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FCC and ISED Test Report for Parts 15.247, 15.207 and RSS-247, RSS Gen (DTS)

Product name : FLEXIDOME IP starlight 8000i

Applicant : Bosch Security Systems B.V.

FCC ID : 2ALVZ-NDE8000

ISED ID : 1249D-NDE8000

Test report No. : 170100199 007 Ver 3.00

Laboratory information

Accreditation

Telefication is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The Designation number is: NL0001.

The Industry Canada registration number for the 3 meter test chamber of Telefication is: 4173A-1.

Documentation

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2005. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Telefication Netherlands.

Testing Location

Test Site	Telefication BV
Test Site location	Edisonstraat 12a 6902 PK Zevenaar The Netherlands Tel. +31889983600 Fax. +31316583189
Test Site FCC	NL0001

Revision History

Version	Date	Remarks	By
v0.50	29-05-2017	First draft	RvB
v1.00	21-08-2018	Release version	RvB
v2.00	12-11-2018	Updated model naming	KR
v3.00	12-11-2018	Updated model naming	KR

Table of Contents

Summary of Test results

FCC	ISED	Description	Section in report	Verdict
15.247(a)	RSS-247 5.2 (1)	6dB Bandwidth	3.1	Pass
--	RSS-GEN 6.6	99% Bandwidth	3.2	Pass
15.247(b)	RSS-247 5.1 (2)	RF output power	3.3	Pass
15.247(e)	RSS-247 5.2 (2)	Power spectral density	3.4	Pass
15.247(d)	RSS-247 5.5	Conducted Spurious emissions	3.5	Pass
15.247(d)	RSS-247 5.5	Conducted Band edge	3.5	Pass
15.209 (a)	RSS-247 5.4	Radiated Spurious emissions	3.6	Pass
15.205 (a)	RSS Gen 8.10	Spurious emissions in the restricted bands	3.6	Pass
15.207 (a)	RSS-Gen 8.8	Conducted spurious on AC mains	3.7	Pass

1 General Description

1.1 Applicant

Client name:	Bosch Security Systems B.V.
Address	Torenallee 49, Eindhoven, The Netherlands
Zip code:	5617 BA
E-mail:	Richard.greijmans@nl.bosch.com
Contact name:	R. Greijmans

1.2 Manufacturer

Manufacturer name:	Bosch Security Systems B.V.
Address:	Torenallee 49, Eindhoven, The Netherlands
Zip code:	5617 BA
E-mail:	Richard.greijmans@nl.bosch.com
Contact name:	R. Greijmans

1.3 Tested Equipment Under Test (EUT)

Product name:	FLEXIDOME IP starlight 8000i
Brand name:	Bosch
Product type:	Security camera
FCC ID:	2ALZV-NDE8000
ISED ID	1249D-NDE8000
Model number:	FLEXIDOME IP starlight 8000i
Variant Model(s):	NDE-8502-R NDE-8502-RT NDE-8503-R NDE-8503-RT NDE-8504-R
Software version:	6.50.0066
Hardware version:	----
Date of receipt	10-04-2017
Tests started:	18-04-2017
Testing ended:	11-04-2018

1.4 Product specifications of Equipment under test

TX Frequency range (MHz):	802.11b/g/n: 2400 – 2483.5
RX frequency range (MHz):	802.11b/g/n: 2400 – 2483.5
Maximum output power to antenna (dBm):	IEEE 802.11b: 16.38 IEEE 802.11g: -8.21(AVG) IEEE 802.11n: -8.07(AVG)
Antenna type:	FPC (flexible printed circuit board)
Antenna gain(dBi):	802.11b/g/n: 1.61
Type of modulation:	Acc. to IEEE 802.11 b/g/n
Emission designator 802.11b:	13M5G1D
Emission designator 802.11g:	16M5G1D
Emission designator 802.11n:	17M6G1D

1.5 Modification of the Equipment Under Test (EUT)

The following modifications have been performed on the sample.

