

EMC Test Report

Project Number: 3044696

Report Number: 3044696EMC05

Revision Level: 0

Client: Intermec Technologies Corp.
6001 36th Avenue W
Everett, WA 988203
United States

Equipment Under Test: Mobile Computer

Model Name: CN51

Model Number: 1015CP01

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: 16 September 2013

Test Result: Compliant

Tested by:



Brian Forster, 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
6dB Bandwidth	15.247(a)(2)	RSS-210 A8.2(a)	Compliant
Peak Power Output	15.247(b)(1)	RSS-210 A8.4(4)	Compliant
Conducted Spurious Emissions	15.247(d)	RSS-210 A8.5	Compliant
Band Edge	15.247(d)	RSS-210 A8.5	Compliant
Radiated Spurious Emissions	15.247(d)	RSS-210 A8.5	Compliant
Spectral Density	15.247(e)	RSS-210 A8.2(b)	Compliant
AC Powerline Conducted Emission	15.207	RSS-GEN 7.2.4	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
 6001 36th Avenue West

2.2 Test Laboratory

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

2.3 General Information of EUT

Marketing Name: Catalina
 Model: 1015CP01
 Serial Number: 333X12000044(Conducted Measurements)
 328X1200002(Radiated Measurements)
 Build Version: 1.0.0.0334
 FCC ID: EHA-1015CP01X1
 Frequency Range: 2402 to 2480 MHz
 5725 to 5850 MHz
 Modulation type: GFSK
 Channel spacing: 20 MHz
 Antenna: Integral

Rated Voltage: 3.8 VDC Internal Battery

Sample Received Date: 08 FEB 2013
 Dates of testing: 08 FEB – 17 JUL 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

2.4 EUT Connection Block Diagram



2.5 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Intermec	EUT	1015CP01	333X1200044(Conducted Measurements) 328X1200002(Radiated Measurements)

3 6dB 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 6 dB bandwidth.

3.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.4 °C

Relative Humidity: 47.8 %

3.4 Test Equipment

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Receiver	ESU40	R&S	B079629	24 SEP 2013

Note: The calibration period equipment is 1 year.

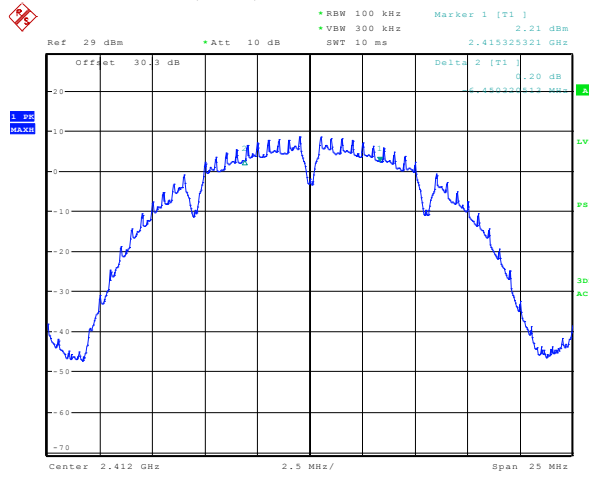
3.5 Test Setup Photographs

Test setup photographs are located in a separate exhibit.

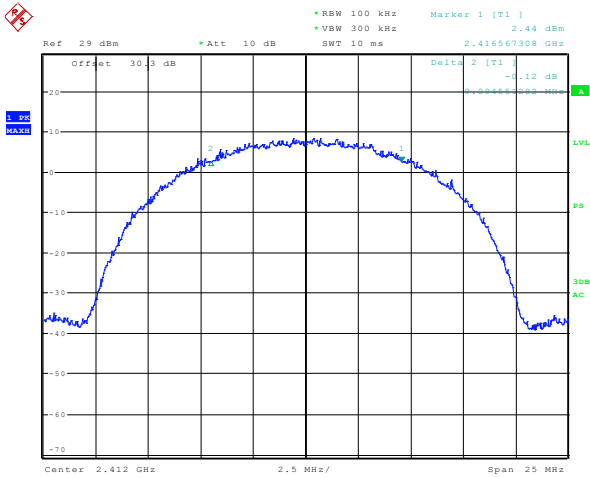
3.6 Test Data

Protocol	Channel	Data Rate	BW (MHz)
802.11b	1	1	6.4
802.11b	1	5.5	9.09
802.11b	1	11	9.65
802.11b	6	1	6.33
802.11b	6	5.5	9.09
802.11b	6	11	9.69
802.11b	11	1	6.45
802.11b	11	5.5	9.09
802.11b	11	11	9.78
802.11g	1	6	12.97
802.11g	1	36	13.14
802.11g	1	54	16.25
802.11g	6	6	12.34
802.11g	6	36	15.58
802.11g	6	54	16
802.11g	11	6	13.52
802.11g	11	36	13
802.11g	11	54	12.89
802.11n	1	MCS0	12.27
802.11n	1	MCS7	12.8
802.11n	6	MCS0	11.85
802.11n	6	MCS7	14.74
802.11n	11	MCS0	12.26
802.11n	11	MCS7	14.07
802.11a	149	6	13.54
802.11a	149	36	15.3
802.11a	149	54	16
802.11a	157	6	13.53
802.11a	157	36	15.02
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802.11a	165	6	14.14
802.11a	165	36	14.07
802.11a	165	54	14.17

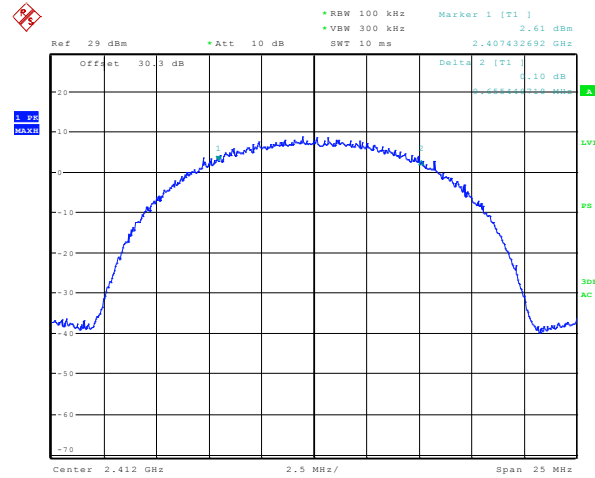
6 dB Bandwidth Plot, 802.11b CH1 1, 5.5, 11MB/s Data rates



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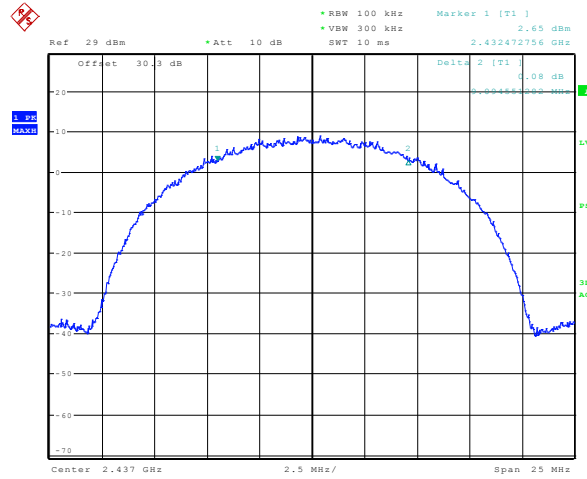
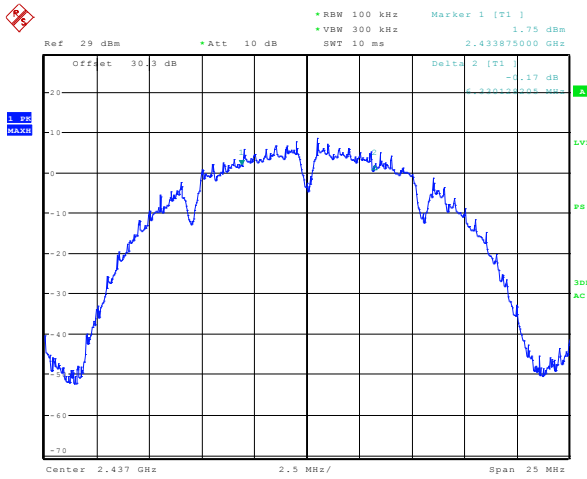


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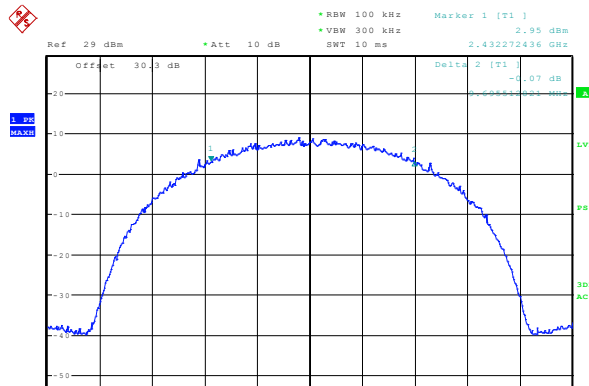
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6 dB Bandwidth Plot, 802.11b CH6 1, 5.5, 11MB/s Data rates

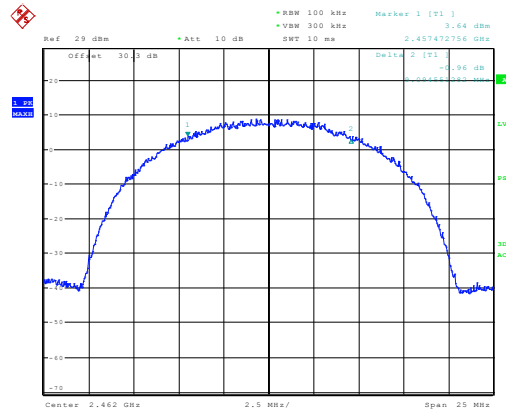
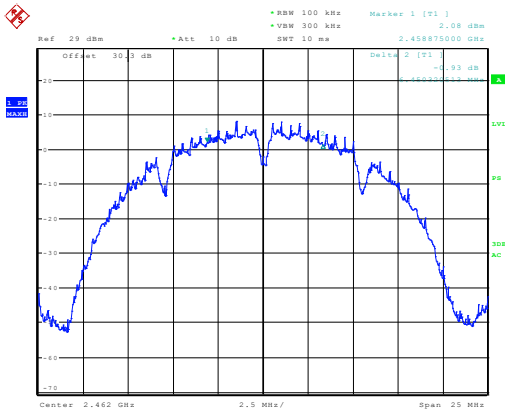


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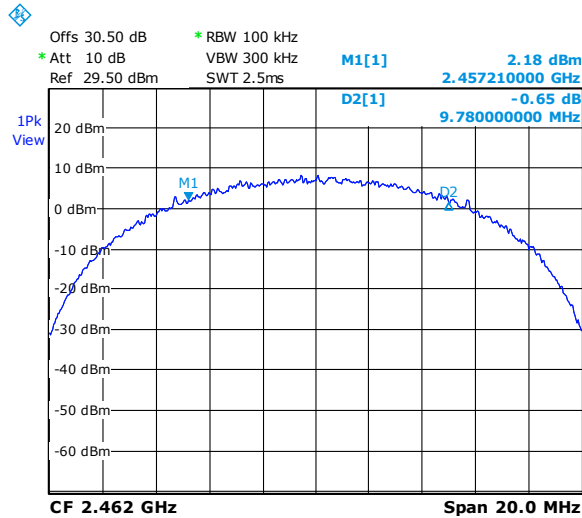


6 dB Bandwidth Plot, 802.11b CH11 1, 5.5, 11MB/s Data rates1



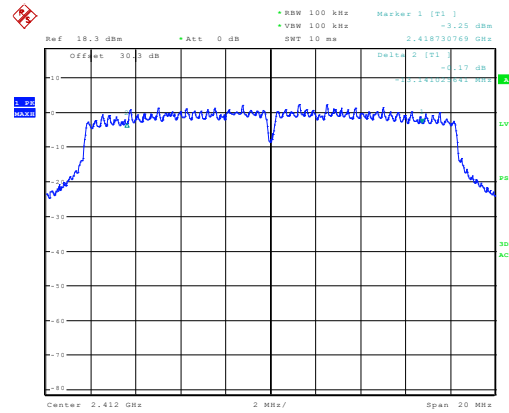
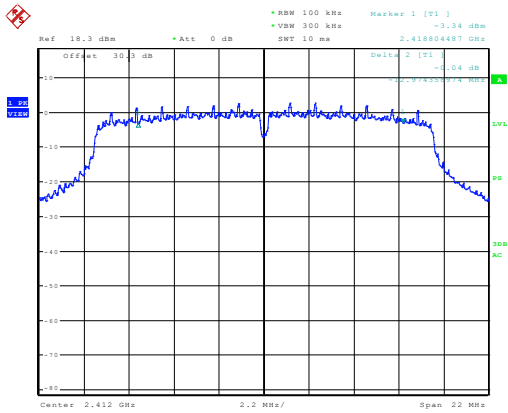
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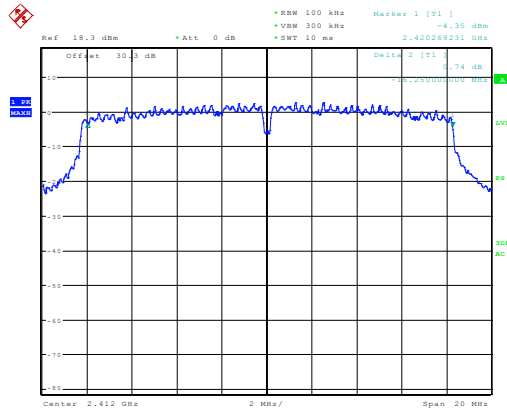
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6 dB Bandwidth Plot, 802.11g CH1 6, 36, 54MB/s Data rates



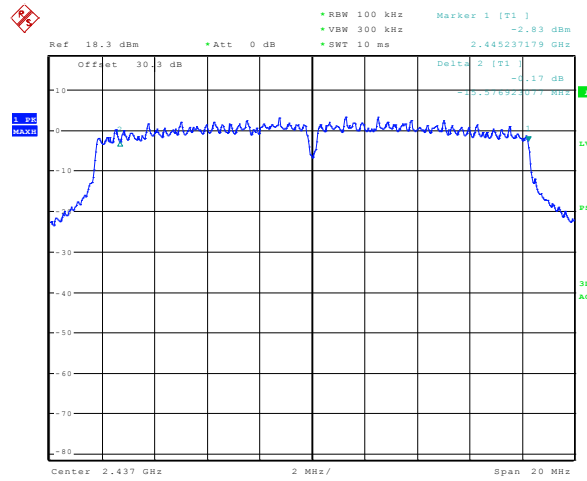
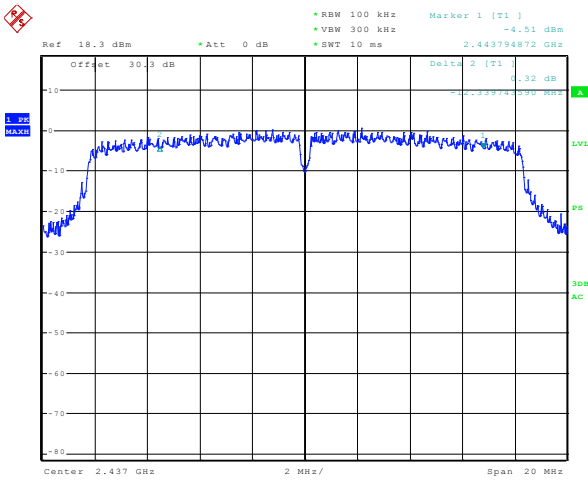
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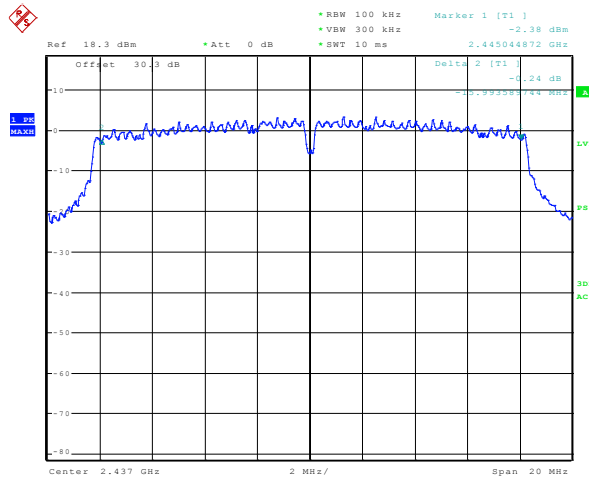
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6 dB Bandwidth Plot, 802.11g CH6 6, 36, 54MB/s Data rates

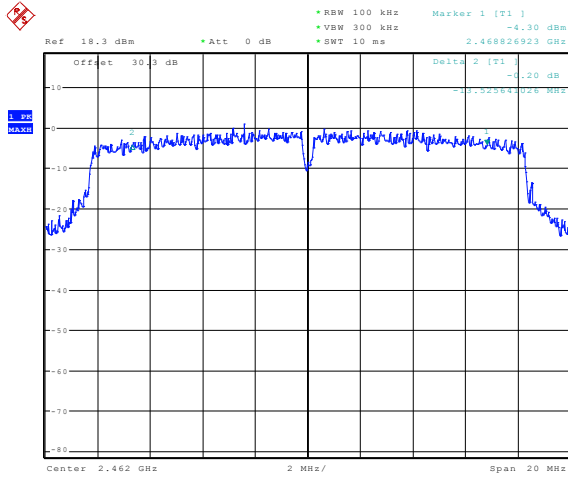


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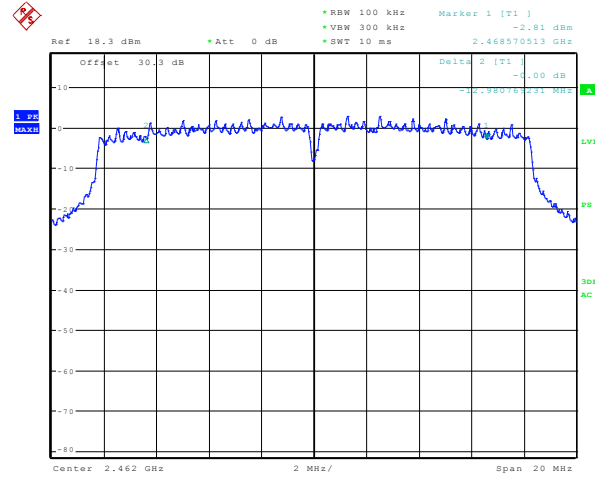
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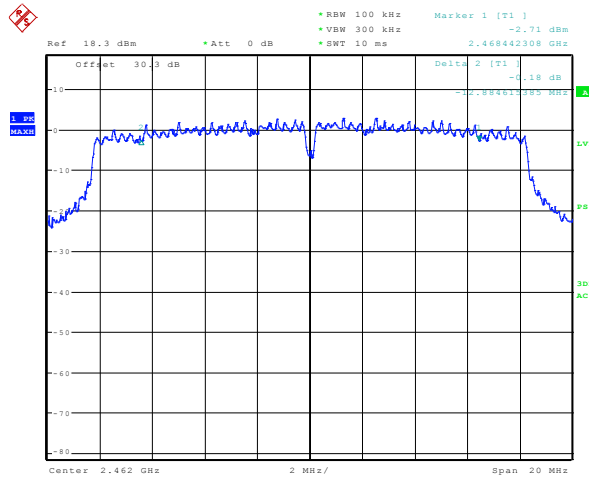
6 dB Bandwidth Plot, 802.11g CH11
6, 36, 54MB/s Data rates



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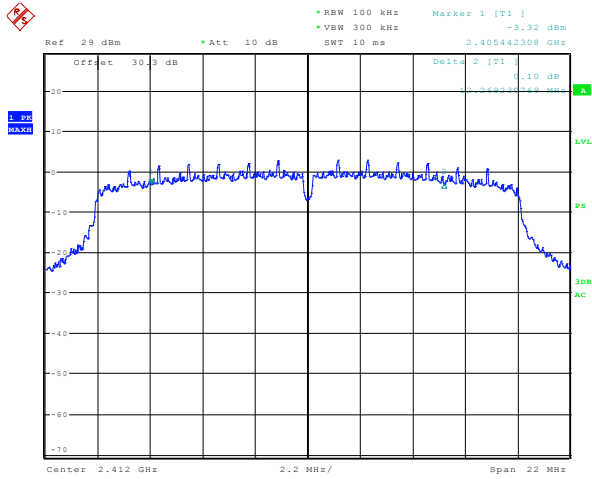


