EMC Test Report

Project Number: 3374150

Report Number: 3374150EMC02 **Revision Level:** 1

Client: Medicalgorithmics

Equipment Under Test: Mobile Computer

Model Name: PocketECG transmitter

Model Number: PocketECG III

Hardware Version: R904

Software Version 10.001-6.000-8287

Applicable Standards: FCC Part 15 Subpart C, § 15.247

RSS-210, Issue 8, December 2010

ANSI C63.10: 2009

Report issued on: 14OCT2014

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.

Table of Contents

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

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name:	Medicalgorithmics S.A
Address:	Al. Jerozolimskie 81
City, State, Zip, Country:	02-001 Warsaw Poland

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:	PocketECG transmitter
Model:	PocketECG III
Serial Number:	P3TR13 -00xxxxx(Conducted Measurements) P3TR13-00020A(Conducted Measurements) P3TR13-00002A(Radiated Measurements) P3TR13-00004A(Radiated Measurements)
Build Version:	1.0.0.0334
FCC ID:	Not Provided
IC ID	Not Provided
Frequency Range:	2412 to 2462 MHz 5745 to 5825 MHz
Modulation type:	CCK, DBPSK, DQPSK BPSK, QPSK, 16QAM, 64QAM
Channel spacing:	20 MHz
Antenna:	Integral
Rated Voltage:	3.7 VDC Internal Battery
Sample Received Date:	10 DEC 2013
Dates of testing:	16 JAN – 26 MAR 2014

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	MedicAlgorithmics	EUT	PocketECG III	P3TR13 -00xxxxx(Conducted Measurements) P3TR13-00020A(Conducted Measurements) P3TR13-00002A(Radiated Measurements) P3TR13-00004A(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
Spectrum Analyzer	FSV	R&S	B085749	28 AUG 2014

Note: The calibration period equipment is 1 year.

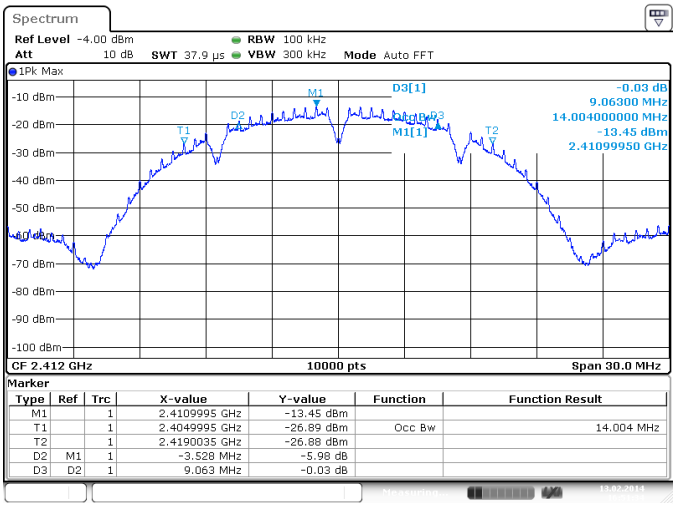
3.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

3.6 *Test Data*

Protocol	Channel	Frequency	Data Rate	BW (MHz)
802.11b	1	2412	1	9.06
802.11b	1	2412	5.5	10.32
802.11b	1	2412	11	9.06
802.11b	6	2437	1	9.53
802.11b	6	2437	5.5	10.07
802.11b	6	2437	11	9.55
802.11b	11	2462	1	9.07
802.11b	11	2462	5.5	10.03
802.11b	11	2462	11	8.58
802.11g	1	2412	6	15.32
802.11g	1	2412	24	15.53
802.11g	1	2412	54	15.64
802.11g	6	2437	6	15.34
802.11g	6	2437	24	15.13
802.11g	6	2437	54	15.14
802.11g	11	2462	6	15.47
802.11g	11	2462	24	15.65
802.11g	11	2462	54	15.34
802.11n	1	2412	MCS0	15.33
802.11n	1	2412	MCS7	15.34
802.11n	6	2437	MCS0	15.53
802.11n	6	2437	MCS7	15.34
802.11n	11	2462	MCS0	15.66
802.11n	11	2462	MCS7	15.33
802.11a	149	5745	6	15.35
802.11a	149	5745	36	15.03
802.11a	149	5745	54	15.54
802.11a	157	5785	6	15.05
802.11a	157	5785	36	15.34
802.11a	157	5785	54	15.33
802.11a	165	5825	6	15.33
802.11a	165	5825	36	15.33
802.11a	165	5825	54	15.33

3.6.1 802.11b, low channel plots



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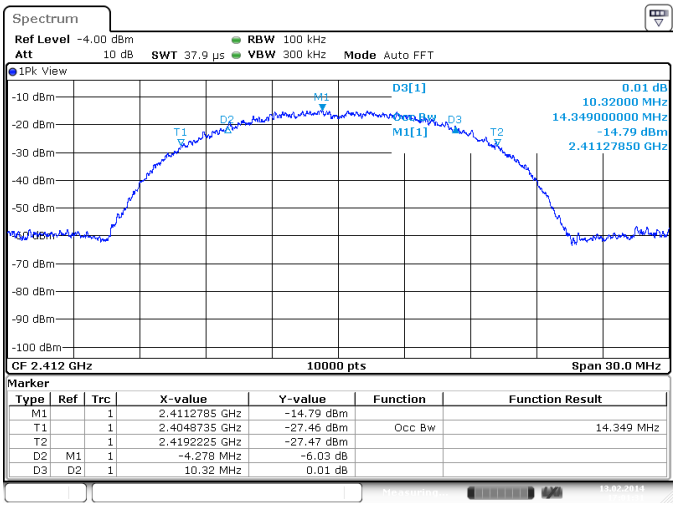

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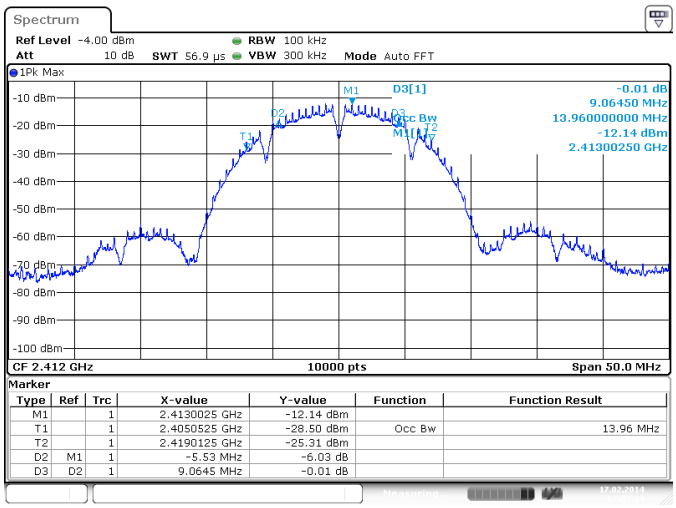

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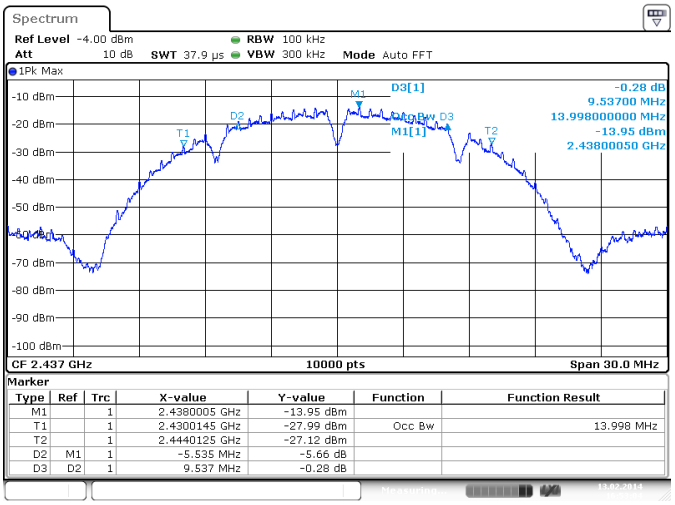
3.6.2 802.11b, mid channel



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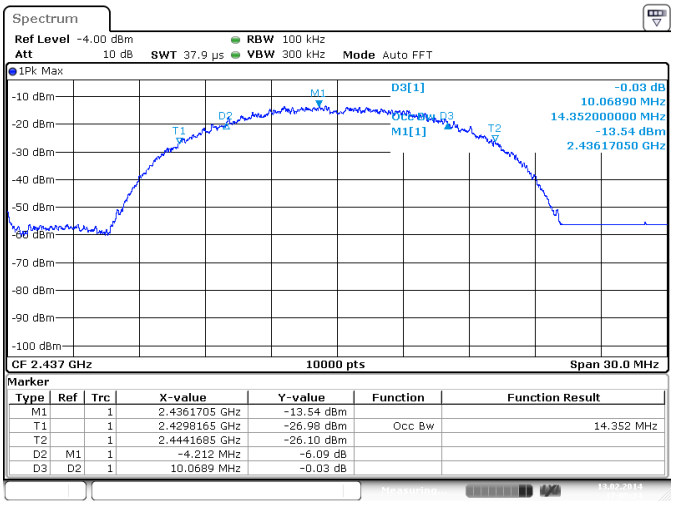

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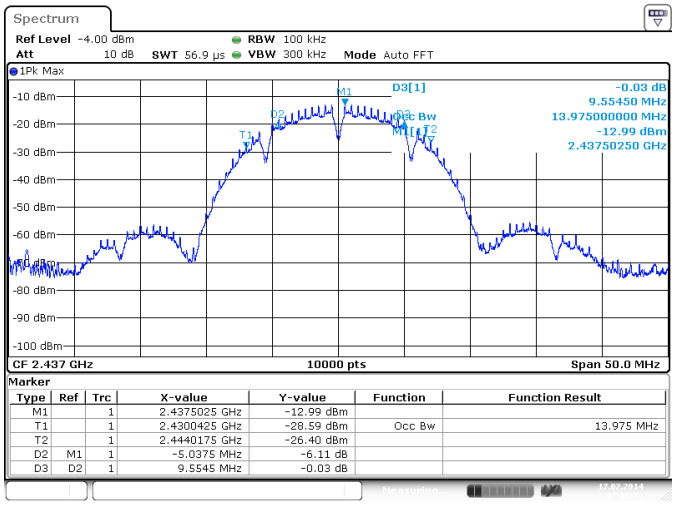

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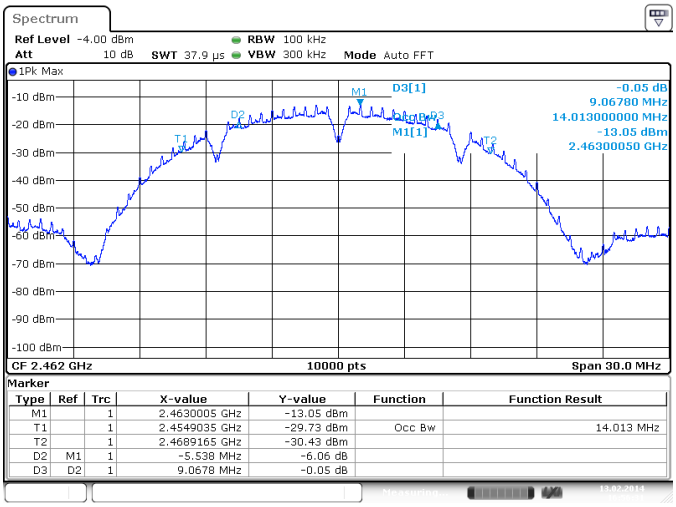
3.6.3 802.11b, high channel plots



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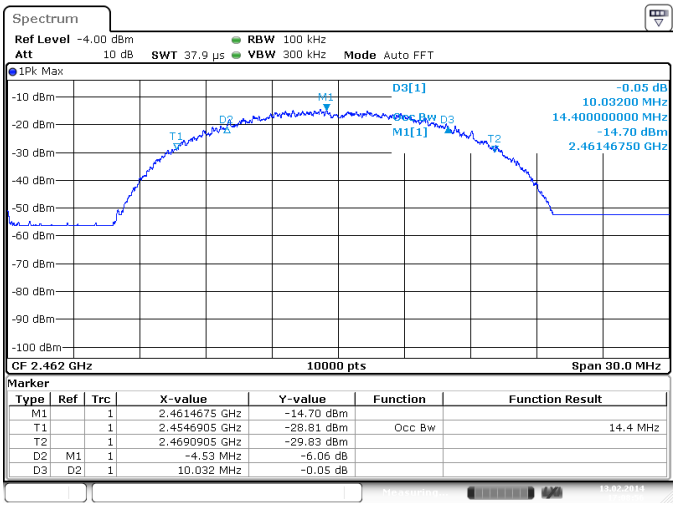

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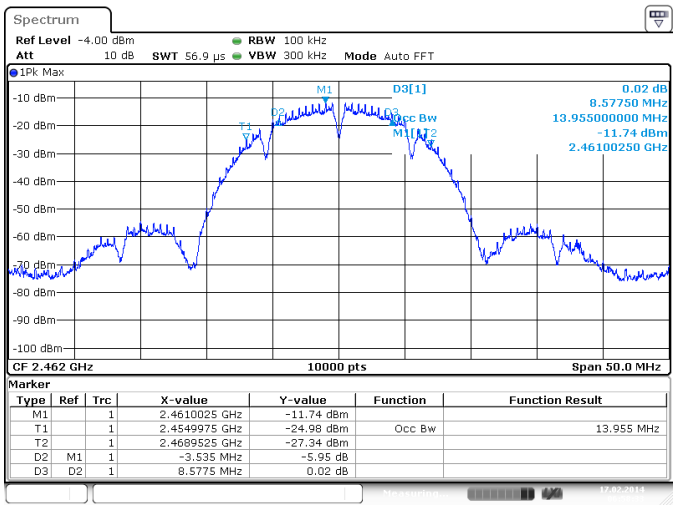

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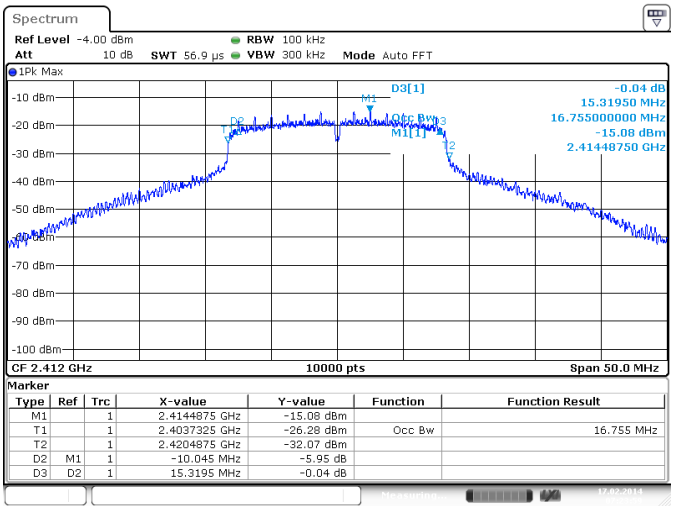
3.6.4 802.11g, low channel plots



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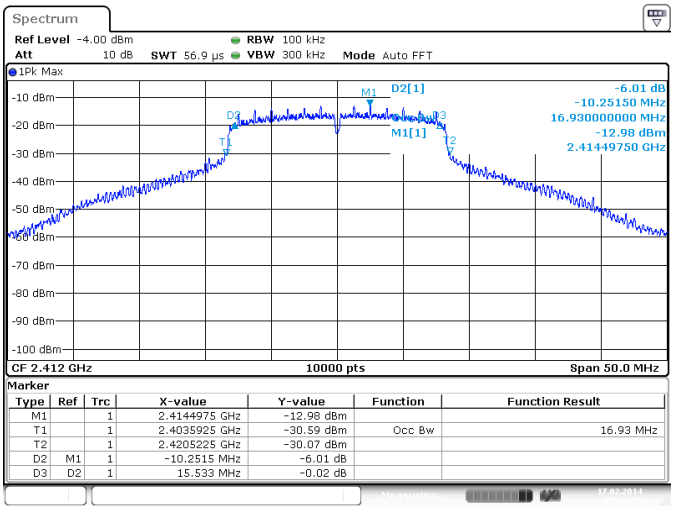

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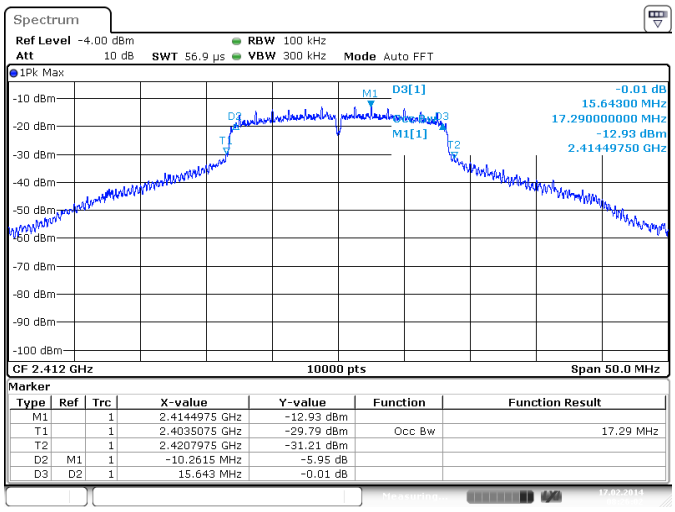

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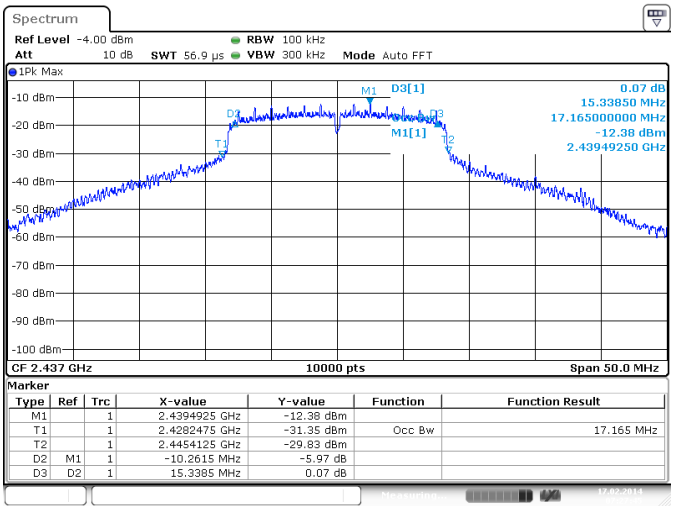
3.6.5 802.11g, mid channel



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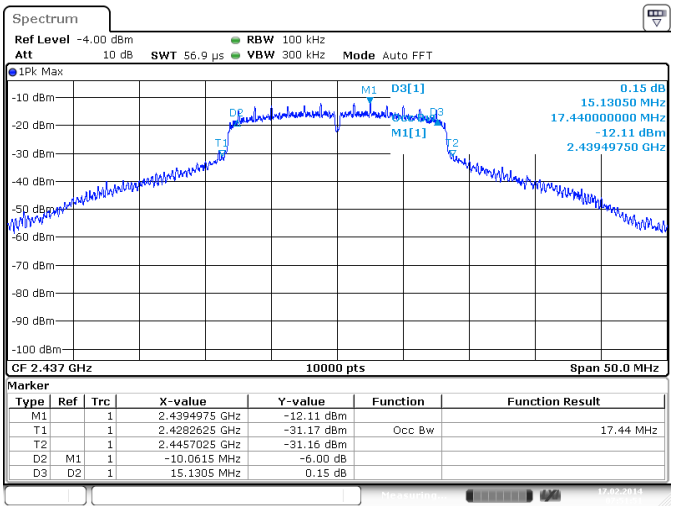

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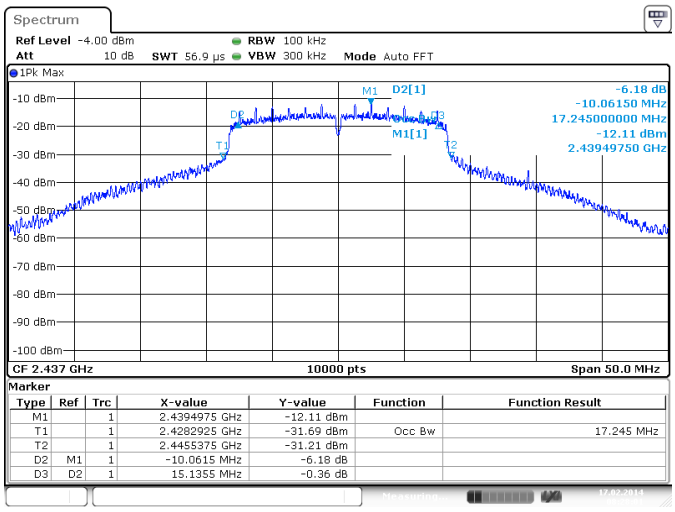

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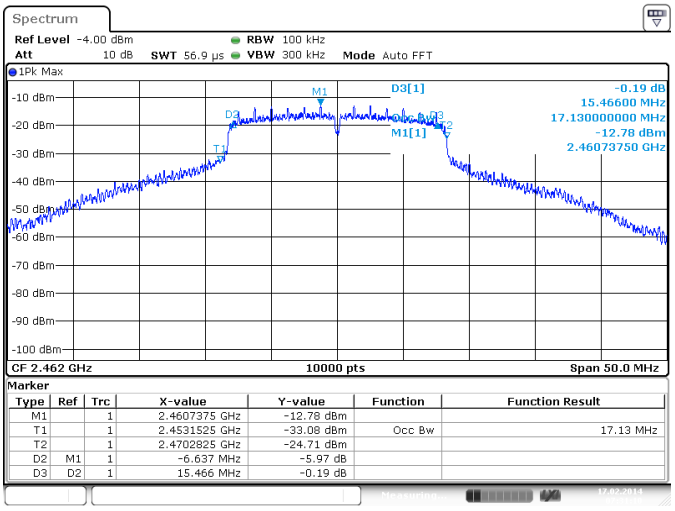
3.6.6 802.11g, high channel plots