Atlantis changes 2 -> B2

- Power panel:
  HW-507 PHY robustness improvement
  HW-497 EMC: add contact area to housing
  HW-512 Add extra 2 GDT's on Ethernet data lines
  HW-513 Create space for Ethernet data lines at blindmate connector
- Installer panel:
  Increase isolation distance

Atlantis changes C2 -> B2

- Wireless LAN antenna:
  Wireless LAN range with internal antenna of the module was very poor.
  Solution is the use of an external antenna as can be seen on the image below
- Cable routing sensor and power cable improvement:
  The height of the camera increased with 6mm to have more space above the PCB stack-up
  Redesign of the motor control panel,
  Updated mechanical size
  Update of flex foil connectors
  Updated locations of connectors
  Cable guide by the PCB bracket
- Radiated emission sensor cable routing:
  Adding distance between SD-card traces and sensor cable (implemented and verified)

1.6 Observations and remarks

None.

1.7 Environmental conditions

Test date	18-04-2017	11-04-2018
Ambient temperature	24.6 °C	24 °C
Humidity	39.7 %	38.4 %

1.8 Measurement Standards

- FCC KDB Publication No. 558074 D01DTS Meas. Guidance V04
- ANSI C63.10:2013

1.9 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247, §15.207
- RSS-247 Issue 2, RSS-GEN Issue 4

1.10 Conclusions

The sample of the product showed **NO NON-COMPLIANCES** to the specifications stated in paragraph 1.9 of this report.

The results of the test as stated in this report, are exclusively applicable to the product items as identified in this report. Telefication accepts no responsibility for any properties of product items in this test report, which are not supported by the tests as specified in paragraph 1.9 *"Applicable standards".*

All tests are performed by:

Name : ing. R. van Barneveld

Review of test methods and report by:

Name : P. van Wanrooij, BASc

The above conclusions have been verified by the following signatory:

Date : 12-11-2018

Name : ing K.A. Roes

Function : Coordinator Radio Laboratory

Signature :

2 Test configuration of the Equipment Under Test

2.1 Test mode

The applicant provided test mode firmware for the EUT, in which it was possible to configure the EUT into different test channels.

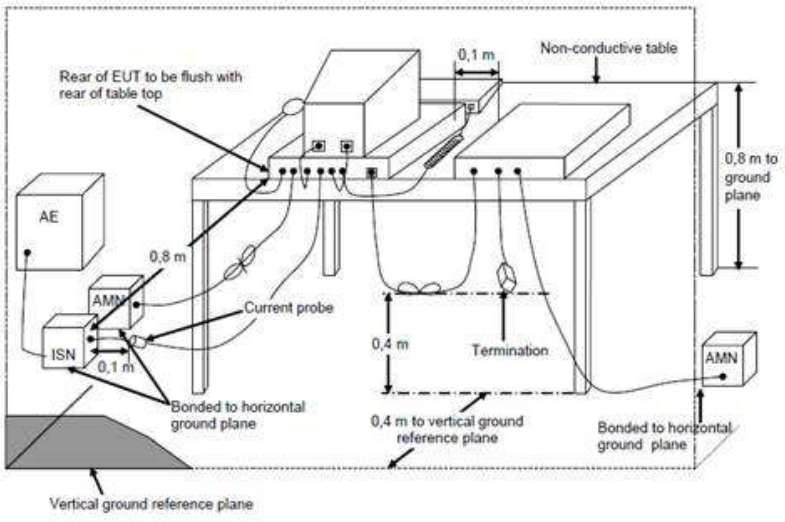
2.2 Tested channels and Data rates

Technology	Channels	Data rate	Frequency (MHz)
802.11b	1	11 Mbps	2412
	6	11 Mbps	2437
	11	11 Mbps	2462
802.11g	1	54 Mbps	2412
	6	54 Mbps	2437
	11	54 Mbps	2462
802.11n	1	MCS 7	2412
	6	MCS 7	2437
	11	MCS 7	2462

