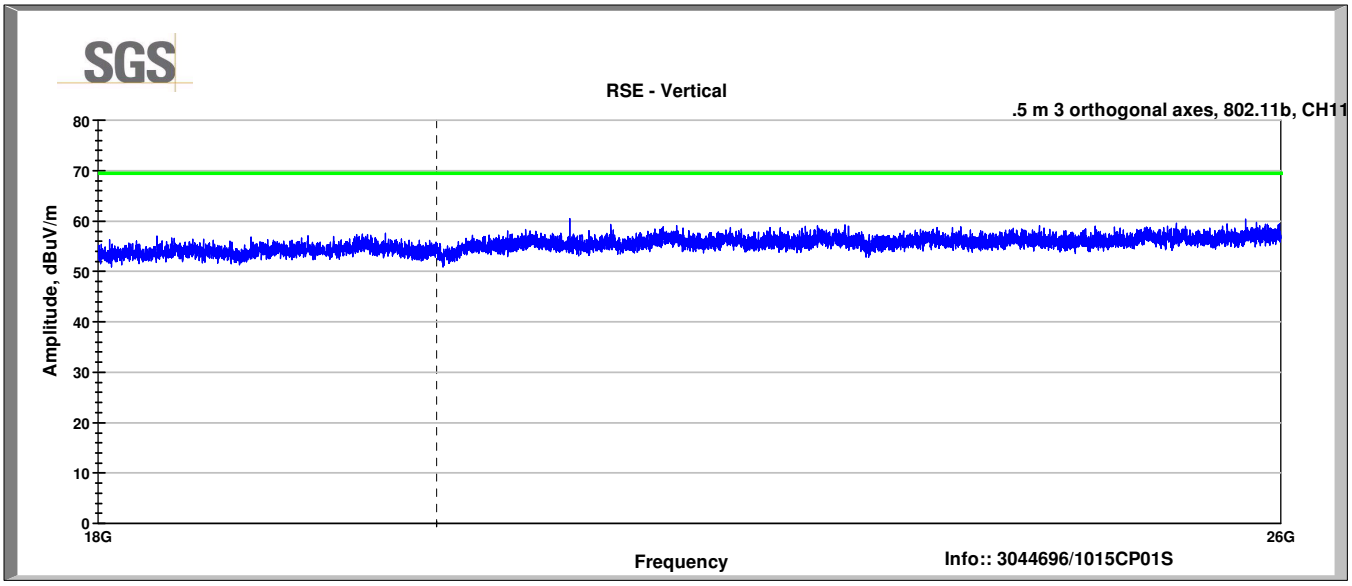

RSE - Vertical
1 m 3 orthogonal axes, 802.11b, CH6
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
1G
10G
18G
Frequency
Info:: 3044696/ 1015CP01S


RSE - Vertical
.5 m 3 orthogonal axes, 802.11b, CH6
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
18G
26G
Frequency
Info:: 3044696/1015CP01S