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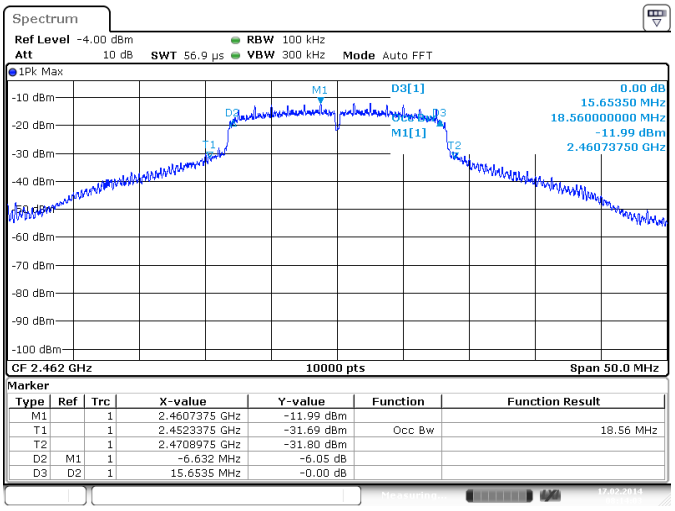

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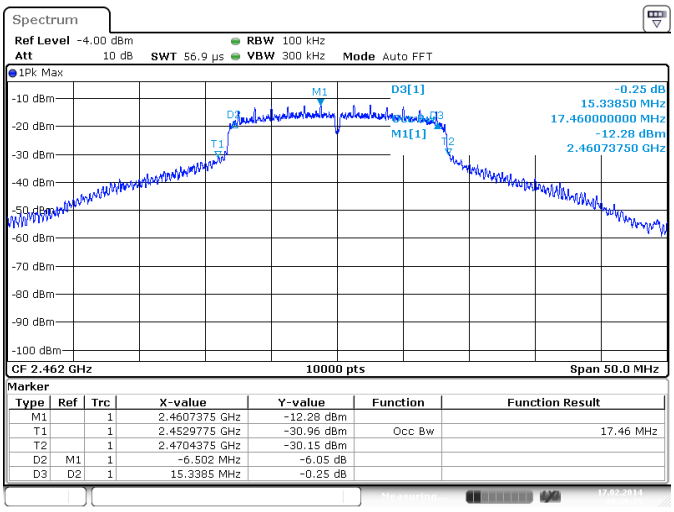

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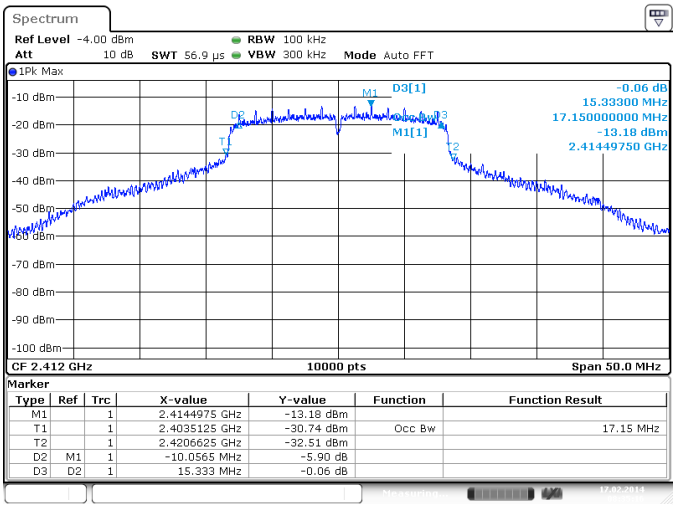
3.6.7 802.11n, low channel plots



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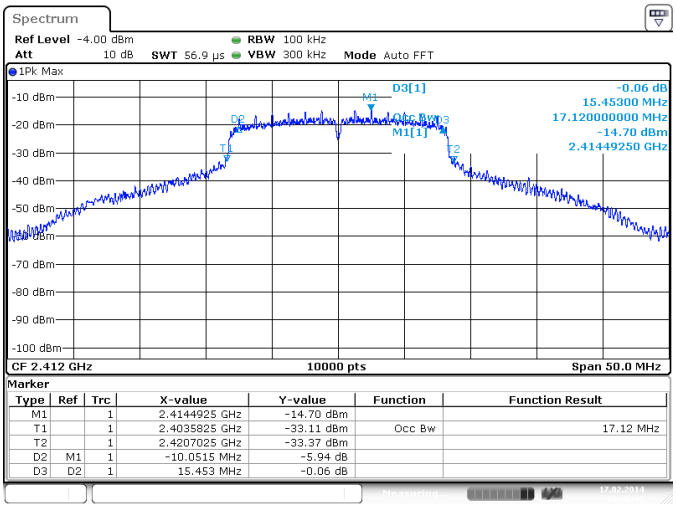

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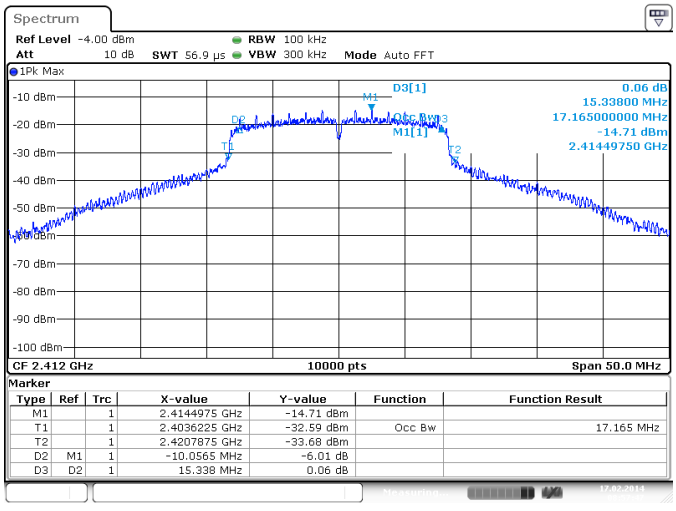

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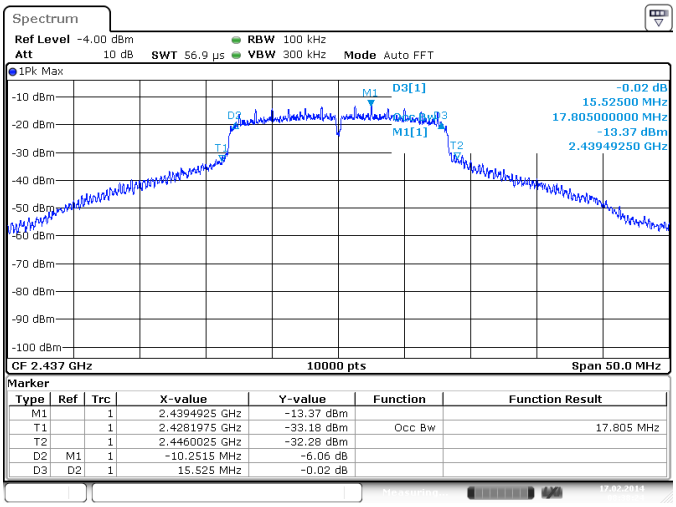
3.6.8 802.11n, mid channel



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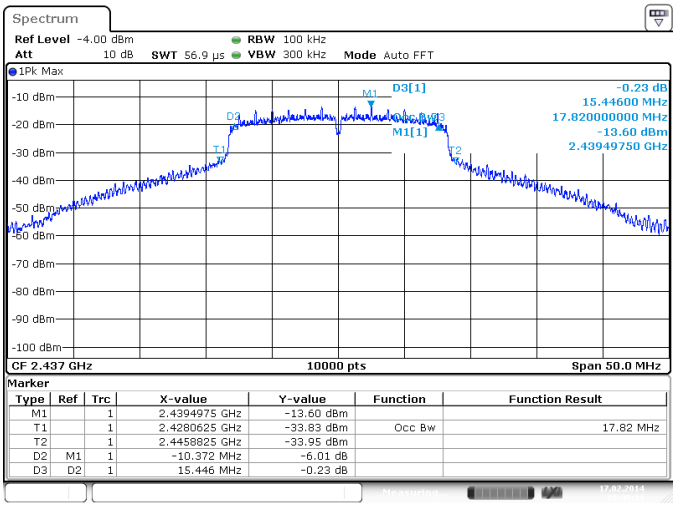

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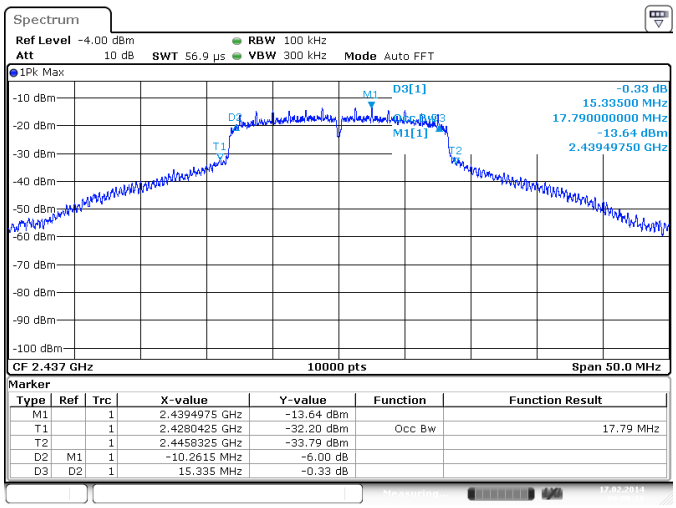

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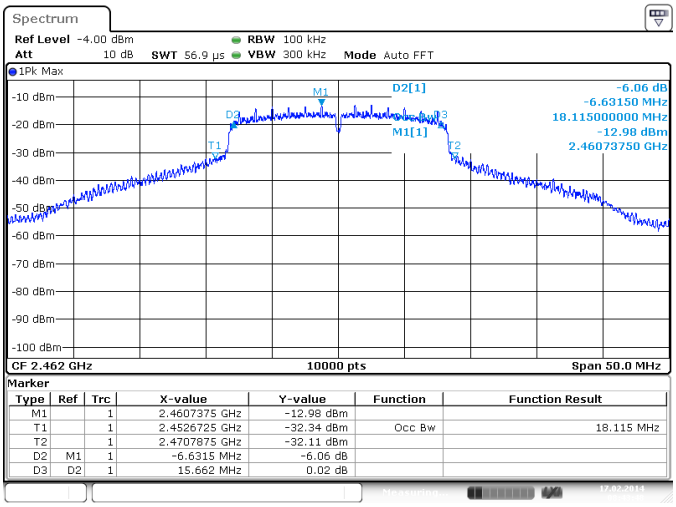
3.6.9 802.11n, high channel plots



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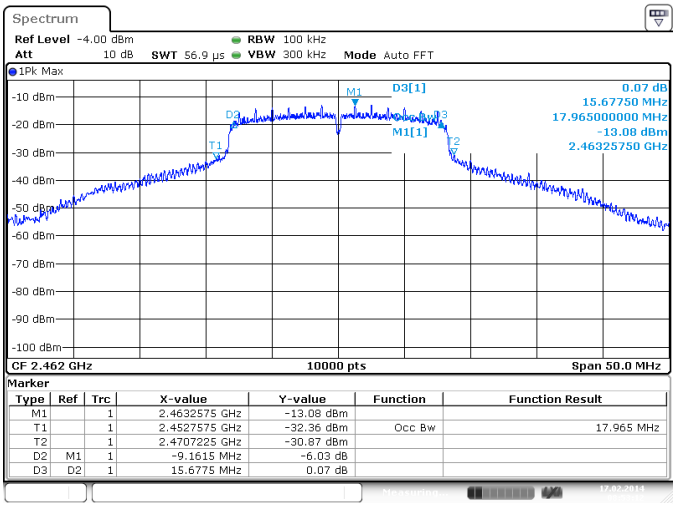

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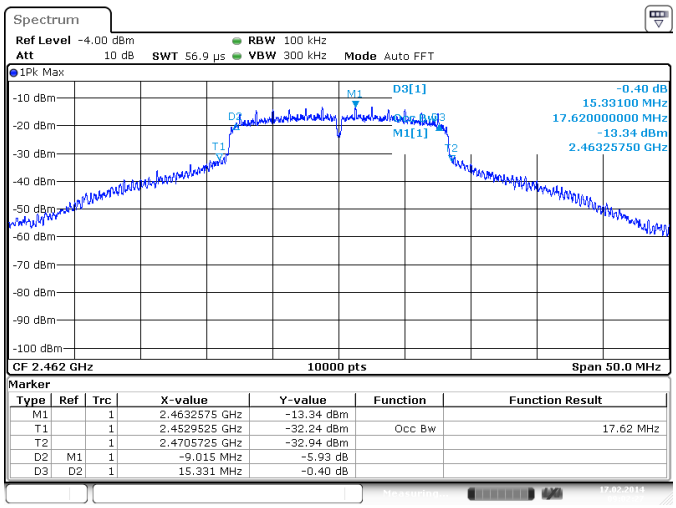

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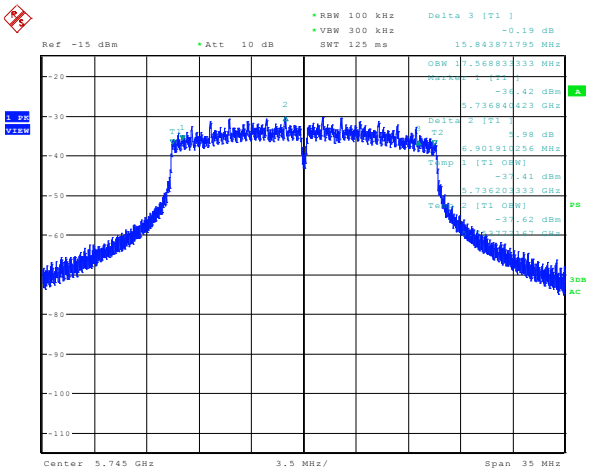
3.6.10 (5GHz) 802.11n, low channel plots



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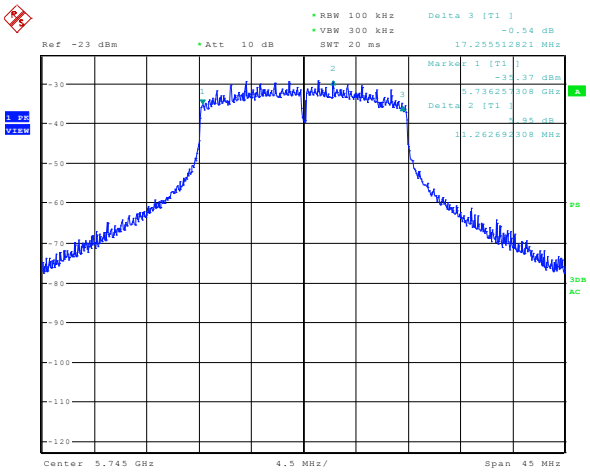

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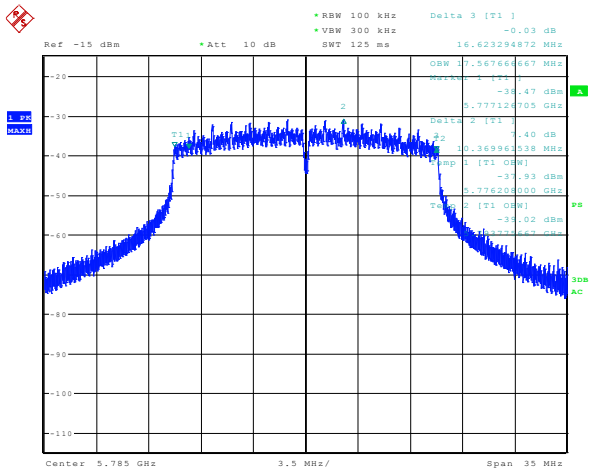
3.6.11 **(5GHz) 802.11n, mid channel**



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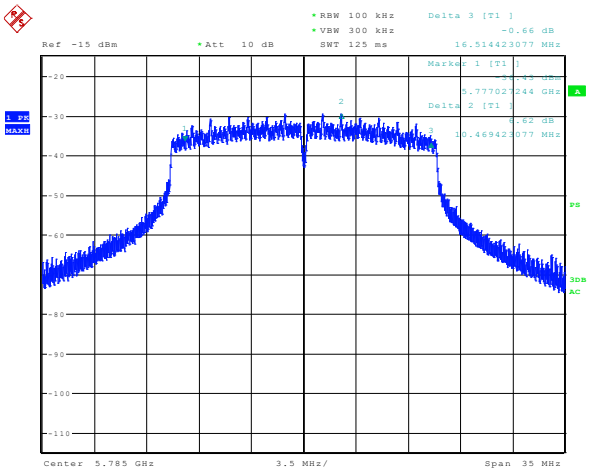

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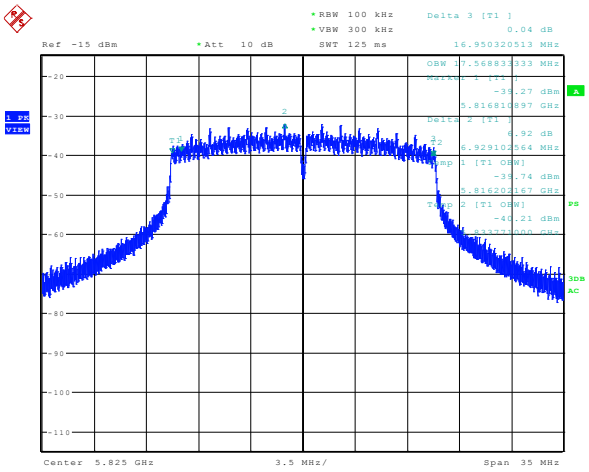
3.6.12 **(5GHz) 802.11n, high channel plots**



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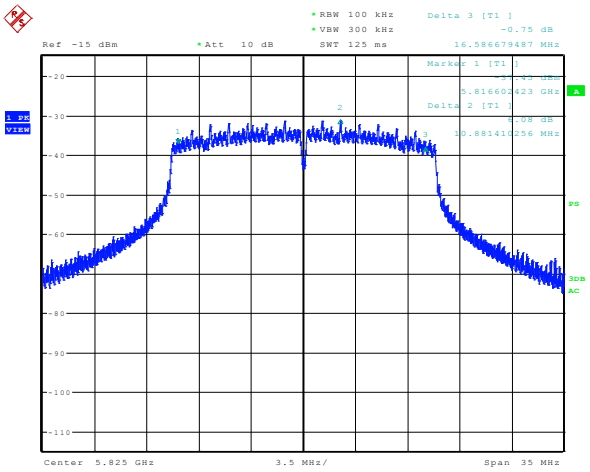

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4 Peak Output Power

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 Analzyer	ESU 8	R&S	B085759	21 JUN 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*

Mode	Freq (MHz)	Channel	Power	802.11b Conducted Power (dBm)			
				Data rate (Mbps)			
				1	2	5.5	11
802.11b	2412	1	dBm	17.21	17.21	17.06	17.23
802.11b	2437	6	dBm	17.39	**17.40**	17.14	17.37
802.11b	2462	11	dBm	17.39	17.38	17.19	17.36

Mode	Freq (MHz)	Channel	Power	802.11g Conducted Power (dBm)							
				Data rate (Mbps)							
				6	9	12	18	24	36	48	54
802.11g	2412	1	dBm	17.15	17.16	17.13	17.14	17.17	17.14	13.26	11.16
802.11g	2437	6	dBm	17.32	17.32	**17.34**	17.33	17.29	17.32	13.29	11.22
802.11g	2462	11	dBm	15.67	15.69	15.65	15.50	15.49	15.66	13.31	11.26

Mode	Freq (MHz)	Channel	Power	802.11n, 2.4GHz 400ns GI, Conducted Power (dBm)							
				Data rate (Mbps)							
				MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n	2412	1	dBm	14.61	14.61	14.61	14.65	14.64	12.15	12.12	10.06
802.11n	2437	6	dBm	14.71	14.72	14.83	14.79	14.76	12.32	12.23	10.20
802.11n	2462	11	dBm	14.72	14.73	**14.84**	14.75	14.73	12.33	12.25	10.21

Mode	Freq (MHz)	Channel	Power	**802.11a Conducted Power (dBm)**							
				Data rate (Mbps)							
				6	9	12	18	24	36	48	54
802.11a	5745	149	dBm	12.84	12.26	12.06	12.33	12.52	12.55	9.72	9.70
802.11a	5765	153	dBm	12.69	12.58	12.32	12.63	12.82	12.73	9.95	9.96
802.11a	5785	157	dBm	12.82	12.86	12.63	12.78	12.91	12.87	10.11	10.12
802.11a	5805	161	dBm	12.98	12.47	12.77	12.91	13.07	12.97	10.23	10.24
802.11a	5825	165	dBm	13.05	12.68	12.82	13.08	**13.14**	13.03	10.27	10.28

Mode	Freq (MHz)	Channel	Power	**802.11n, 20 MHz BW, 5GHz 400ns GI, Conducted Power (dBm)**							
				Data rate (Mbps)							
				MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n	5745	149	dBm	11.44	11.41	11.38	11.37	10.96	9.39	9.39	7.48
802.11n	5765	153	dBm	11.76	11.66	11.63	11.08	11.22	9.57	9.70	7.68
802.11n	5785	157	dBm	11.90	11.81	11.76	11.65	11.42	9.70	9.80	7.90
802.11n	5805	161	dBm	**12.00**	11.87	11.83	11.57	11.53	9.91	9.91	7.99
802.11n	5825	165	dBm	11.91	11.88	11.95	11.54	11.40	9.71	9.94	8.03

5 Radiated Spurious Emissions

5.1 *Test Result*

Test Description	Test Specification	Test Result
Radiated Spurious Emissions	15.247(d) and 15.209(a)	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 40 GHz

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, 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.

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 2 meters
18 to 40 GHz - The EUT to measurement antenna distance is 1/2 meter

The limit in any 100 kHz bandwidth is 30 dB below the measured peak power in any 100 kHz Bandwidth or the 15.209(a) field strength limits; whichever is greater.

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	ESU8	R&S	B085759	21JUN14
Spectrum Analyzer	ESU40	R&S	B085629	07OCT14
Cable	Sucoflex	Huber Suhner	B079714	6AUG14
Cable	Sucoflex	Huber Suhner	B079661	06AUG14
Cable	Sucoflex	Huber Suhner	B079822	29OCT14
Cable	Sucoflex	Huber Suhner	B079823	29OCT14
Antenna	3117	ETS Lindgren	B079691	10JUN14
Antenna	3116B	ETS Lindgren	B079697	28FEB14
Antenna	JB6	Sunol	B079690	24SEP2014
Preamplifier	TSPR18	R&S	B094463	13FEB15
Preamplifier	NSP1840-HG	Miteq	B087572	31OCT14

Note: The calibration period equipment is 1 year.