2.3 Conducted Test setup

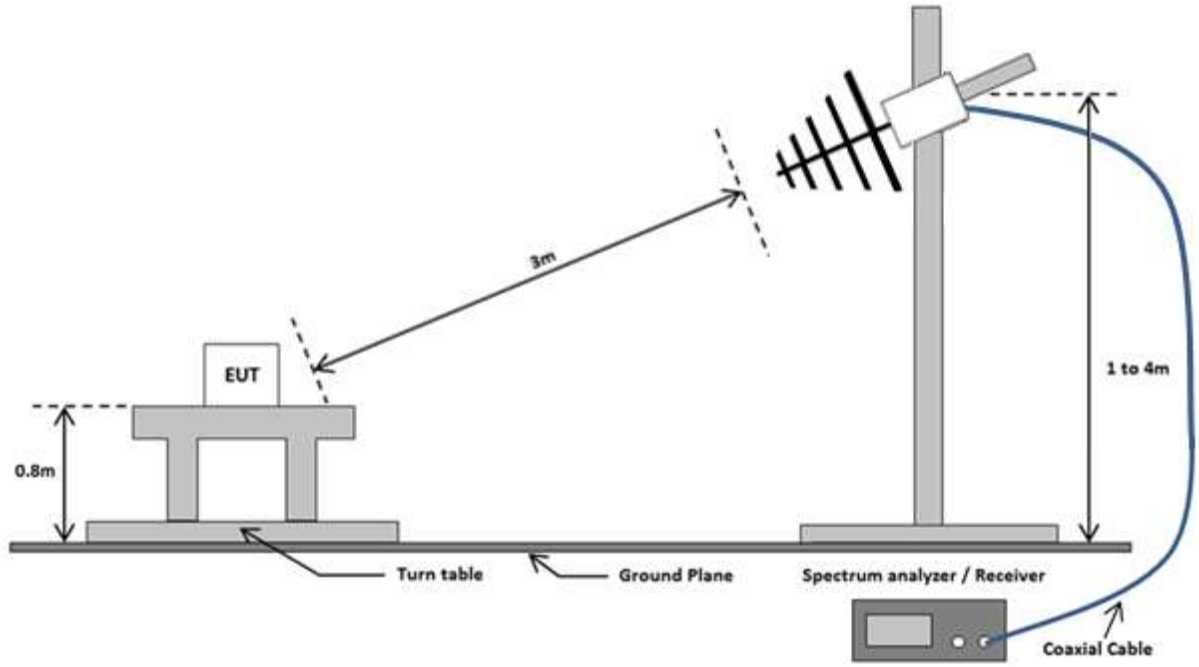
RF tests at antenna connector

Emissions test at 24 Volt AC

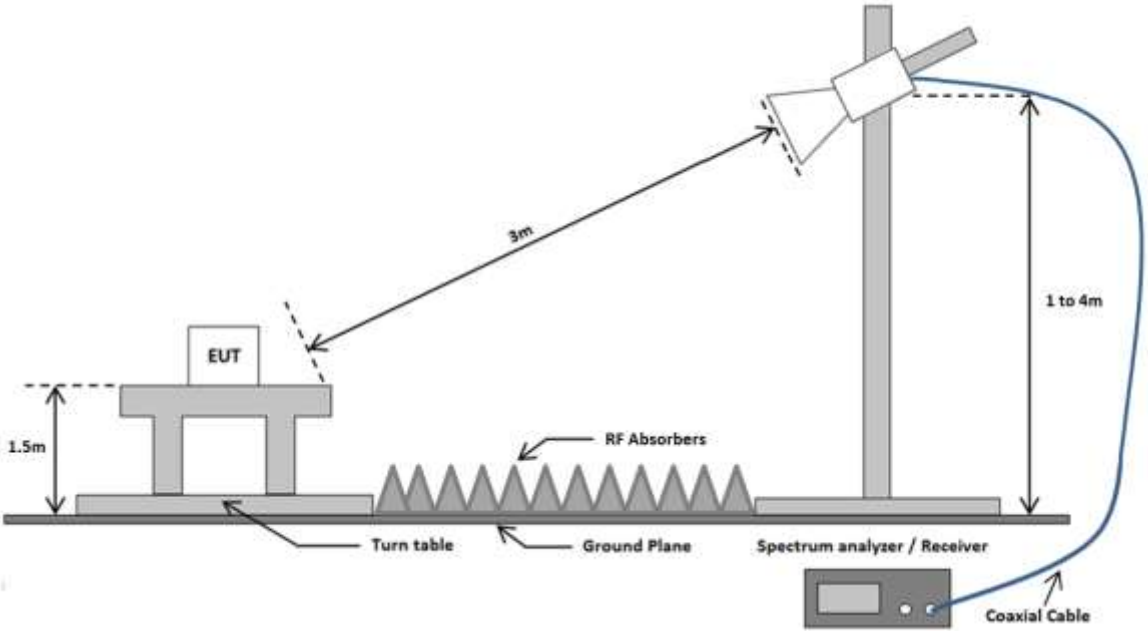


2.4 Radiated Test setup

Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



2.5 Equipment used in the test configuration

Description	Manufacturer	Model	ID	Used at Par.
Signal Generator	Hewlett Packard	83650B	TE00487	3.1 to 3.5
Spectrum Analyzer	Rohde & Schwarz	FSV	TE01269	3.1 to 3.5
Spectrum Analyzer	Rohde & Schwarz	FSP40	TE11125	3.6
Spectrum Analyzer	Rohde & Schwarz	ESR7	TE01220	3.6, 3.7
10 MHz distribution Amplifier	Stanford Research Systems	FS735/1	TE01278	3.1 to 3.5
USB to GPIB adapter	National Instruments	GPIB-USB-HS+	TE01283	3.1 to 3.5
Biconilog Antenna	Chase	CBL6112A	TE00967	3.6
Horn Antenna	EMCO The Electro – Mechanics Co	3115	TE00531	3.6
SAC Chamber	Comtest Engineering BV	-	TE00861	3.6
Artificial Mains Network (AMN)	Rohde & Schwarz	ESH3-Z5	TE00208	3.7
Pulse limiter	Rohde & Schwarz	ESH3-Z2	TE00756	3.7
High pass filter	Wainwright instruments	WHK3.0/18G-10EF	TE01140	3.6
Pre-amplifier	Hewlett Packard	8449B	TE00092	3.6
Software	D.A.R.E Instruments	Radimation 2016.2.8	--	3.6 - 3.7

2.6 Explanation of the Measurement results for all conducted test items

The path loss between the EUT and the spectrum analyser for the frequency range of 30 MHz to 40 GHz has been measured and stored in the transducer table of the spectrum analyser. This transducer table is used for level offset of the spectrum analyser. With this level offset the spectrum analysers reading will be exactly the RF output.

2.7 Sample calculation

Field Strength Measurement example:

Frequency (GHz)	Polarization	Height(m)	Peak (dBµV/m)
7,236	Horizontal	2	52.5

The following relation applies:

E (dBµV/m) = U(dBµV) + AF (dB/m) – G (dB) + CL (dB)

Where:

E = Electric field strength
U = Measuring receiver voltage
AF = Antenna factor
G = Gain of the pre-amplifier
CL = Cable loss

(52.5 = 48.12 + 36.1 - 37.42 + 5.7)

3 Test results

3.1 6dB bandwidth Measurement

3.1.1 Limit

The minimum 6 dB Bandwidth shall be at least 500 kHz.

3.1.2 Measurement instruments

The measurement instruments are listed in chapter 2.5 of this report.