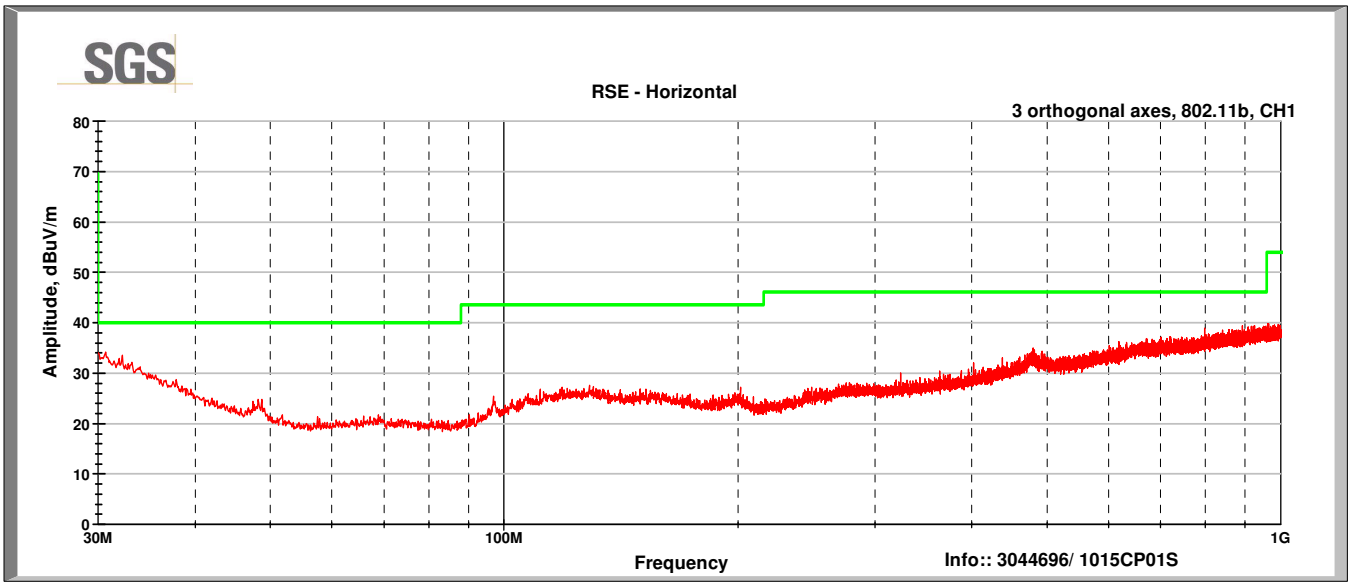
High Channel

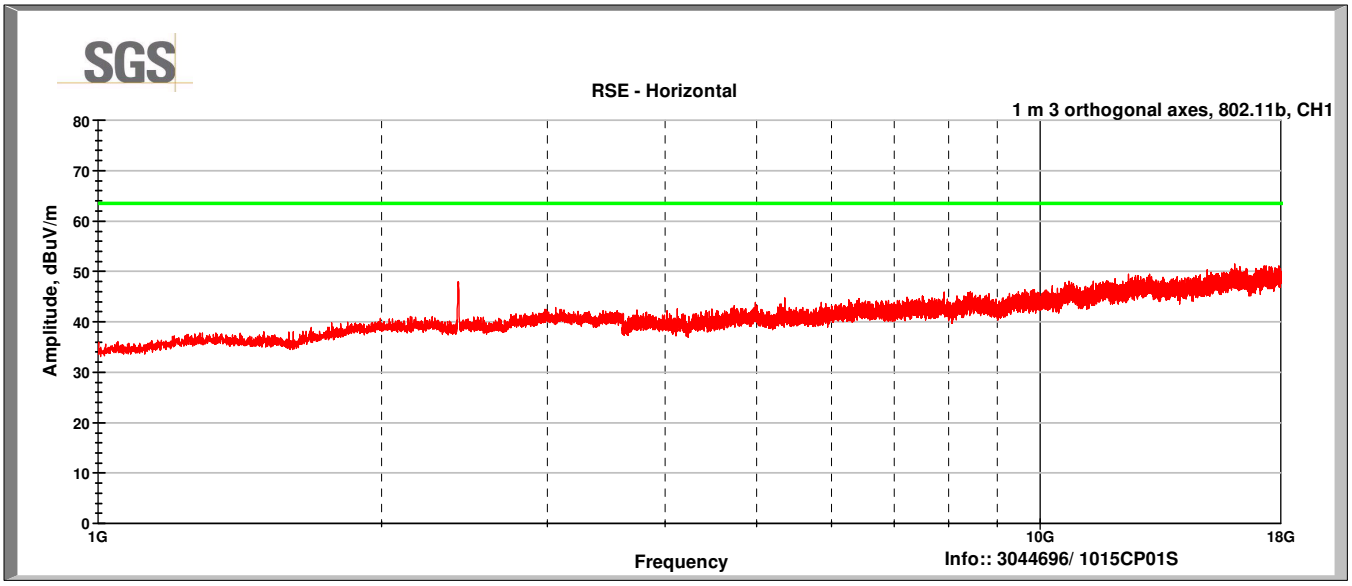


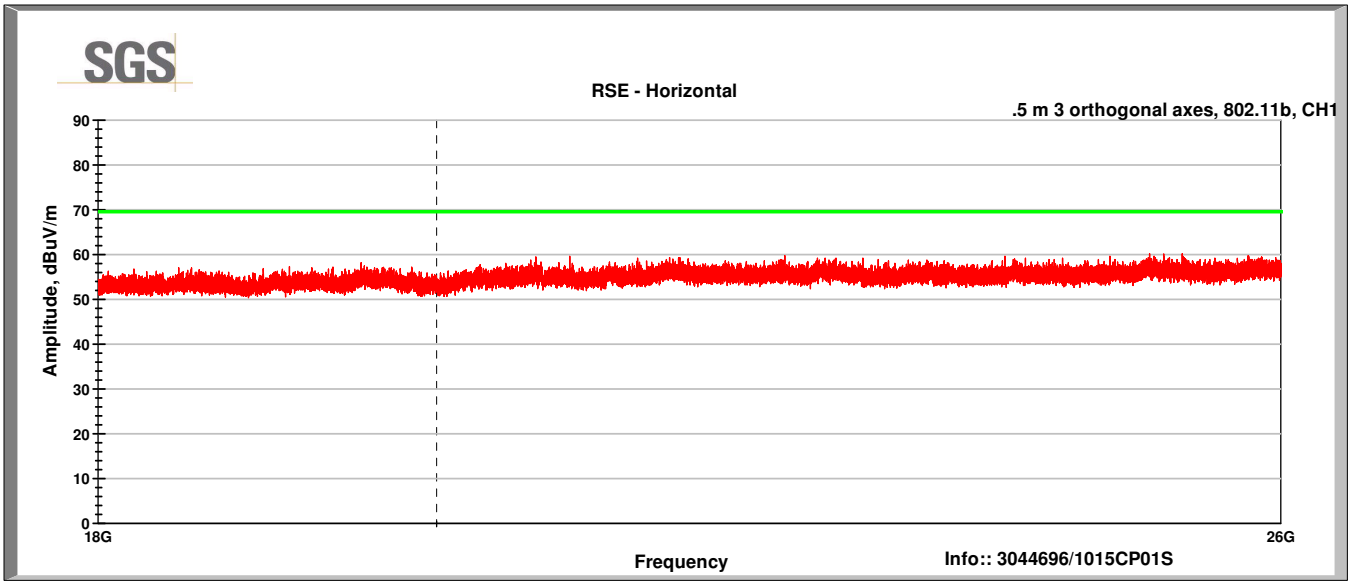




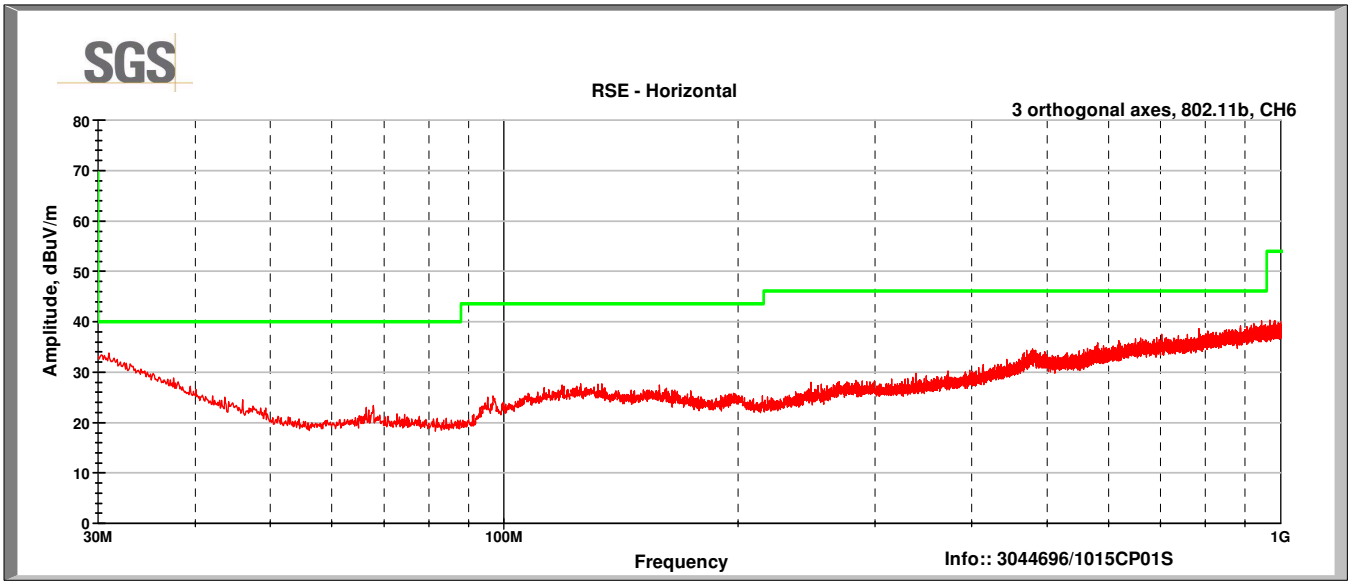
Horizontal Data - Low Channel




RSE - Horizontal
1 m 3 orthogonal axes, 802.11b, CH1
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
1G
10G
18G
Frequency
Info:: 3044696/ 1015CP01S


RSE - Horizontal
.5 m 3 orthogonal axes, 802.11b, CH1
Amplitude, dBuV/m
90
80
70
60
50
40
30
20
10
0
18G
26G
Frequency
Info:: 3044696/1015CP01S