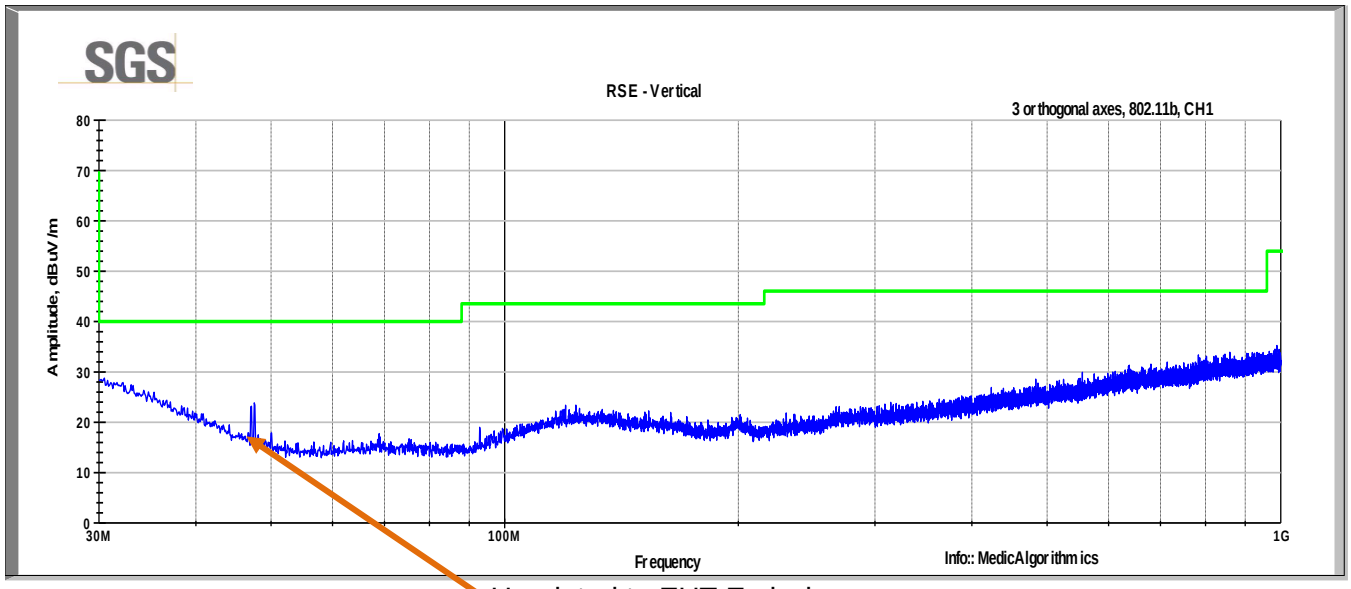
5.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

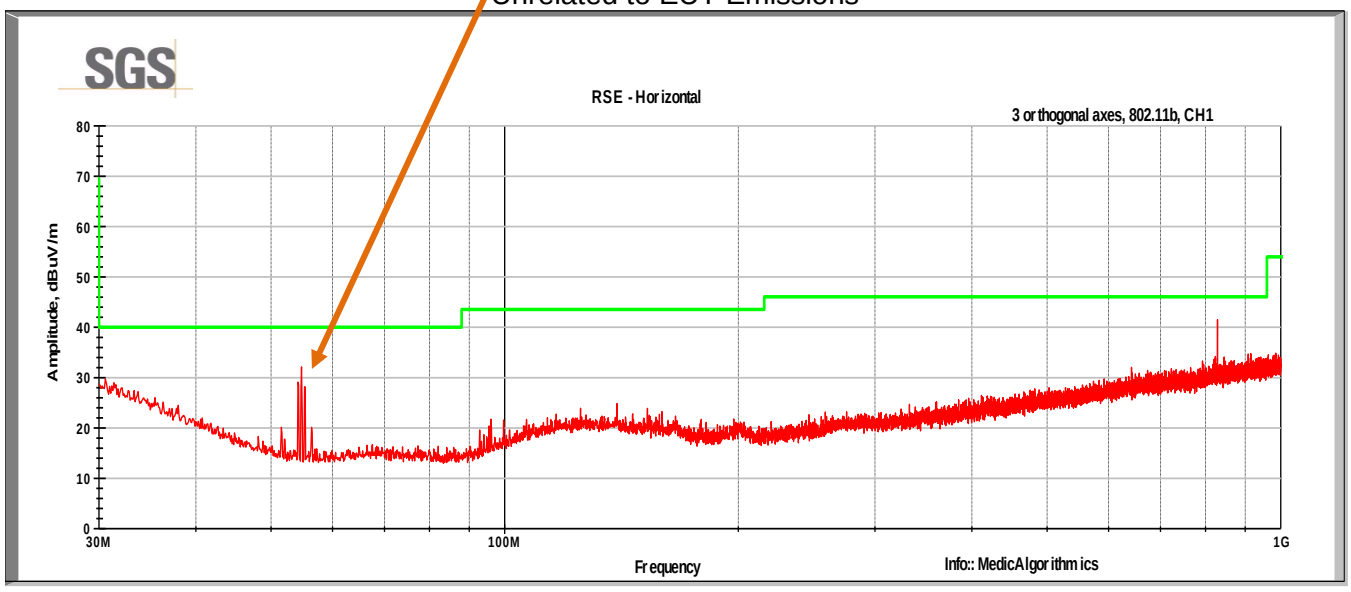
5.6 *Test Data*

Frequency (MHz)	Peak Value (dBuV/m)	Mode	Polarization	Channel	15.209(a) Limit (dBuV/m)	Margin (dB)
828.99	41.5	b	H	1	46	-4.5
4823.87	45.41	b	H	1	57.5	-12.09
4824.43	45.43	b	V	1	57.5	-12.07
9647.90	47.02	b	V	1	57.5	-10.48
9647.90	44.11	b	H	1	57.5	-13.39
21707.43	62.72	b	H	1	69.5	-6.78
21708.60	61.03	b	V	1	69.5	-8.47
4873.73	48.39	b	V	6	57.5	-9.11
4874.30	48.38	b	H	6	57.5	-9.12
9747.63	46.99	b	H	6	57.5	-10.51
9748.20	46.47	b	V	6	57.5	-11.03
4923.60	45.78	b	V	11	57.5	-11.72
4924.17	45.2	b	H	11	57.5	-12.3
9847.93	48.86	b	V	11	57.5	-8.64
5266.00	45.93	a	V	149	57.5	-11.57
5266.25	45.97	a	H	149	57.5	-11.53
6223.60	42.65	a	V	149	57.5	-14.85
6223.60	43.97	a	H	149	57.5	-13.53
5266.25	46.15	a	H	157	57.5	-11.35
5266.50	45.93	a	V	157	57.5	-11.57
6266.80	46.23	a	V	157	57.5	-11.27
11570.00	44.55	a	V	157	57.5	-12.95
5339.50	47.77	a	V	165	57.5	-9.73
5339.75	49.89	a	H	165	57.5	-7.61
6310.00	43.95	a	H	165	57.5	-13.55
6310.40	42.01	a	H	165	57.5	-15.49

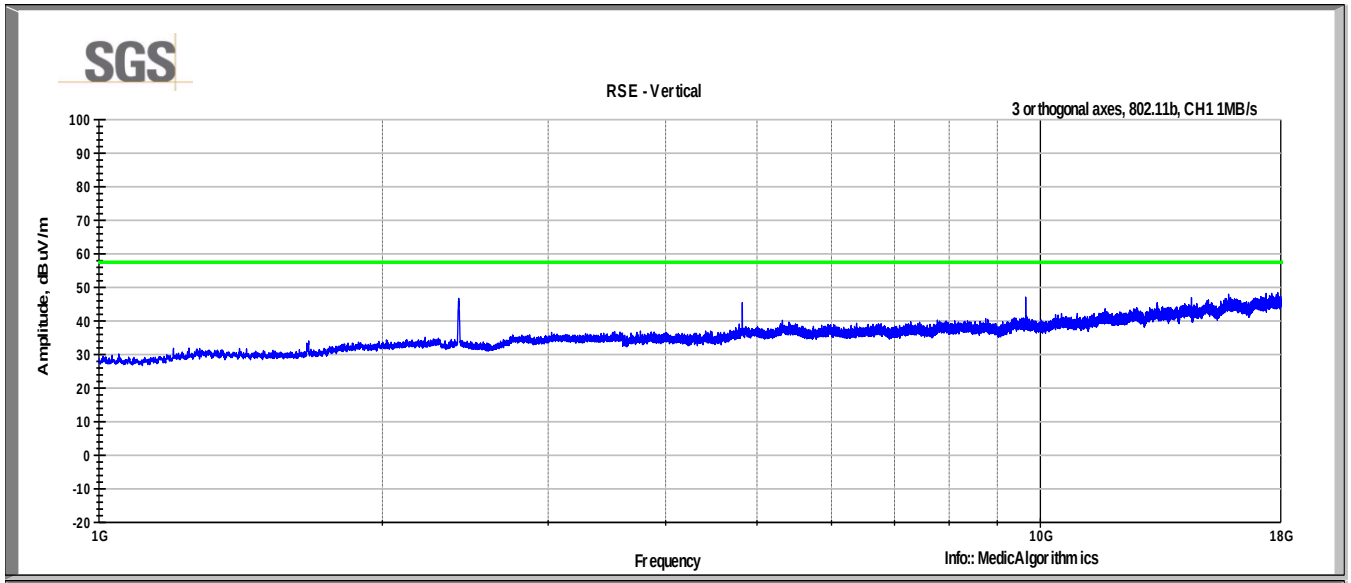
802.11b
CH1 1MB
30 1000 MHz

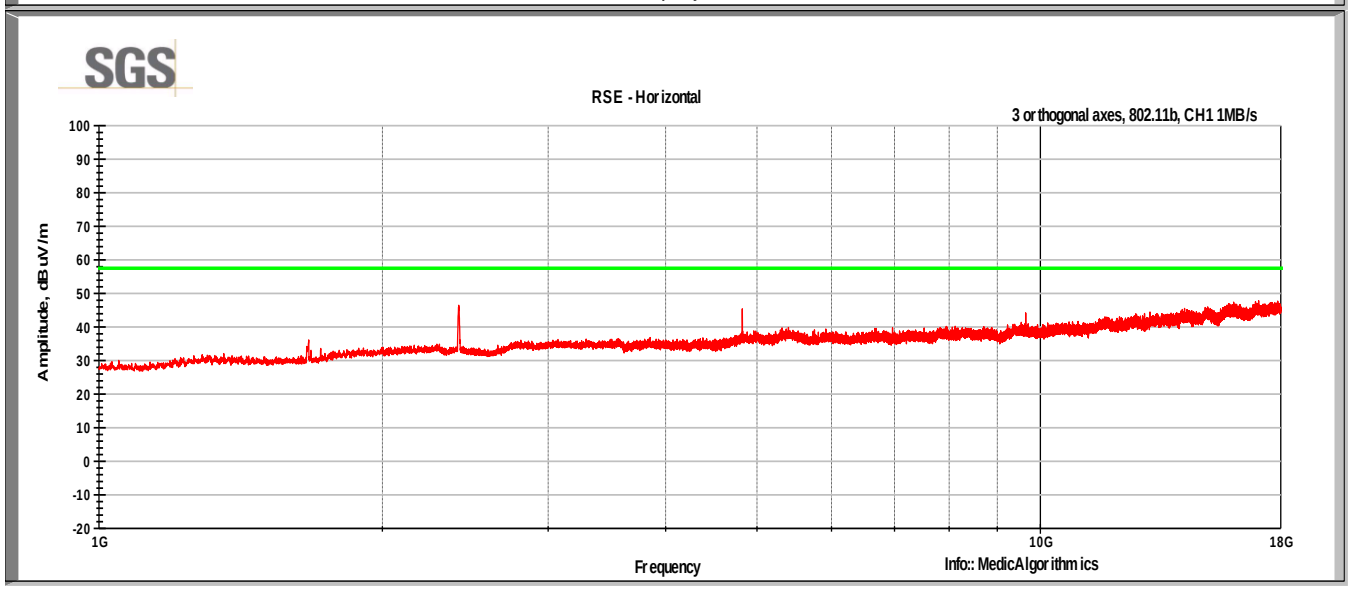


Unrelated to EUT Emissions

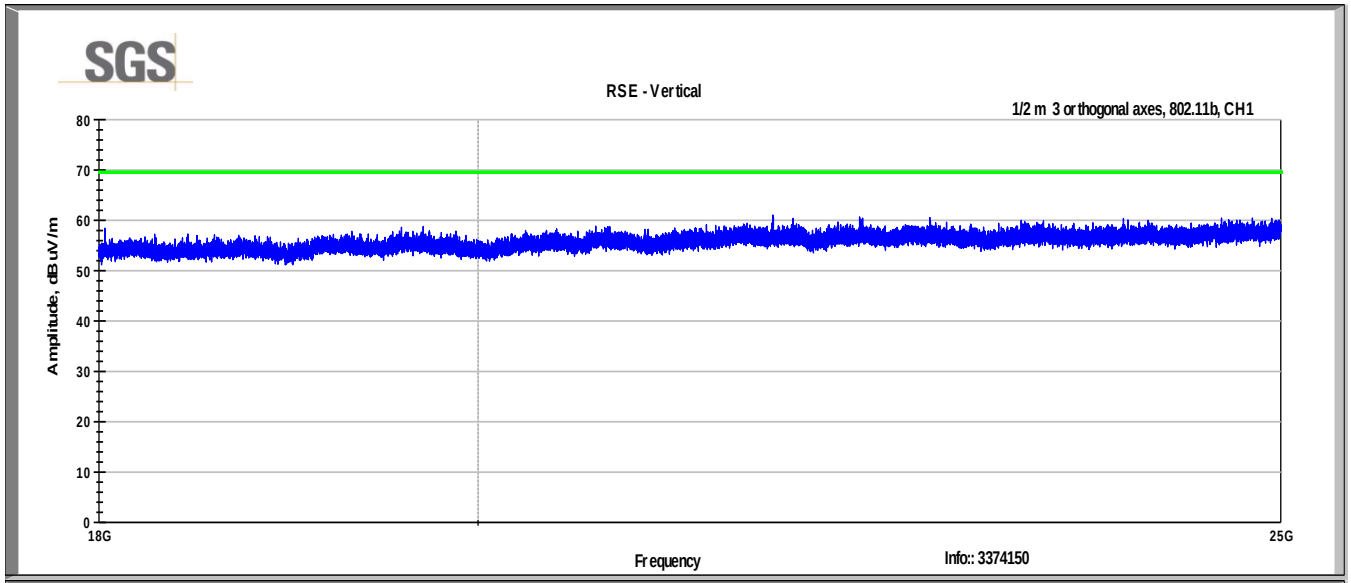


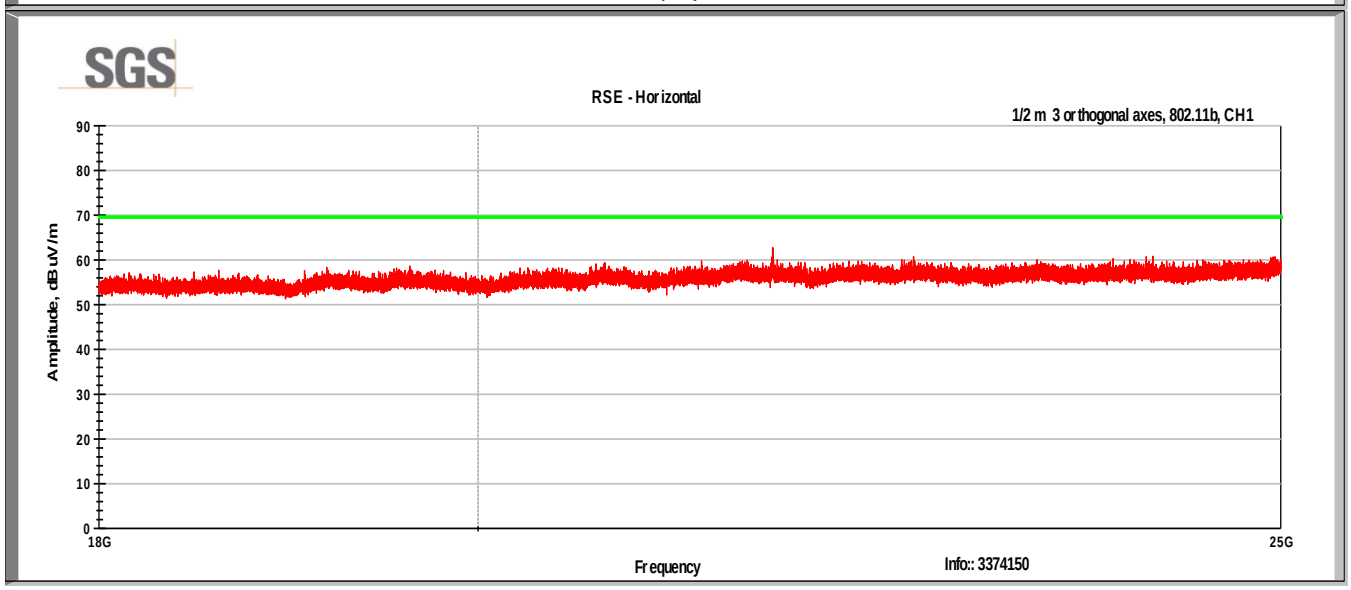
1 – 18GHz


SGS
RSE - Vertical
3 orthogonal axes, 802.11b, CH1 1MB/s
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
10
0
-10
-20
1G
10G
18G
Frequency
Info:: MedicAlgorithmics

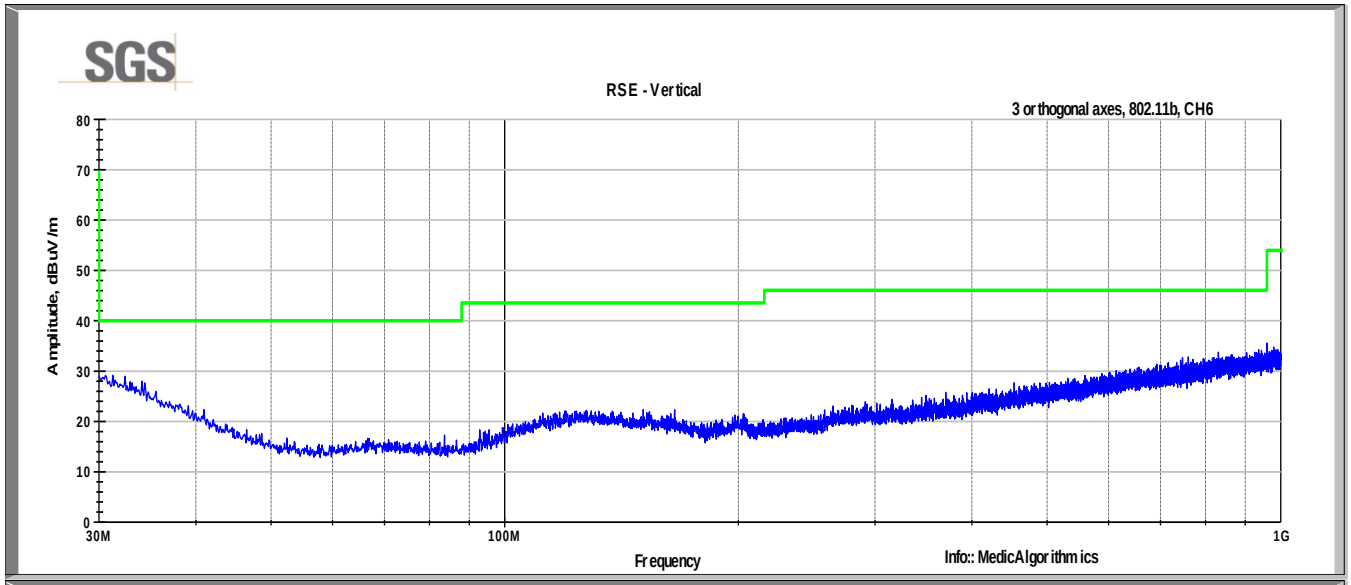

SGS
RSE - Horizontal
3 orthogonal axes, 802.11b, CH1 1MB/s
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
10
0
-10
-20
1G
10G
18G
Frequency
Info:: MedicAlgorithmics

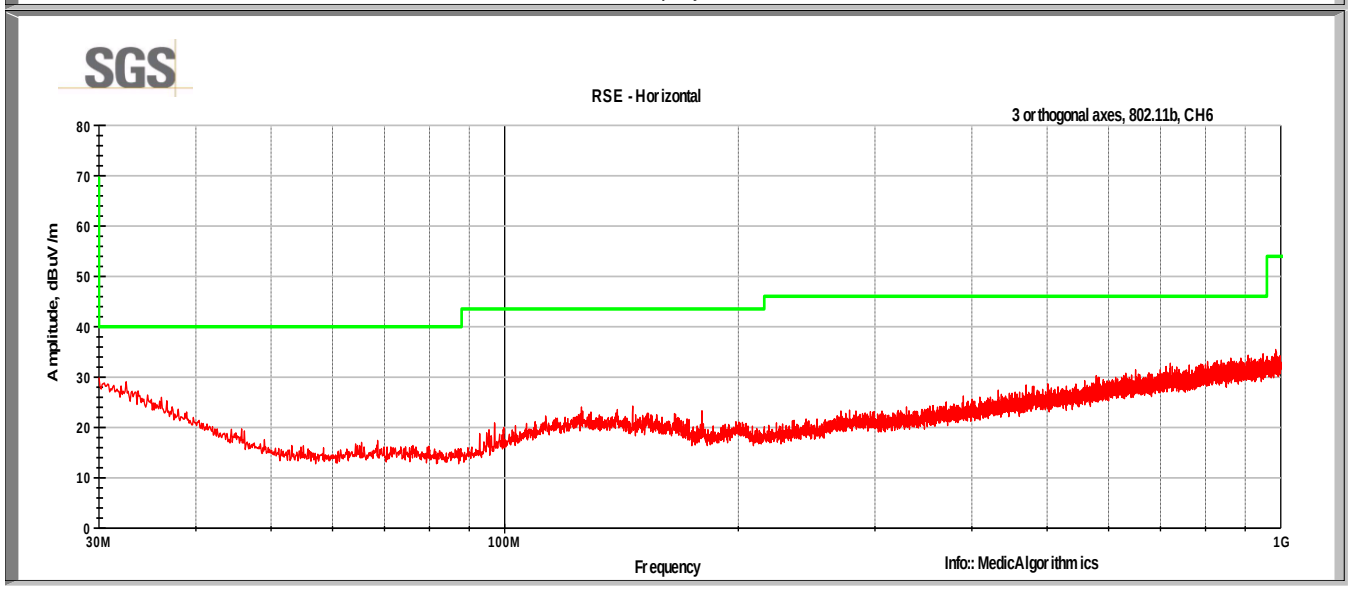
18 – 25 GHz


SGS
RSE - Vertical
1/2 m 3 orthogonal axes, 802.11b, CH1
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
18G
25G
Frequency
Info:: 3374150