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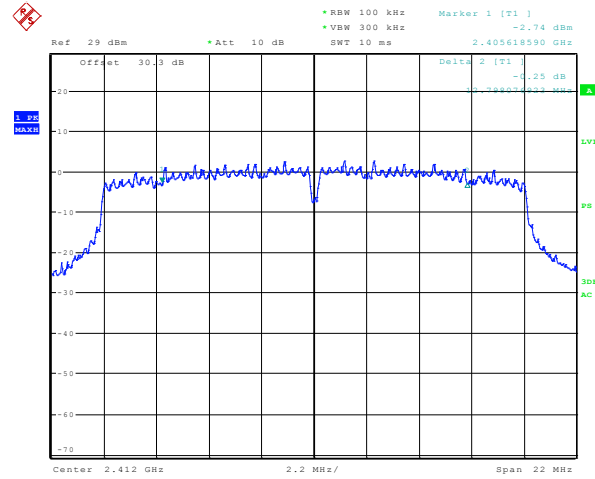


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6 dB Bandwidth Plot, 802.11n CH1 MCS0 and MCS7 Data rates

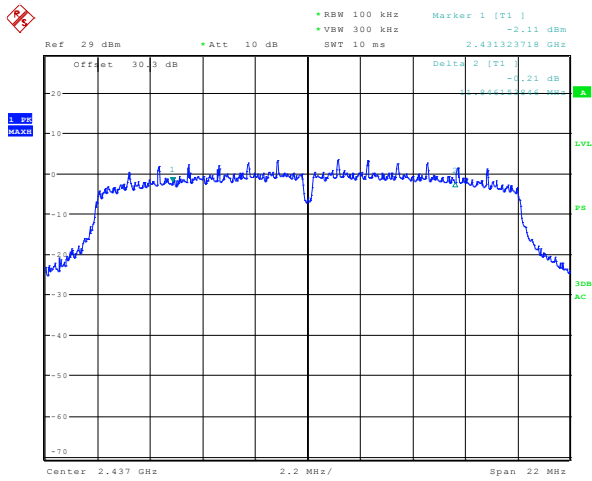


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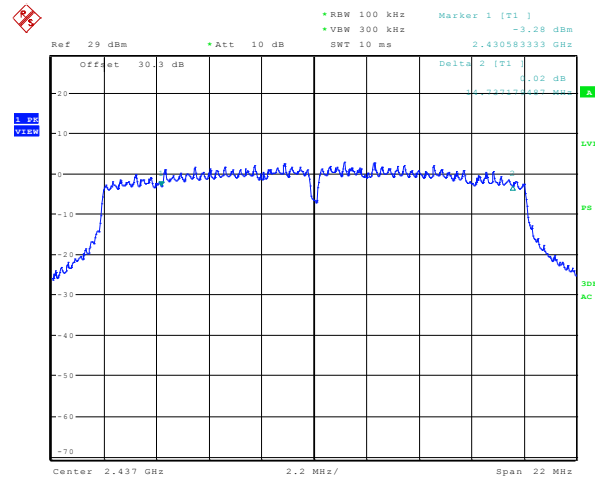


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6 dB Bandwidth Plot, 802.11n CH6 MCS0 and MCS7 Data rates

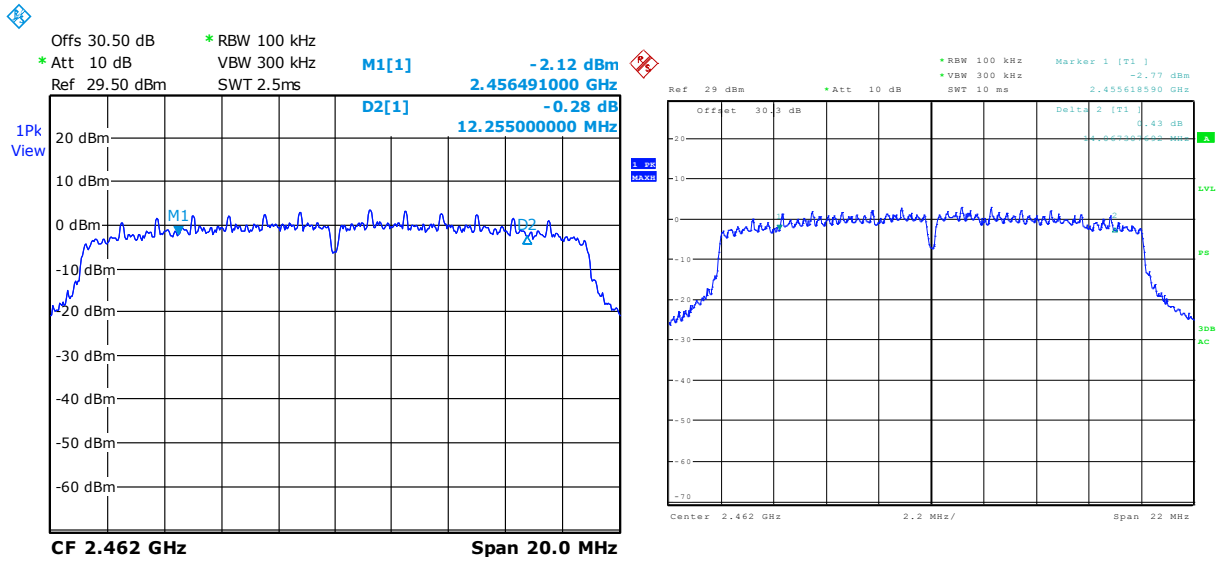


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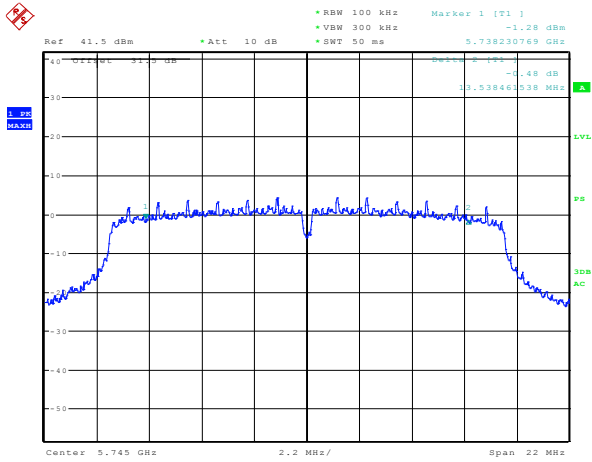
6 dB Bandwidth Plot, 802.11n CH11 MCS0 and MCS7 Data rates



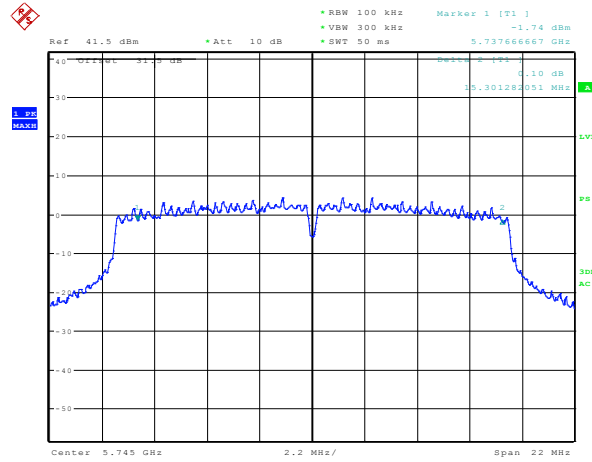
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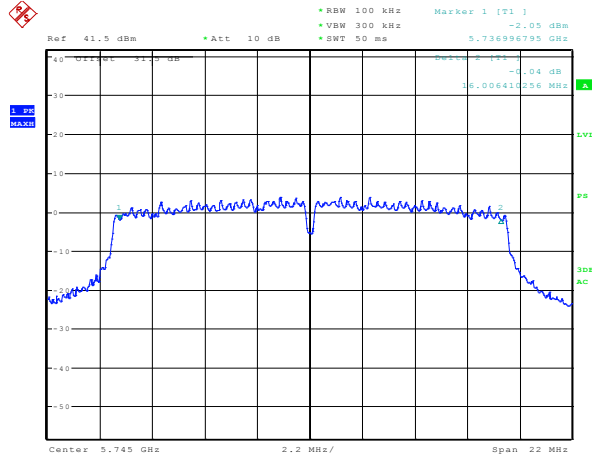
6 dB Bandwidth Plot, 802.11a CH149 6, 36 and 54MB



Date: 24.FEB.2013 22:21:48

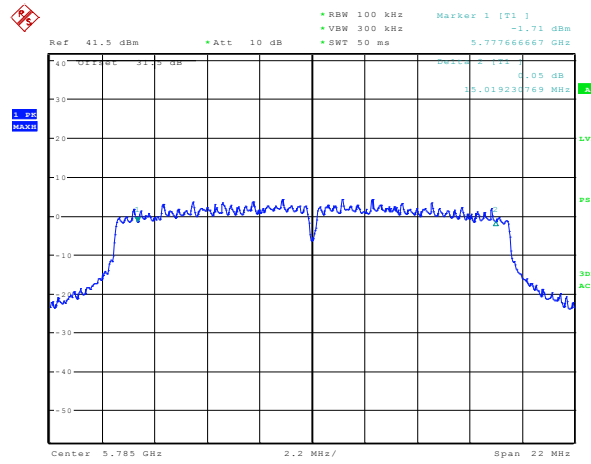
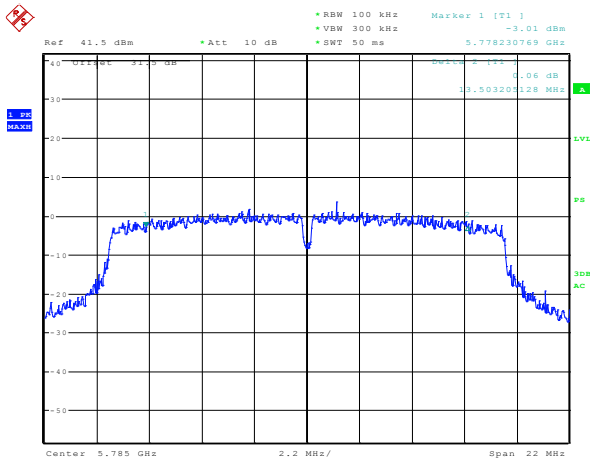


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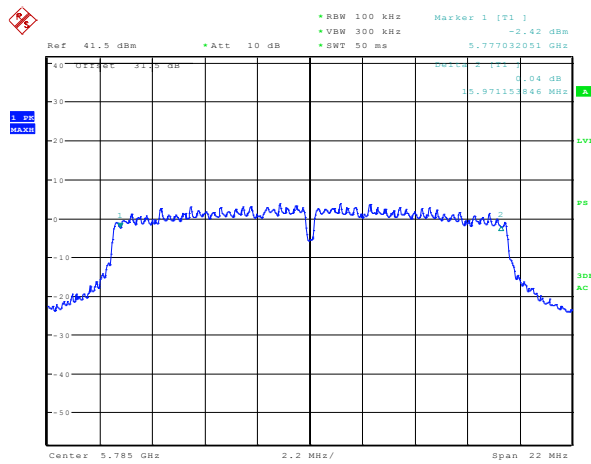
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6 dB Bandwidth Plot, 802.11a CH157 6, 36 and 54MB



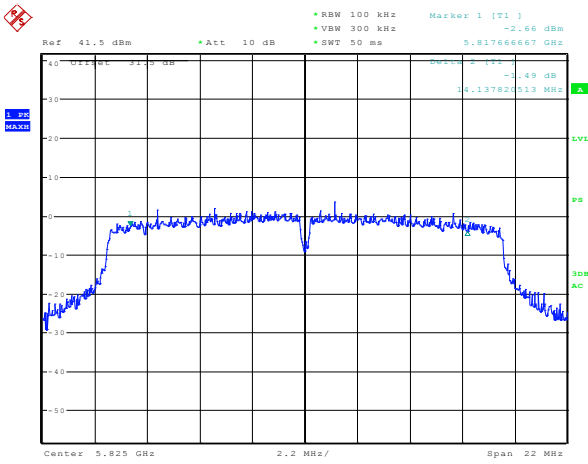
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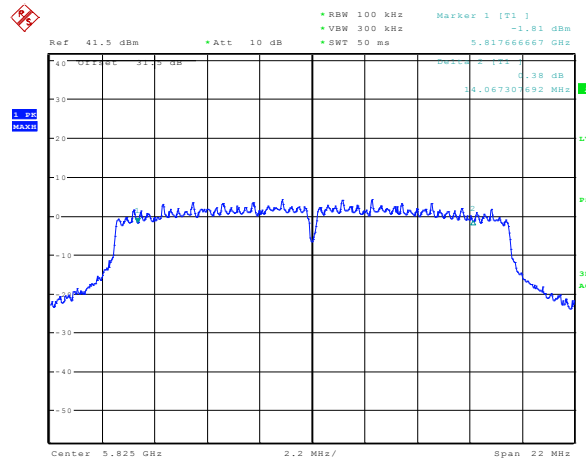


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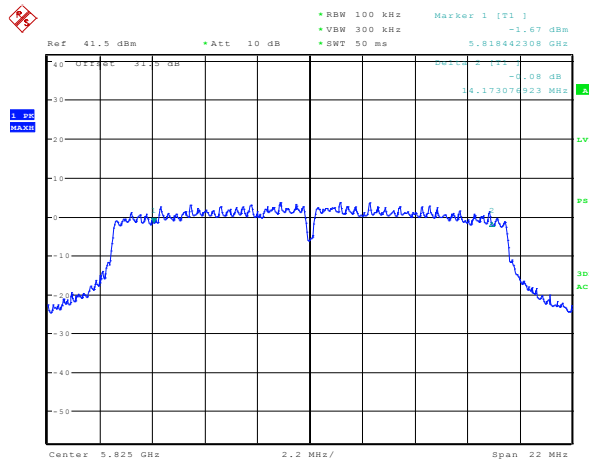
6 dB Bandwidth Plot, 802.11a CH165 6, 36 and 54MB



Date: 24.FEB.2013 22:46:34



Date: 24.FEB.2013 22:47:56



Date: 24.FEB.2013 22:49:26

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 spectrum analyzer.

Method Used: FCC KDB "558074 D01 DTS Meas Guidance v03r01", Clause 9.2.2.2.

Limit

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: 21.1 °C
Relative Humidity: 46.4 %

4.4 Test Equipment

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	FSV 30	R&S	101595	28 AUG 2014
Network Analyzer	ZVL	R&S	B079799	1 JUL 2014
Attenuator	BW-S30W2+	Mini-Circuits	NA	VBU

Note: The calibration period equipment is 1 year.

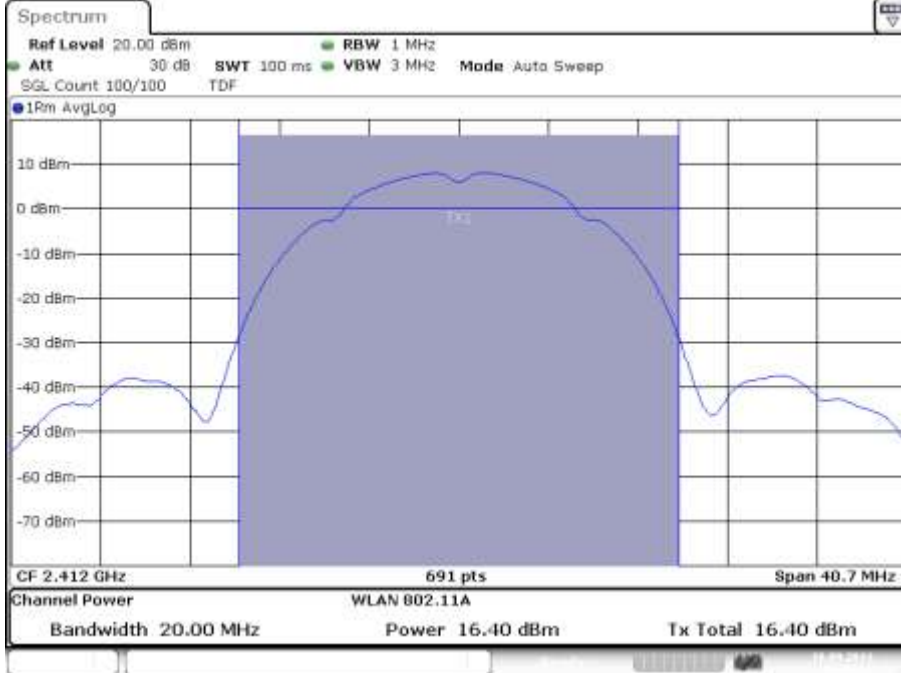
4.5 Test Setup Photographs

Test setup photographs are located in a separate exhibit.

4.6 Test Data

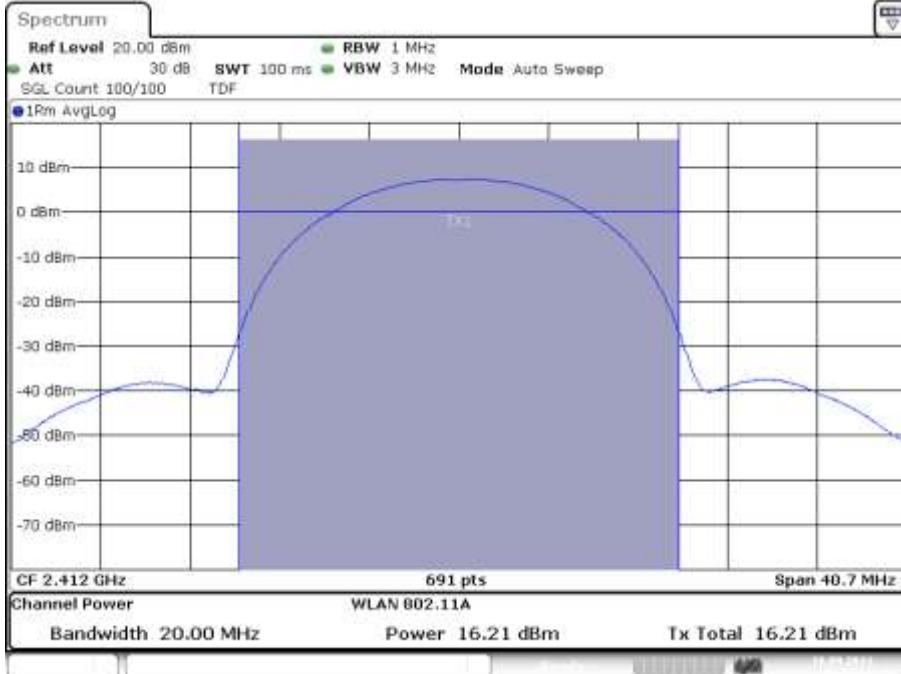
Protocol	Channel	Data Rate	Power, dBm
802.11b	1	1	16.40
802.11b	1	11	16.21
802.11b	6	1	16.45
802.11b	6	11	16.31
802.11b	11	1	16.37
802.11b	11	11	16.11
802.11g	1	6	12.94
802.11g	1	36	12.75
802.11g	1	54	12.63
802.11g	6	6	13.00
802.11g	6	36	12.79
802.11g	6	54	12.70
802.11g	11	6	12.92
802.11g	11	36	12.71
802.11g	11	54	12.61
802.11n	1	MCS0	12.90
802.11n	1	MCS7	12.21
802.11n	6	MCS0	12.93
802.11n	6	MCS7	12.23
802.11n	11	MCS0	12.89
802.11n	11	MCS7	12.17
802.11a	149	6	12.14
802.11a	149	36	11.92
802.11a	149	54	11.40
802.11a	157	6	12.06
802.11a	157	36	11.81
802.11a	157	54	11.24
802.11a	165	6	12.05
802.11a	165	36	11.85
802.11a	165	54	11.29
802.11n	149	MCS0	12.11
802.11n	149	MCS7	9.95
802.11n	157	MCS0	11.96
802.11n	157	MCS7	9.83
802.11n	165	MCS0	12.02
802.11n	165	MCS7	9.86

802.11b, CH1, 1



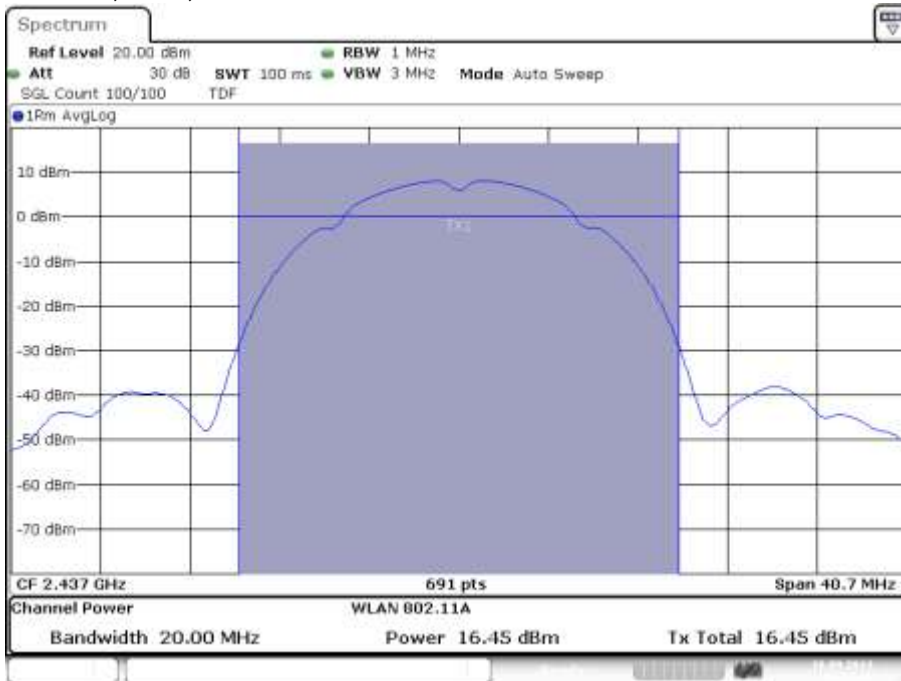
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802.11b, CH1, 11