Mid Channel


RSE - Horizontal
3 orthogonal axes, 802.11b, CH6
Amplitude, dBuV/m
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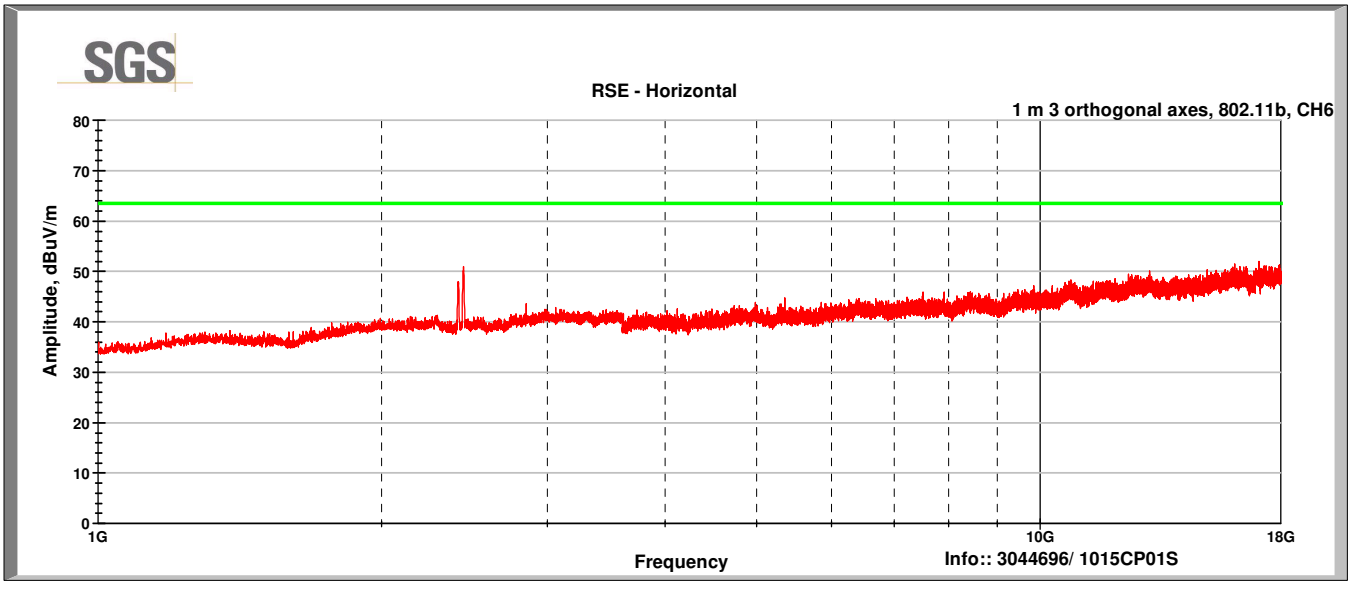
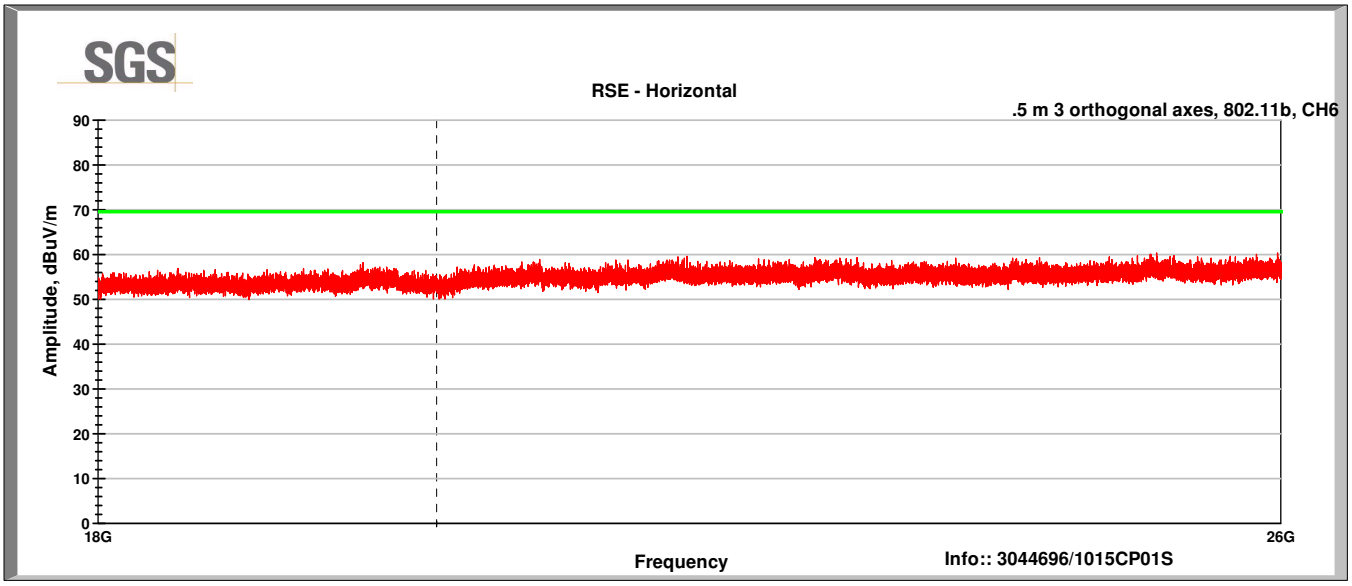
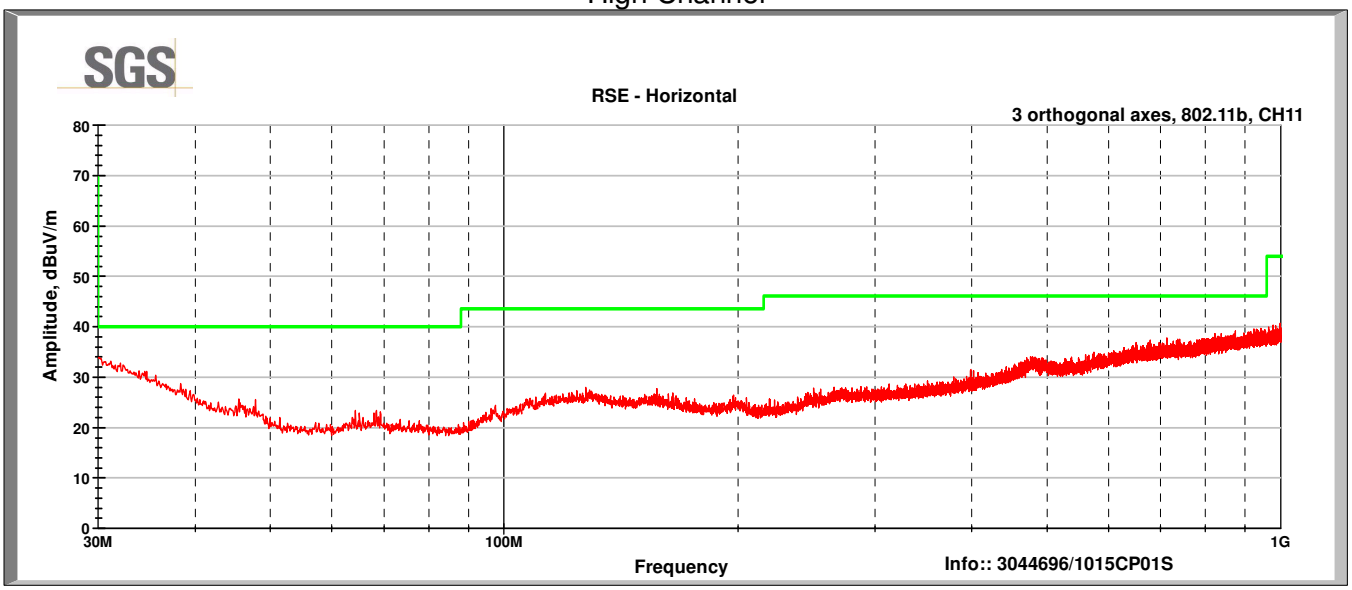
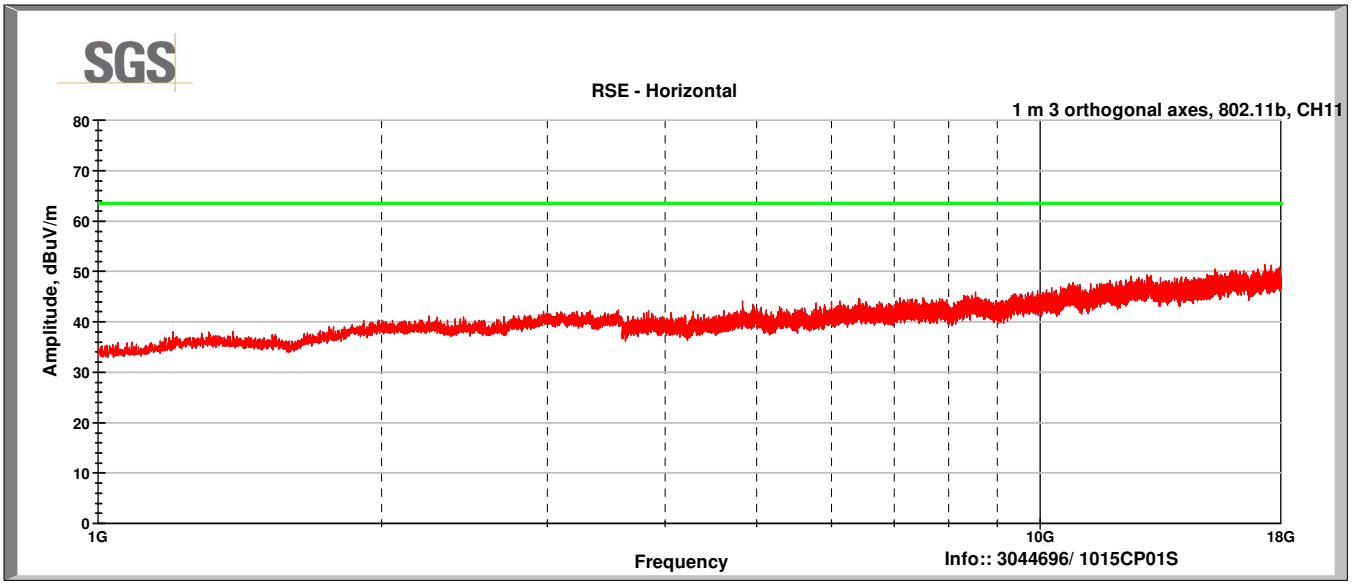
70
60
50
40
30
20
10
0
30M
100M
1G
Frequency
Info:: 3044696/1015CP01S