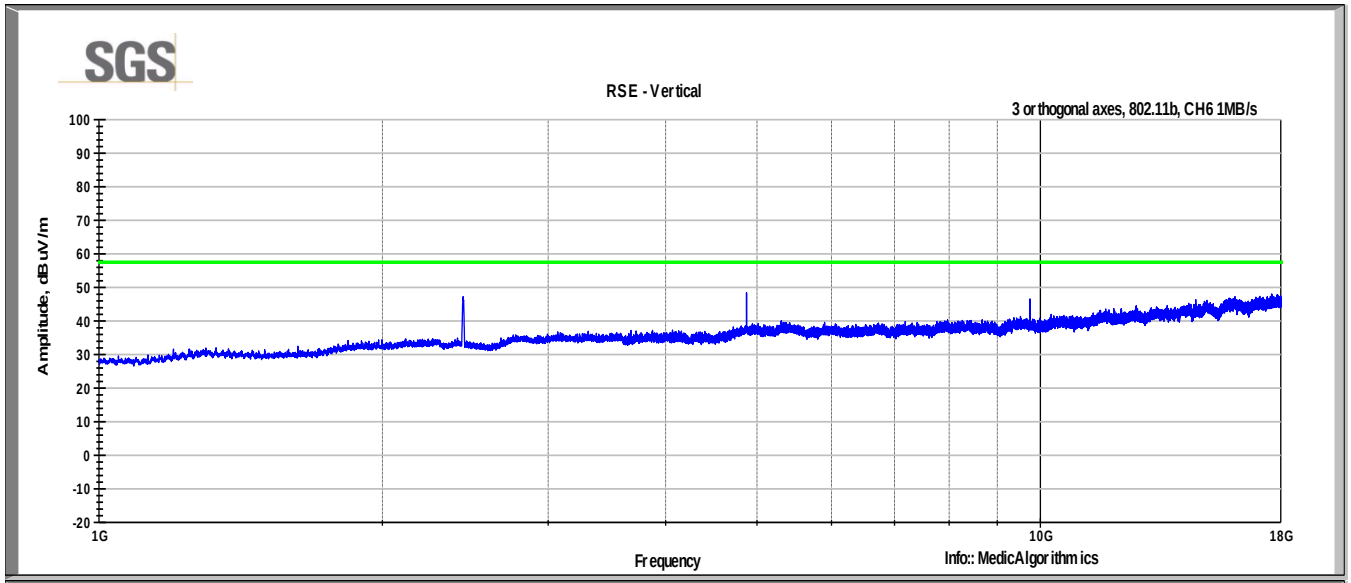

SGS
RSE - Horizontal
1/2 m 3 orthogonal axes, 802.11b, CH1
Amplitude, dBuV/m
90
80
70
60
50
40
30
20
10
0
18G
25G
Frequency
Info:: 3374150

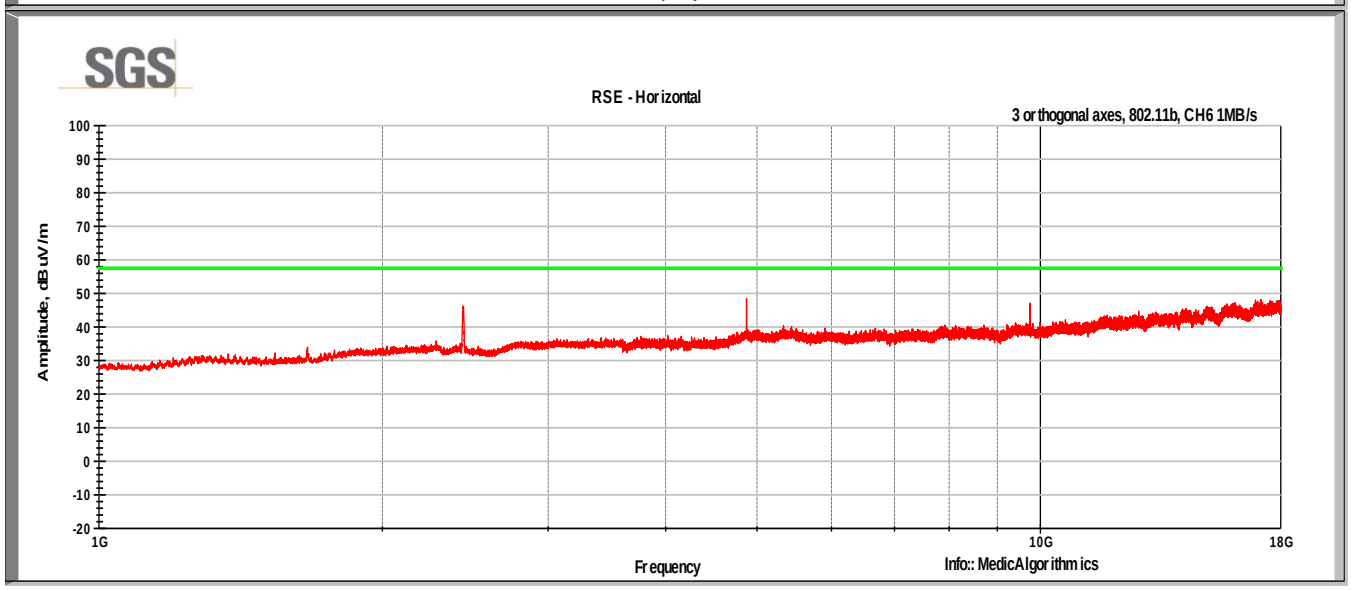
CH6 1MB
30 – 1000 MHz



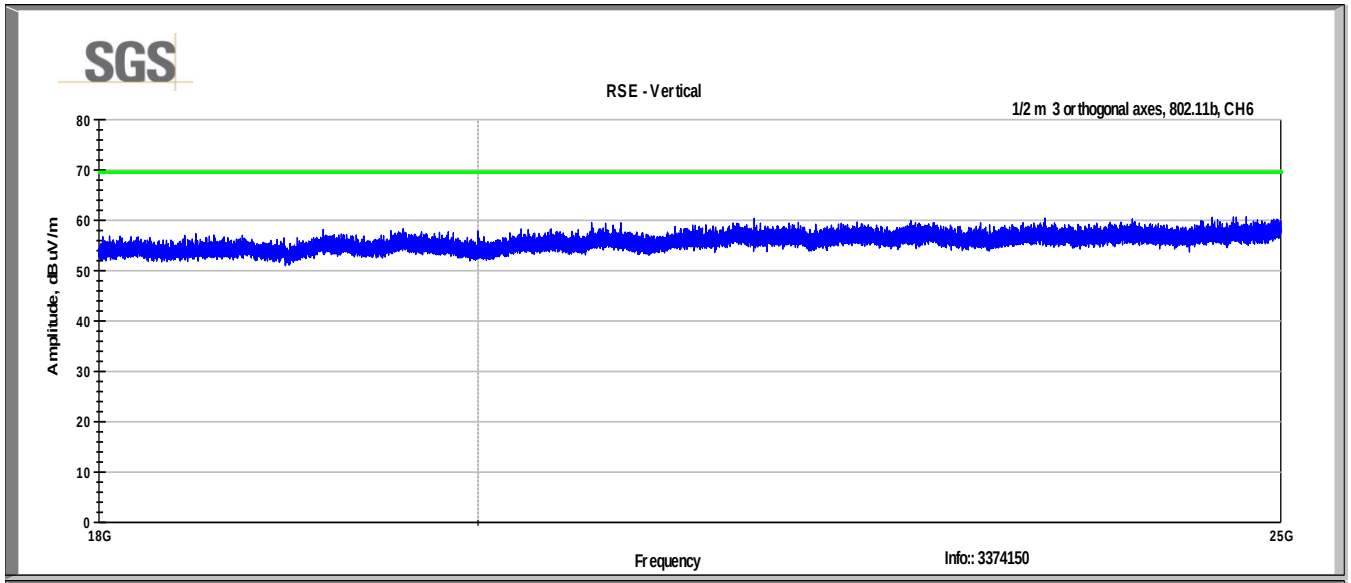


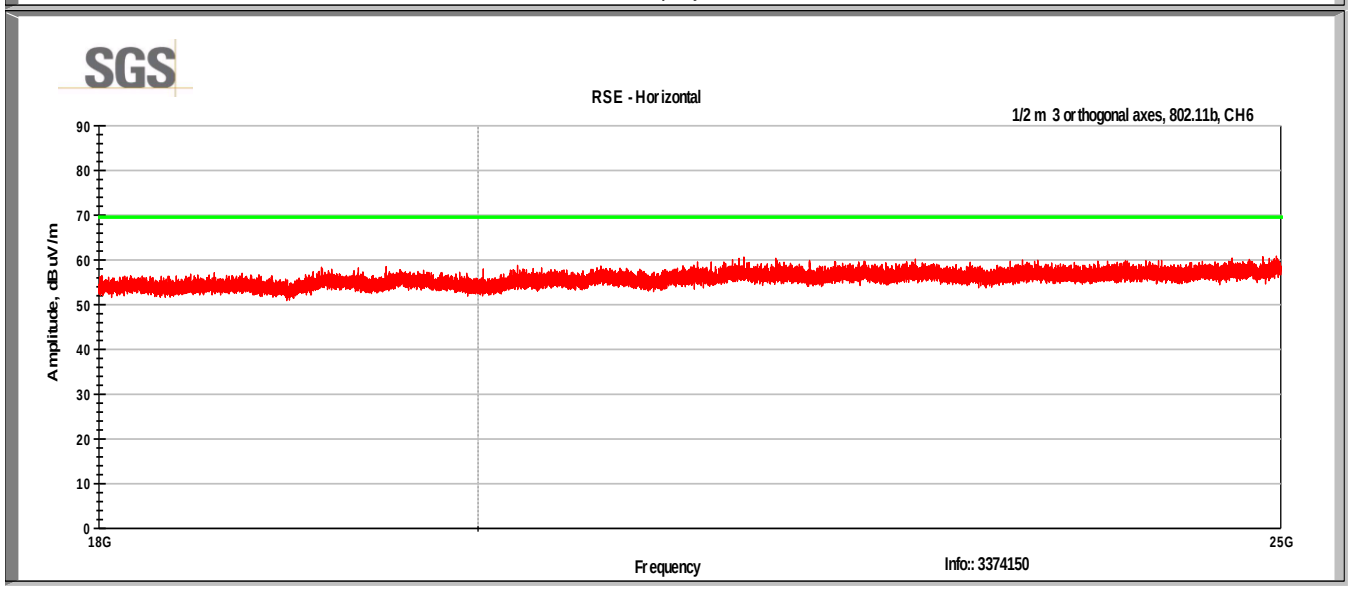
1 – 18 GHz


SGS
RSE - Vertical
3 orthogonal axes, 802.11b, CH6 1MB/s
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
10
0
-10
-20
1G
10G
18G
Frequency
Info:: MedicAlgorithmics

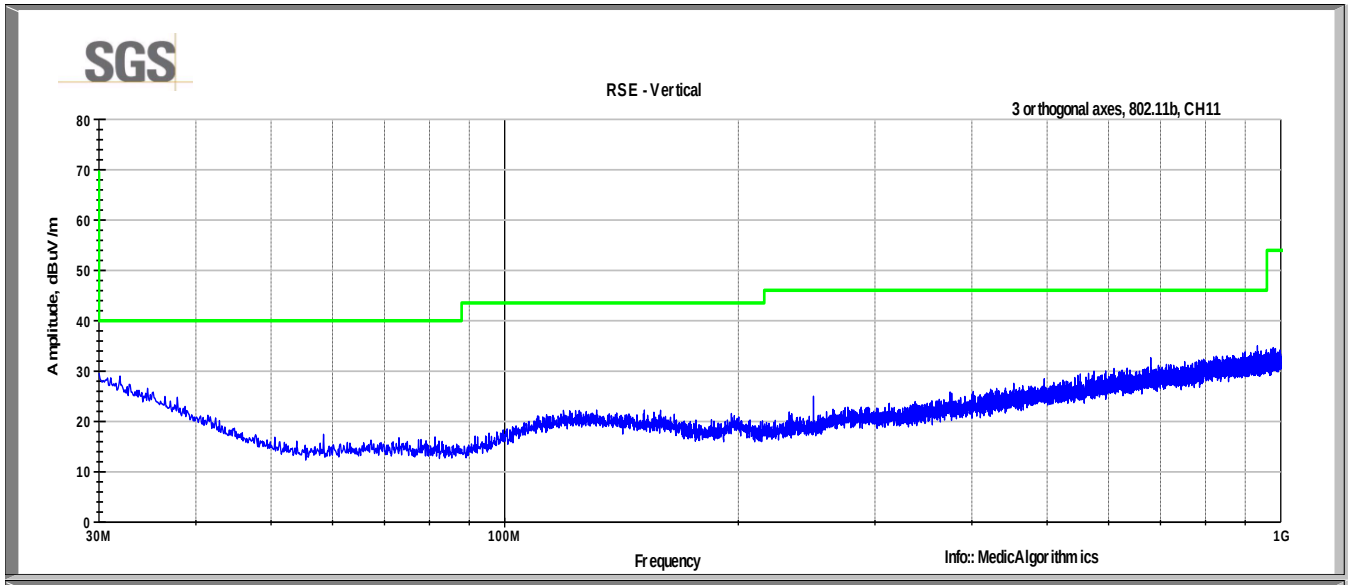

SGS
RSE - Horizontal
3 orthogonal axes, 802.11b, CH6 1MB/s
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
10
0
-10
-20
1G
10G
18G
Frequency
Info:: MedicAlgorithmics

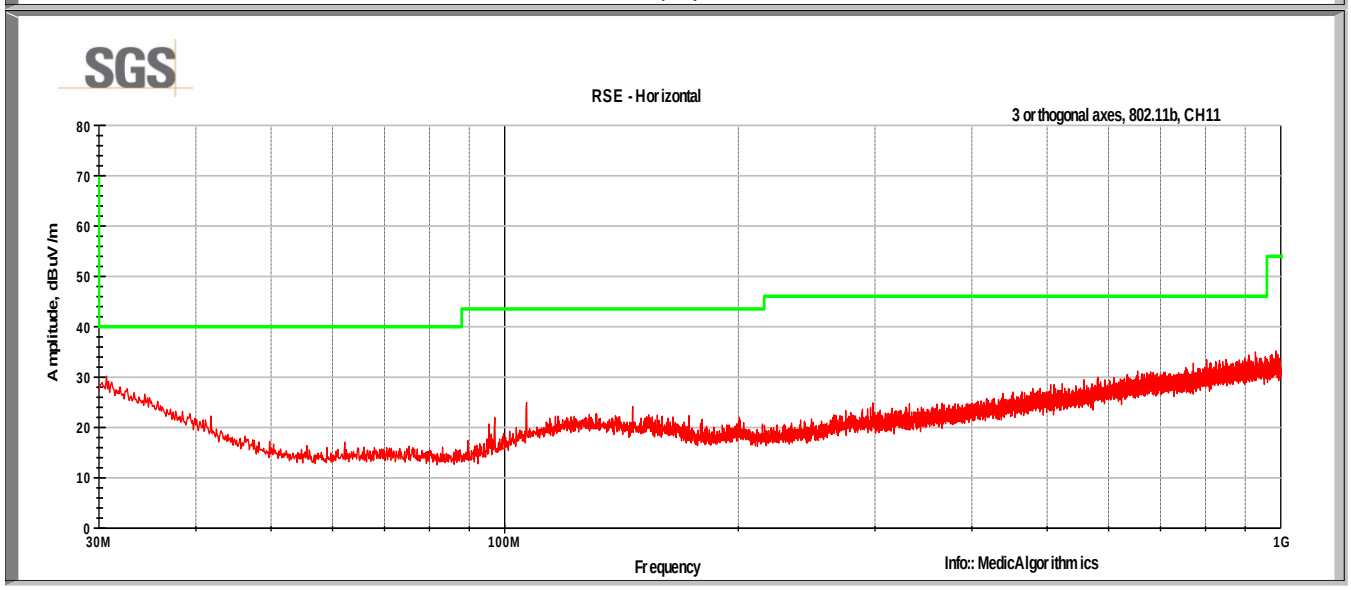
18 – 25 GHz


SGS
RSE - Vertical
1/2 m 3 orthogonal axes, 802.11b, CH6
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
18G
25G
Frequency
Info:: 3374150

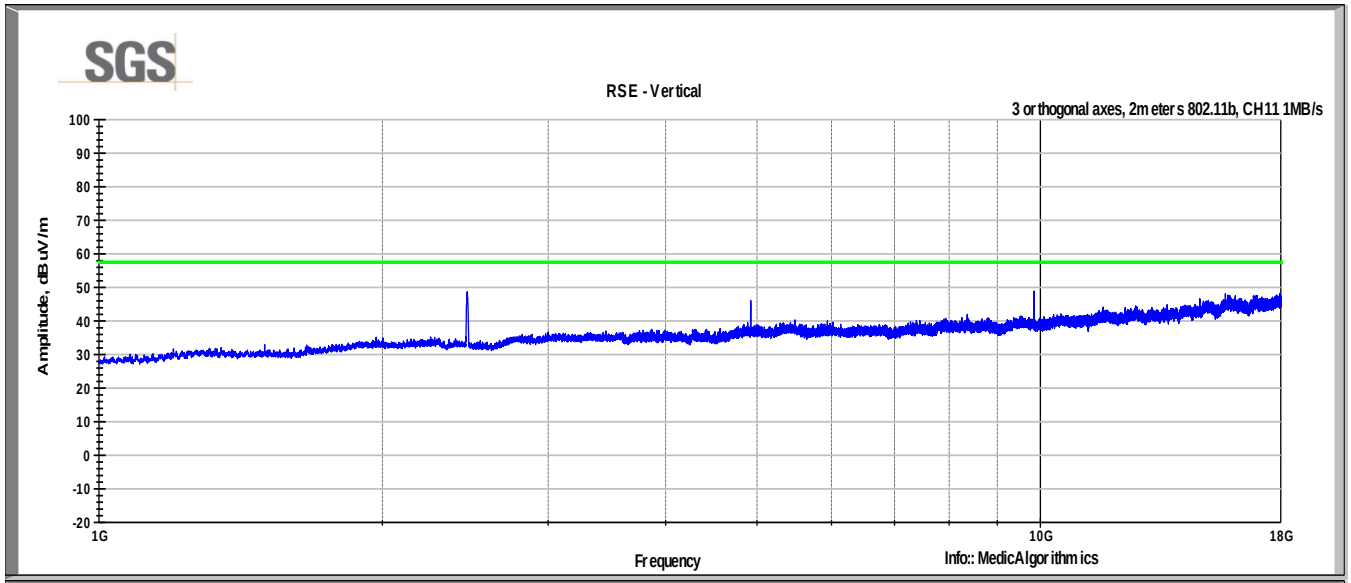

SGS
RSE - Horizontal
1/2 m 3 orthogonal axes, 802.11b, CH6
Amplitude, dBuV/m
90
80
70
60
50
40
30
20
10
0
18G
25G
Frequency
Info:: 3374150