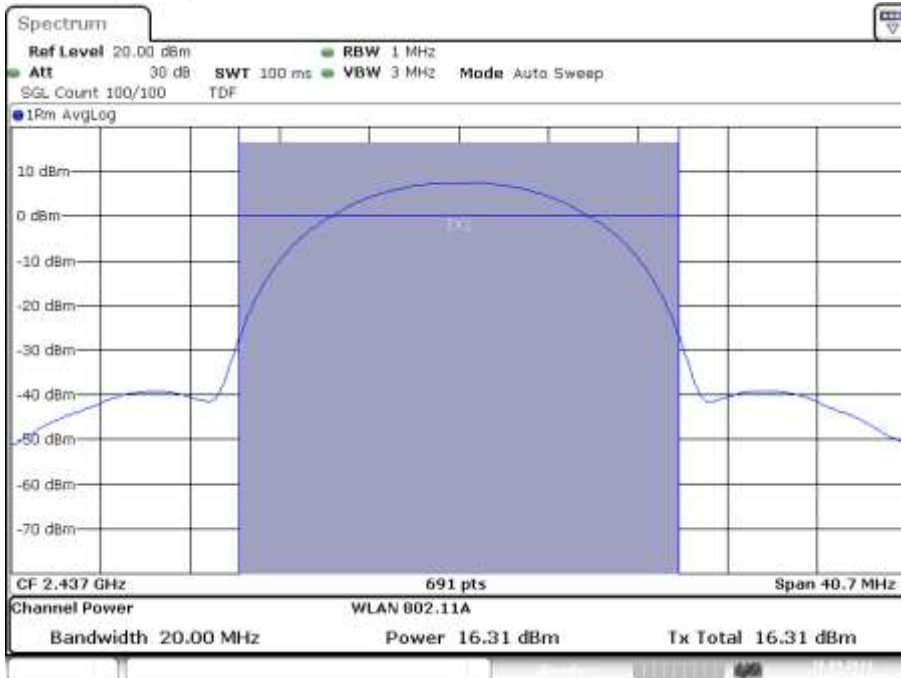
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802.11b, CH6, 1



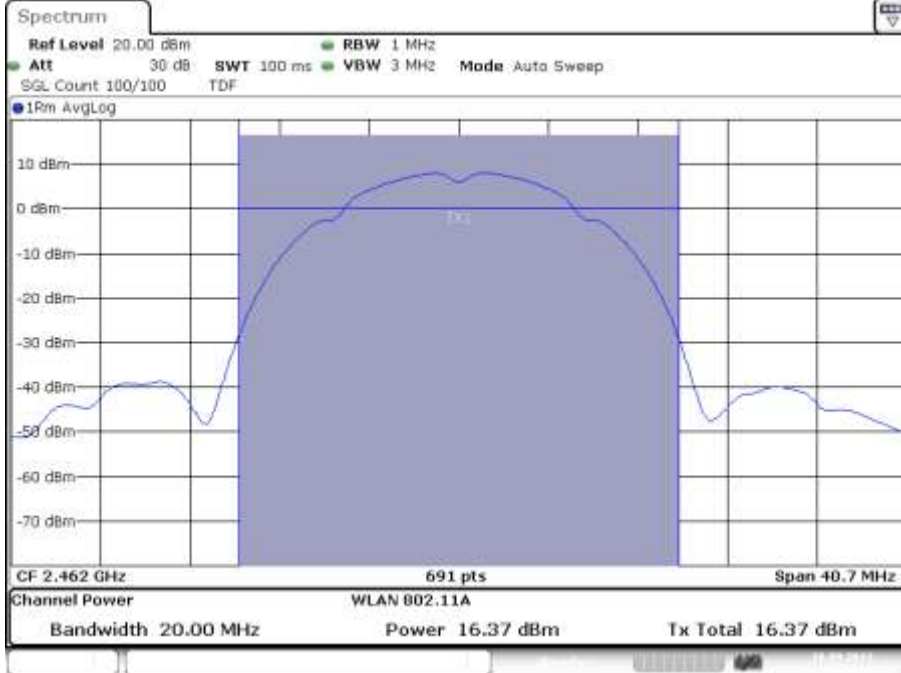
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802.11b, CH6, 11



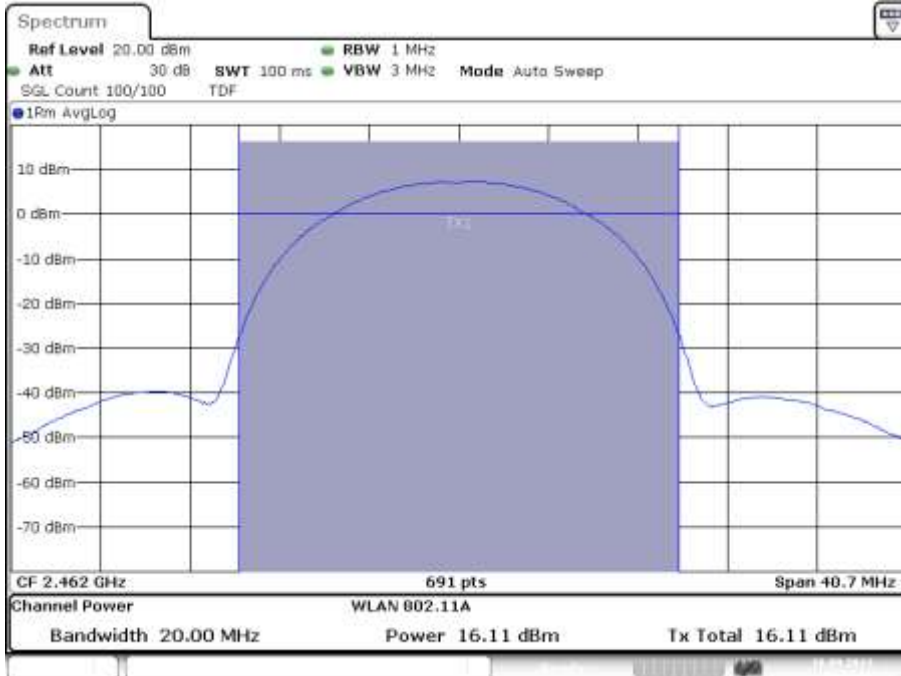
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802.11b, CH11, 1



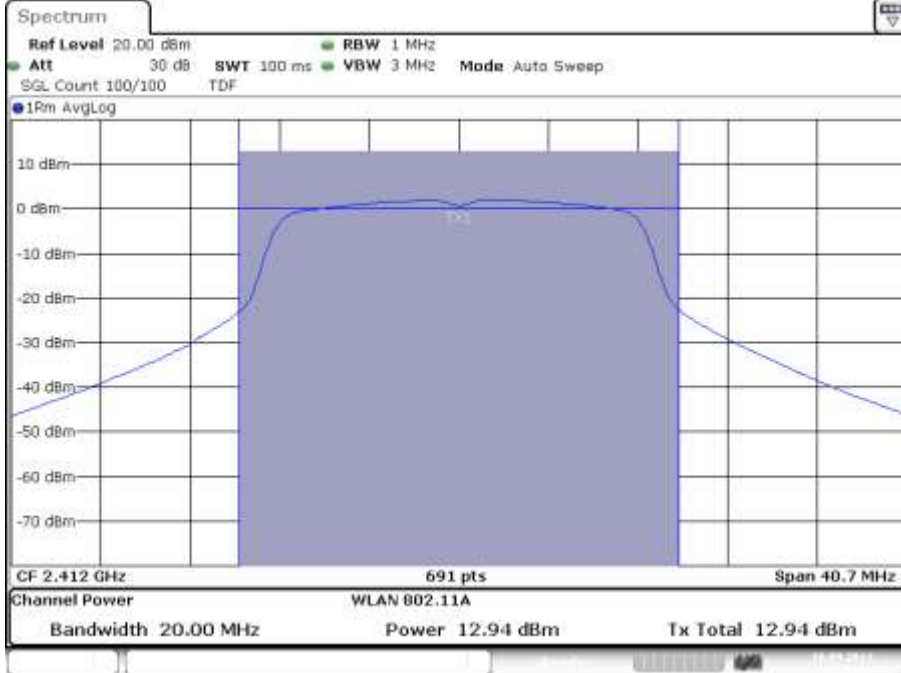
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802.11b, CH11, 11



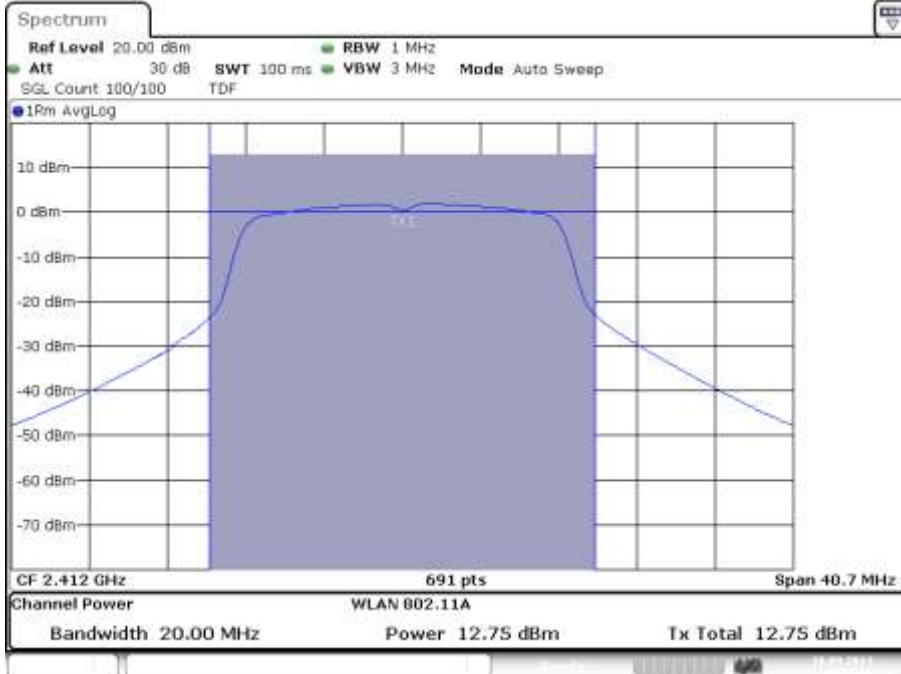
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802.11g, CH1, 6



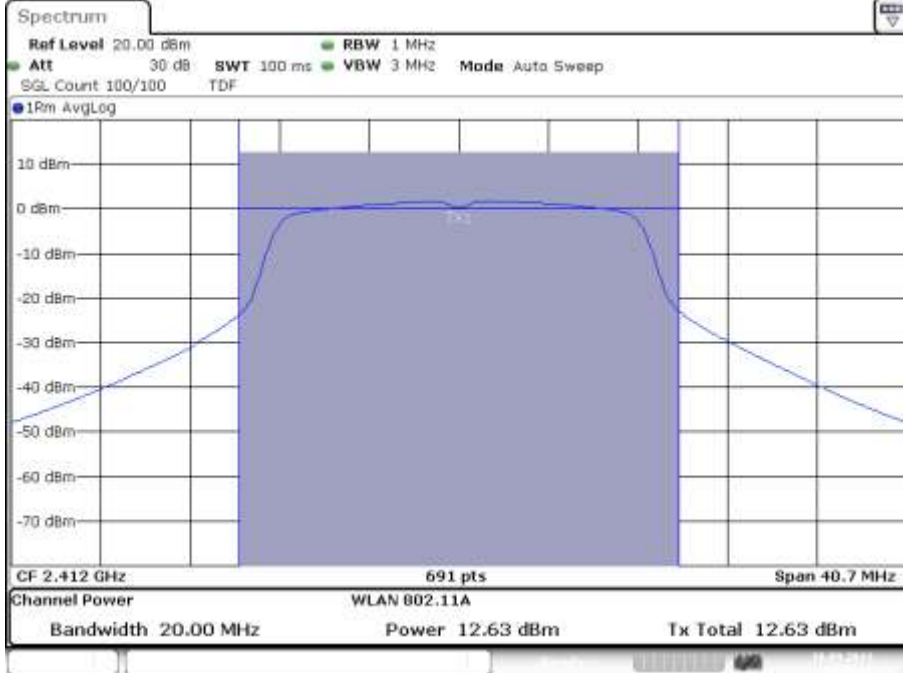
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802.11g, CH1, 36



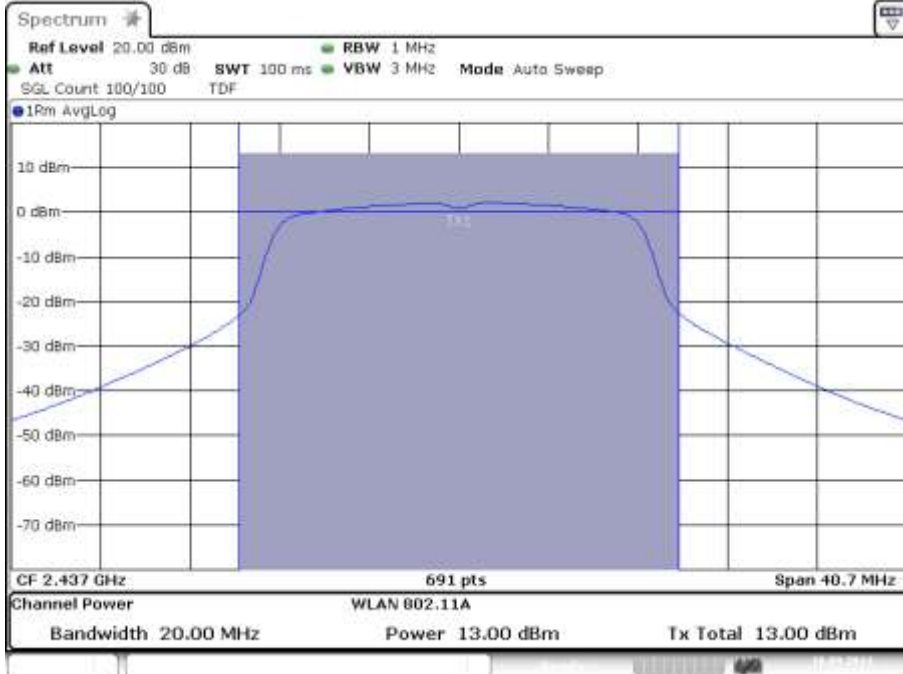
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802.11g, CH1, 54



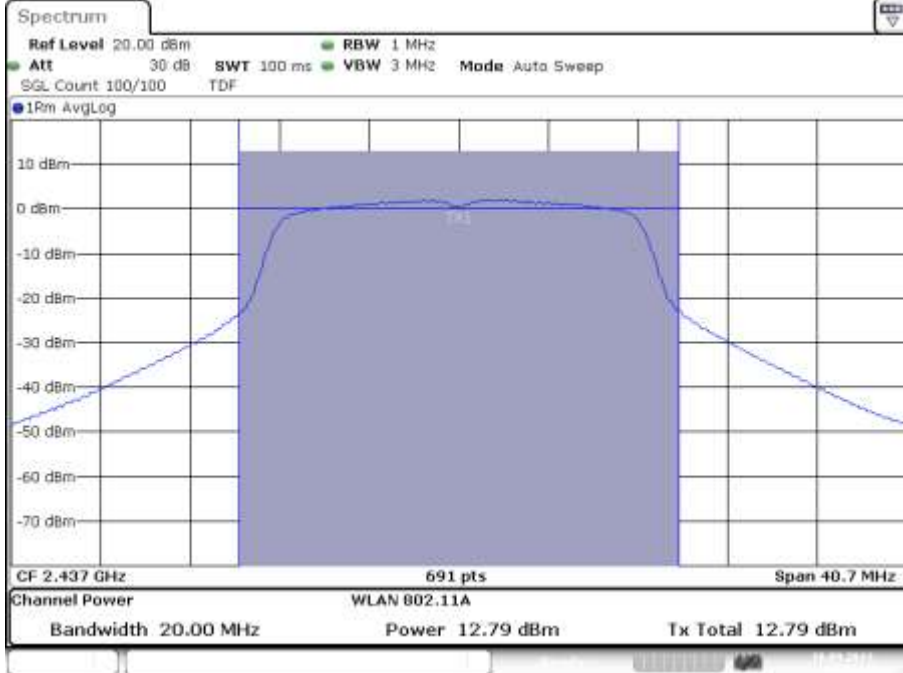
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802.11g, CH6, 6



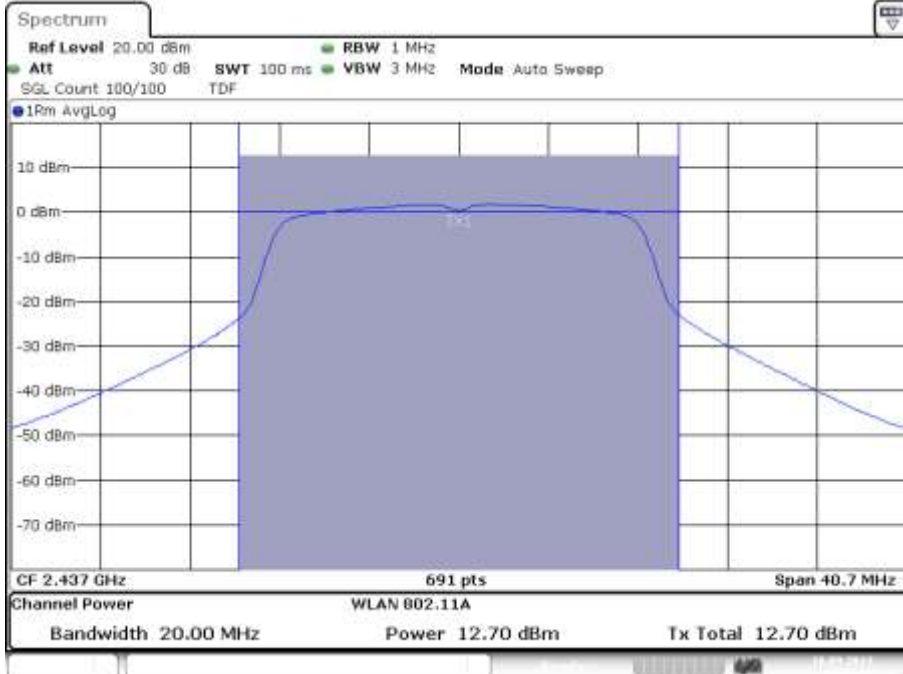
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802.11g, CH6, 36



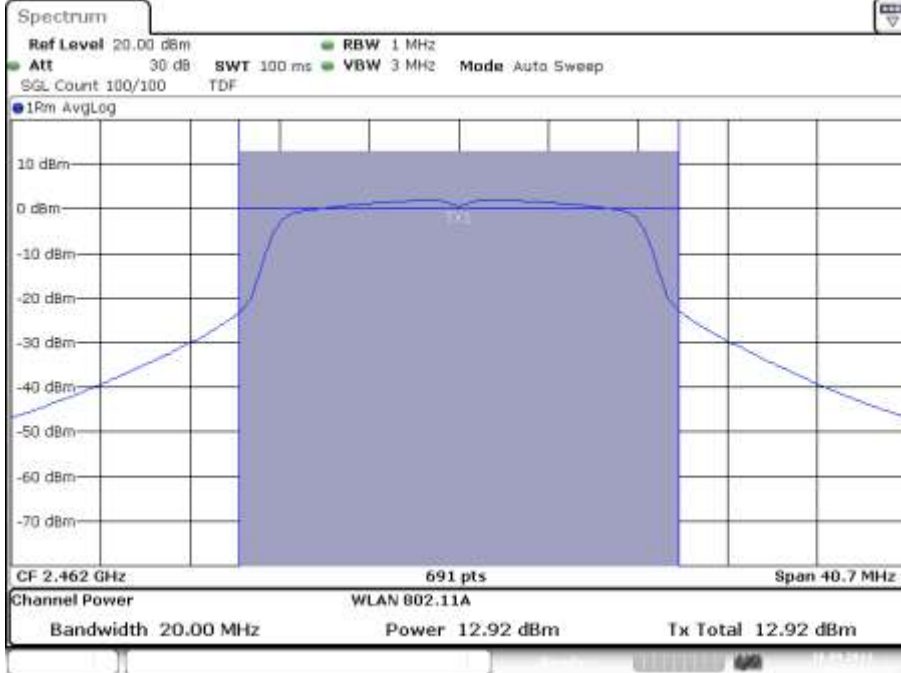
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802.11g, CH6, 54