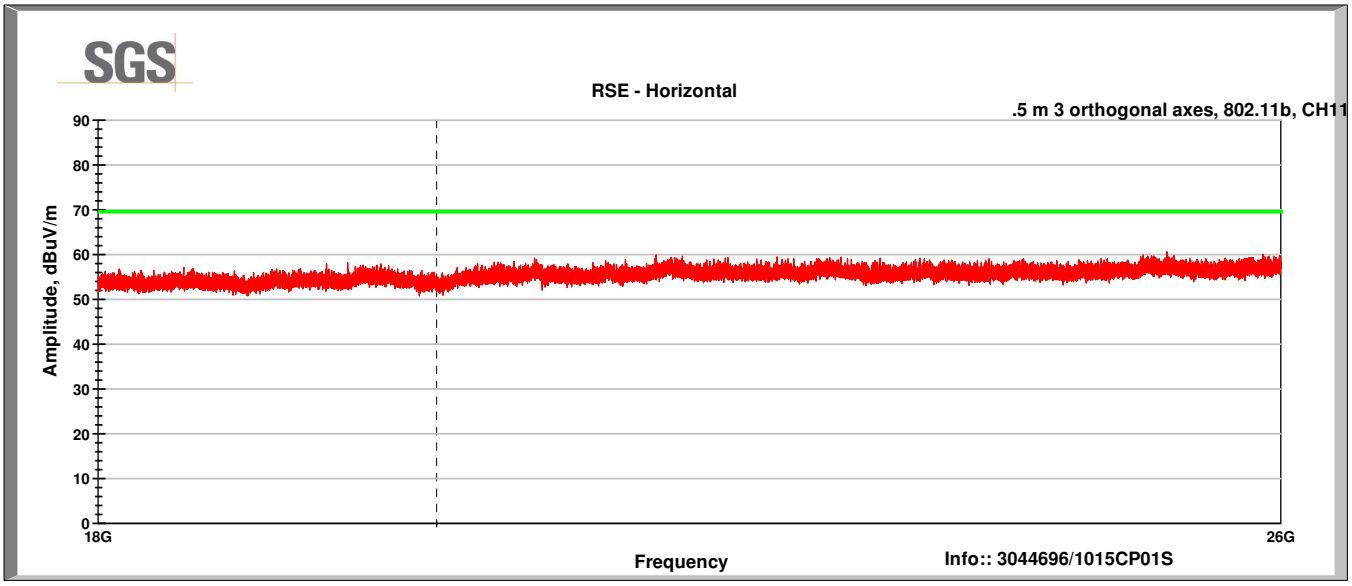

RSE - Horizontal
1 m 3 orthogonal axes, 802.11b, CH6
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
1G
10G
18G
Frequency
Info:: 3044696/ 1015CP01S



High Channel




RSE - Horizontal
1 m 3 orthogonal axes, 802.11b, CH11
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
1G
10G
18G
Frequency
Info:: 3044696/ 1015CP01S


RSE - Horizontal
.5 m 3 orthogonal axes, 802.11b, CH11
Amplitude, dBuV/m
90
80
70
60
50
40
30
20
10
0
18G
26G
Frequency
Info:: 3044696/1015CP01S

8 Radiated Emissions at Band Edge / Restricted Band

8.1 *Test Result*

Test Description	Test Specification	Test Result
Field strength of spurious radiation	15.247 (d) and 15.209	Compliant

8.2 *Test Method*

Peak and average field strength measurements were performed at the Frequency of 2483.5 MHz, which is a restricted band at the edge of the allowable transmit band. The resolution bandwidth was set to 1 MHz. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits of 54 dBuV/m for average measurements and 74 dBuV/m for peak measurements.

The market-delta method of ANSI 63.9:2009 is used if needed.

Measurements were made in the following modes of operation: 802.11b,g,n at high channel and using representative data rates.

Test distance: 1m

8.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 24.8 ℃
Relative Humidity: 30.7 %

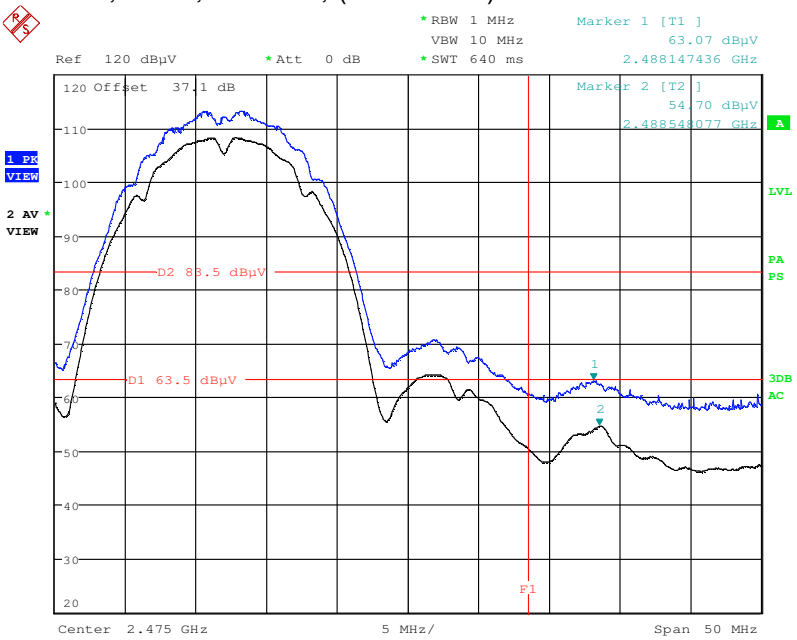
8.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Bilog Antenna	JB6	Sunol	B079690	12 Sep 2013
Receiver	ESU40	R & S	B079629	24 Aug 2013
Coaxial Cable	Sucoflex 106	Huber+Suhner	B079660	13 Aug 2013
Coaxial Cable	Sucoflex 106	Huber+Suhner	B085888	22 Oct 2013

Note: The calibration period equipment is 1 year.

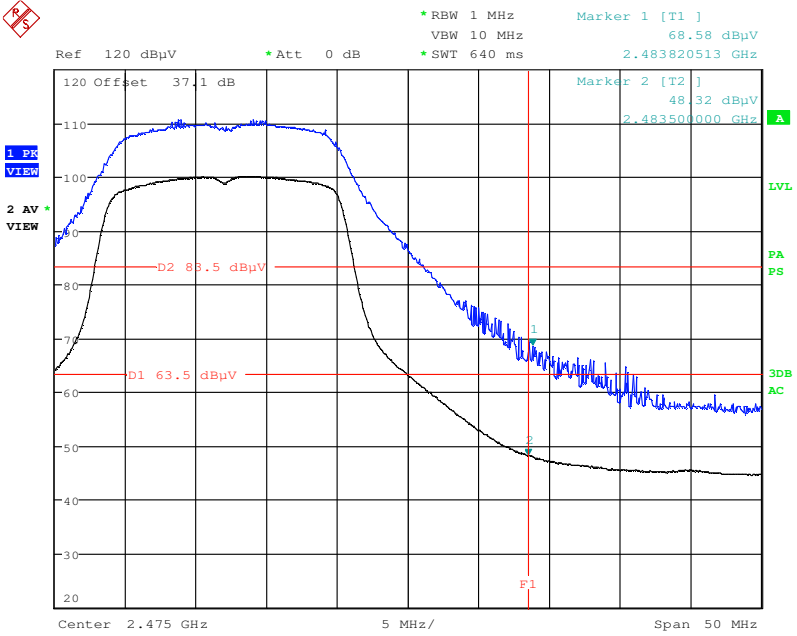
8.5 *Test Data*

802.11b, Ch11, 1Mbits/s, (worst case)



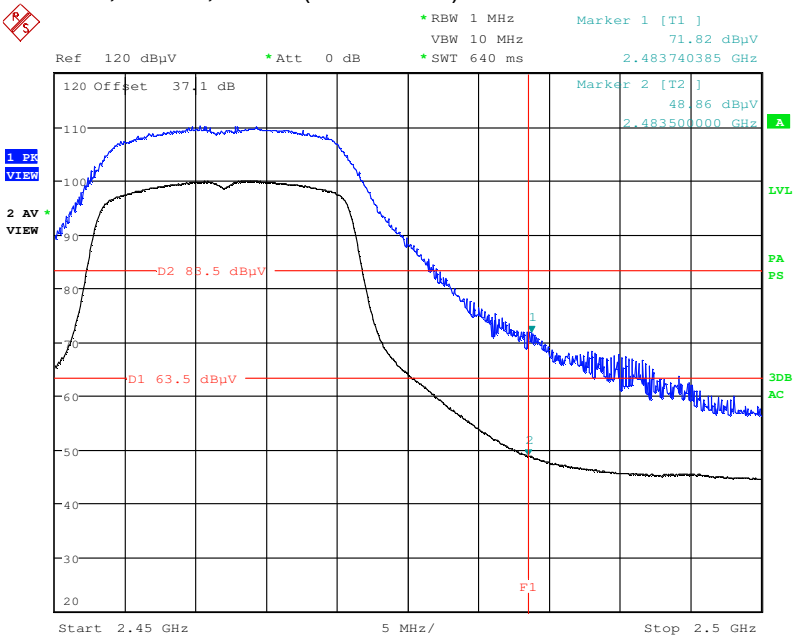
Date: 14.MAY.2013 10:07:00

802.11g, 6Mbits/s, Ch11 (worst case)



Date: 14.MAY.2013 10:05:31

802.11n, MCS0, Ch11 (worst case)



Date: 14.MAY.2013 10:04:01

9 Conducted Emissions

9.1 *Test Result*

Test Description	Basic Standards	Test Result
Conducted Emissions	15.107, Class B ANSI C63.4:2009	Compliant

9.2 *Test Method*

With the receivers resolution bandwidth was set to 9 kHz the initial preliminary exploratory scans were performed over the measuring frequency range (0.15MHz to 30MHz) using a max hold mode incorporating a Peak detector and Average detector and using the TILE! software. The final test data was measured using a Quasi-Peak detector and Average detector and compared against the limits indicated in the table below.