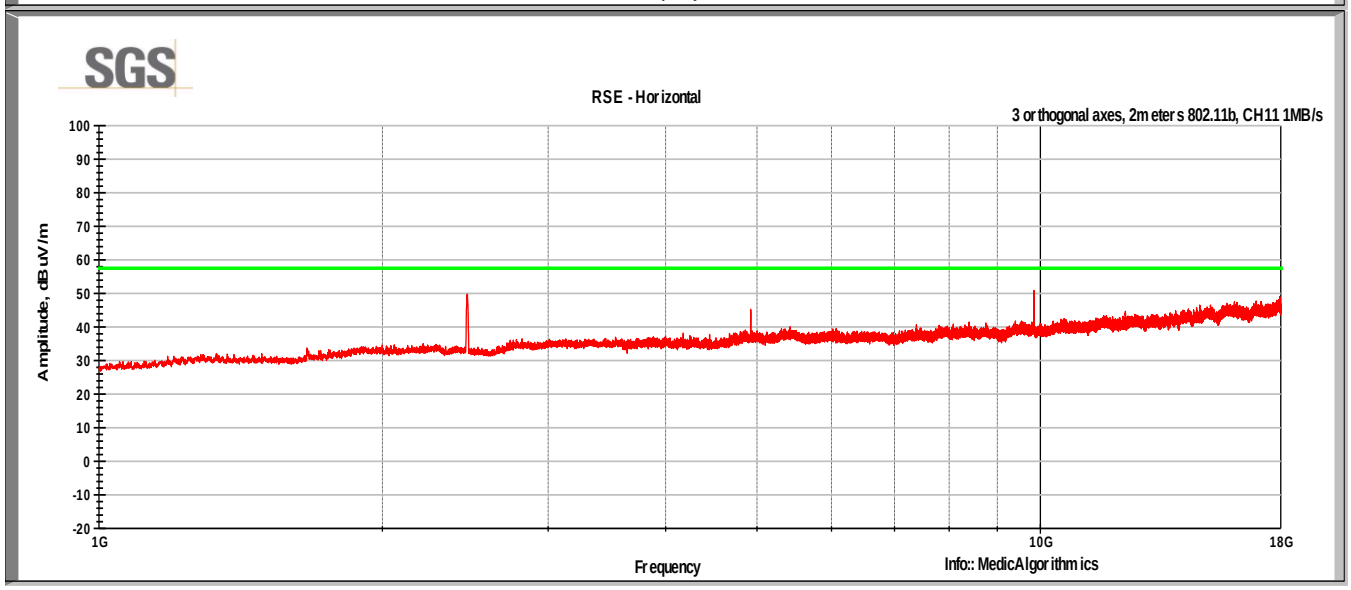
CH11 1MB
30 – 1000 MHz



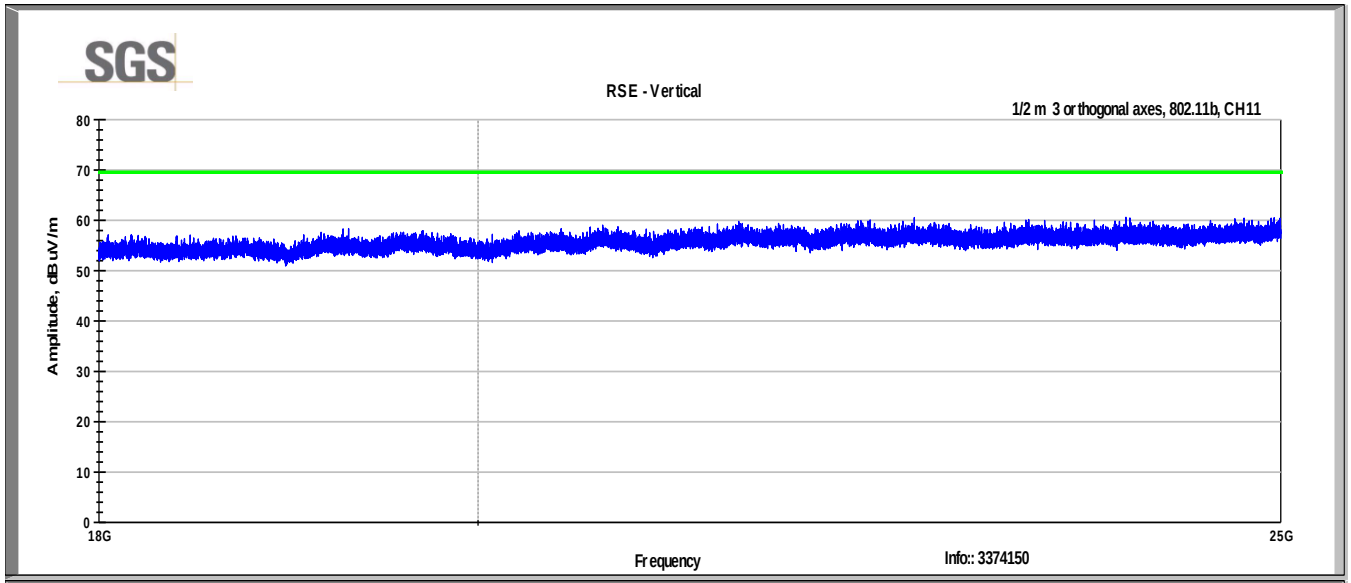


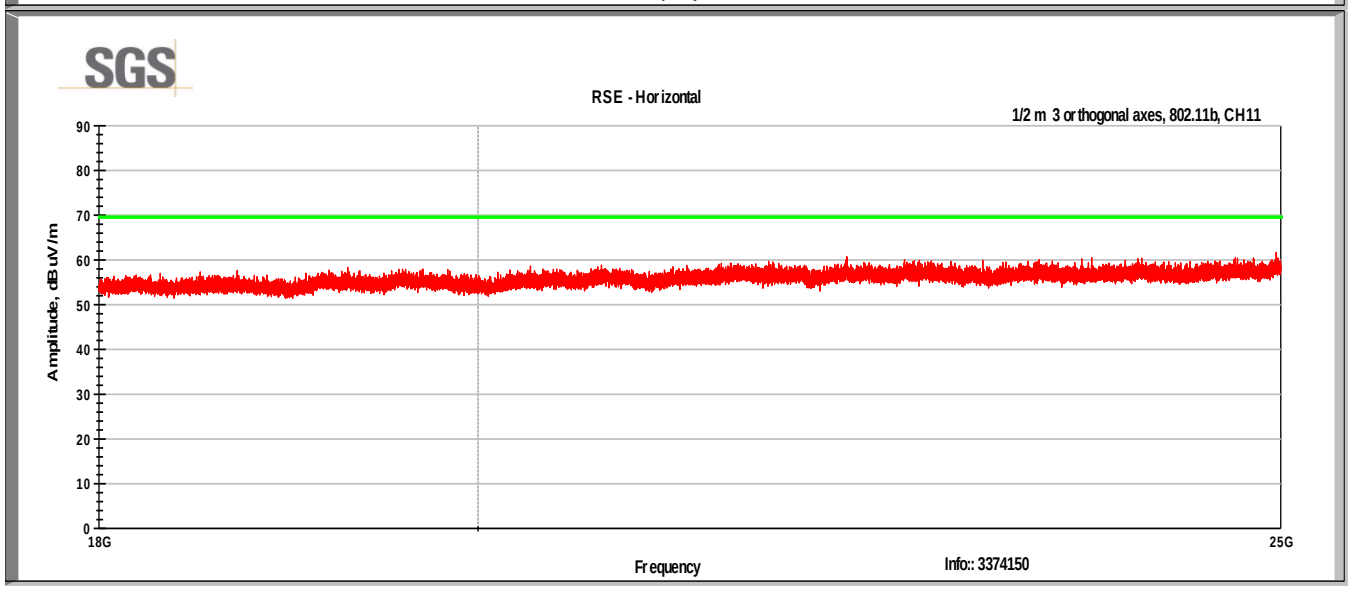
1 – 18 GHz


SGS
RSE - Vertical
3 orthogonal axes, 2m eters 802.11b, CH11 1MB/s
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
10
0
-10
-20
1G
10G
18G
Frequency
Info:: MedicAlgorithmics

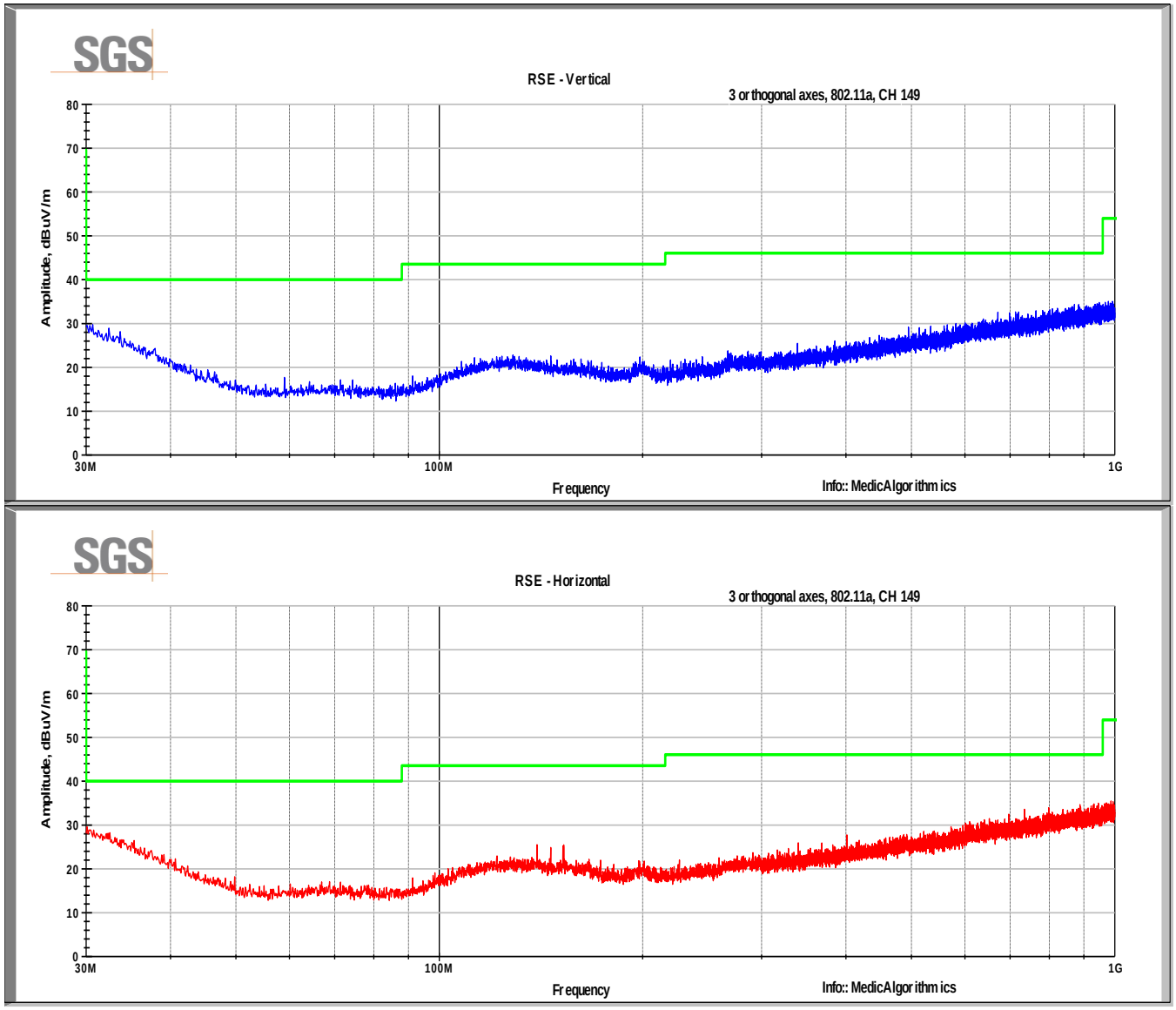

SGS
RSE - Horizontal
3 orthogonal axes, 2m eters 802.11b, CH11 1MB/s
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
10
0
-10
-20
1G
10G
18G
Frequency
Info:: MedicAlgorithmics

18 – 25 GHz

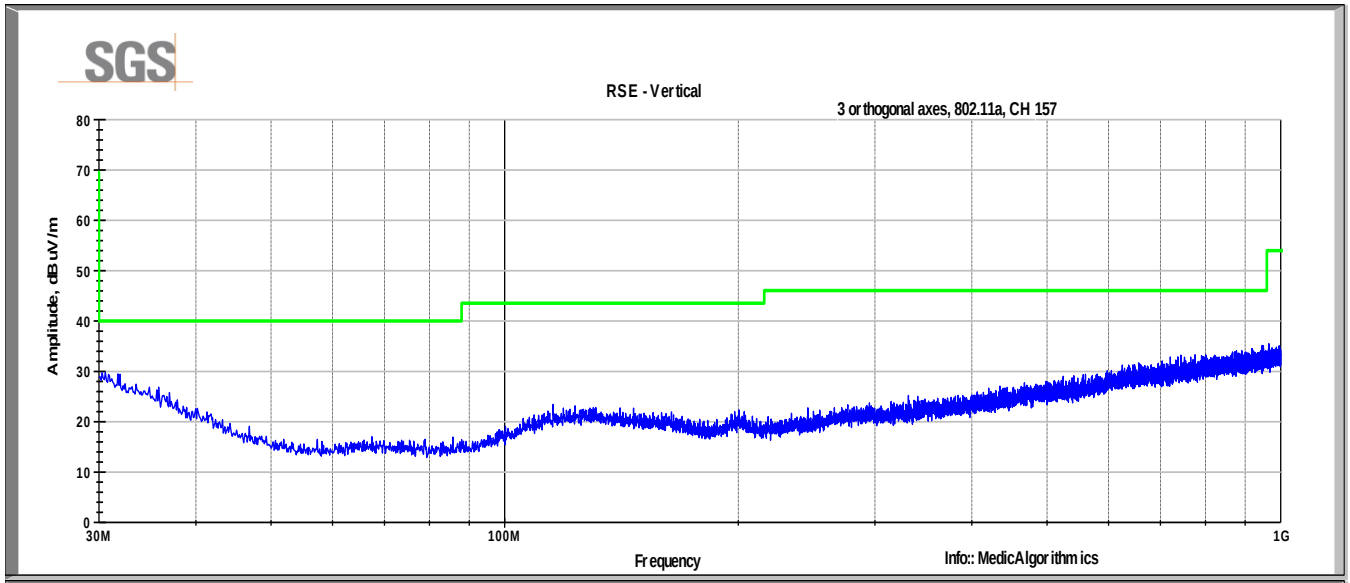

SGS
RSE - Vertical
1/2 m 3 orthogonal axes, 802.11b, CH11
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
18G
25G
Frequency
Info:: 3374150

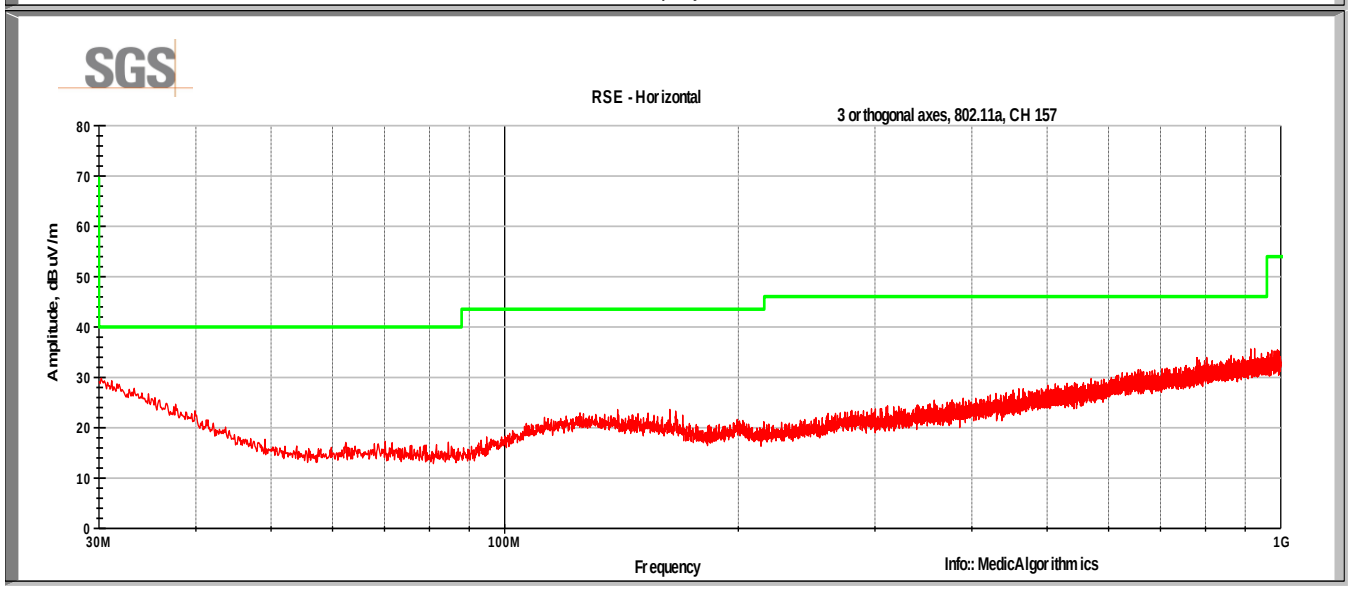

SGS
RSE - Horizontal
1/2 m 3 orthogonal axes, 802.11b, CH11
Amplitude, dBuV/m
90
80
70
60
50
40
30
20
10
0
18G
25G
Frequency
Info:: 3374150

5 GHz Channels
30 – 1000 MHz
CH 149

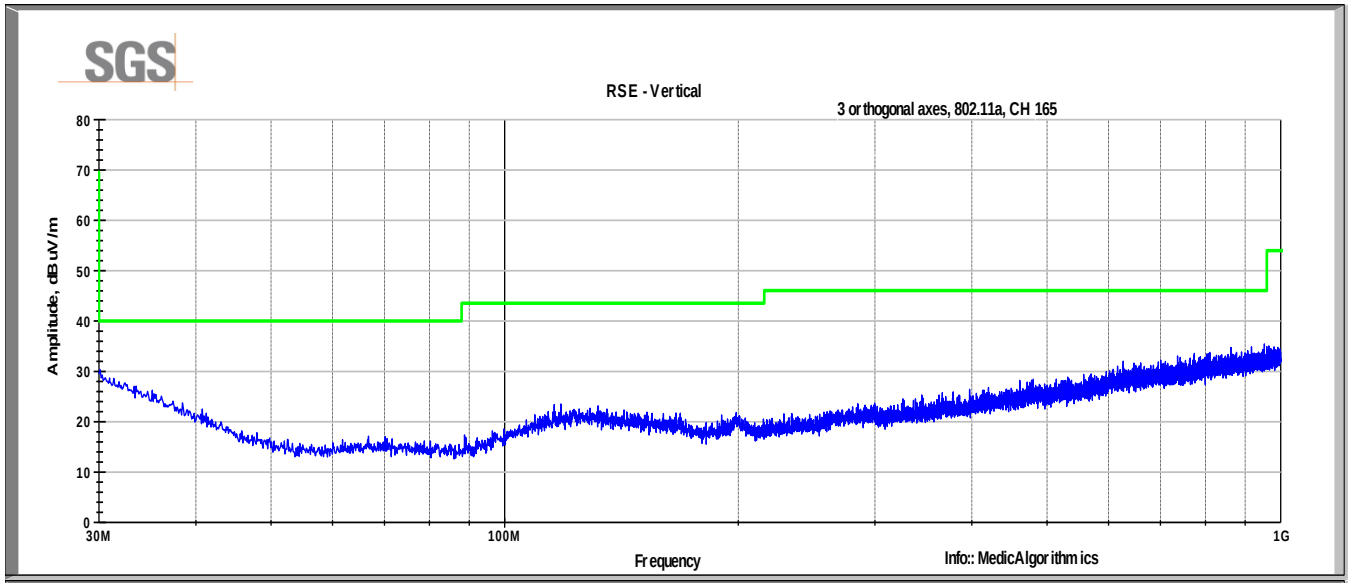


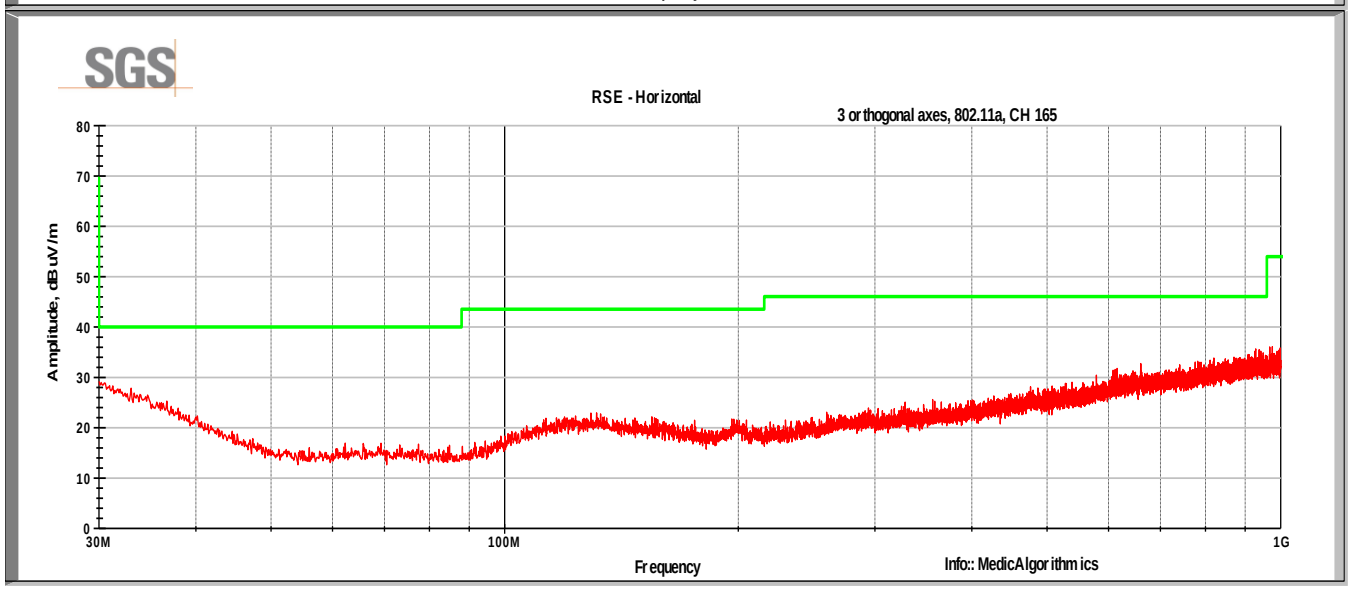
CH 157


SGS
RSE - Vertical
3 orthogonal axes, 802.11a, CH 157
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
30M
100M
1G
Frequency
Info:: MedicAlgorithmics

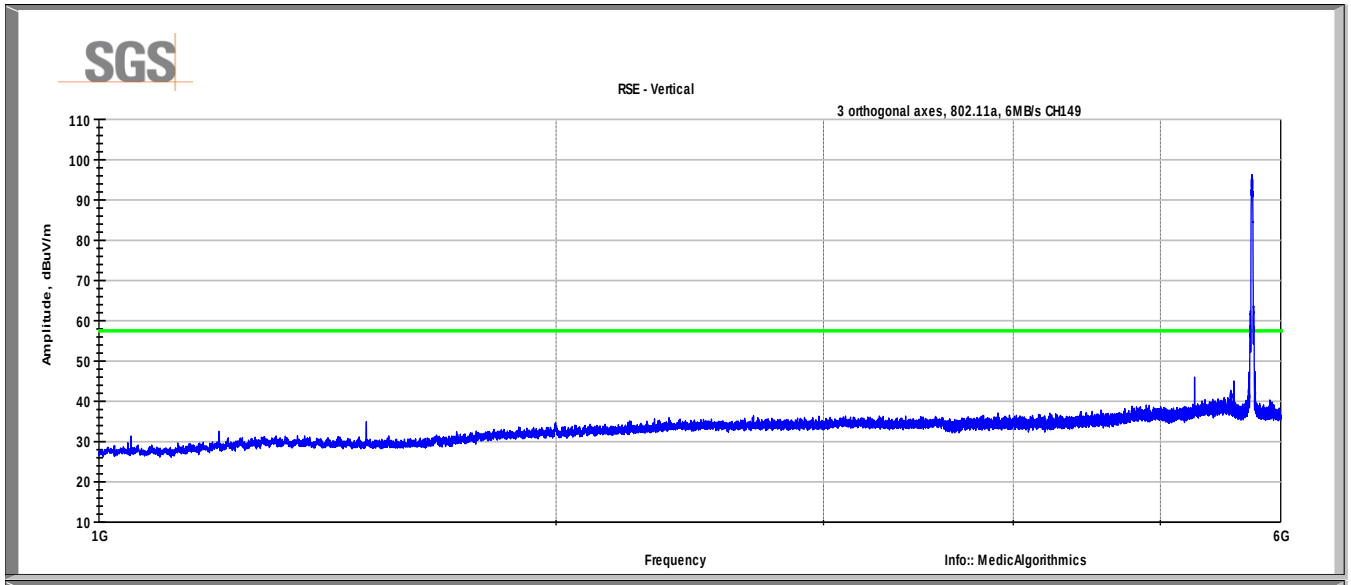

SGS
RSE - Horizontal
3 orthogonal axes, 802.11a, CH 157
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
30M
100M
1G
Frequency
Info:: MedicAlgorithmics