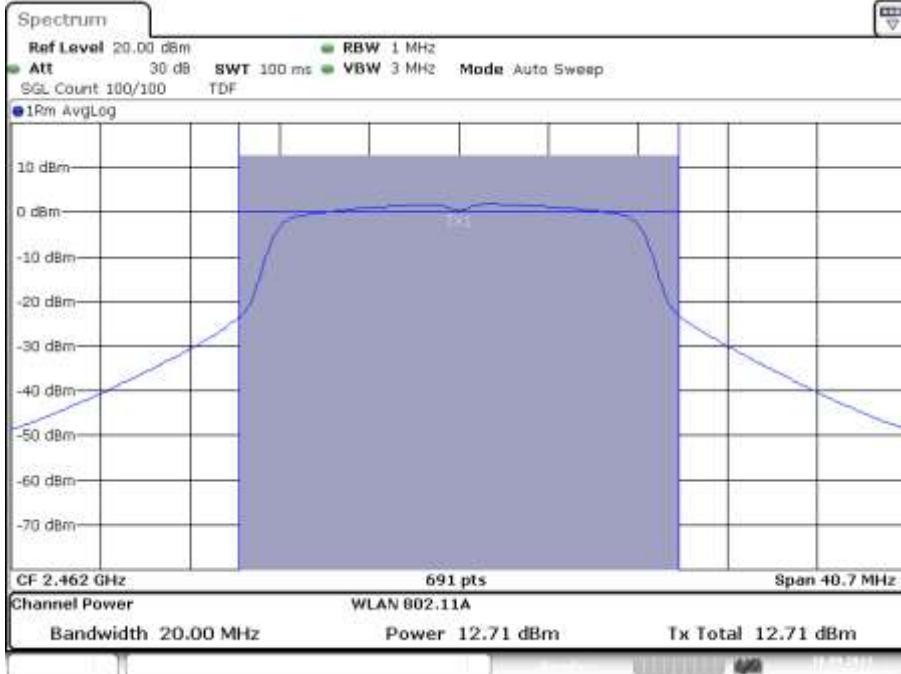
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802.11g, CH11, 6



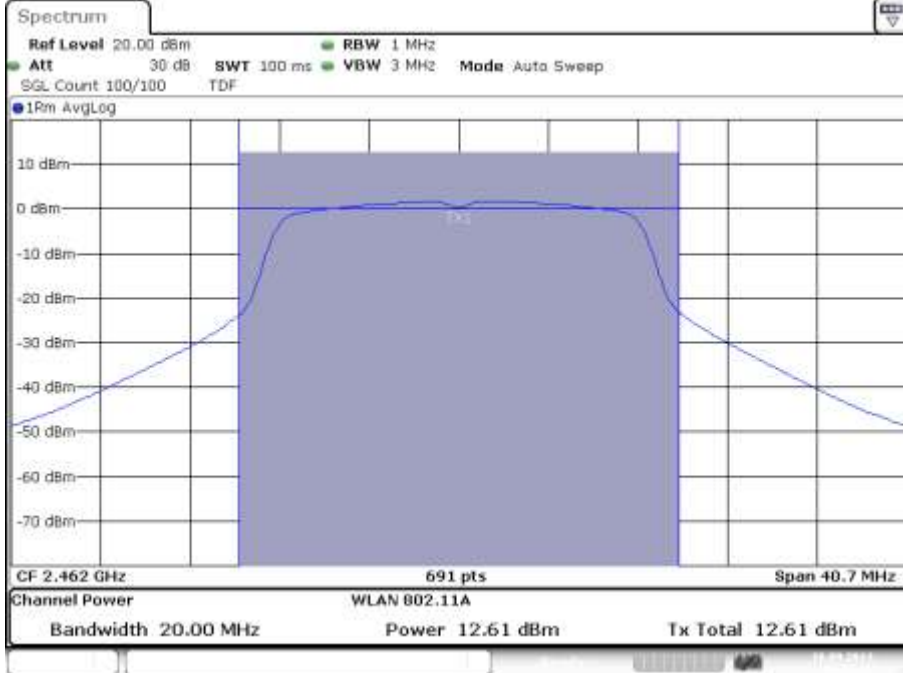
Date: 16.SEP.2013 09:57:16

802.11g, CH11, 36



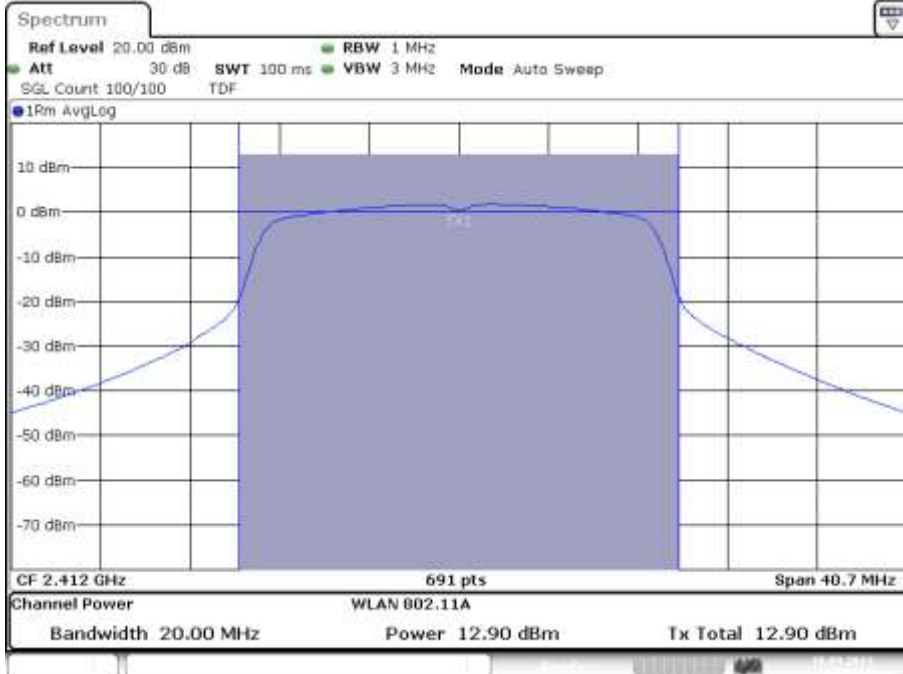
Date: 16.SEP.2013 09:58:08

802.11g, CH11, 54



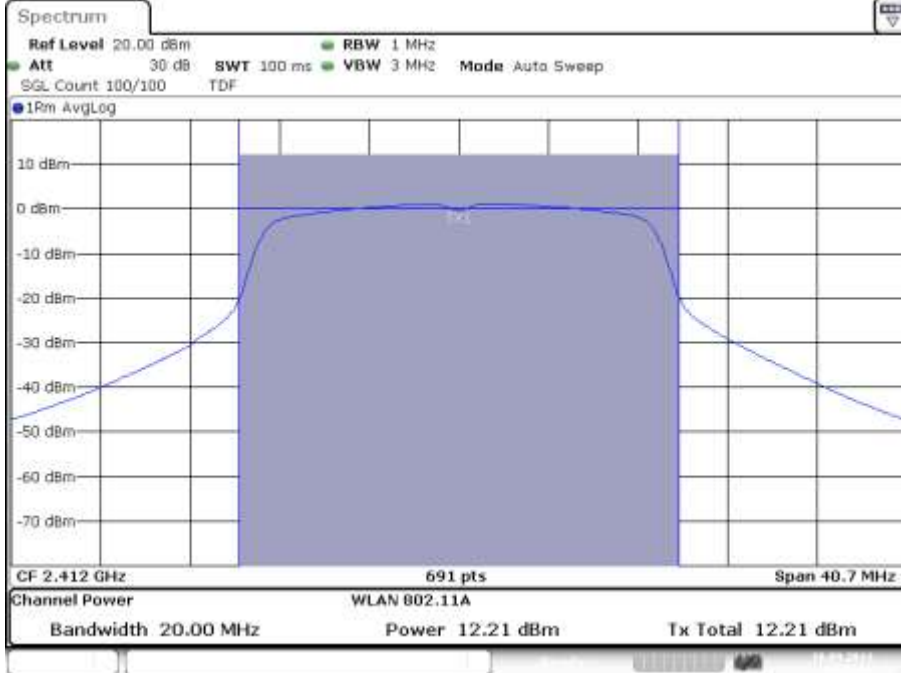
Date: 16.SEP.2013 09:58:36

802.11n, CH1, MCS0



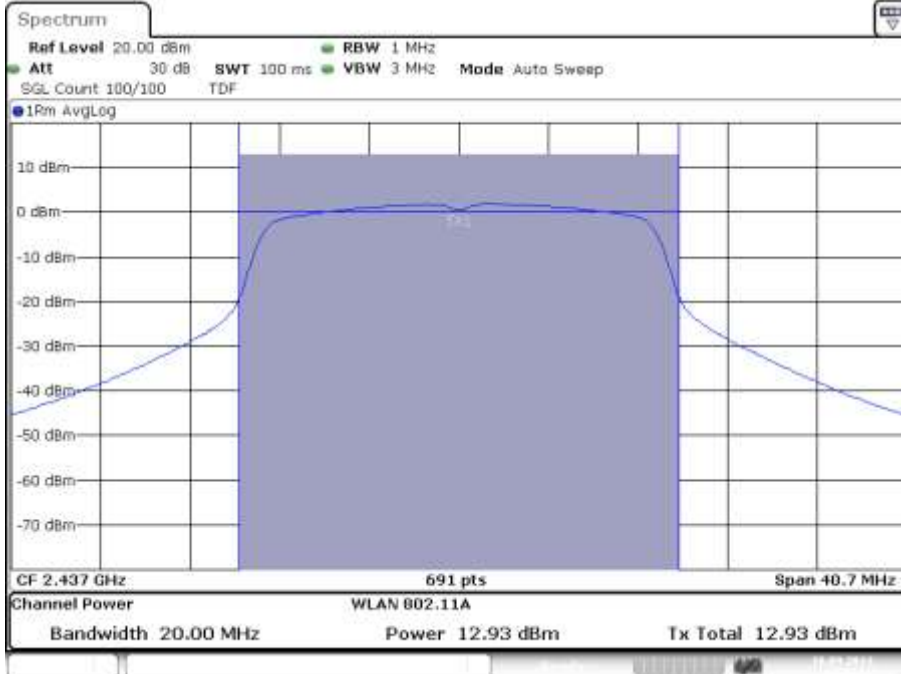
Date: 16.SEP.2013 10:03:15

802.11g, CH1, MCS7



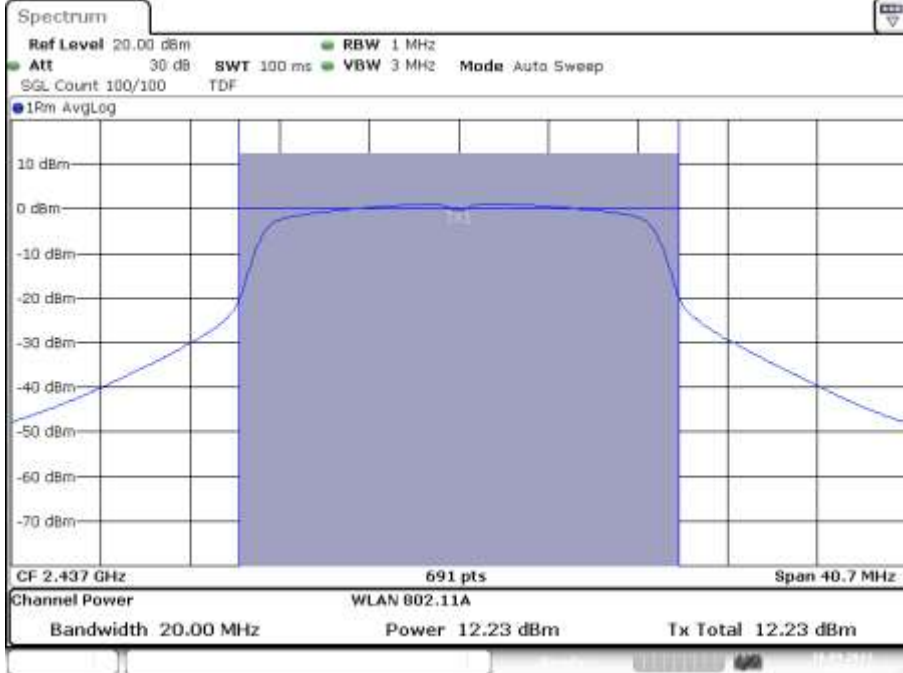
Date: 16.SEP.2013 10:03:58

802.11n, CH6, MCS0



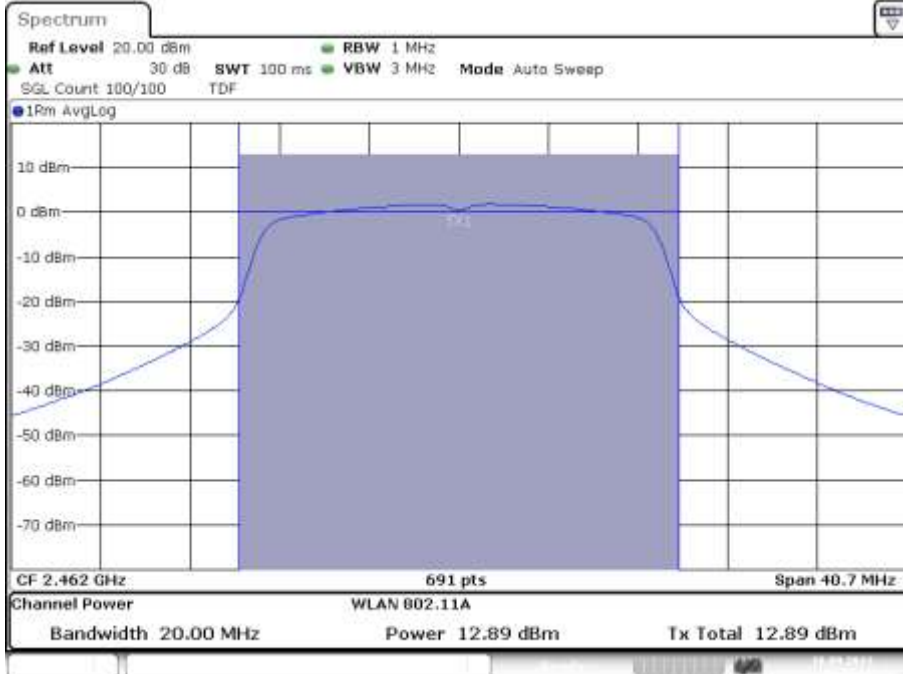
Date: 16.SEP.2013 10:06:55

802.11g, CH6, MCS7



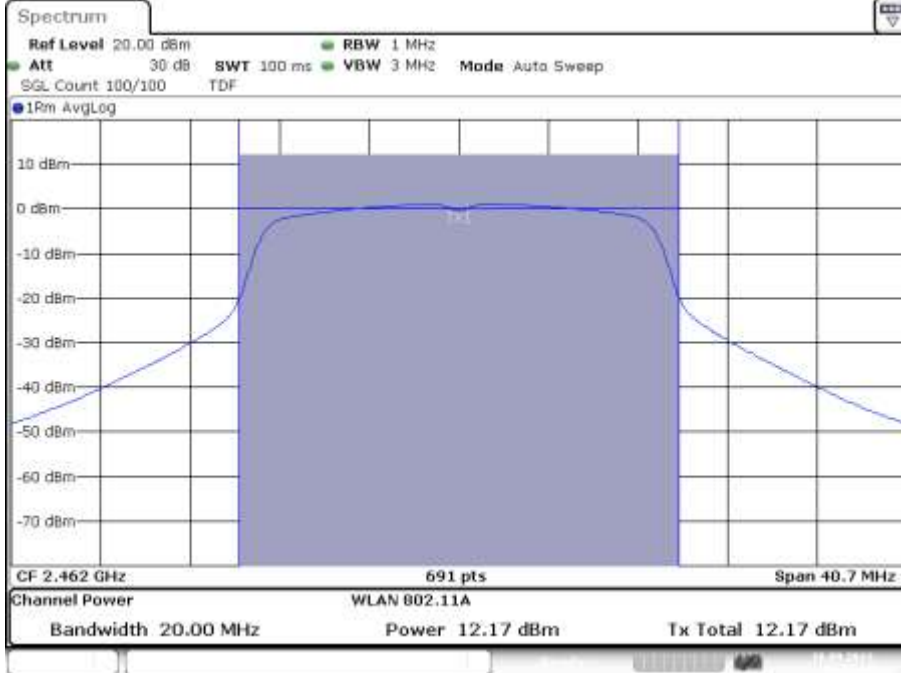
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802.11n, CH11, MCS0



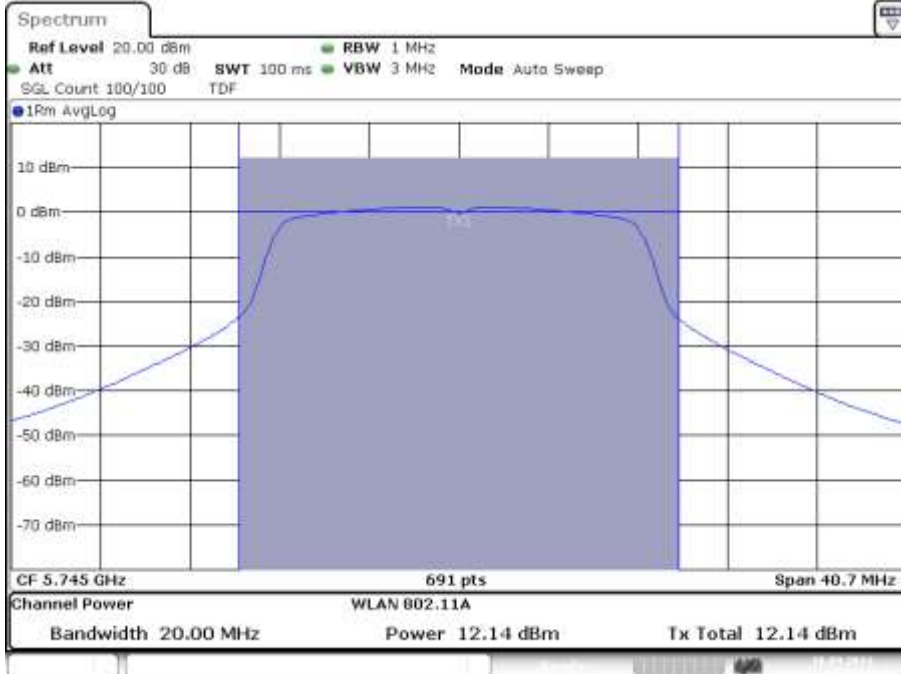
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802.11g, CH11, MCS7