Frequency Range	Class A Limits (dBuV)		Class B Limits (dBuV)	
	FCC	CISPR	FCC	CISPR
0.15 to 0.5 MHz	Avg 66 QP 79		Avg 56 to 46 QP 66 to 56	
0.5 to 5 MHz	Avg 60 QP 73		Avg 46 Pk 56	
5 to 30 MHz	Avg 60 QP 73		Avg 50 Pk 60	

9.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 24.4 ℃
Relative Humidity: 47.8 %

9.4 *Test Equipment*

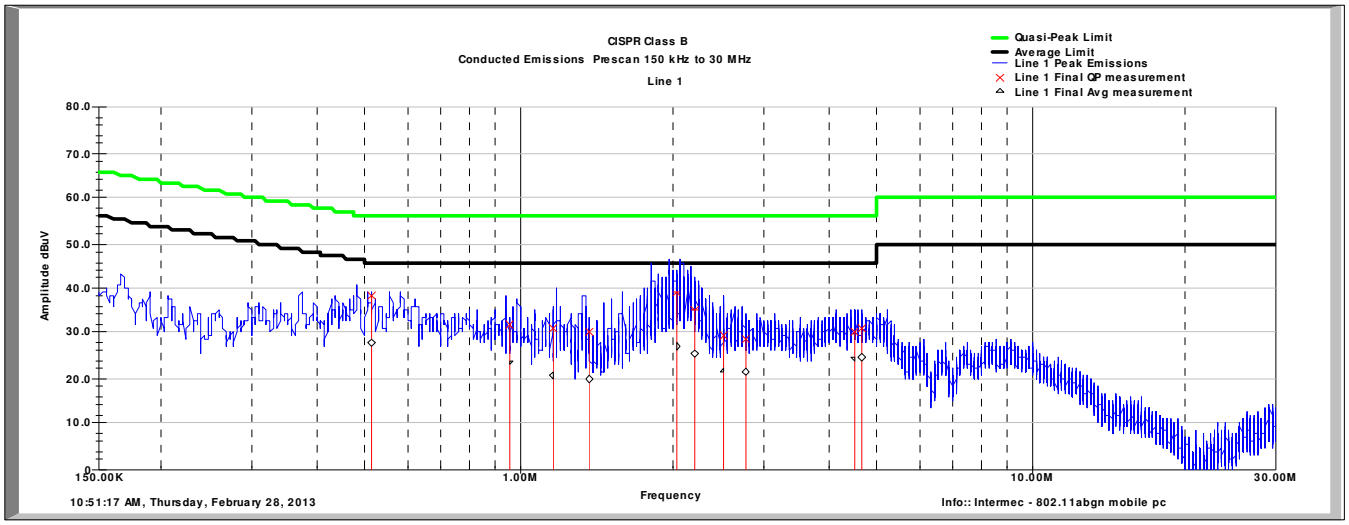
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
LISN	NNB51	TESEQ	B085882	9 OCT 2013
Receiver	ESU40	R & S	B079629	24 Sep 2013

Note: The calibration period equipment is 1 year.

Software:
“Conducted Emissions” TILE! profile dated 10 Nov 2011

9.5 *Test Data*

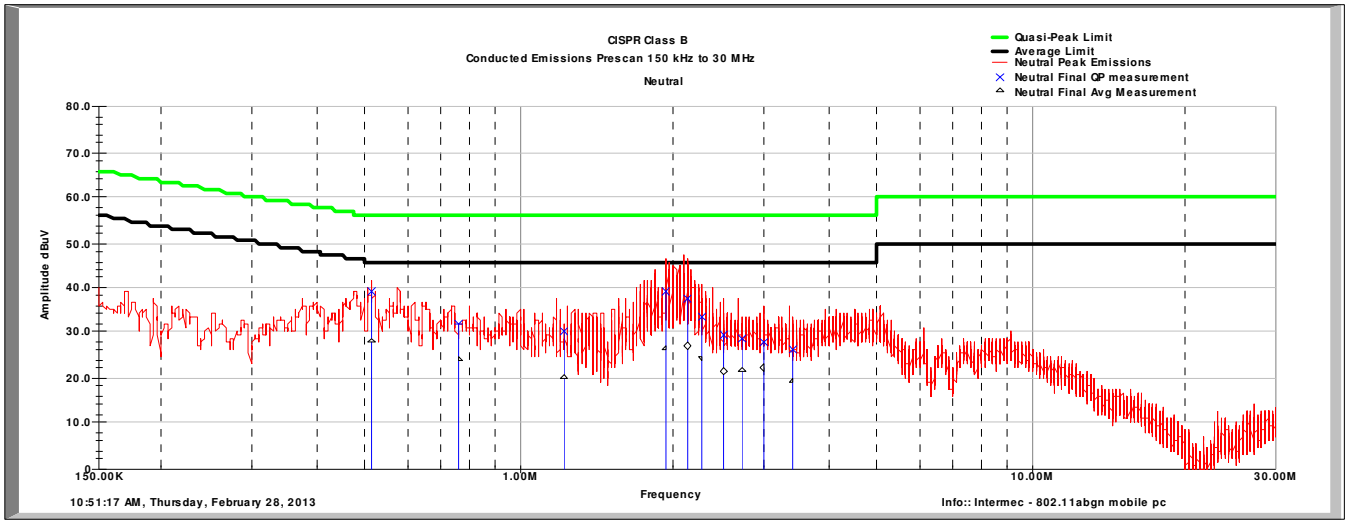
802.11b CH1 1MB
Line 1 Conducted Emissions Plot



Line 1 Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.512	38.4	56.0	-17.6	28.0	46.0	-18.0
0.961	32.1	56.0	-23.9	23.6	46.0	-22.4
1.153	31.2	56.0	-24.8	20.4	46.0	-25.6
1.365	30.4	56.0	-25.6	19.9	46.0	-26.1
2.033	38.8	56.0	-17.2	27.0	46.0	-19.0
2.198	35.5	56.0	-20.5	25.5	46.0	-20.5
2.488	29.6	56.0	-26.4	21.7	46.0	-24.3
2.746	28.8	56.0	-27.2	21.3	46.0	-24.7
4.476	30.4	56.0	-25.6	24.3	46.0	-21.7
4.632	30.9	56.0	-25.1	24.5	46.0	-21.5