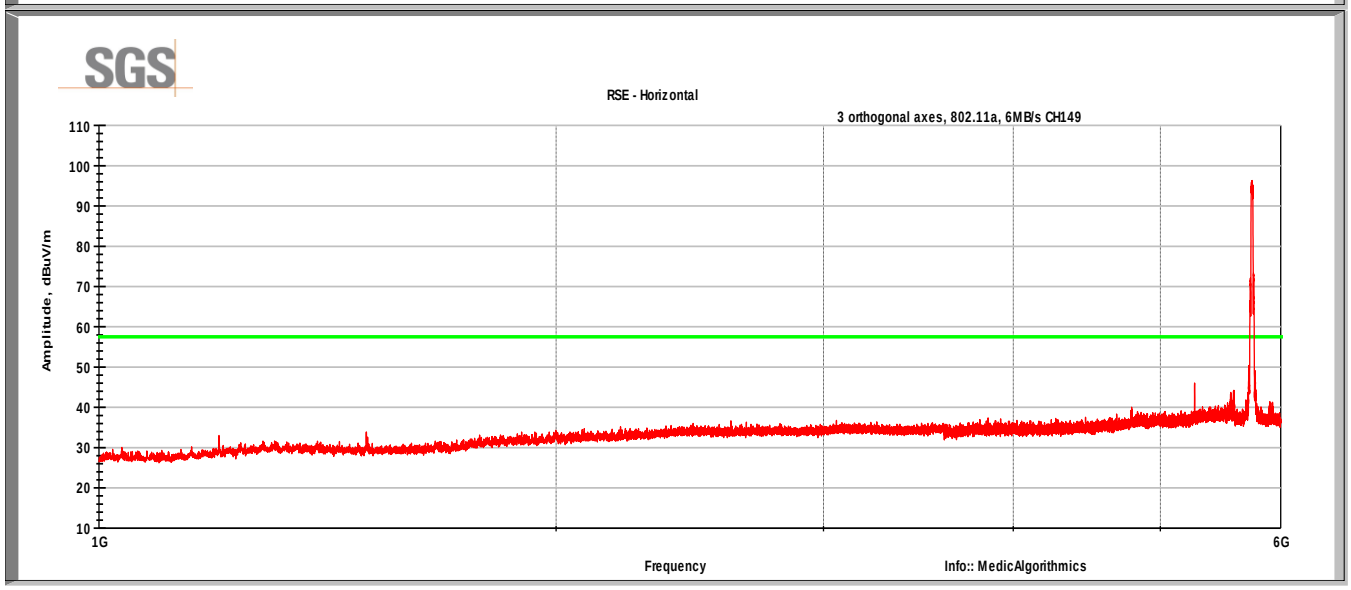
CH 165


SGS
RSE - Vertical
3 orthogonal axes, 802.11a, CH 165
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
30M
100M
1G
Frequency
Info:: MedicAlgorithmics

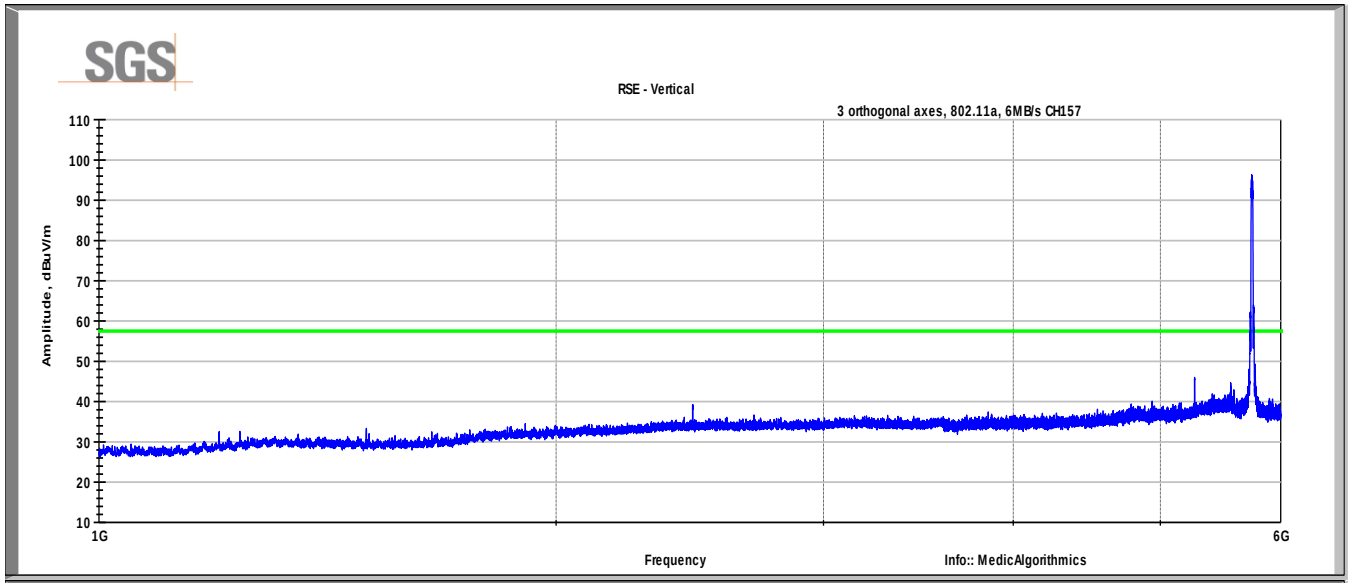

SGS
RSE - Horizontal
3 orthogonal axes, 802.11a, CH 165
Amplitude, dBuV/m
80
70
60
50
40
30
20
10
0
30M
100M
1G
Frequency
Info:: MedicAlgorithmics

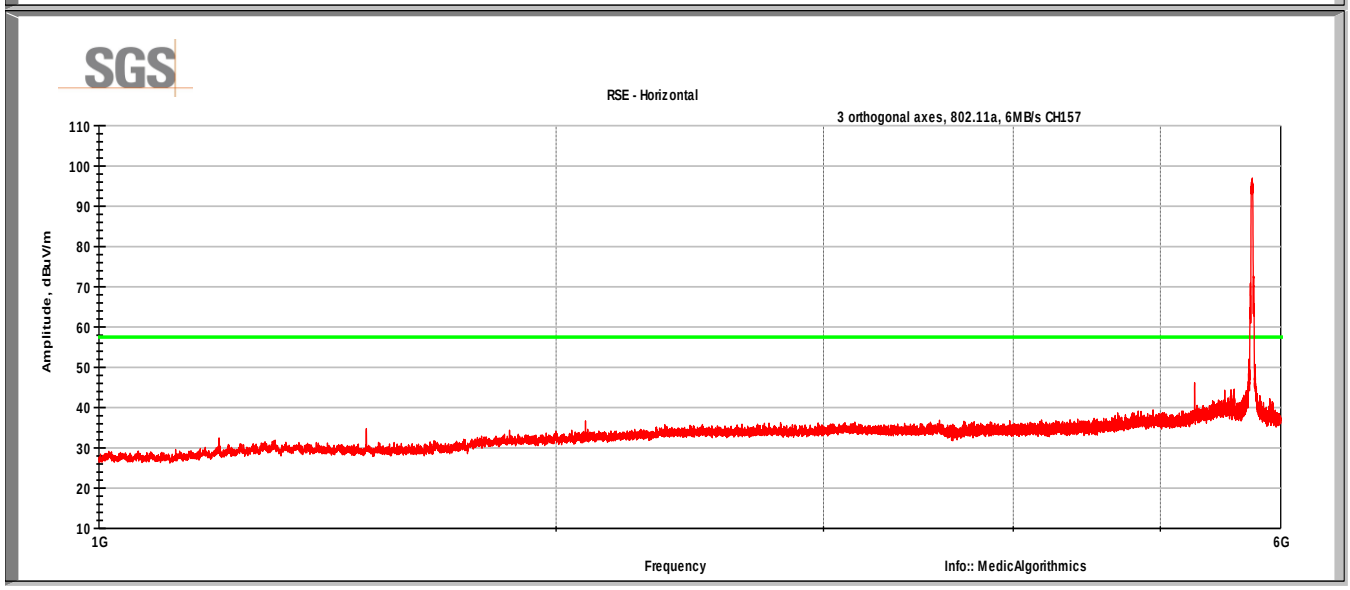
1 – 6 GHz
CH 149


SGS
RSE - Vertical
3 orthogonal axes, 802.11a, 6MBi/s CH149
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
1G
6G
Frequency
Info:: MedicAlgorithmics

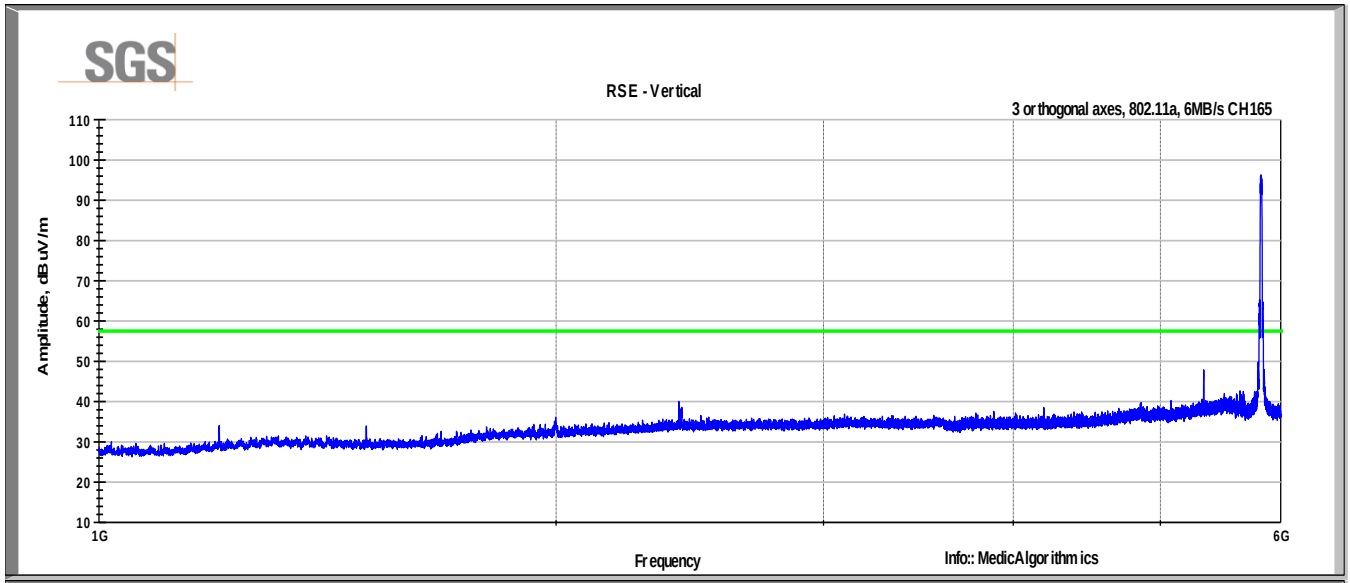

SGS
RSE - Horizontal
3 orthogonal axes, 802.11a, 6MBi/s CH149
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
1G
6G
Frequency
Info:: MedicAlgorithmics

CH 157


SGS
RSE - Vertical
3 orthogonal axes, 802.11a, 6MB/s CH157
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
1G
6G
Frequency
Info:: MedicAlgorithmics


SGS
RSE - Horizontal
3 orthogonal axes, 802.11a, 6MB/s CH157
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
1G
6G
Frequency
Info:: MedicAlgorithmics

CH 165


SGS
RSE - Vertical
3 orthogonal axes, 802.11a, 6MB/s CH165
Amplitude, dBuV/m
110
100
90
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70
60
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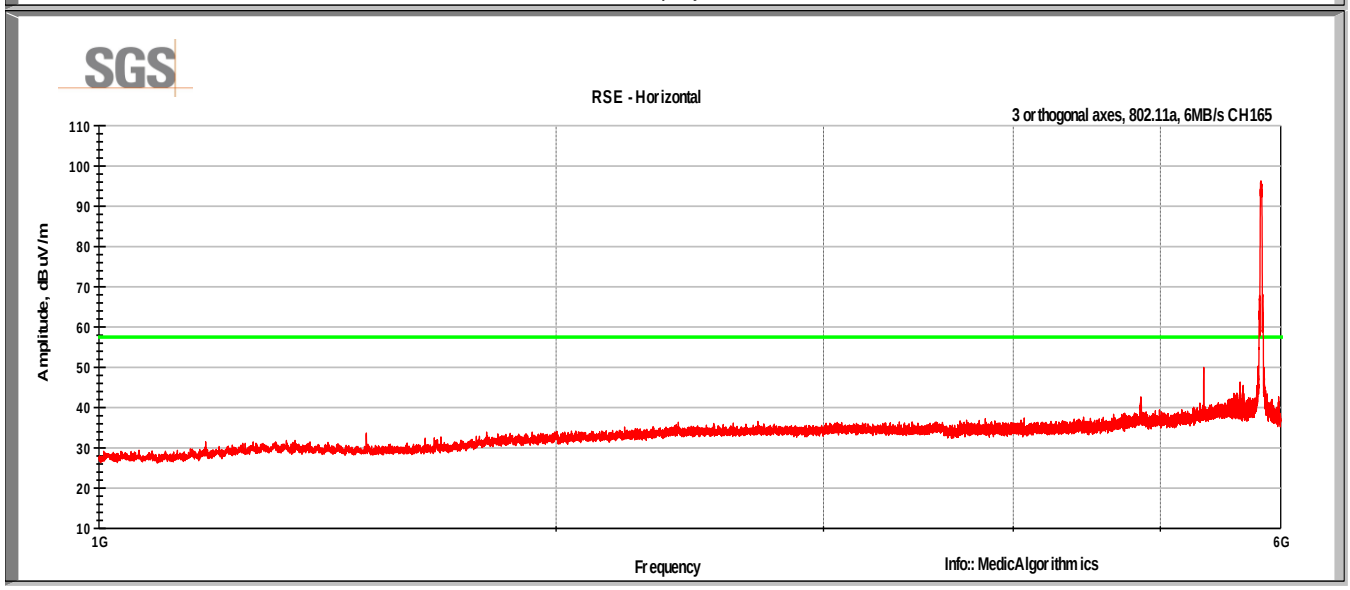
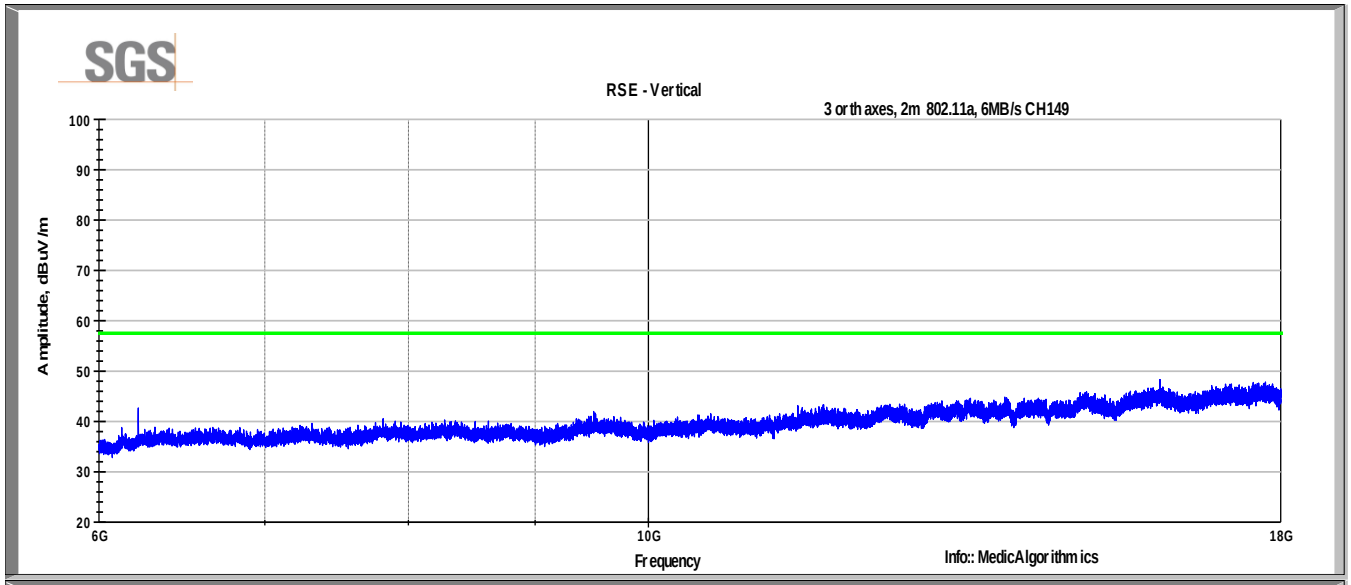
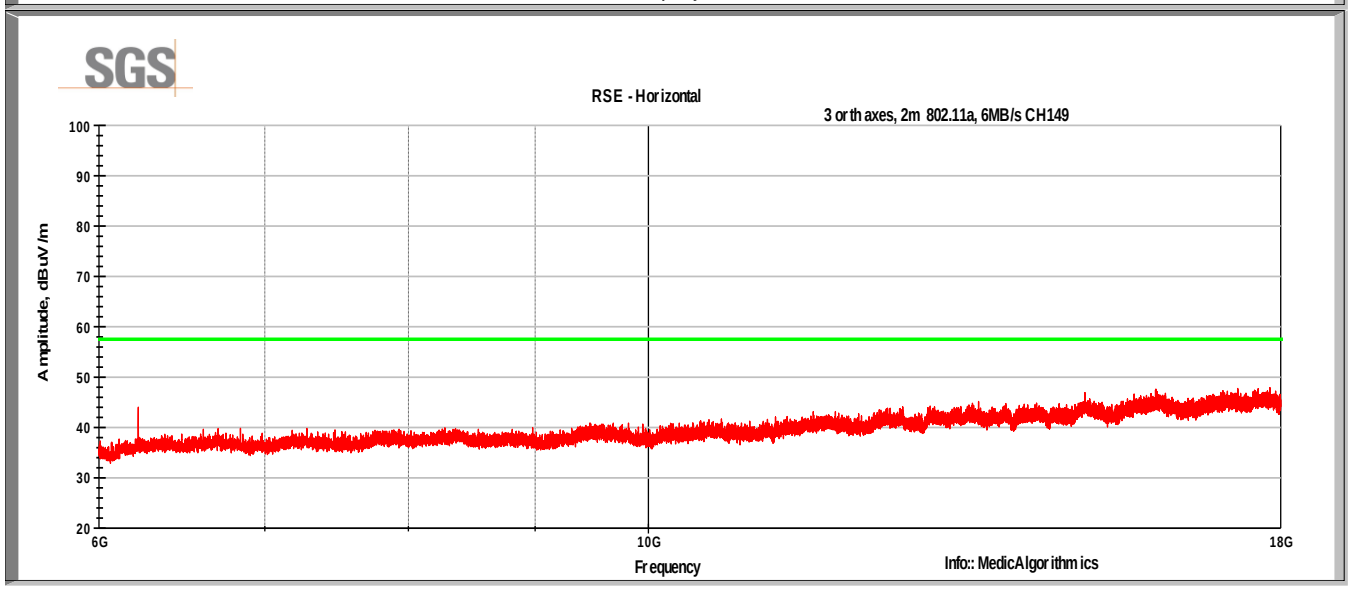
40
30
20
10
1G
6G
Frequency
Info:: MedicAlgorithmics

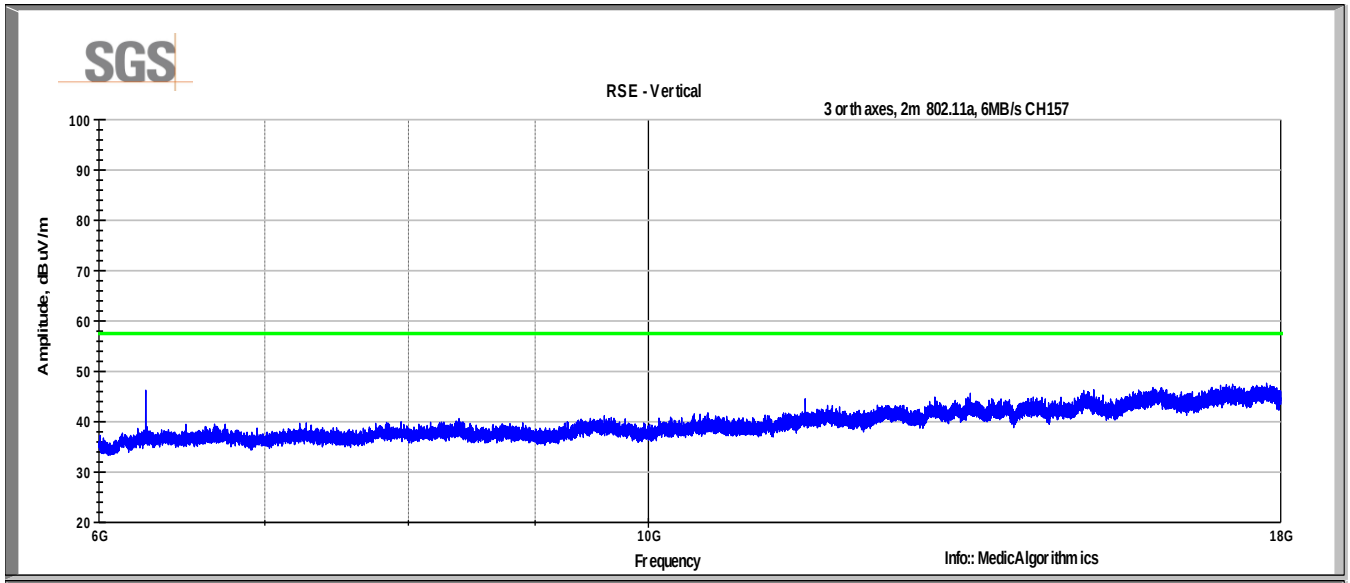

SGS
RSE - Horizontal
3 orthogonal axes, 802.11a, 6MB/s CH165
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
1G
6G
Frequency
Info:: MedicAlgorithmics