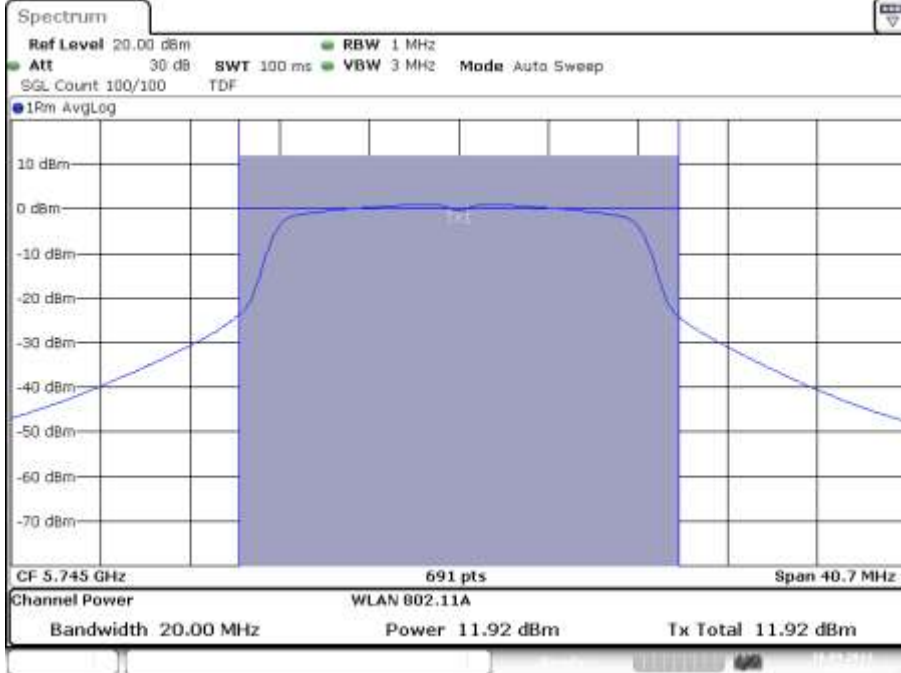
Date: 16.SEP.2013 09:59:44

802.11a, CH149, 6



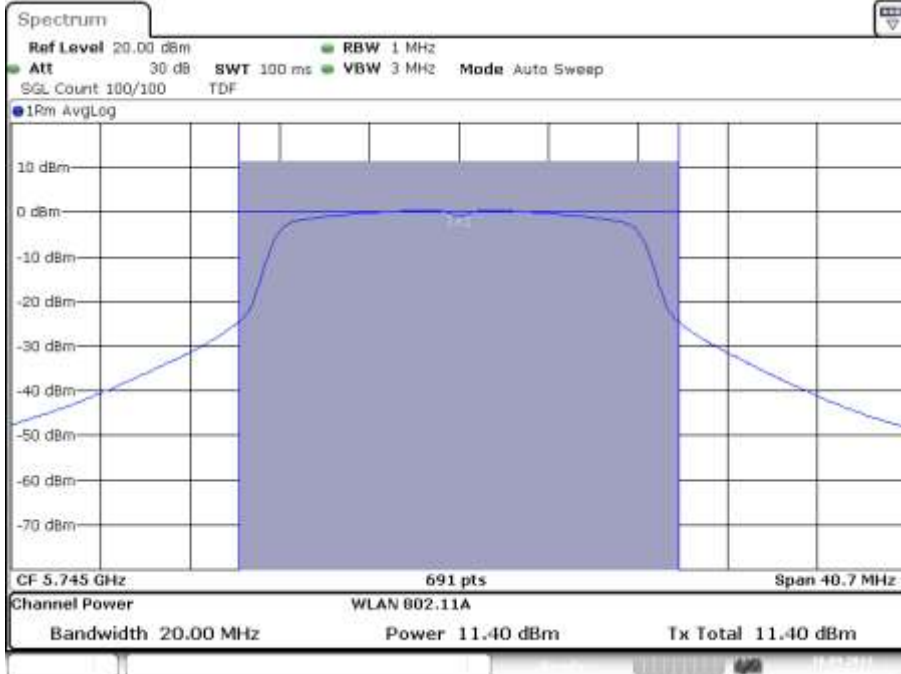
Date: 16.SEP.2013 10:41:23

802.11a, CH149, 36



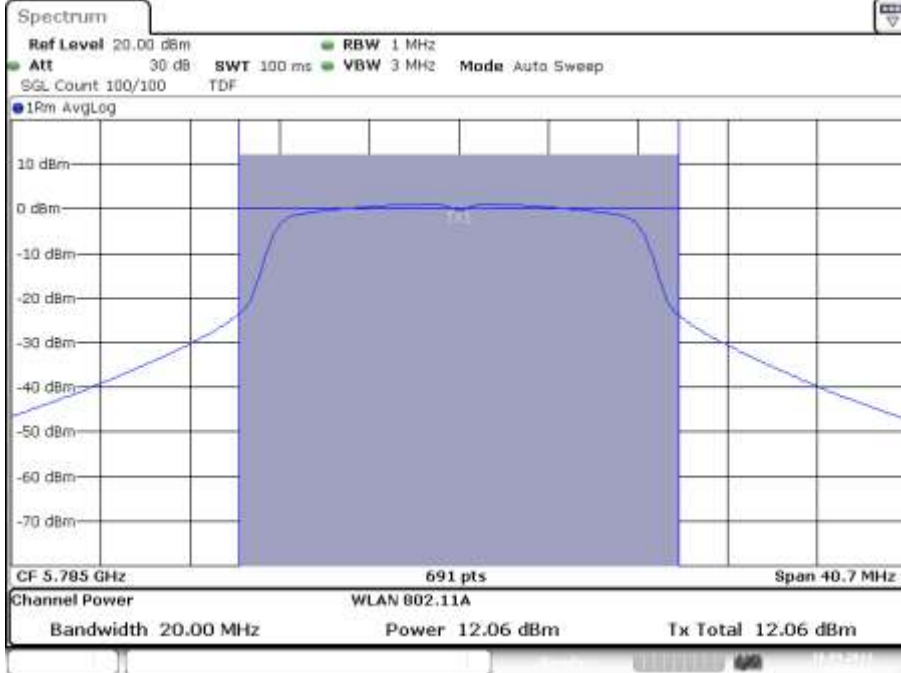
Date: 16.SEP.2013 10:43:56

802.11a, CH149, 54



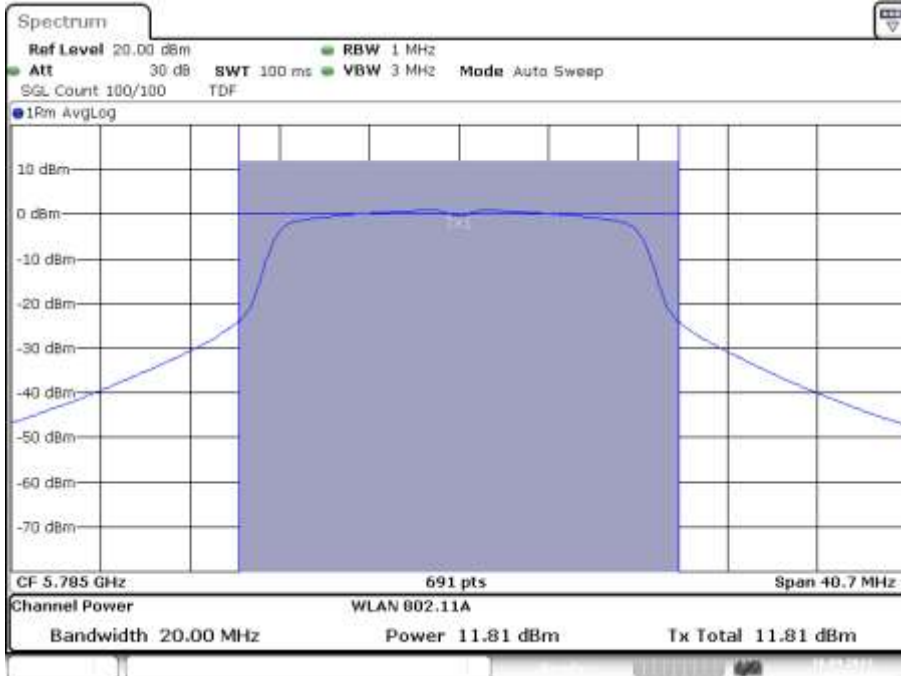
Date: 16.SEP.2013 10:44:56

802.11a, CH157, 6



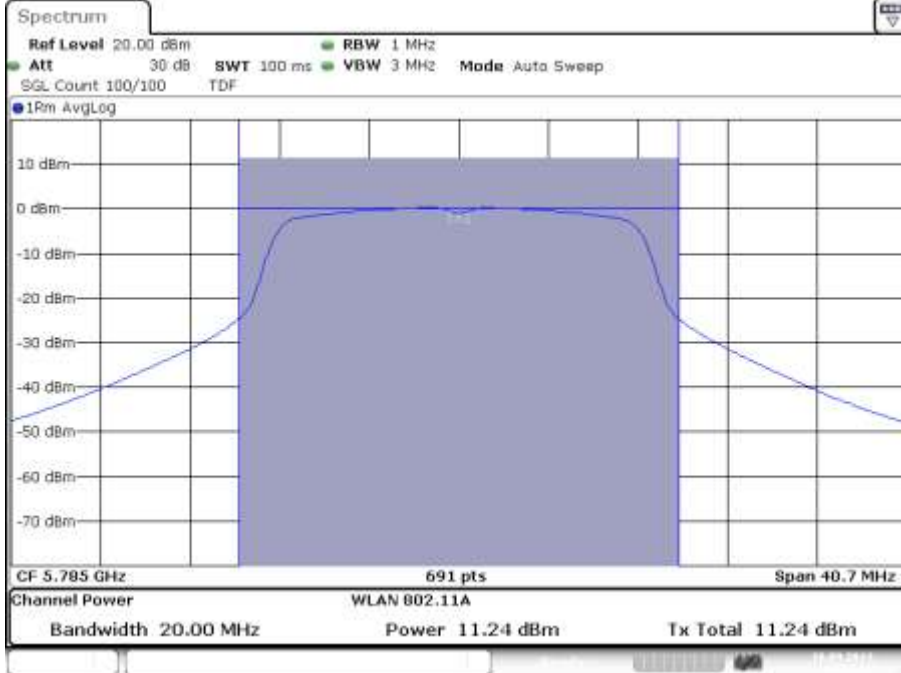
Date: 16.SEP.2013 10:49:03

802.11a, CH157, 36



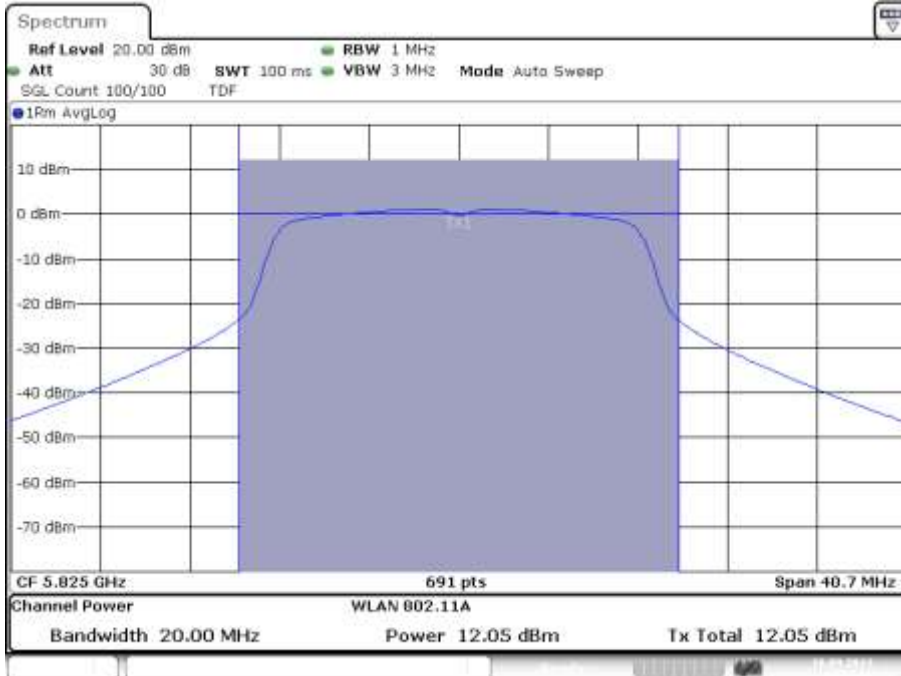
Date: 16.SEP.2013 10:50:34

802.11a, CH157, 54



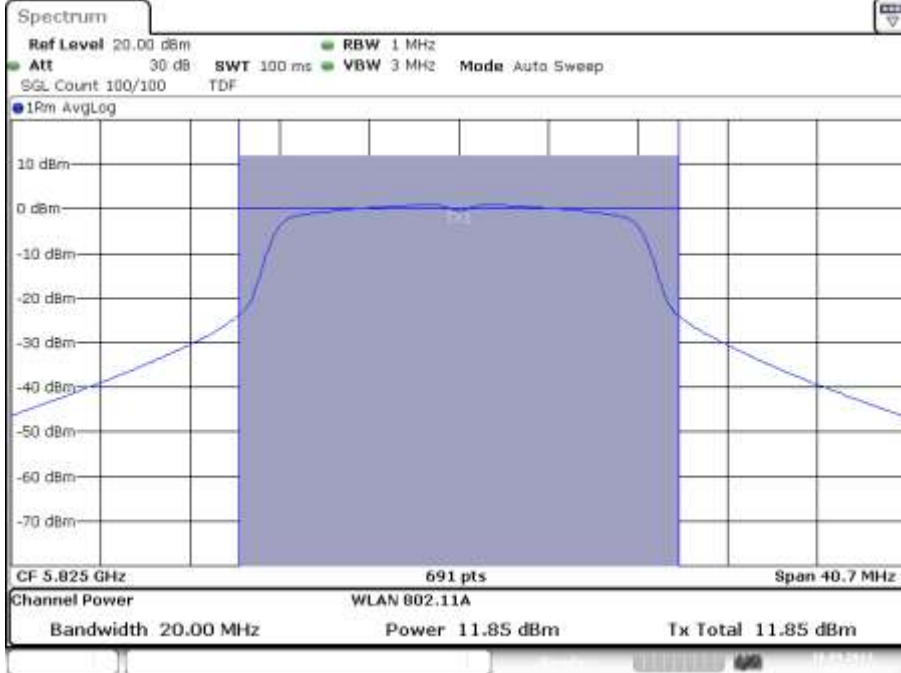
Date: 16.SEP.2013 10:51:07

802.11a, CH165, 6



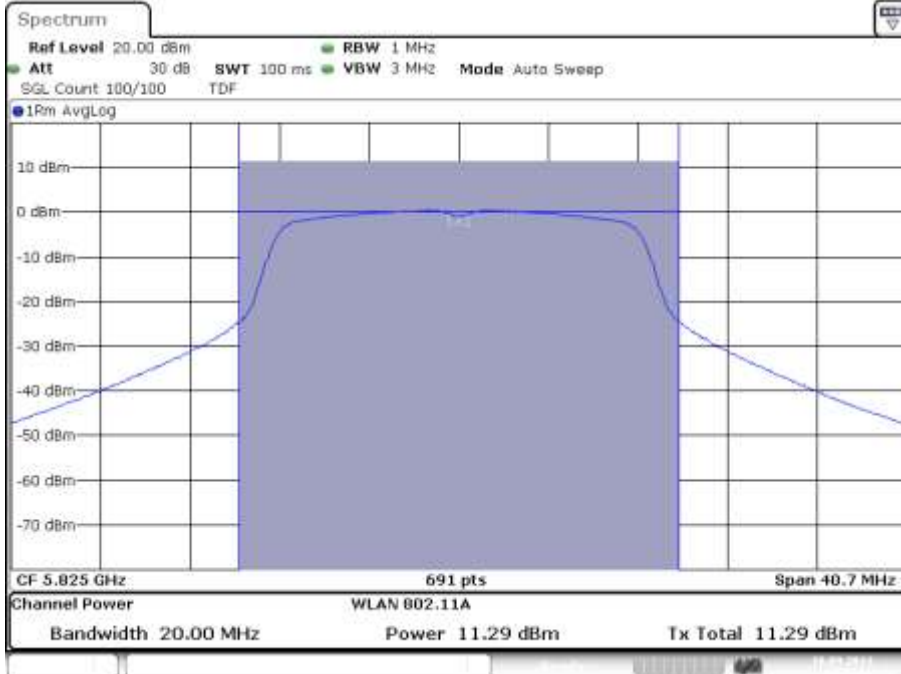
Date: 16.SEP.2013 10:54:00

802.11a, CH165, 36



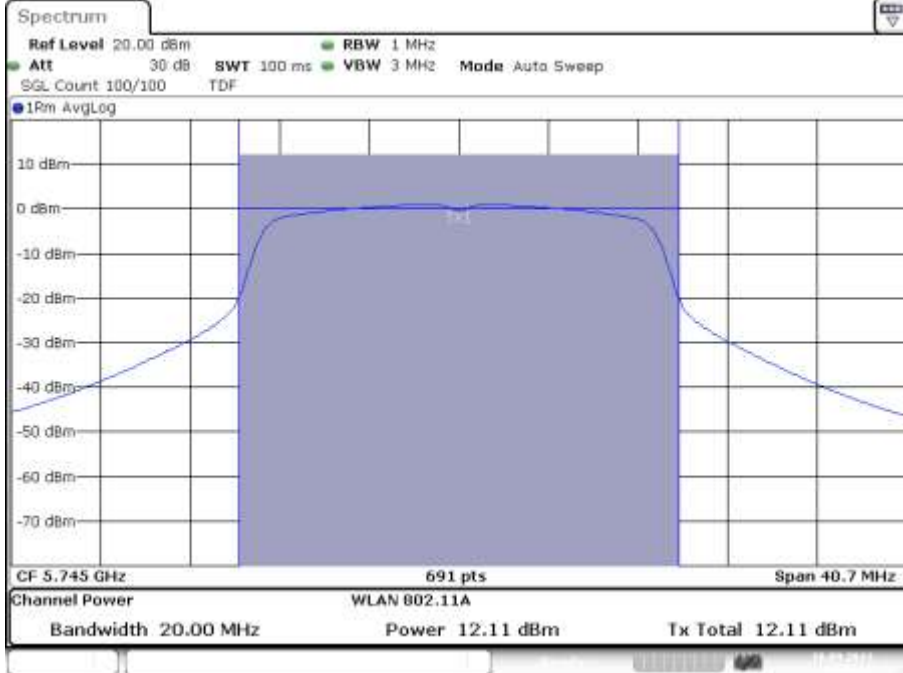
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802.11a, CH165, 54



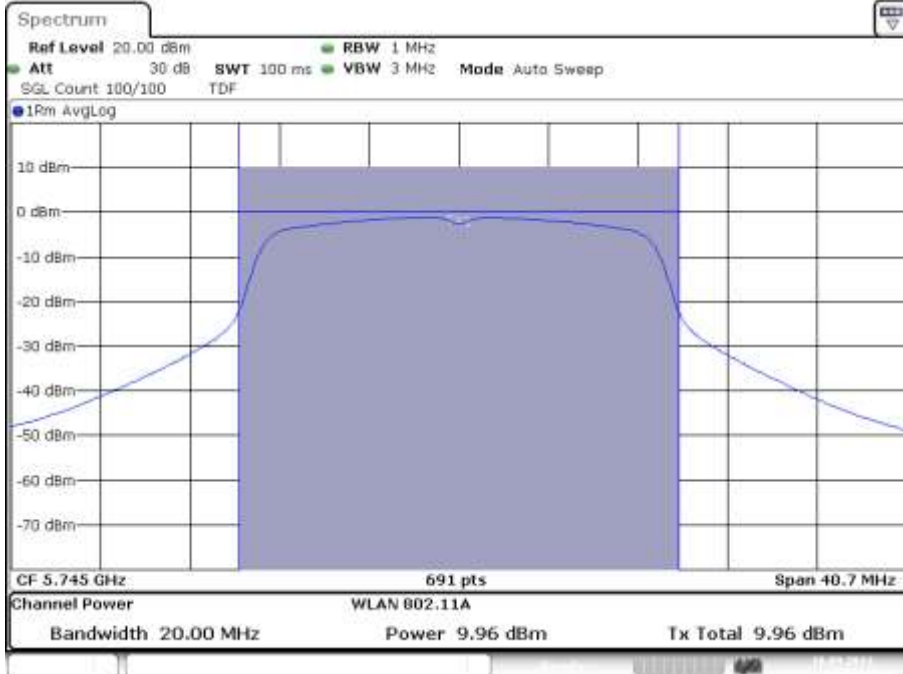
Date: 16.SEP.2013 10:55:06

802.11n, CH149, MCS0



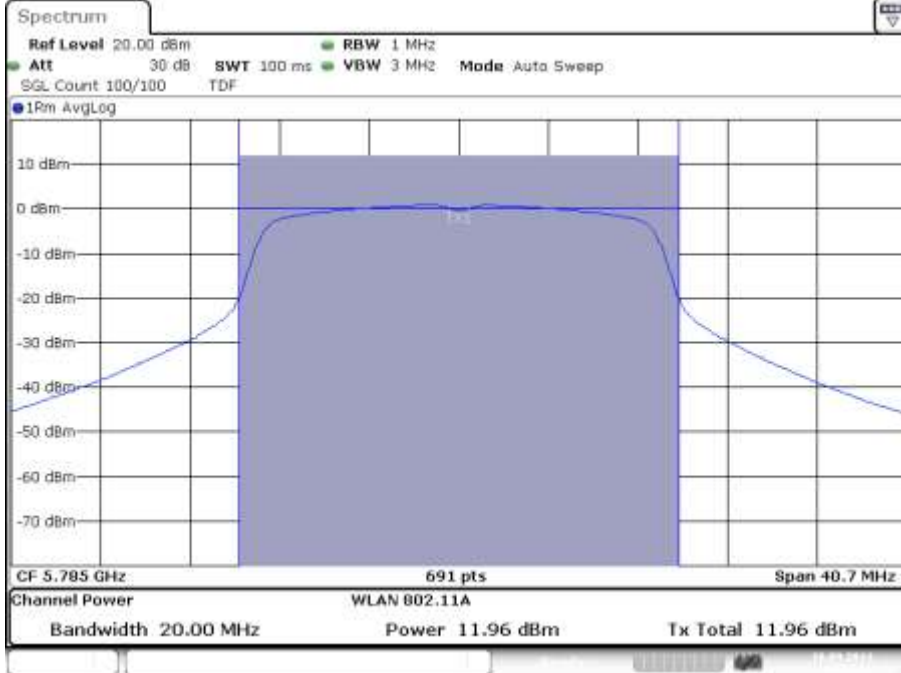
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802.11n, CH149, MCS7