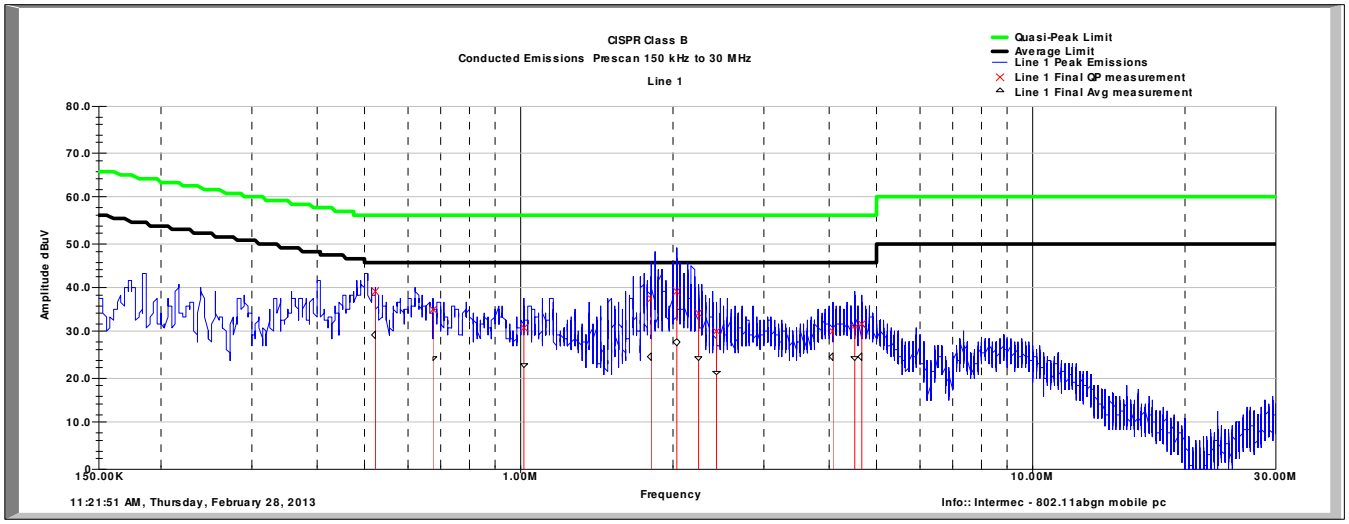
Neutral Conducted Emissions Plot



Neutral Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.514	38.9	56.0	-17.1	28.2	46.0	-17.8
0.763	32.3	56.0	-23.7	24.1	46.0	-21.9
1.215	30.6	56.0	-25.4	20.2	46.0	-25.8
1.912	39.4	56.0	-16.6	26.6	46.0	-19.4
2.123	37.8	56.0	-18.2	26.9	46.0	-19.1
2.254	33.7	56.0	-22.3	24.4	46.0	-21.6
2.499	29.7	56.0	-26.3	21.2	46.0	-24.8
2.726	28.6	56.0	-27.4	21.8	46.0	-24.2
2.971	28.2	56.0	-27.8	22.3	46.0	-23.7
3.395	26.3	56.0	-29.7	19.3	46.0	-26.7

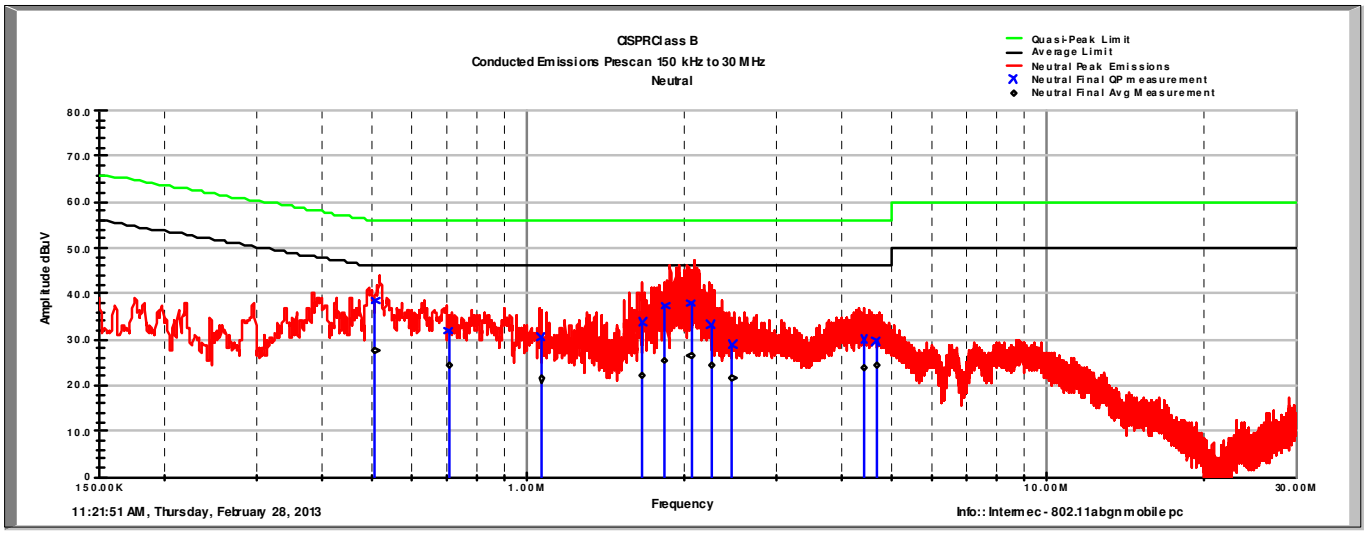
CH6 1MB
Line 1 Conducted Emissions Plot



Line 1 Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.519	39.4	56.0	-16.6	29.3	46.0	-16.7
0.681	35.4	56.0	-20.6	24.4	46.0	-21.6
1.020	31.2	56.0	-24.8	22.7	46.0	-23.3
1.790	37.8	56.0	-18.2	24.9	46.0	-21.1
2.023	39.4	56.0	-16.6	28.0	46.0	-18.0
2.235	34.3	56.0	-21.7	24.3	46.0	-21.7
2.415	30.4	56.0	-25.6	21.2	46.0	-24.8
4.050	30.0	56.0	-26.0	24.5	46.0	-21.5
4.496	31.5	56.0	-24.5	24.4	46.0	-21.6
4.625	31.6	56.0	-24.4	24.7	46.0	-21.3

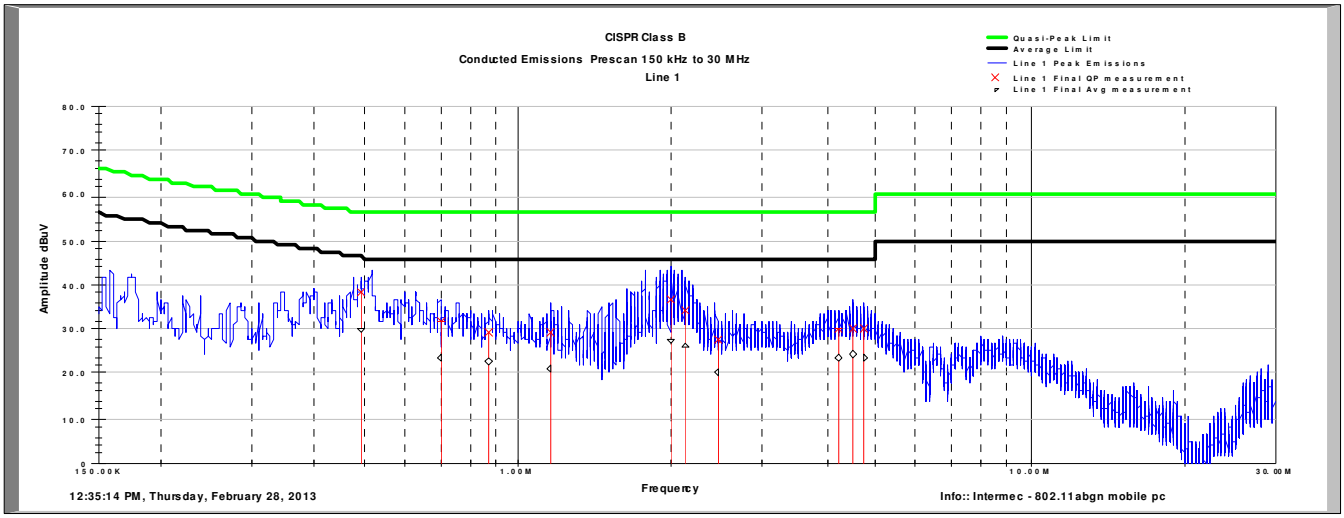
Neutral Conducted Emissions Plot



Neutral Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.509	38.6	56.0	-17.4	27.7	46.0	-18.3
0.705	32.0	56.0	-24.0	24.2	46.0	-21.8
1.061	30.6	56.0	-25.4	21.4	46.0	-24.6
1.659	33.8	56.0	-22.2	22.2	46.0	-23.8
1.836	37.5	56.0	-18.5	25.4	46.0	-20.6
2.059	38.0	56.0	-18.0	26.5	46.0	-19.5
2.253	33.2	56.0	-22.8	24.2	46.0	-21.8
2.482	28.8	56.0	-27.2	21.5	46.0	-24.5
4.437	30.0	56.0	-26.0	23.8	46.0	-22.2
4.686	29.7	56.0	-26.3	24.5	46.0	-21.5