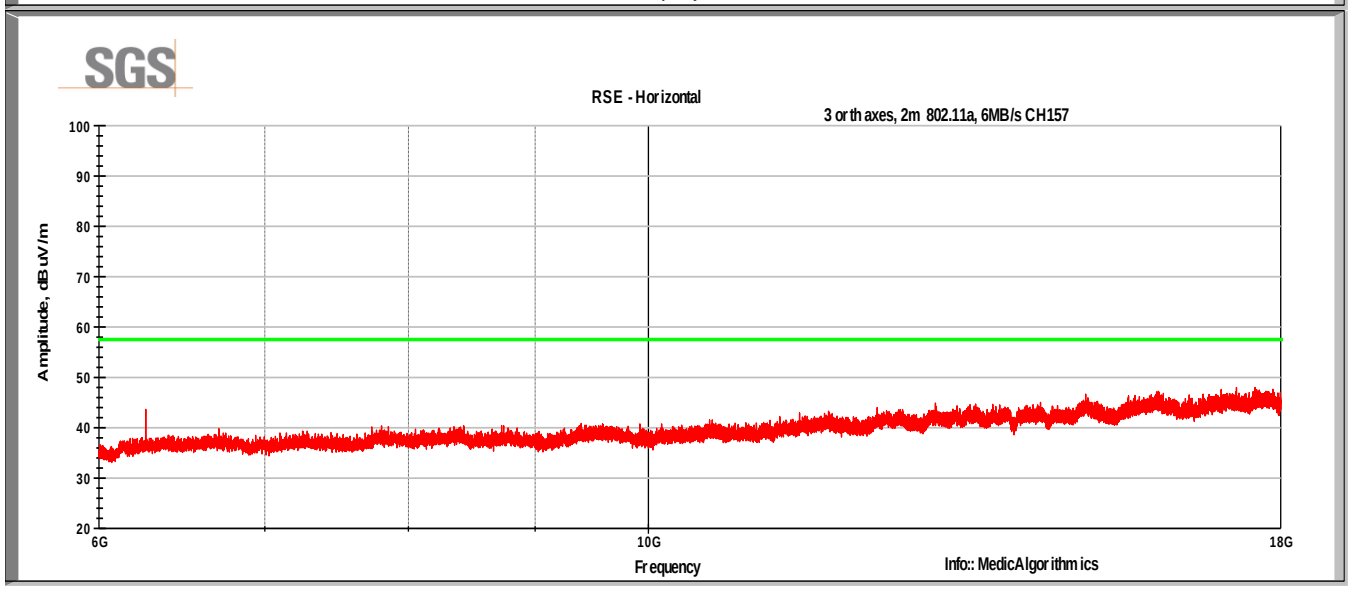
6 – 18 GHz
CH 149



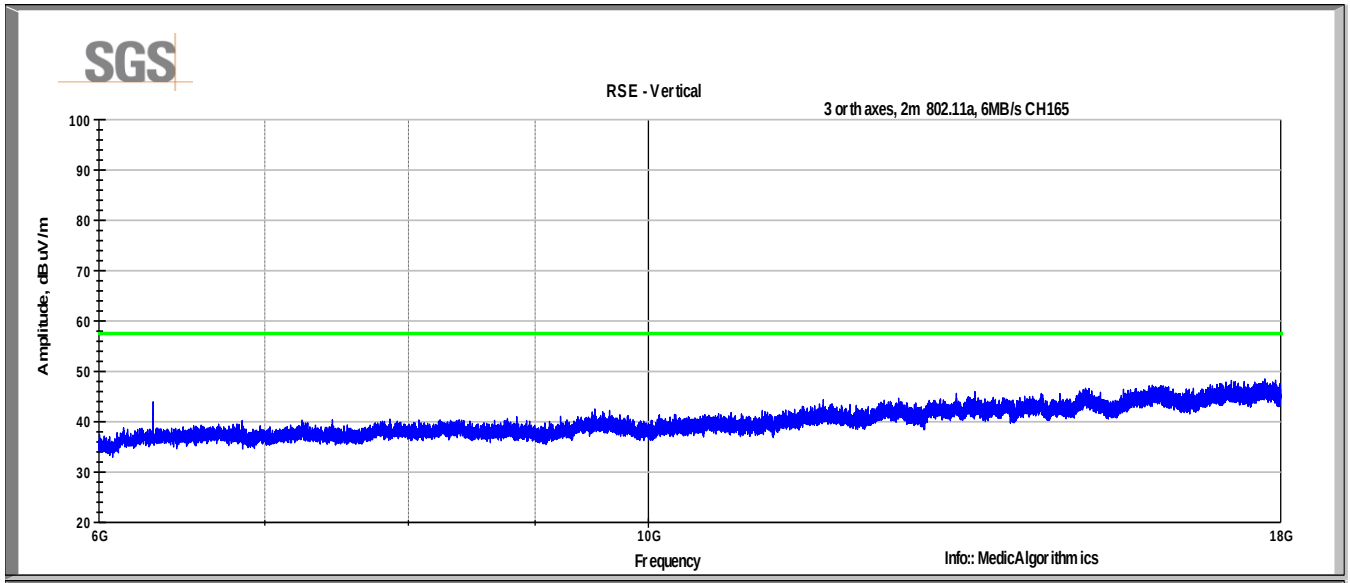


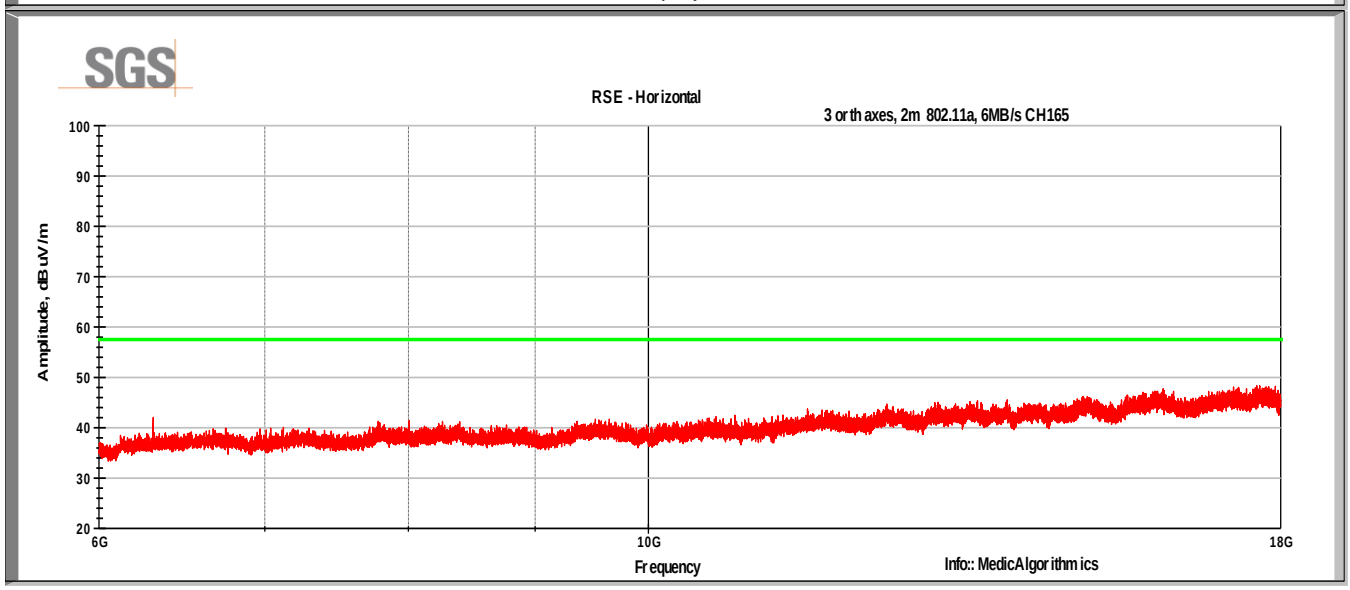
CH 157


RSE - Vertical
3 orth axes, 2m 802.11a, 6MB/s CH157
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
6G
10G
18G
Frequency
Info:: MedicAlgorithmics

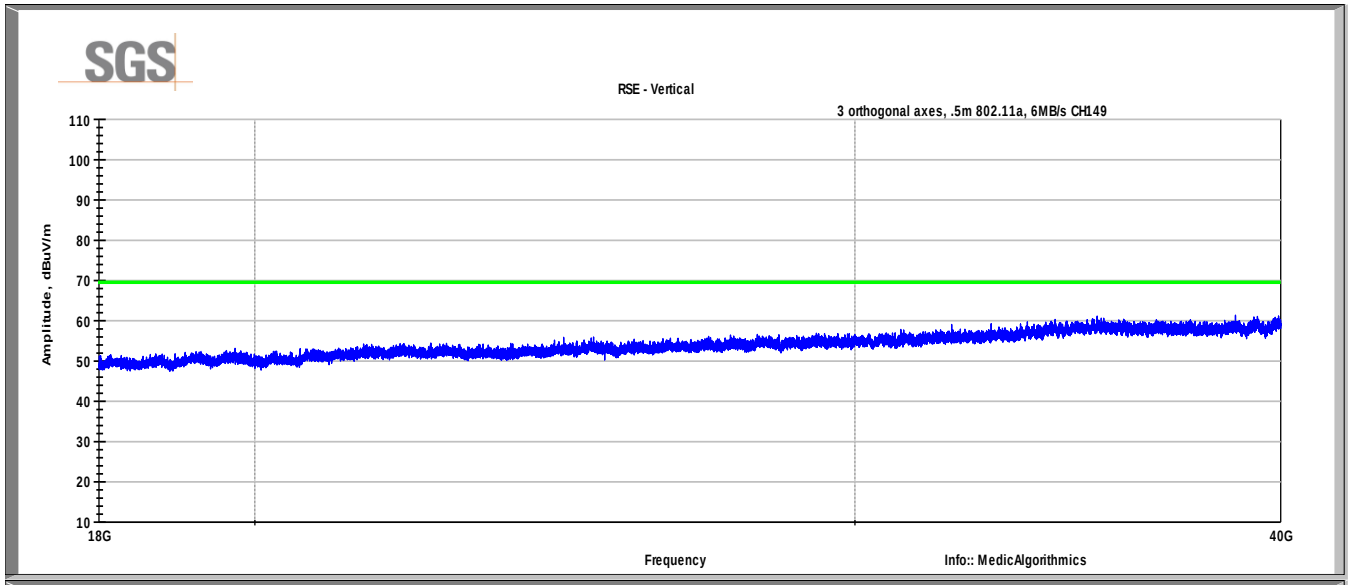

RSE - Horizontal
3 orth axes, 2m 802.11a, 6MB/s CH157
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
6G
10G
18G
Frequency
Info:: MedicAlgorithmics

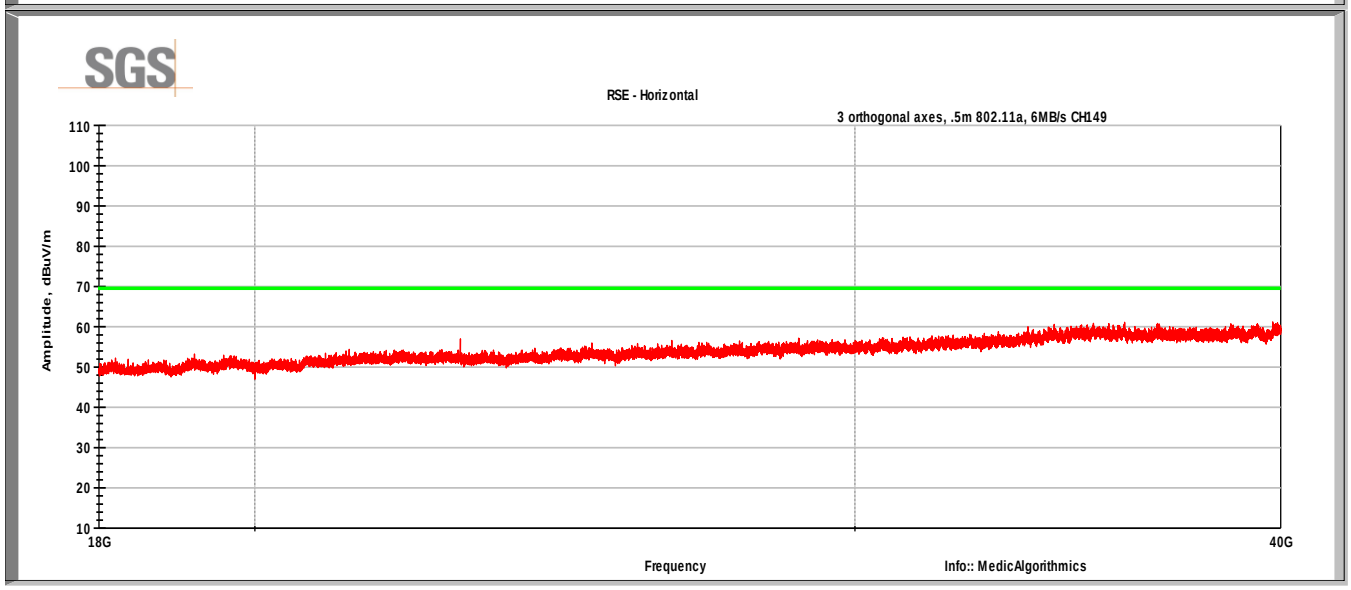
CH 165


SGS
RSE - Vertical
3 orth axes, 2m 802.11a, 6MB/s CH165
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
6G
10G
18G
Frequency
Info:: MedicAlgorithmics

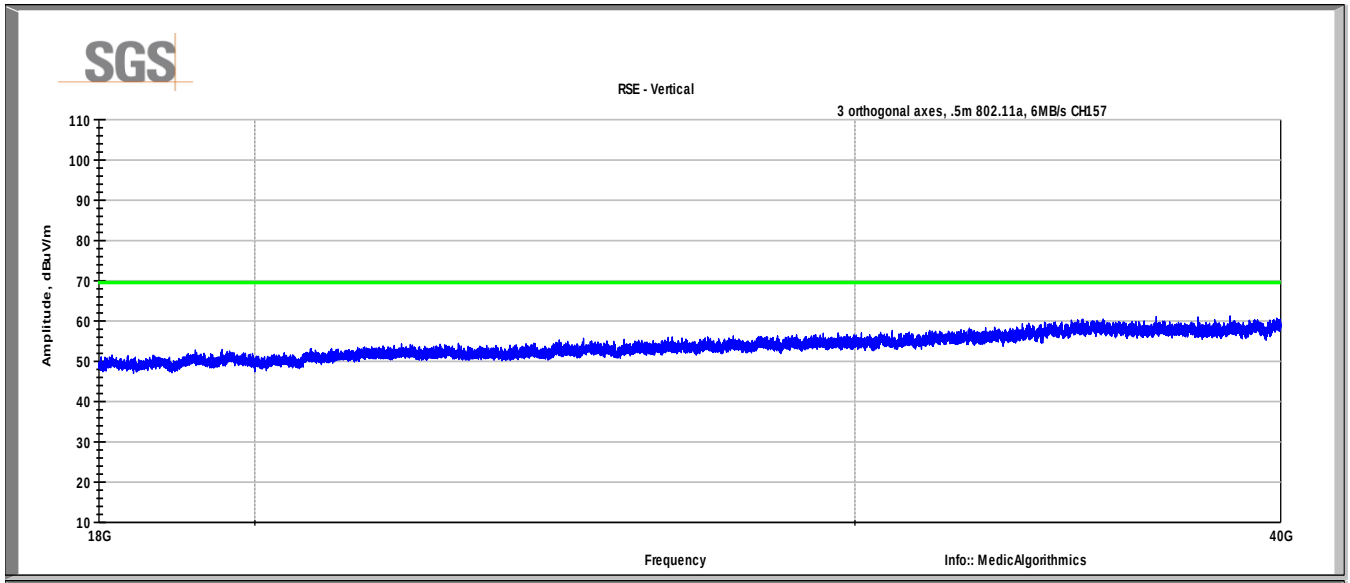

SGS
RSE - Horizontal
3 orth axes, 2m 802.11a, 6MB/s CH165
Amplitude, dBuV/m
100
90
80
70
60
50
40
30
20
6G
10G
18G
Frequency
Info:: MedicAlgorithmics

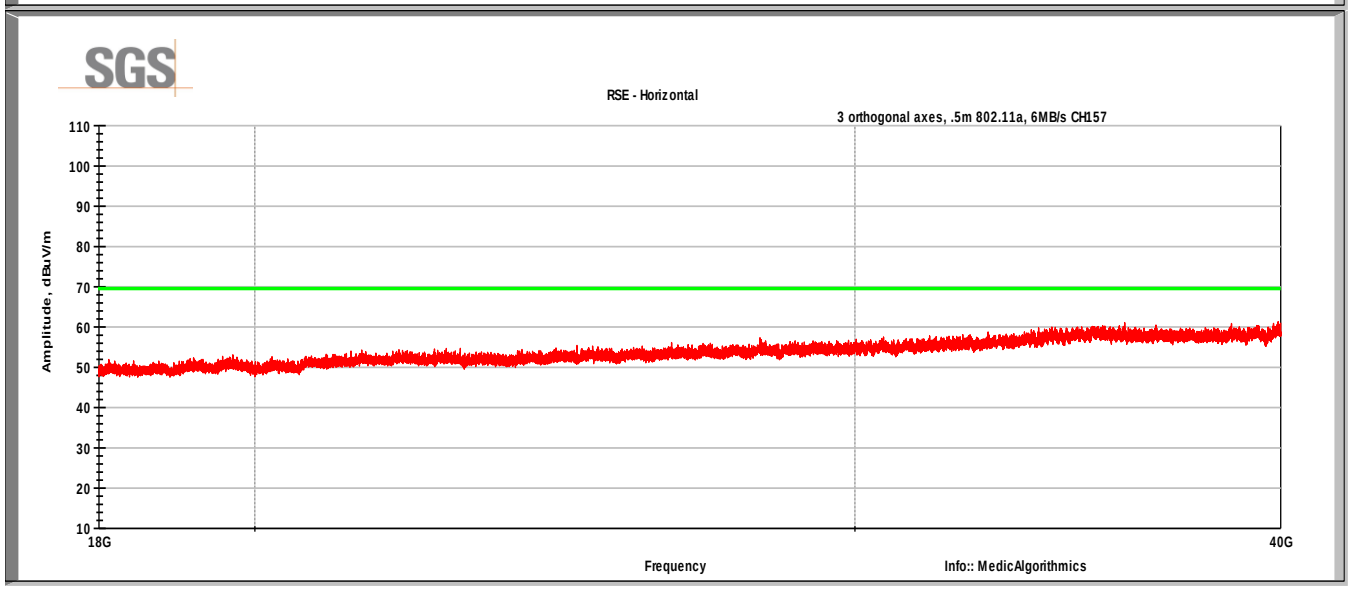
18 – 40 GHz
CH 149



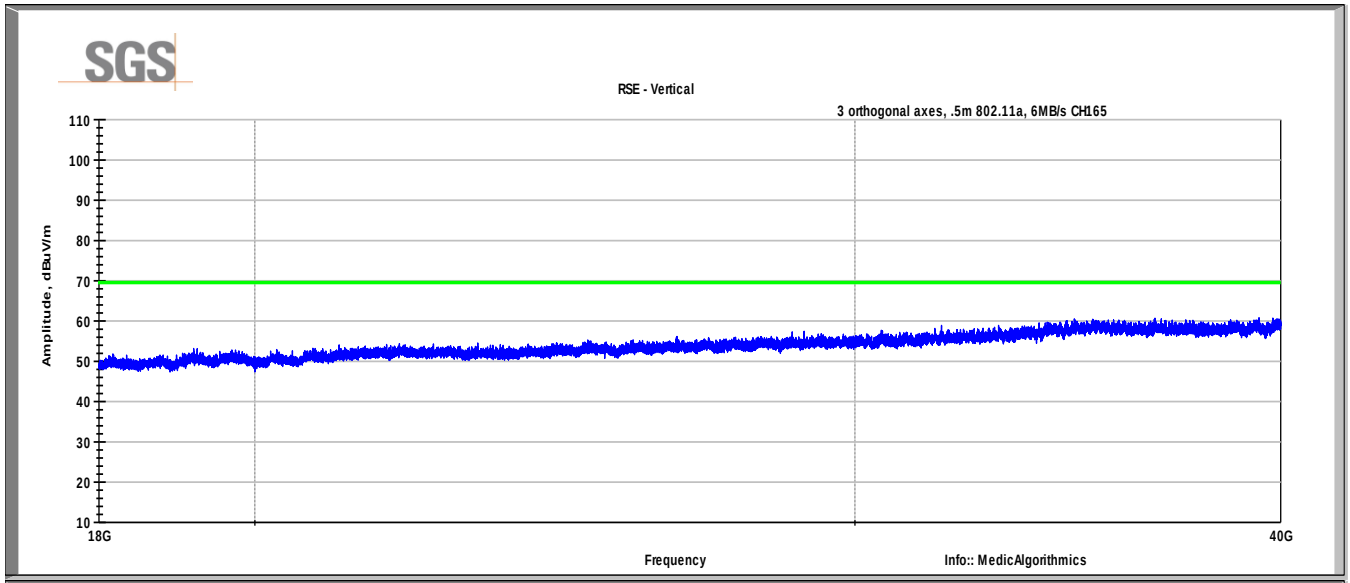


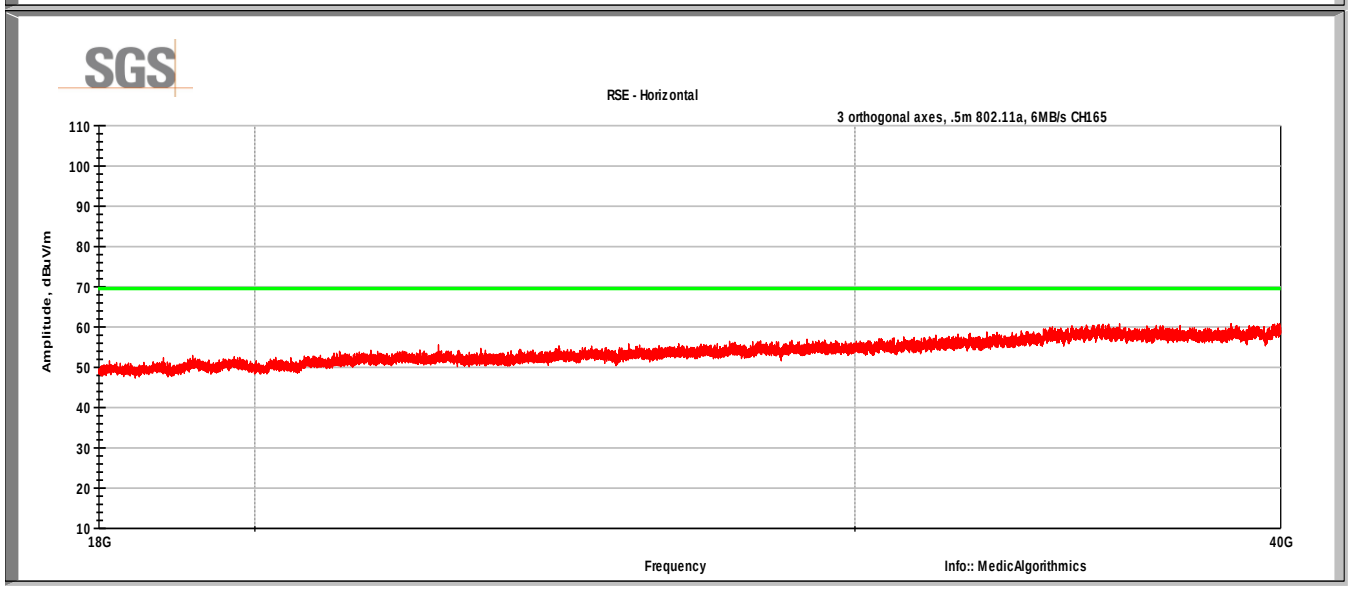
CH 157


RSE - Vertical
3 orthogonal axes, .5m 802.11a, 6MB/s CH157
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
18G
40G
Frequency
Info:: MedicAlgorithmics


RSE - Horizontal
3 orthogonal axes, .5m 802.11a, 6MB/s CH157
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
18G
40G
Frequency
Info:: MedicAlgorithmics

CH 165


SGS
RSE - Vertical
3 orthogonal axes, .5m 802.11a, 6MB/s CH165
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
18G
40G
Frequency
Info:: MedicAlgorithmics


SGS
RSE - Horizontal
3 orthogonal axes, .5m 802.11a, 6MB/s CH165
Amplitude, dBuV/m
110
100
90
80
70
60
50
40
30
20
10
18G
40G
Frequency
Info:: MedicAlgorithmics

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*

Method AVGPSD-1 from KDB 558074 was utilized for PSD measurements.