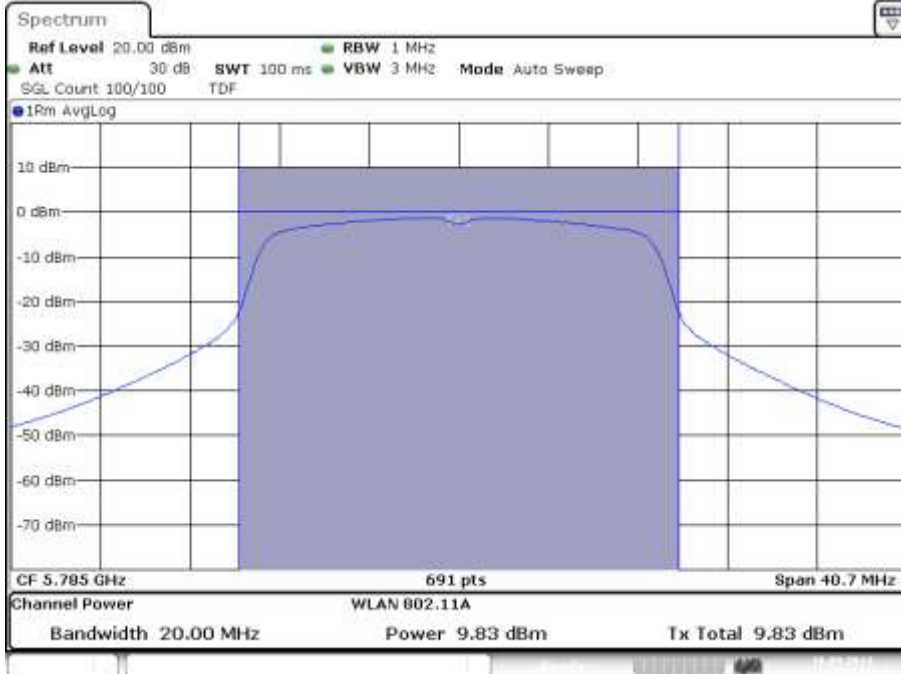
Date: 16.SEP.2013 10:46:55

802.11n, CH157, MCS0



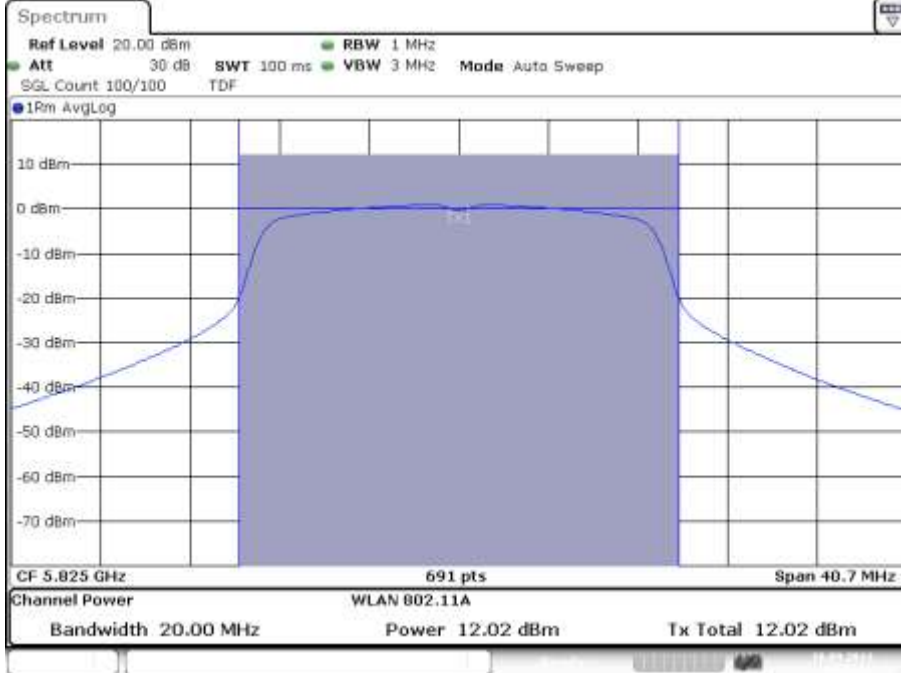
Date: 16.SEP.2013 10:51:53

802.11n, CH157, MCS7



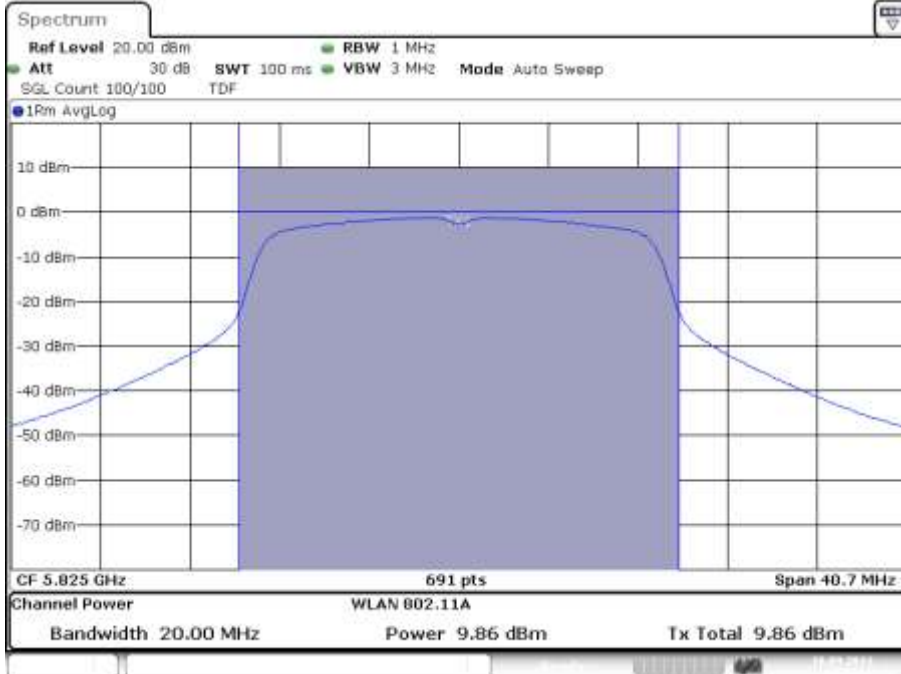
Date: 16.SEP.2013 10:53:00

802.11n, CH165, MCS0



Date: 16.SEP.2013 10:56:02

802.11n, CH165, MCS7



Date: 16.SEP.2013 10:56:32

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.

The Spectrum analyzer internal attenuation was adjusted between subranges during the measurement process, resulting in slightly different noise floor profiles during 802.11b,g measurements.

5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.1 °C

Relative Humidity: 37.8 %

5.4 Test Equipment

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	8565E	Agilent	B14984B	15OCT2013
Attenuator	BW-S30W2+	Mini-Circuits	B079794	VBU
40 GHz sig gen	HMC-T2240	Hittite	B079813	VBU

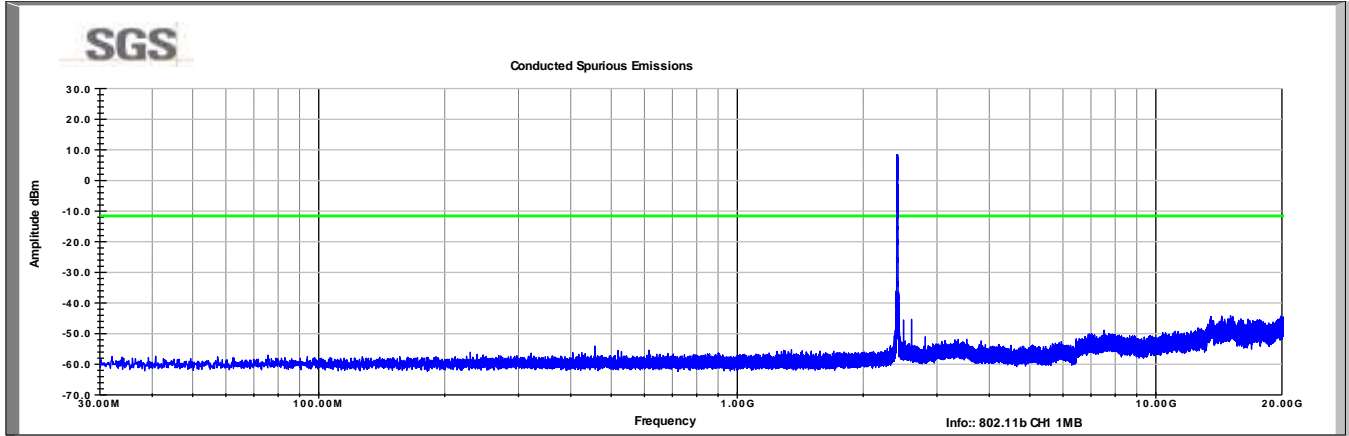
Note: The calibration period equipment is 1 year.

5.5 Test Setup Photographs

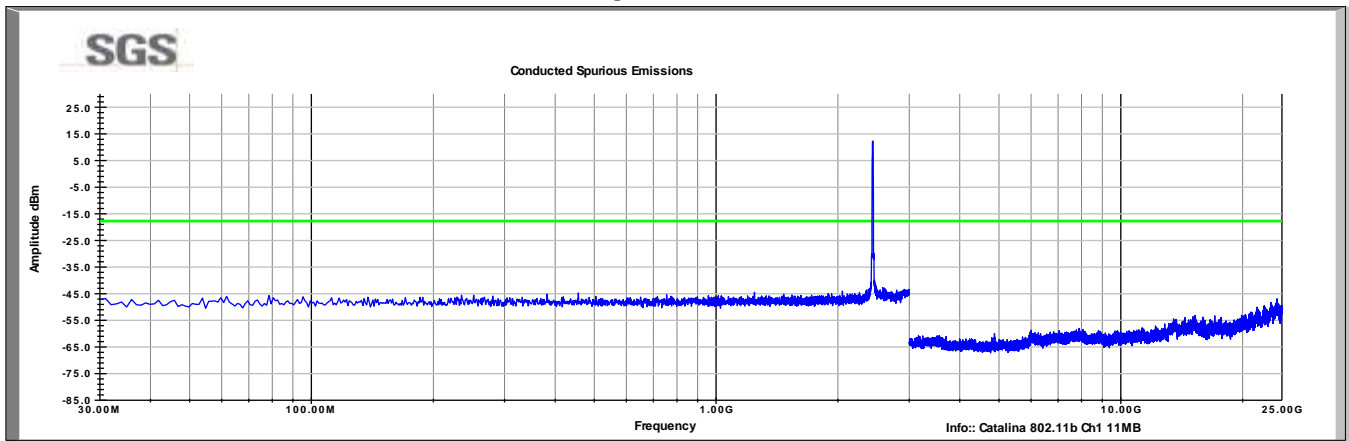
Test setup photographs are located in a separate exhibit.