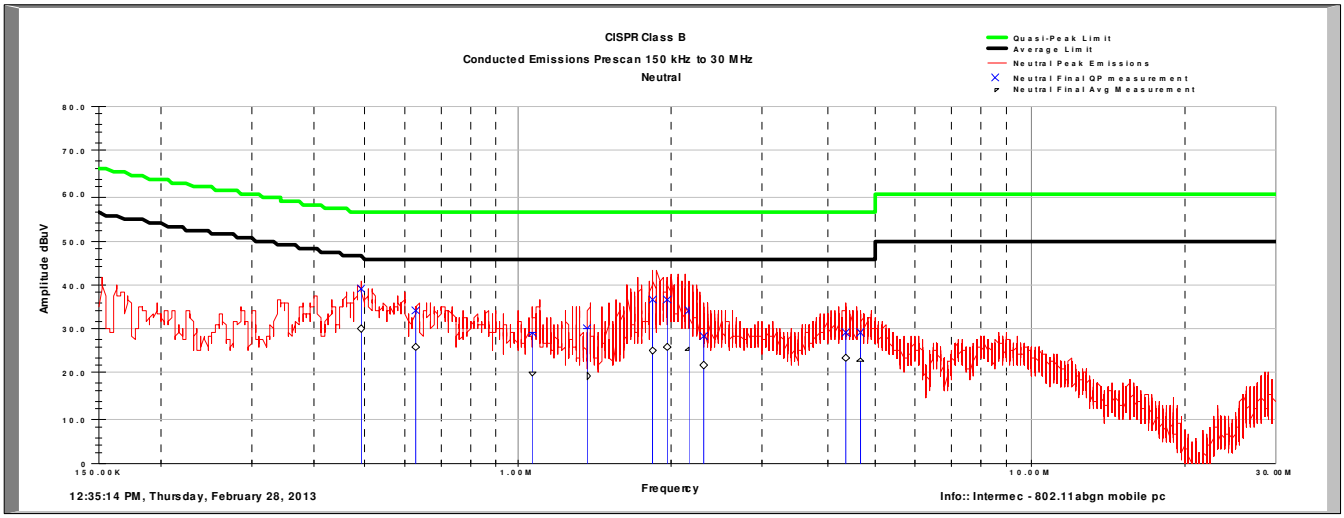
CH11 1MB
Line 1 Conducted Emissions Plot



Line 1 Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.491	38.5	56.2	-17.7	29.8	46.2	-16.4
0.701	32.2	56.0	-23.8	23.8	46.0	-22.2
0.874	29.6	56.0	-26.4	22.7	46.0	-23.3
1.148	29.1	56.0	-26.9	21.0	46.0	-25.0
1.976	36.5	56.0	-19.5	27.5	46.0	-18.5
2.125	34.0	56.0	-22.0	26.3	46.0	-19.7
2.440	27.7	56.0	-28.3	20.3	46.0	-25.7
4.239	29.8	56.0	-26.2	23.6	46.0	-22.4
4.508	30.5	56.0	-25.5	24.2	46.0	-21.8
4.765	30.0	56.0	-26.0	23.7	46.0	-22.3

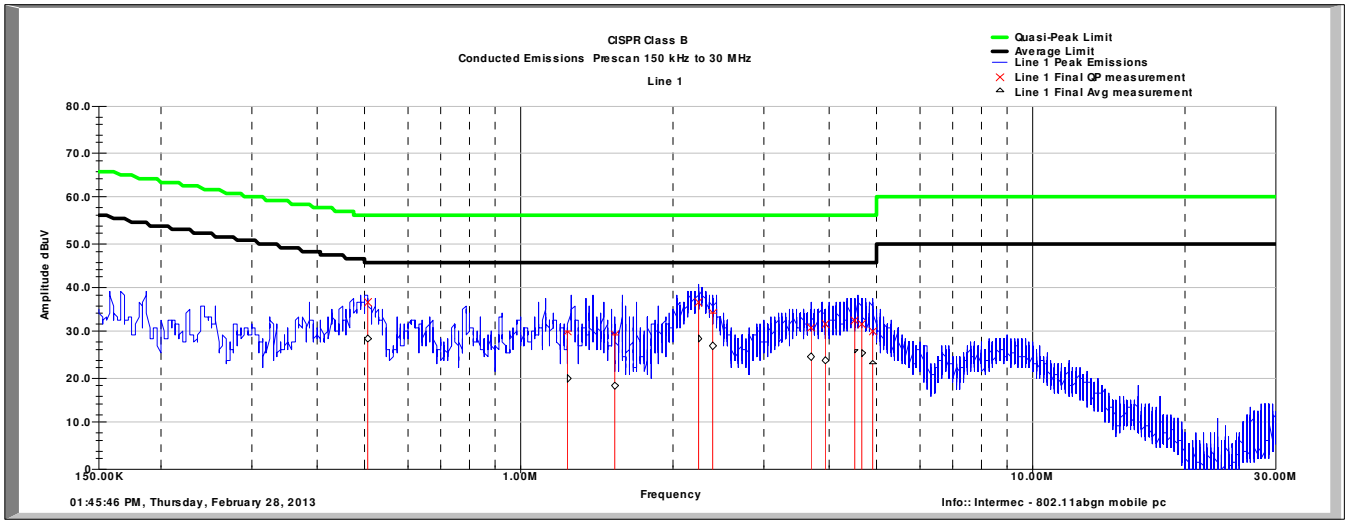
Neutral Conducted Emissions Plot



Neutral Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.493	38.9	56.1	-17.2	29.9	46.1	-16.2
0.632	34.4	56.0	-21.6	25.9	46.0	-20.1
1.060	29.0	56.0	-27.0	20.0	46.0	-26.0
1.367	30.5	56.0	-25.5	19.4	46.0	-26.6
1.822	36.5	56.0	-19.5	25.0	46.0	-21.0
1.959	36.7	56.0	-19.3	26.2	46.0	-19.8
2.138	34.0	56.0	-22.0	25.5	46.0	-20.5
2.305	28.8	56.0	-27.2	22.0	46.0	-24.0
4.371	29.7	56.0	-26.3	23.6	46.0	-22.4
4.641	29.2	56.0	-26.8	23.1	46.0	-22.9

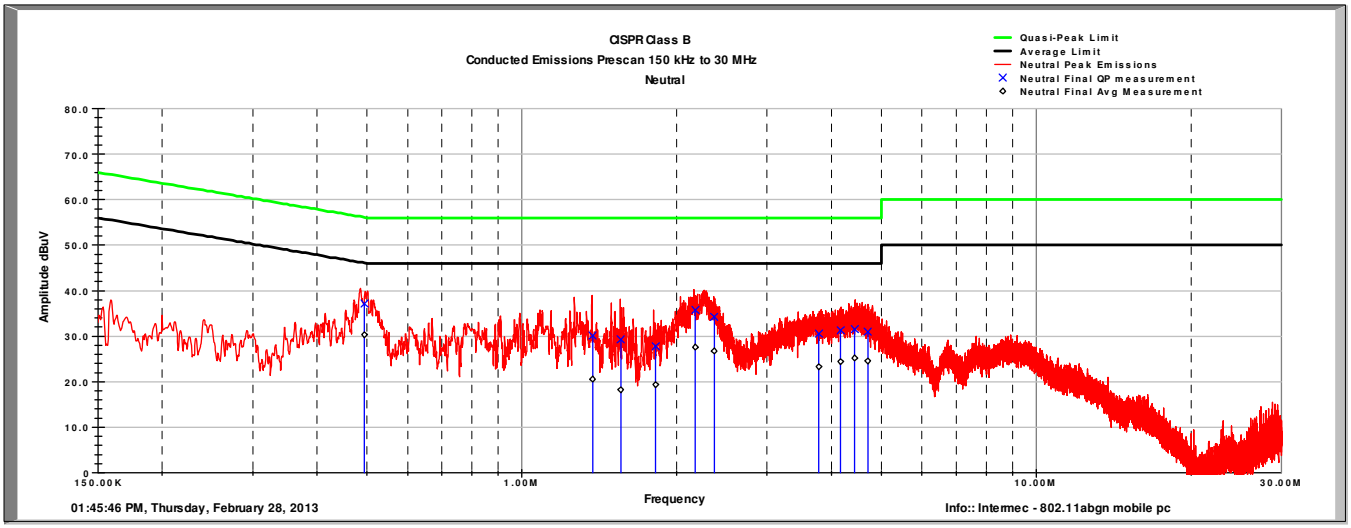
802.11a CH149 6MB
Line 1 Conducted Emissions Plot