- RMS detector, trace averaging over 100 sweeps
- Resolution bandwidth of 100 kHz
- Video bandwidth > 300 kHz

The limit is +8 dBm.

6.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.4 °C
Relative Humidity: 47.8 %

6.4 *Test Equipment*

Test date: 17 July 2013

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI Reciever	ESU8	R&S	B085759	21 June 2014

Note: The calibration period equipment is 1 year.

6.5 *Test Setup Photographs*

Test setup photographs are located in a separate exhibit.

6.6 *Test Data*

Channel	Mode	Center Frequency (MHz)	Data Rate (MB/s)	PSD (dBm)	Limit (dBm/kHz)	Margin (dB)
6	b	2437	1	2.82	8	-5.18
6	b	2437	2	2.85	8	-5.15
6	g	2437	6	0.36	8	-7.64
6	g	2437	12	0.37	8	-7.63
6	n	2437	MCS0	-1.36	8	-9.36
6	n	2437	MCS2	-3.73	8	-11.73
157	a	5785	24	2.57	8	-5.43
157	n	5785	MCS0	2.28	8	-5.72

7 Band Edge Summary Results

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*

Peak and average field strength measurements were performed at the restricted band edges of 2390MHz and 2483.5MHz. Measurements were made using the conducted methods defined in Section 12 of FCC publication D01 DTS Meas Guidance v03r01. The measurements were recorded and using the equation E = EIRP – 20log D + 104.8, the readings were converted to a radiated field strength equivalent. The resultant data were compared to the average limit of 54 dBµV/m and peak limit of 74 dBµV/m.
All 2.4 and 5GHz emissions were measured and shown that the 30dB occupied bandwidth is contained within the allowed frequency range as measured in a 100 kHz resolution bandwidth.

Measurements were made in the following modes of operation: 802.11b,g and n at low and high channels. The worst-case data rates of 6Mbit/s and MCS0,7 were used.

7.3 *Test Site*

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

Environmental Conditions
Temperature: 24.8 °C
Relative Humidity: 30.7 %

7.4 *Test Equipment*

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	7-Oct-2014

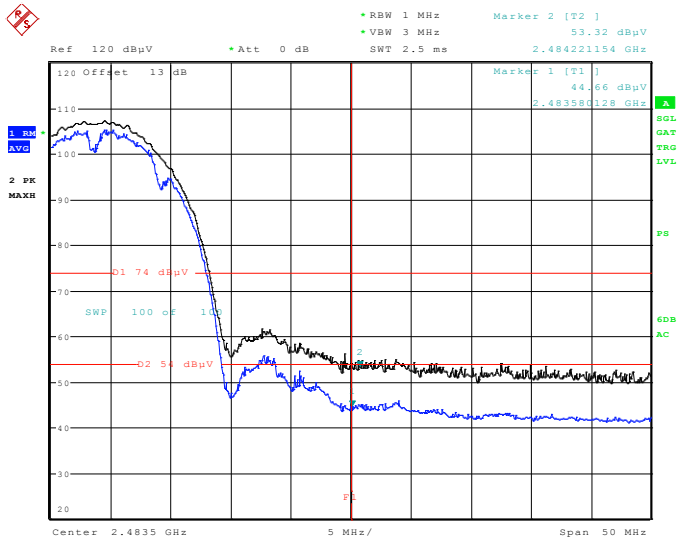
Note: The calibration period equipment is 1 year.

7.5 *Test Data*

Restricted band-edges
Worst case measurements 2.4 GHz band

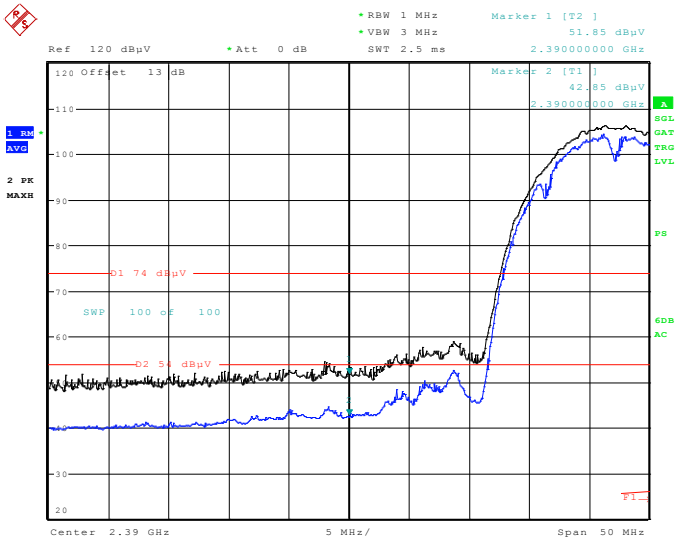
Channel	Protocol	Frequency (MHz)	Measurement (dBuV)	Detector Peak/AVG	limit (dBuV)	margin (dB)
1	n	2390	67.14	PK	74	-6.86
1	n	2390	49.52	AVG	54	-4.48
11	n	2483.5	70.57	PK	74	-3.43
11	n	2483.5	53.18	AVG	54	-0.82

802.11b CH11 1 MB/s



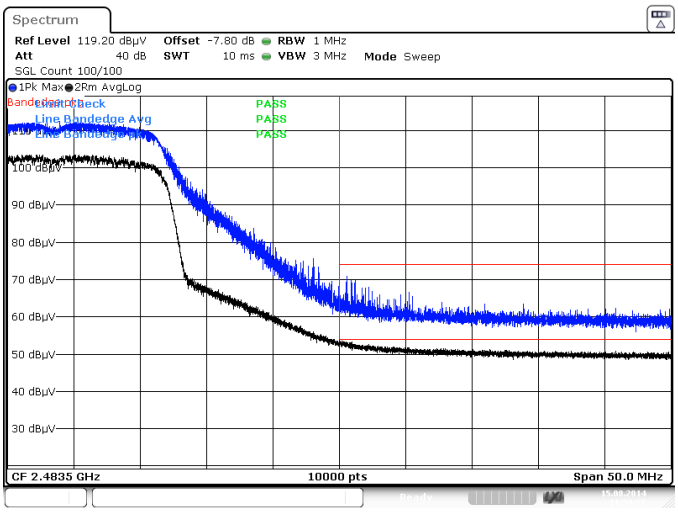
Date: 3.MAR.2014 11:32:40

802.11b CH1



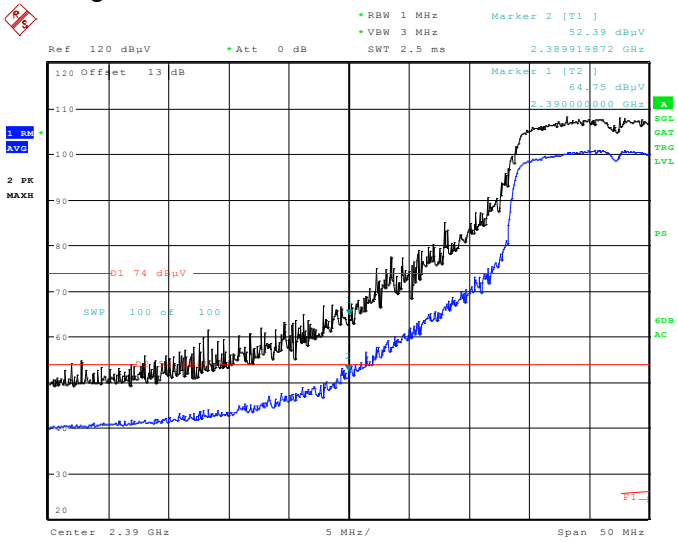
Date: 3.MAR.2014 11:36:54

802.11g CH11 6MB/s



Date: 15.AUG.2014 11:39:38

802.11g CH1 6MB/s



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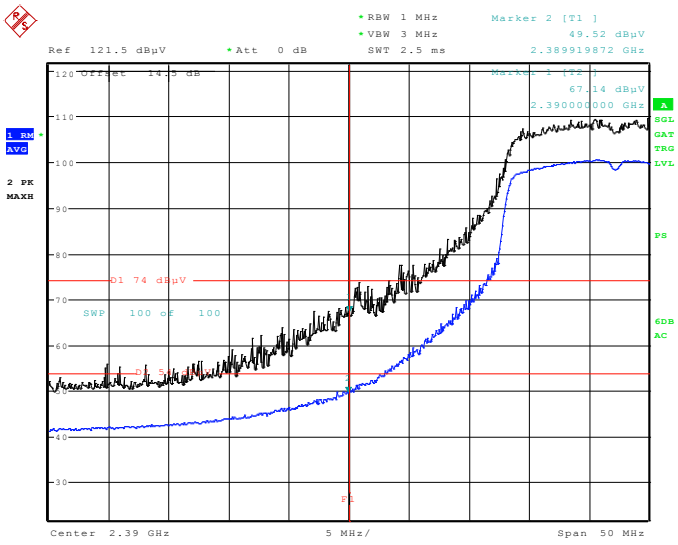
802.11n MCS2 CH 1



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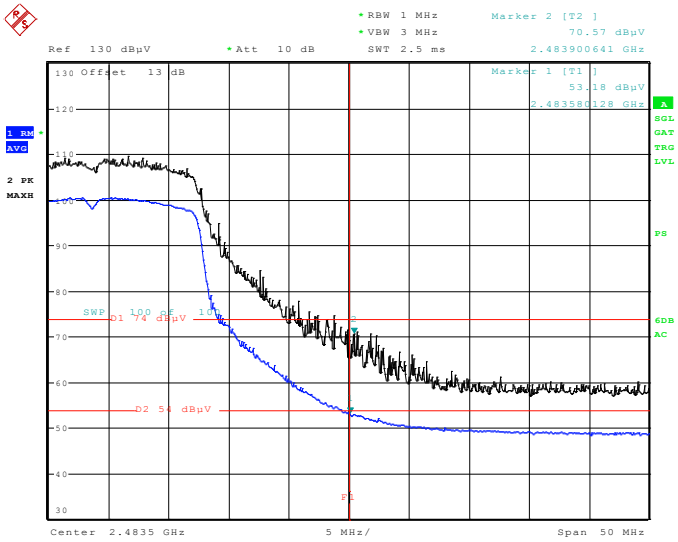
802.11n MCS2 CH 11



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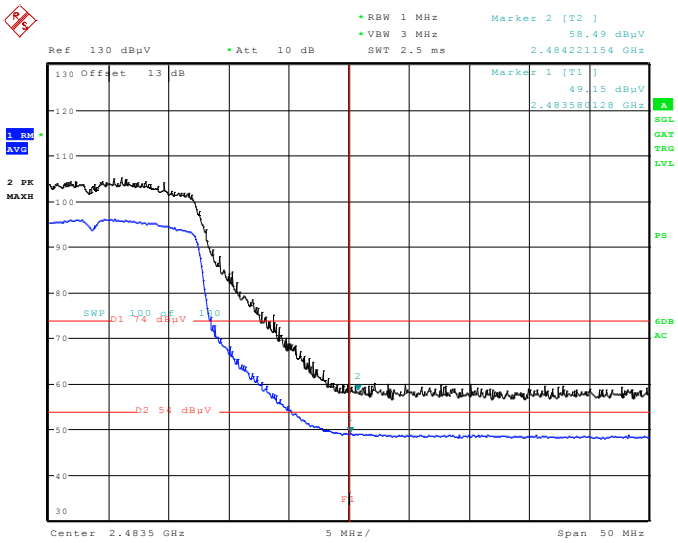
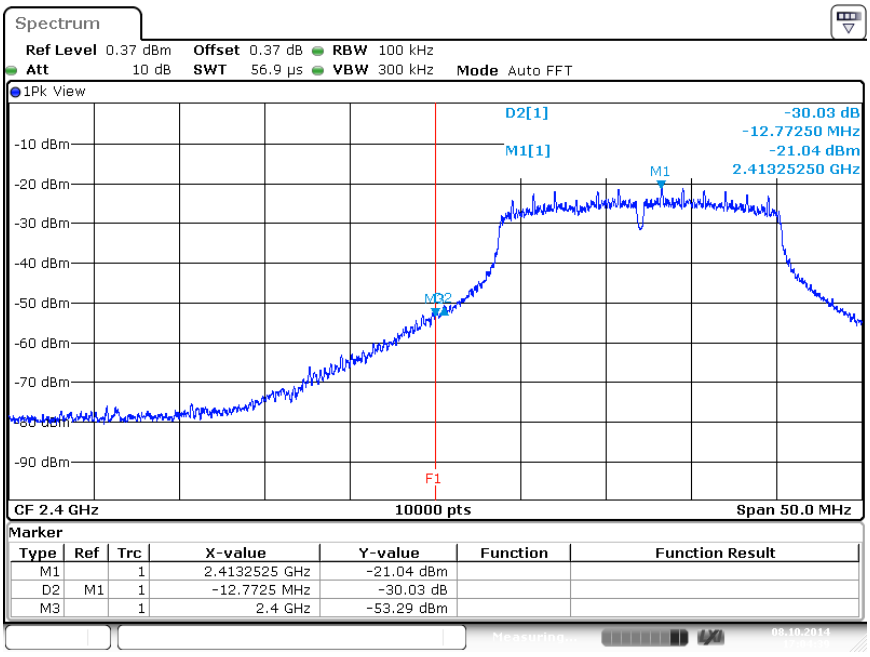
802.11n CH11 MCS7



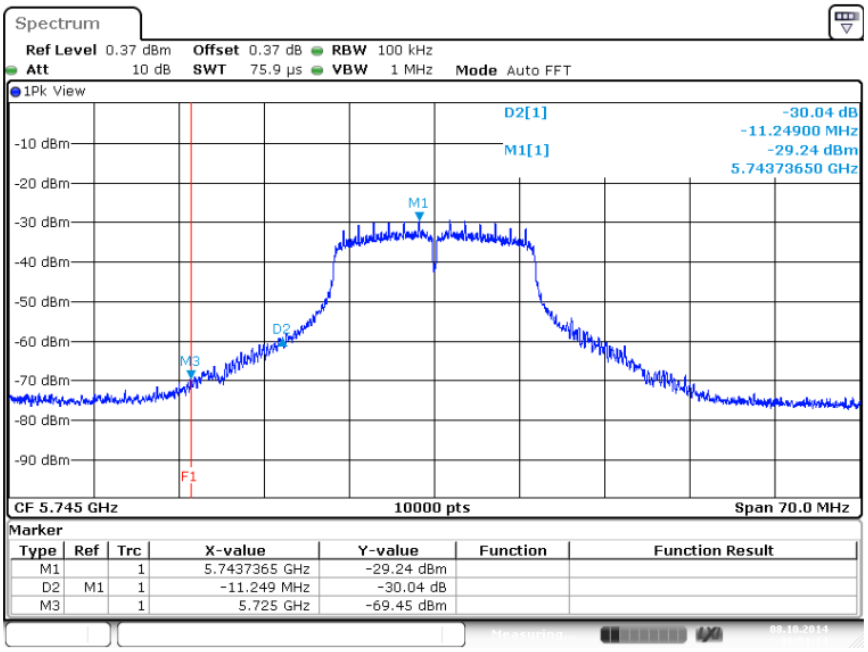
Date: 3.MAR.2014 11:19:04

Authorized Band-edges
802.11n



Date: 8.OCT.2014 17:04:39

802.11a
5745 MHz



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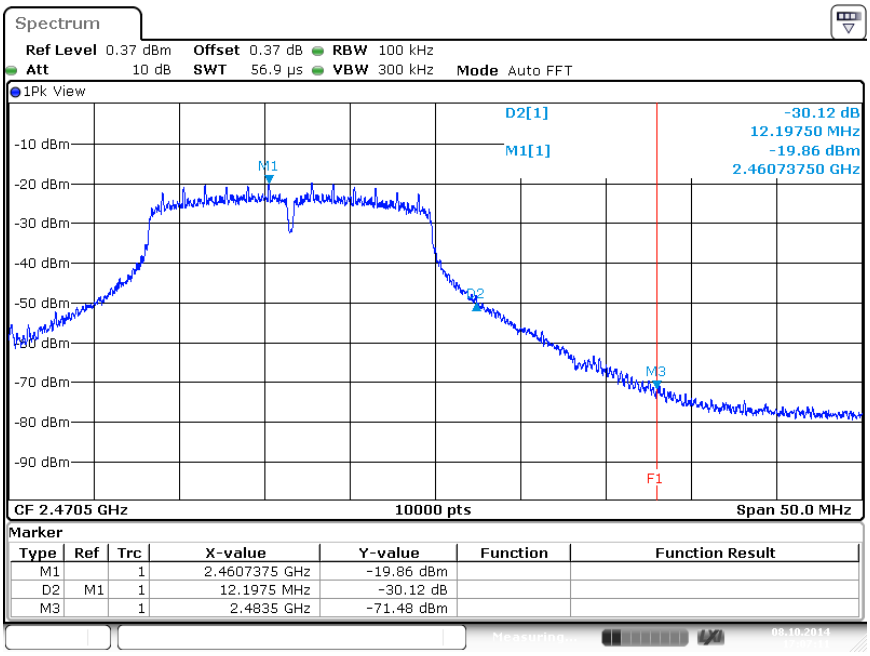

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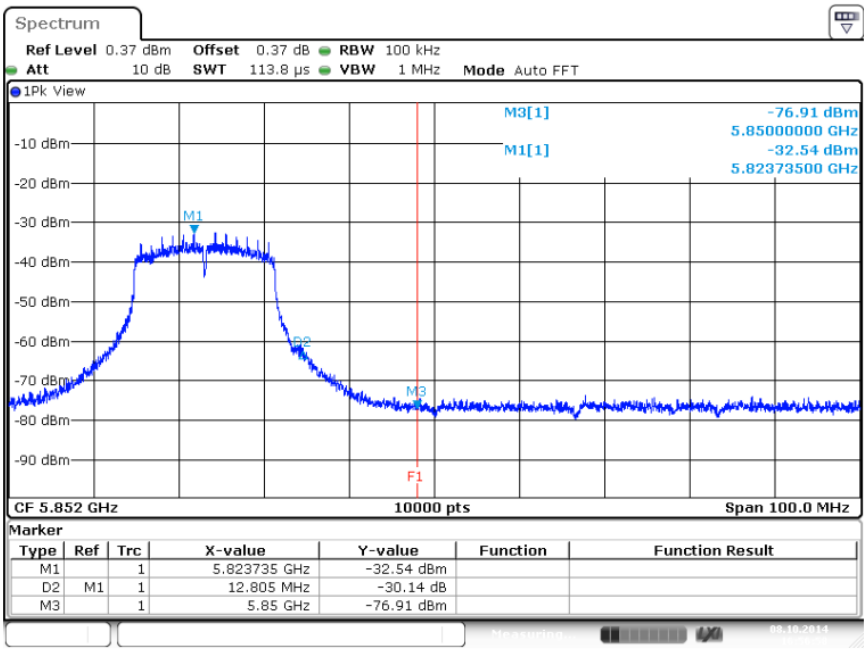
5825 MHz



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8 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	15AUG2014
1	Added center frequencies to tables in Sections 3.6 and 6.6. clarified bandedge measurement methods, PSD procedures. Corrected limit in Tabel 5.6. corrected frequency range on Page 4. Included 5 GHz band edge measurements.	14OCT2014