5.6 Test Data

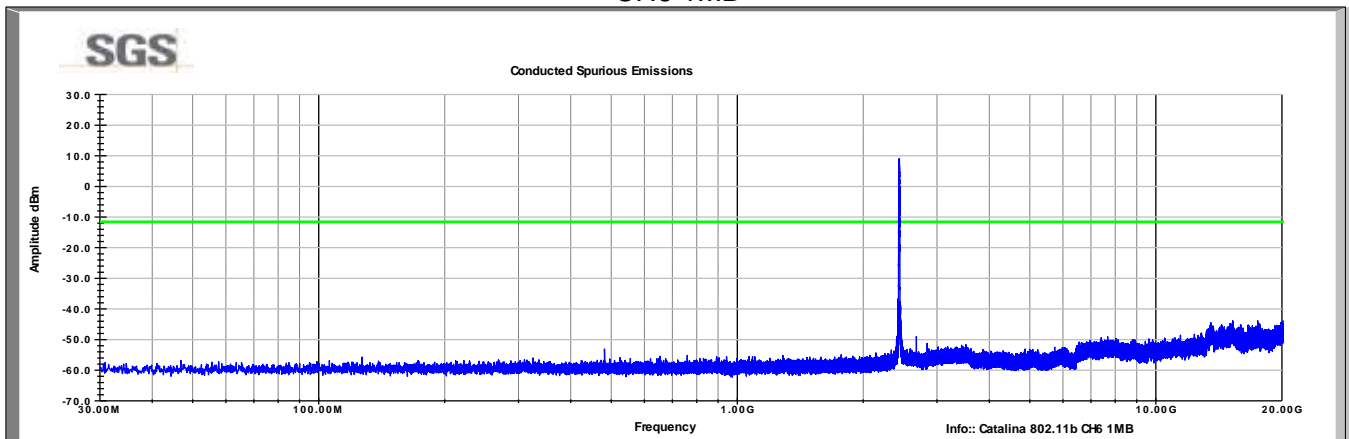
802.11b CH1 1MB



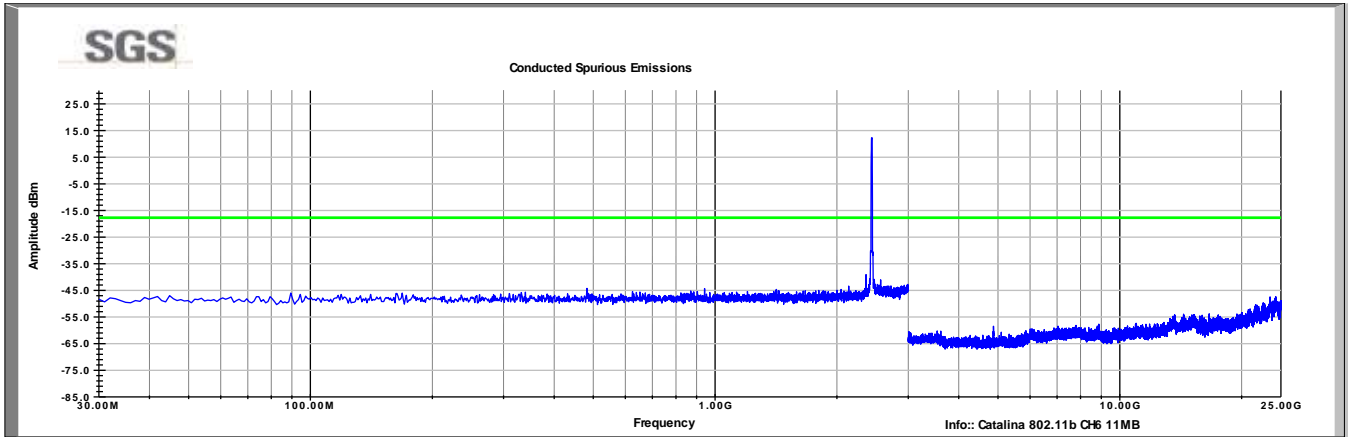
CH1 11MB



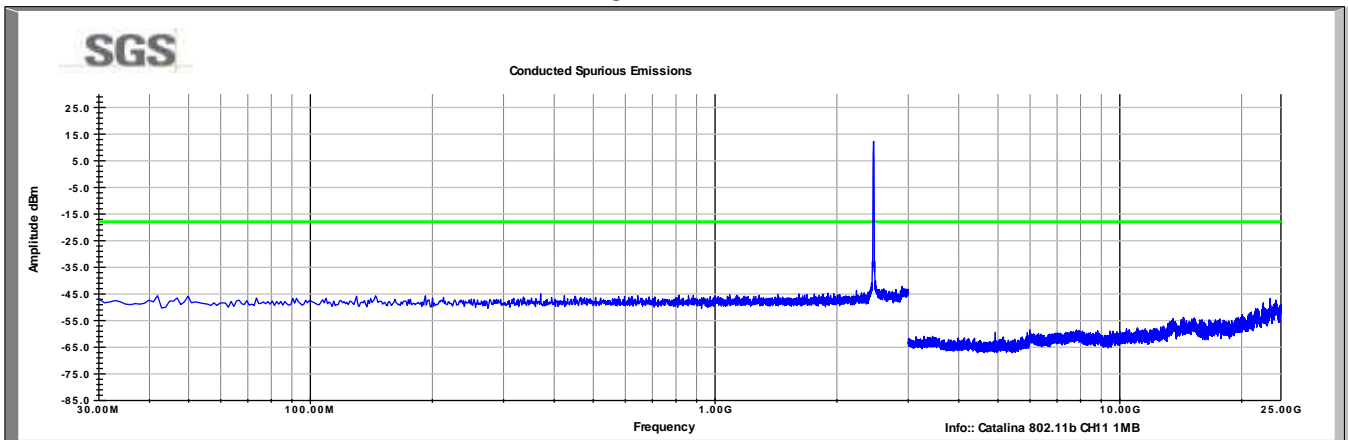
CH6 1MB



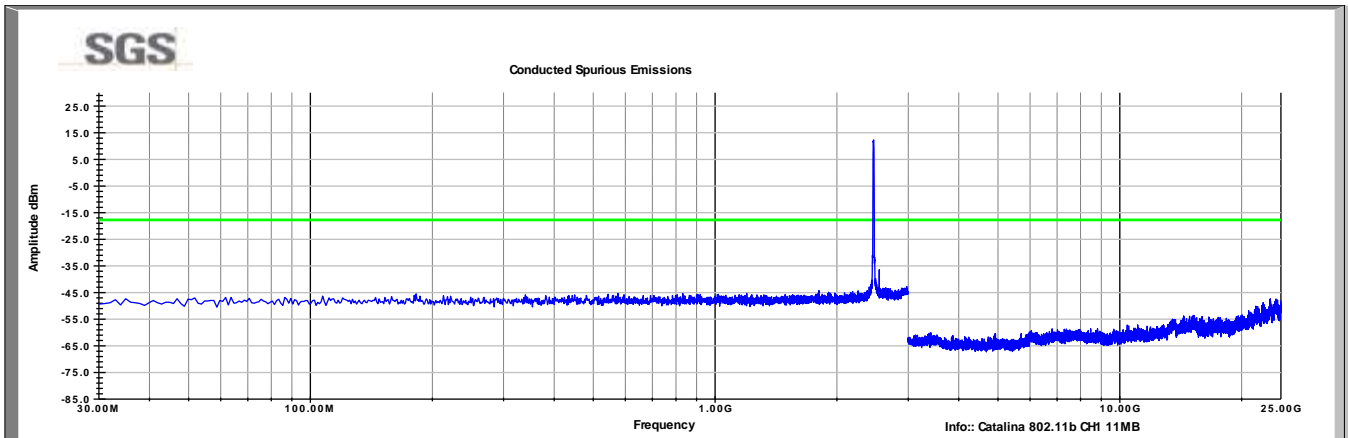
CH6 11MB



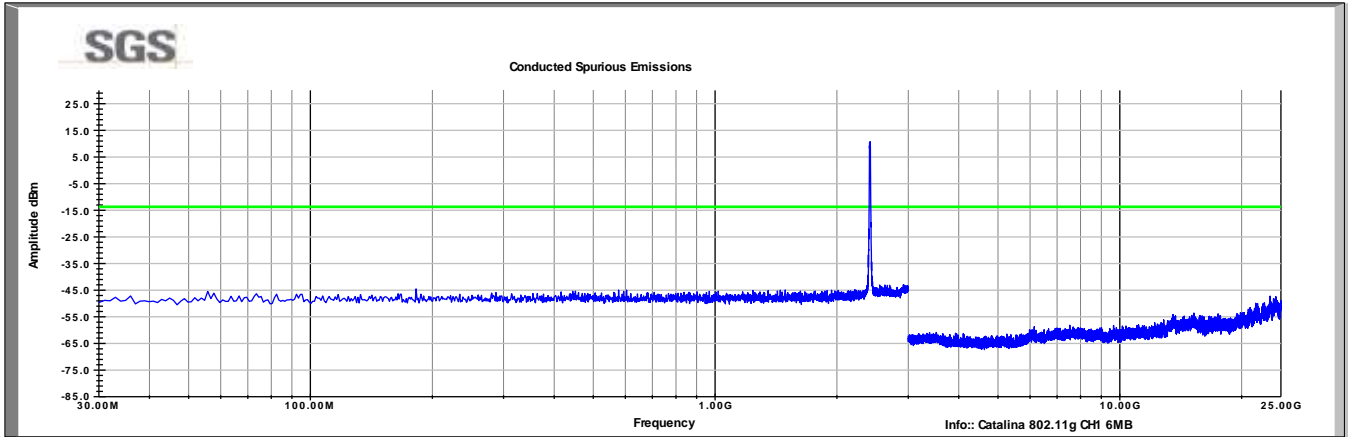
CH11 1MB



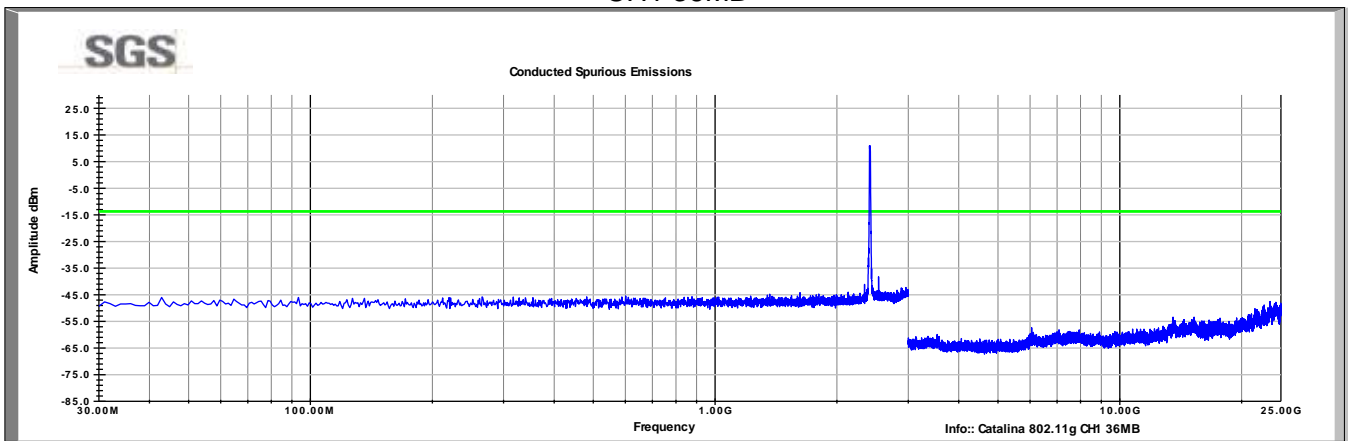
CH11 11MB



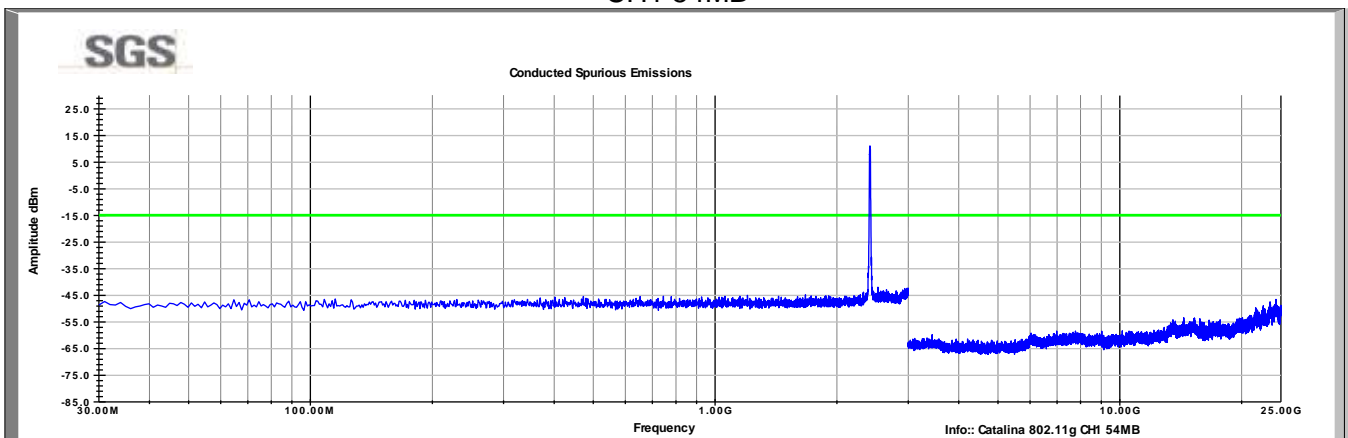
802.11g
CH1 6MB



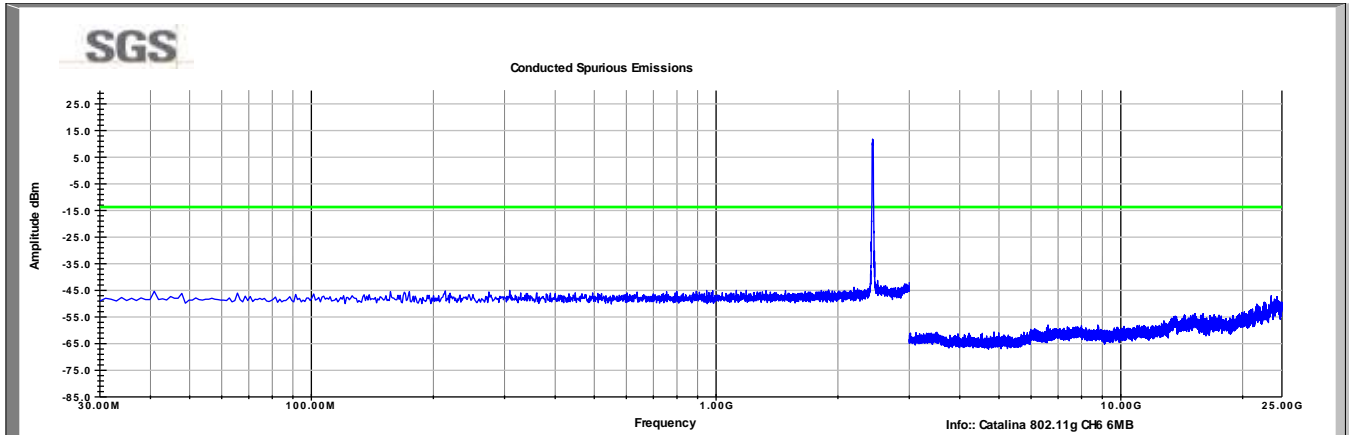
CH1 36MB



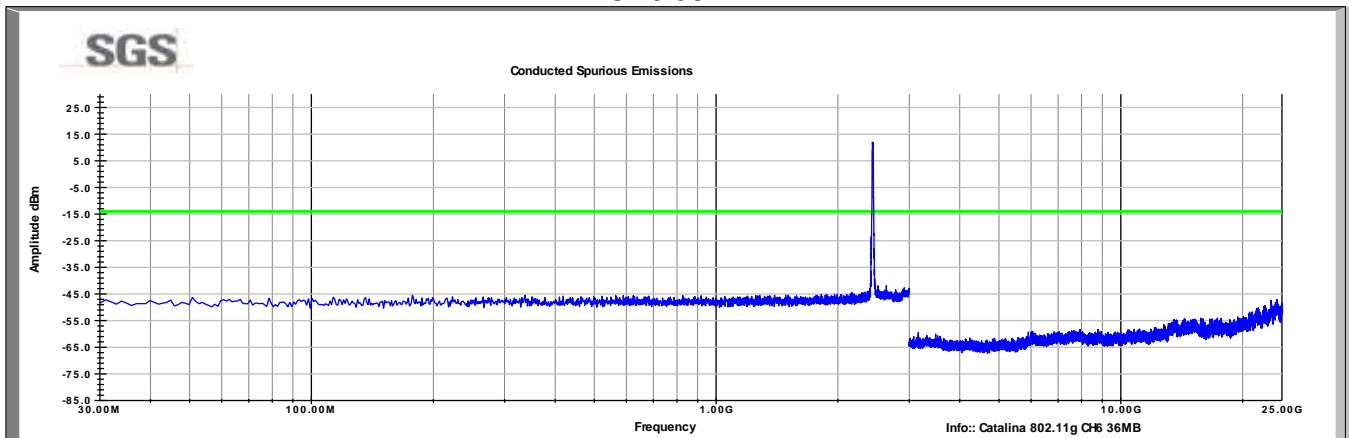
CH1 54MB



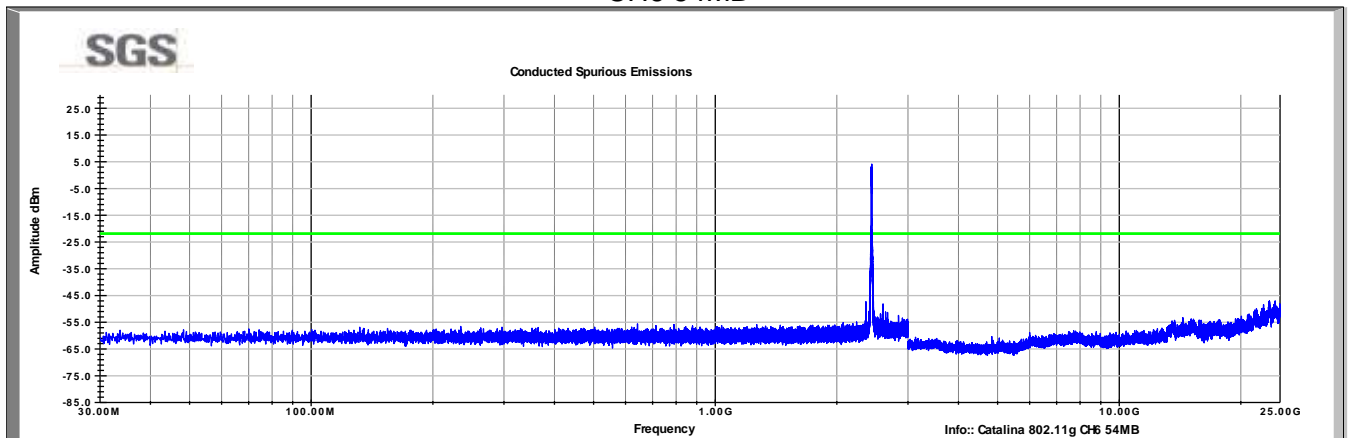
CH6 6MB



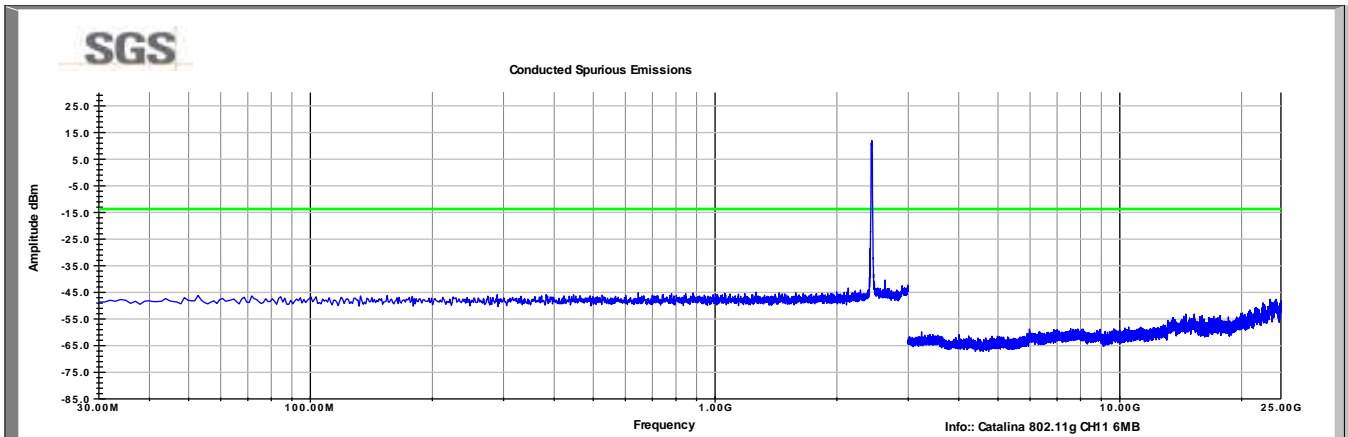
CH6 36MB



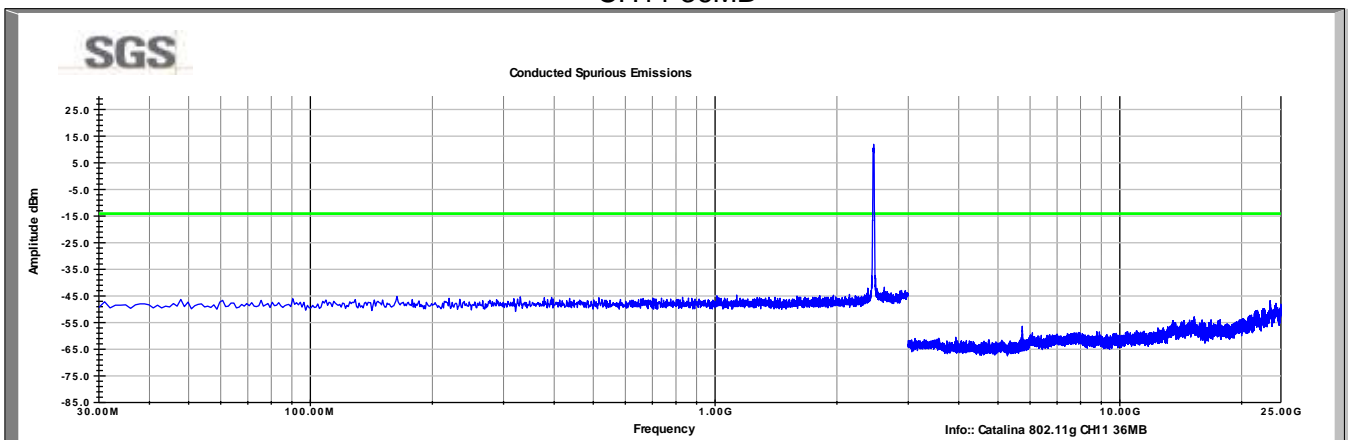
CH6 54MB



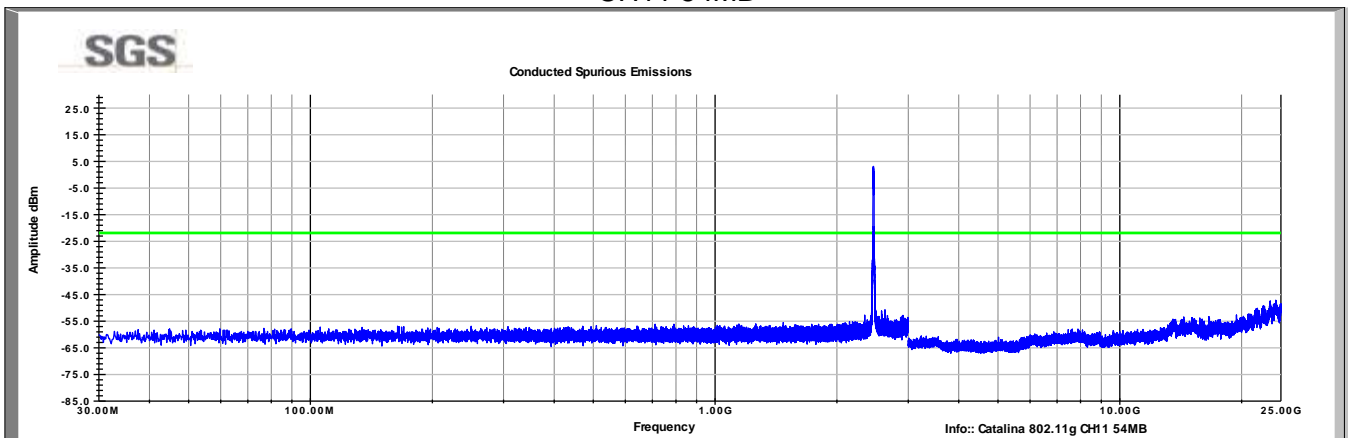
CH11 6MB



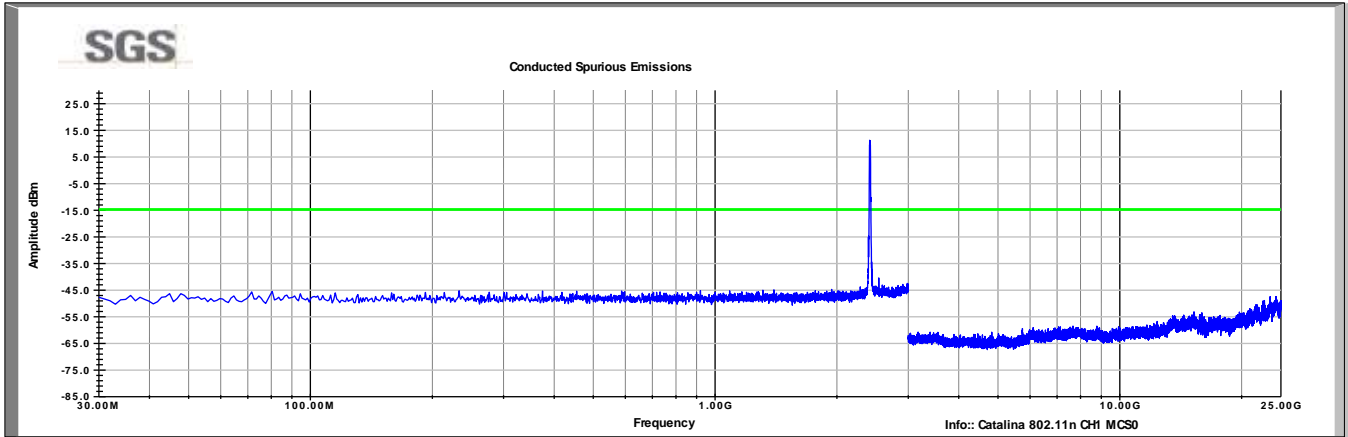