Line 1 Conducted Emissions data

Frequency MHz	QP Value dBuV	QP Limit dBuV	Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.504	36.8	56.0	-19.2	28.9	46.0	-17.1
1.247	29.9	56.0	-26.1	20.0	46.0	-26.0
1.536	29.9	56.0	-26.1	18.3	46.0	-27.7
2.247	36.7	56.0	-19.3	28.5	46.0	-17.5
2.374	34.7	56.0	-21.3	27.1	46.0	-18.9
3.706	30.9	56.0	-25.1	24.5	46.0	-21.5
3.945	31.6	56.0	-24.4	23.8	46.0	-22.2
4.527	32.3	56.0	-23.7	26.0	46.0	-20.0
4.687	31.8	56.0	-24.2	25.5	46.0	-20.5
4.878	30.3	56.0	-25.7	23.4	46.0	-22.6

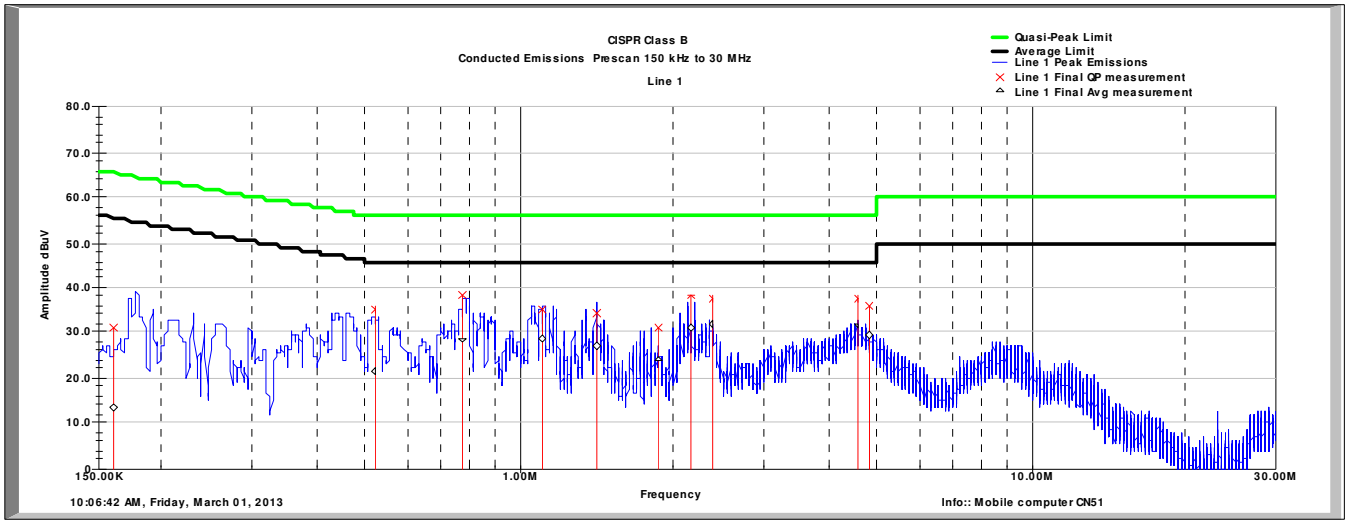
Neutral Conducted Emissions Plot



Neutral Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.495	37.1	56.1	-19.0	30.3	46.1	-15.8
1.374	30.1	56.0	-25.9	20.5	46.0	-25.5
1.559	29.3	56.0	-26.7	18.3	46.0	-27.7
1.822	27.8	56.0	-28.2	19.4	46.0	-26.6
2.176	35.7	56.0	-20.3	27.6	46.0	-18.4
2.368	34.3	56.0	-21.7	26.7	46.0	-19.3
3.782	30.5	56.0	-25.5	23.3	46.0	-22.7
4.171	31.3	56.0	-24.7	24.4	46.0	-21.6
4.440	31.5	56.0	-24.5	25.2	46.0	-20.8
4.711	31.0	56.0	-25.0	24.6	46.0	-21.4

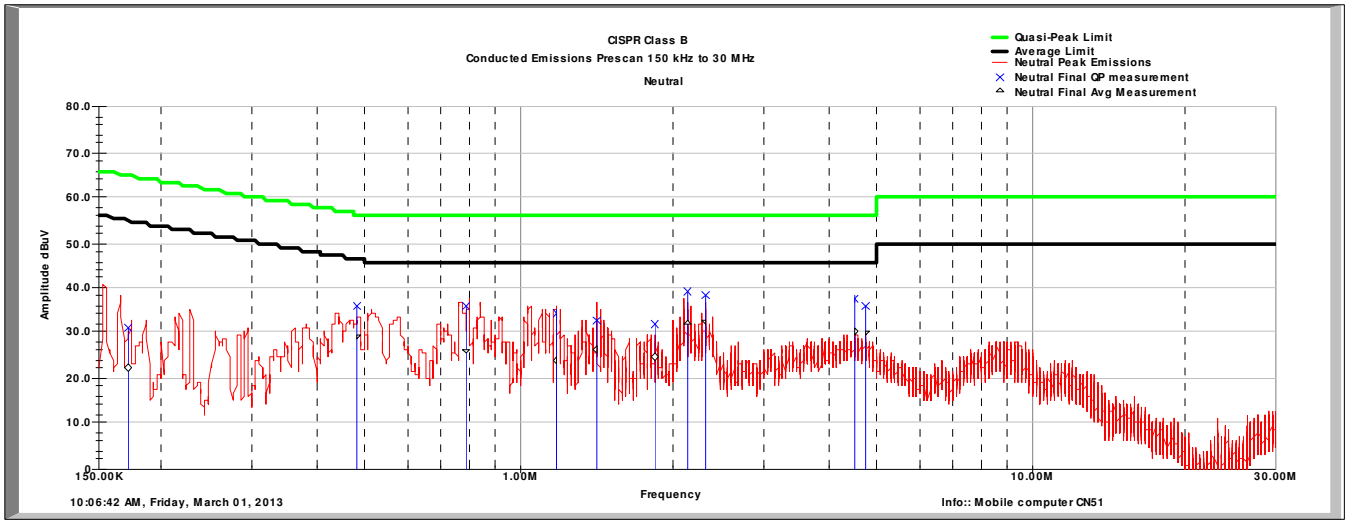
802.11a CH165 6MB
Line 1 Conducted Emissions Plot



Line 1 Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.160	31.1	65.5	-34.4	13.4	55.5	-42.1
0.517	35.0	56.0	-21.0	21.4	46.0	-24.6
0.770	38.6	56.0	-17.4	28.4	46.0	-17.6
1.102	35.5	56.0	-20.5	28.6	46.0	-17.4
1.412	34.3	56.0	-21.7	26.9	46.0	-19.1
1.855	31.2	56.0	-24.8	24.2	46.0	-21.8
2.153	38.0	56.0	-18.0	31.1	46.0	-14.9
2.362	37.3	56.0	-18.7	31.7	46.0	-14.3
4.544	37.9	56.0	-18.1	31.6	46.0	-14.4
4.820	35.9	56.0	-20.1	29.4	46.0	-16.6

Neutral Conducted Emissions Plot



Neutral Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.172	31.2	64.9	-33.7	22.2	54.9	-32.7
0.484	36.3	56.3	-20.0	29.2	46.3	-17.1
0.782	36.0	56.0	-20.0	26.0	46.0	-20.0
1.170	34.2	56.0	-21.8	24.0	46.0	-22.0
1.403	32.7	56.0	-23.3	26.5	46.0	-19.5
1.842	32.2	56.0	-23.8	24.9	46.0	-21.1
2.127	38.8	56.0	-17.2	32.2	46.0	-13.8
2.292	38.7	56.0	-17.3	32.4	46.0	-13.6
4.540	37.4	56.0	-18.6	30.5	46.0	-15.5
4.758	36.3	56.0	-19.7	30.0	46.0	-16.0

10 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	2 Aug 2013