CH11 36MB



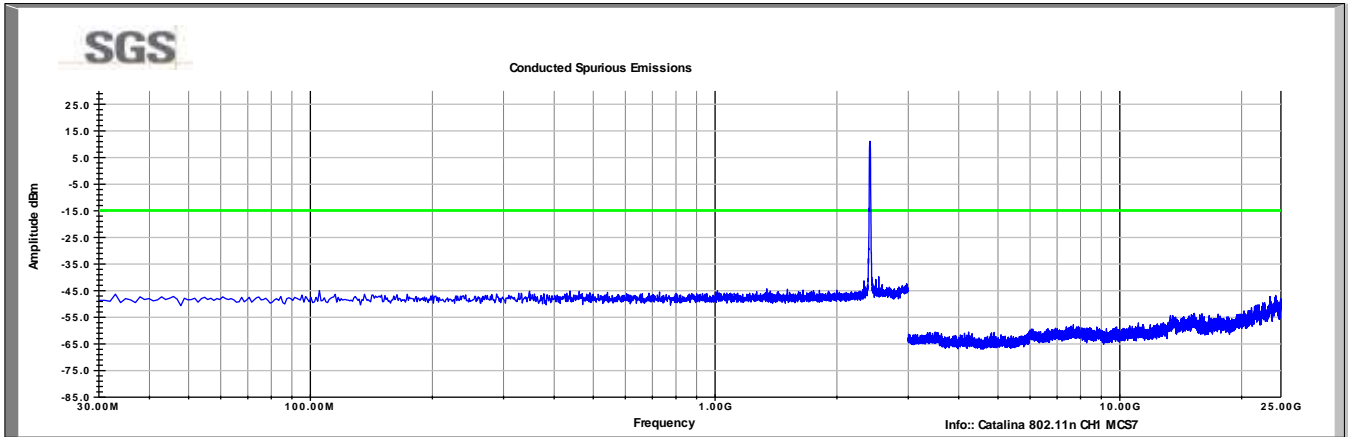
CH11 54MB



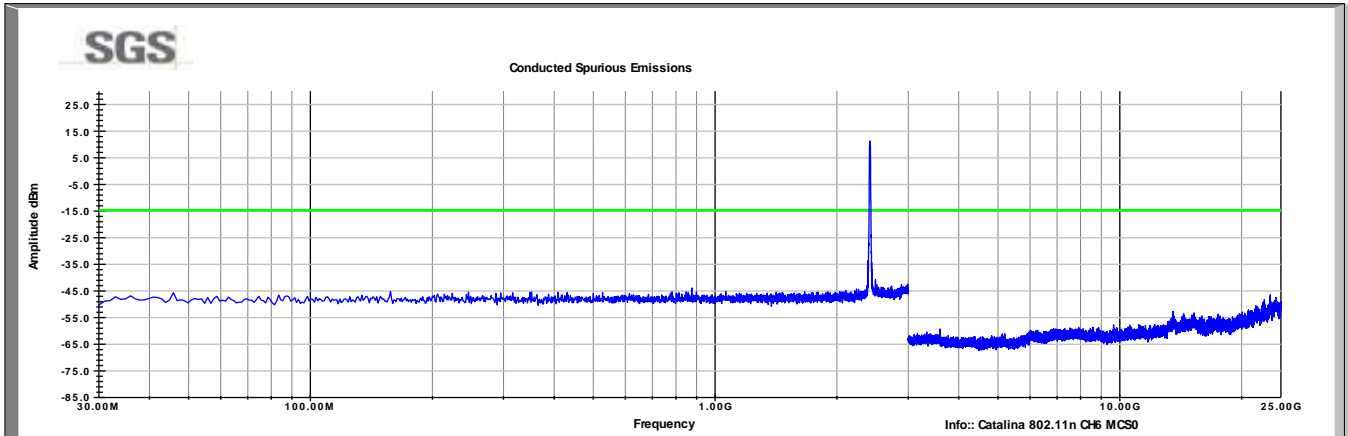
802.11n
CH1 MCS0



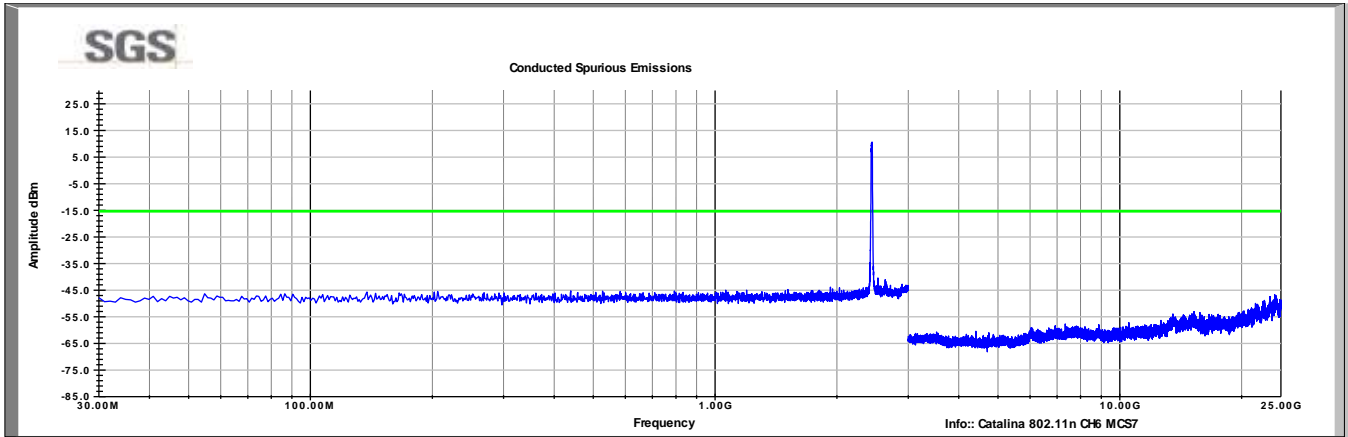
CH1 MCS7



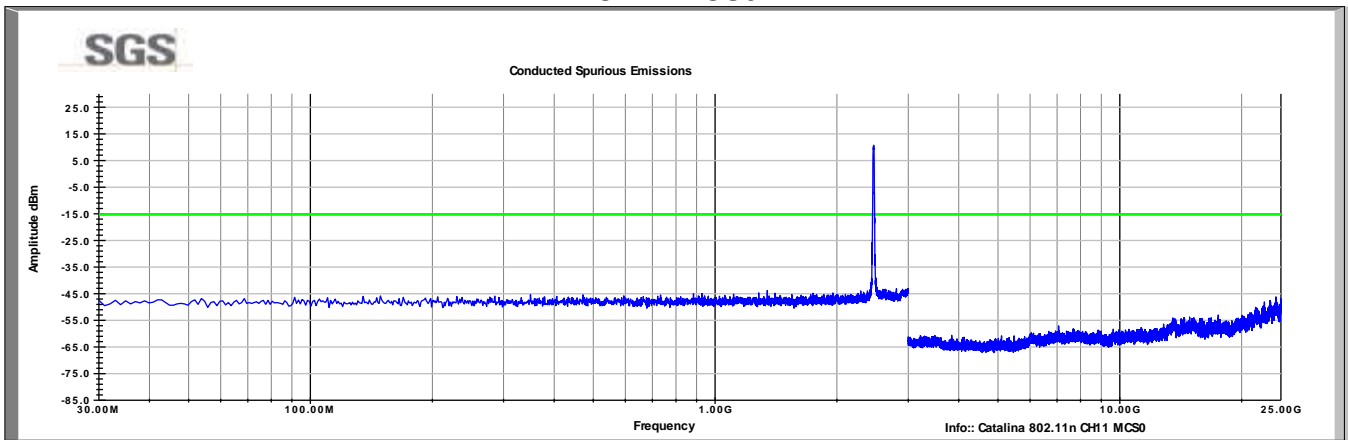
CH6 MCS0



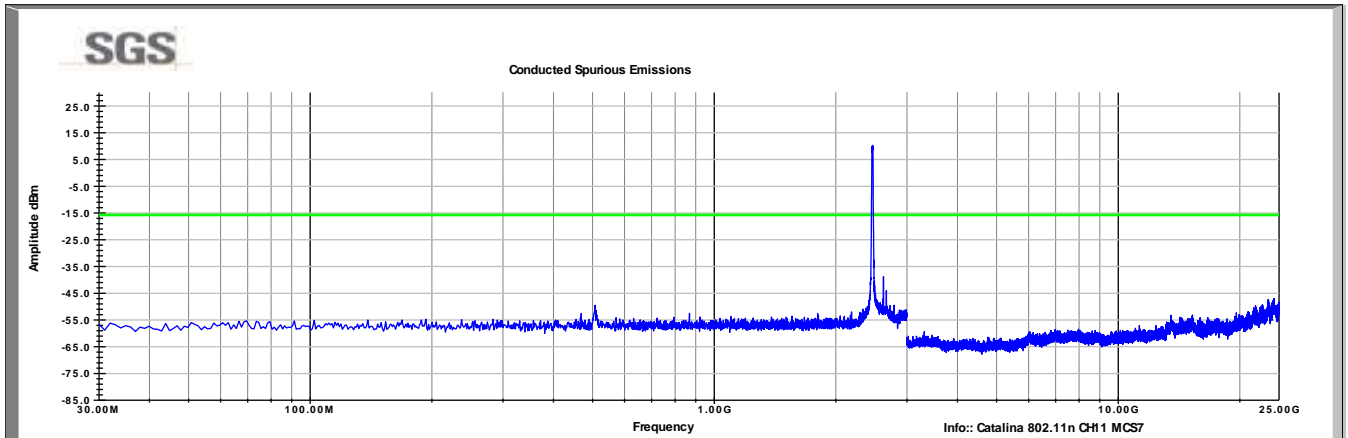
CH6 MCS7



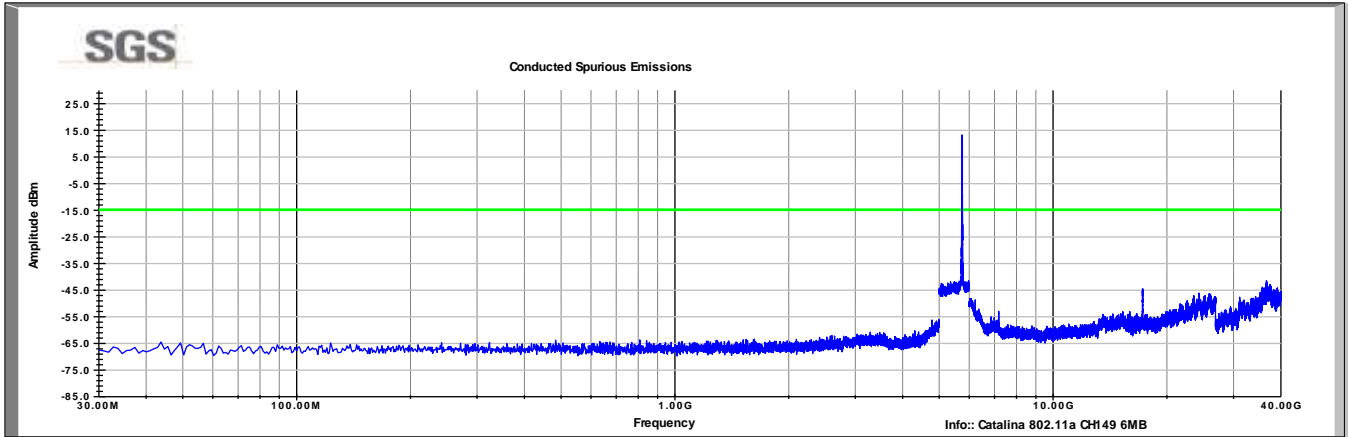
CH11 MCS0



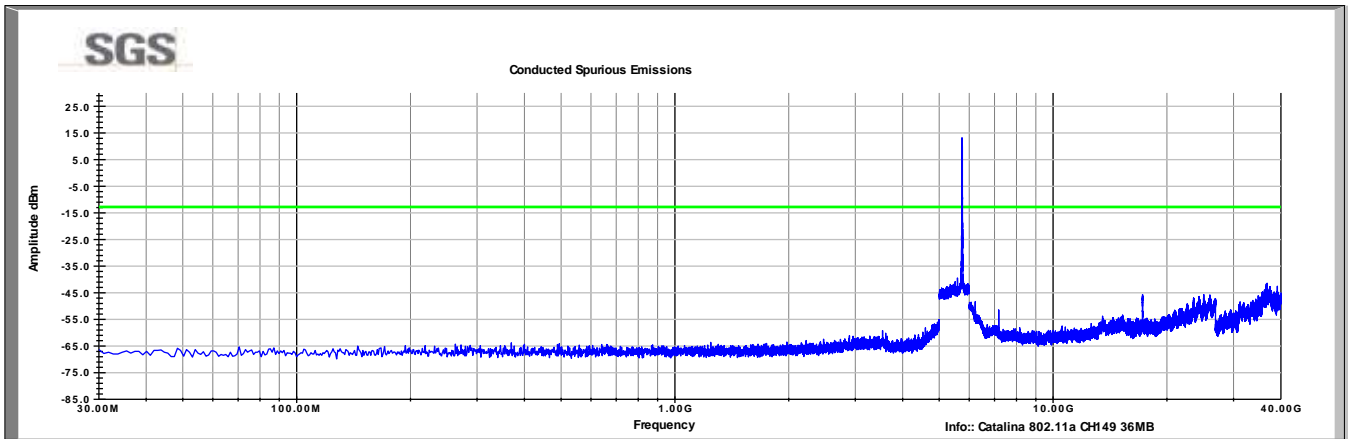
CH11 MCS7



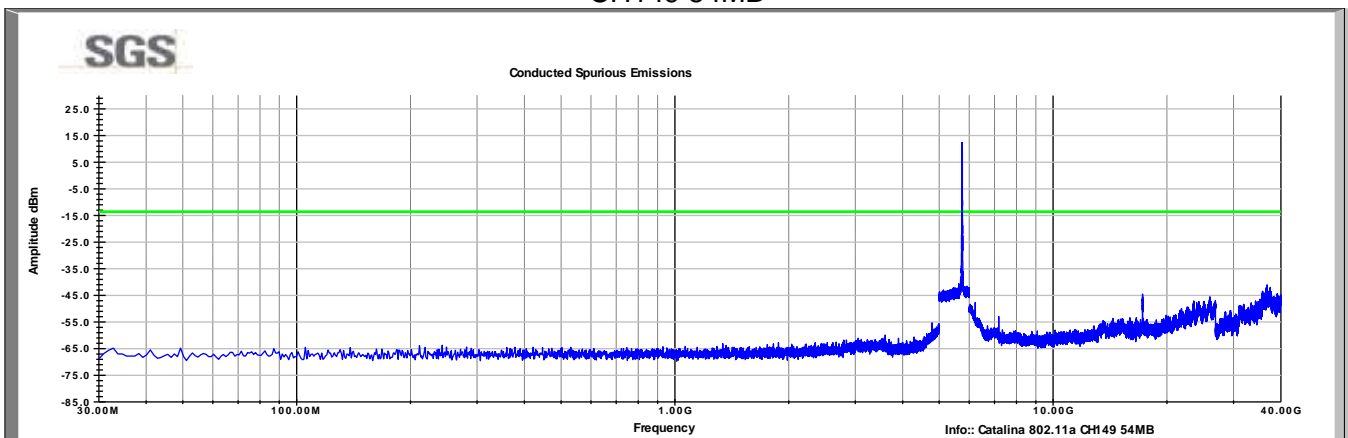
802.11a
CH149 6MB



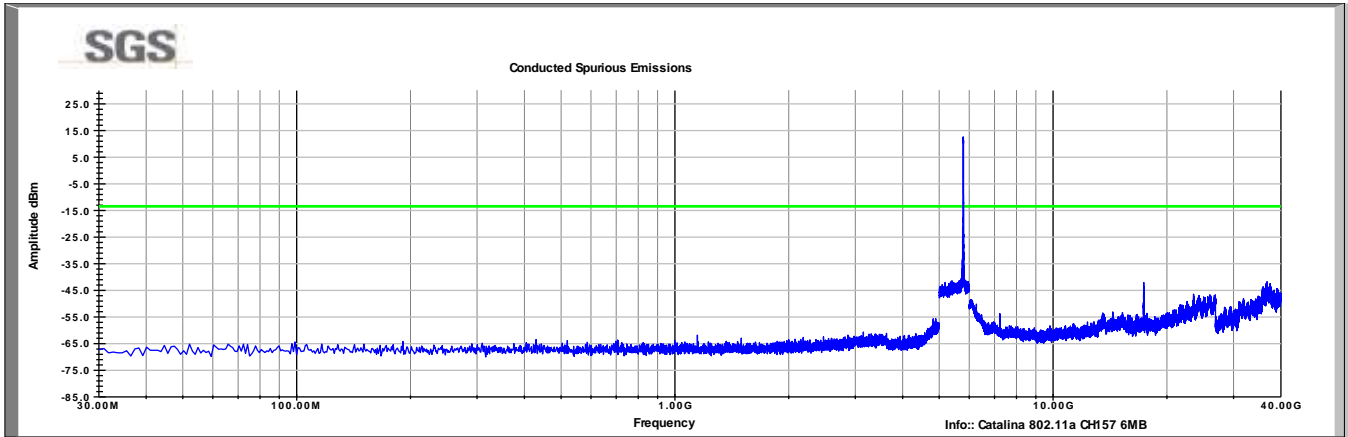
CH149 36MB



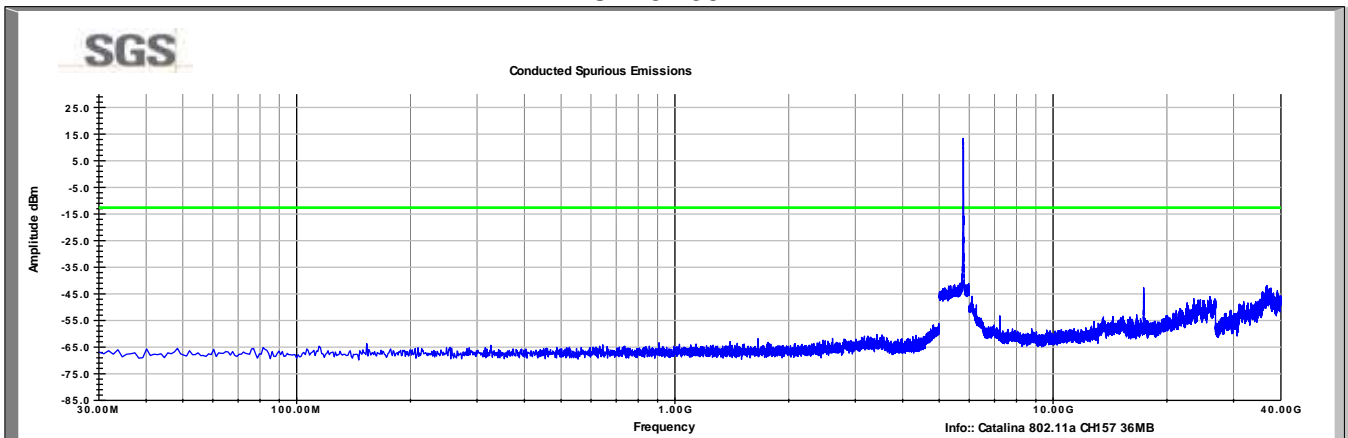
CH149 54MB



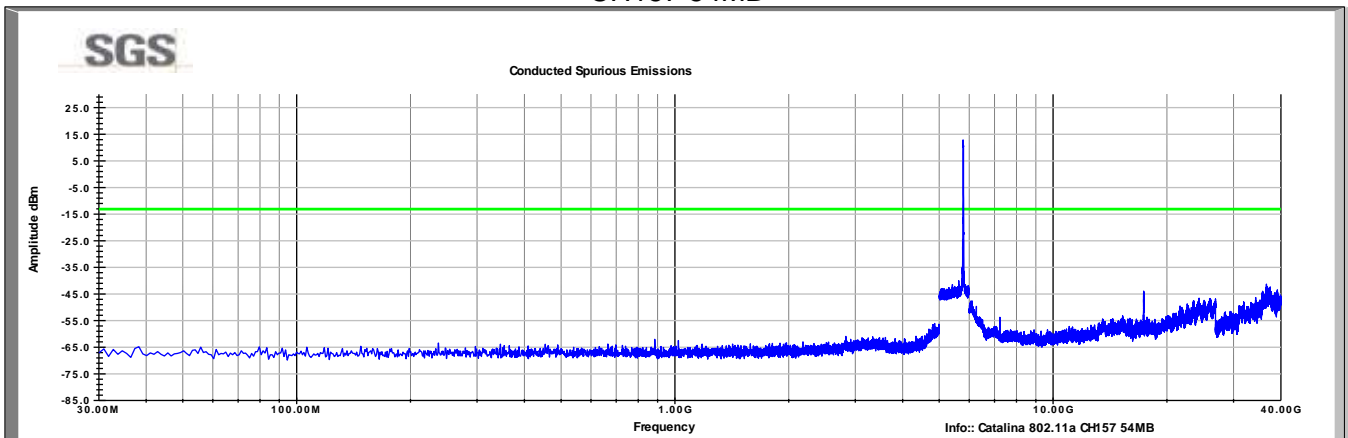
CH157 6MB



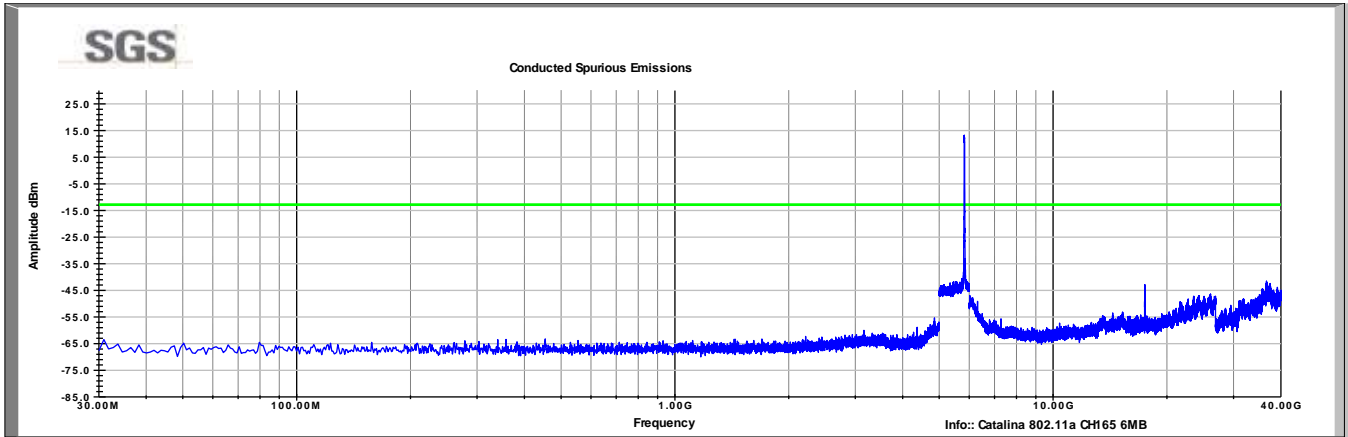
CH157 36MB



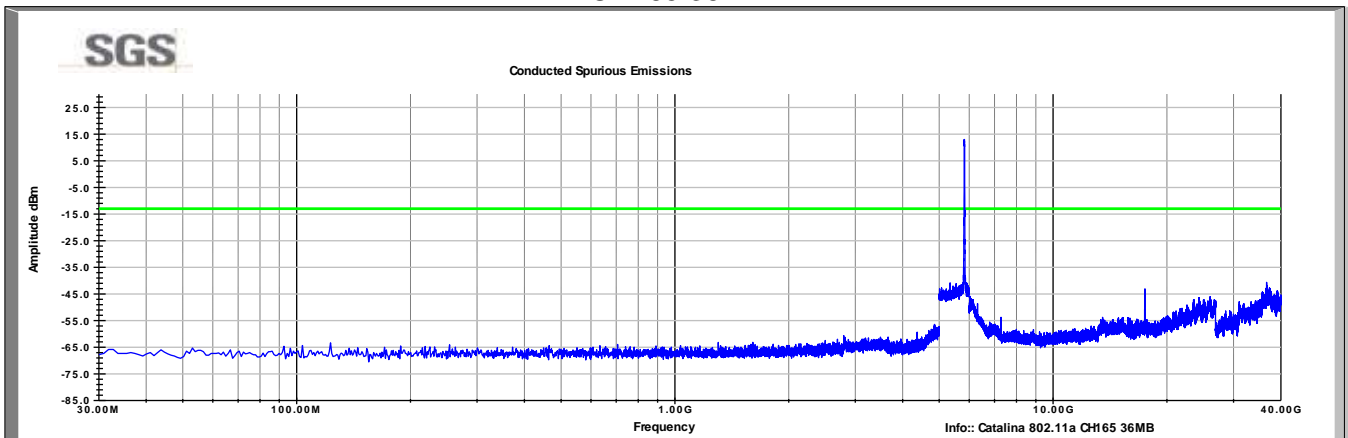
CH157 54MB



CH165 6MB



CH165 36MB



CH165 54MB