3.1.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.1.4 Test procedure

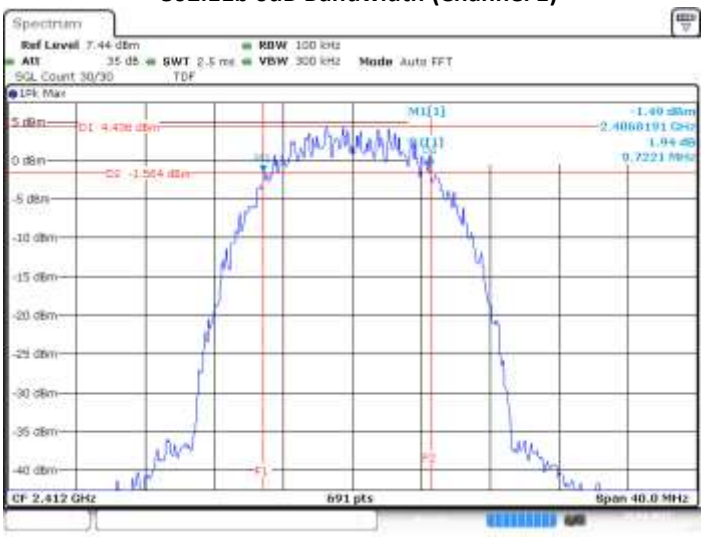
The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
IRN 017 - Occupied bandwidth (Hz), method 4.

3.1.5 Test Results of the 6 dB bandwidth Measurement

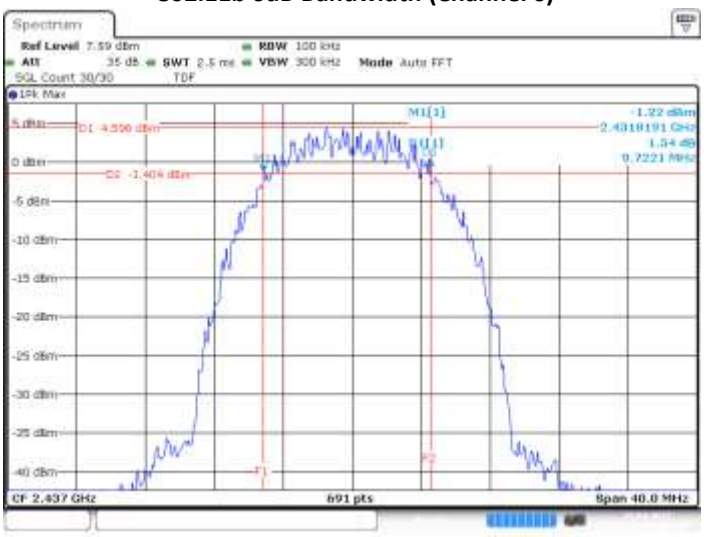
Technology Std.	Channel	Frequency (MHz)	Data rate	6dB bandwidth (kHz)
IEEE 802.11b	1	2412	11 Mbps	9722
	6	2437	11 Mbps	9722
	11	2462	11 Mbps	9722
IEEE 802.11g	1	2412	54 Mbps	16454
	6	2437	54 Mbps	16397
	11	2462	54 Mbps	16397
IEEE 802.11n	1	2412	MCS7	17676
	6	2437	MCS7	17676
	11	2462	MCS7	17676
Uncertainty	± 485 kHz			

3.1.6 Plots of the 6 dB bandwidth Measurement

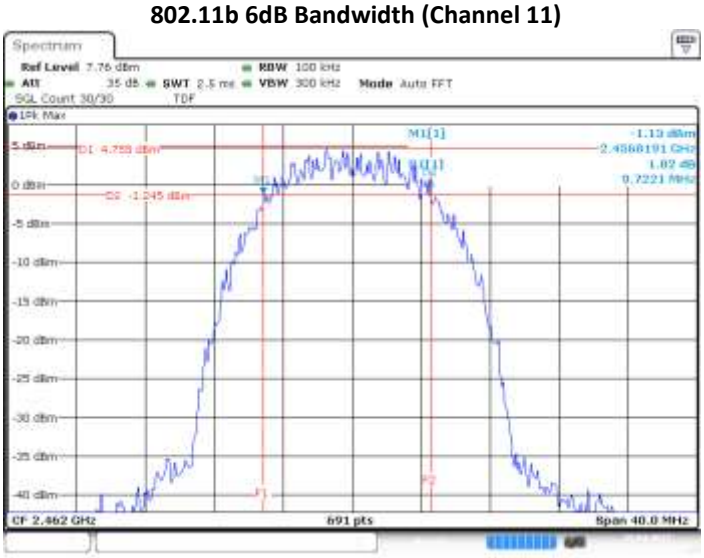
802.11b 6dB Bandwidth (Channel 1)



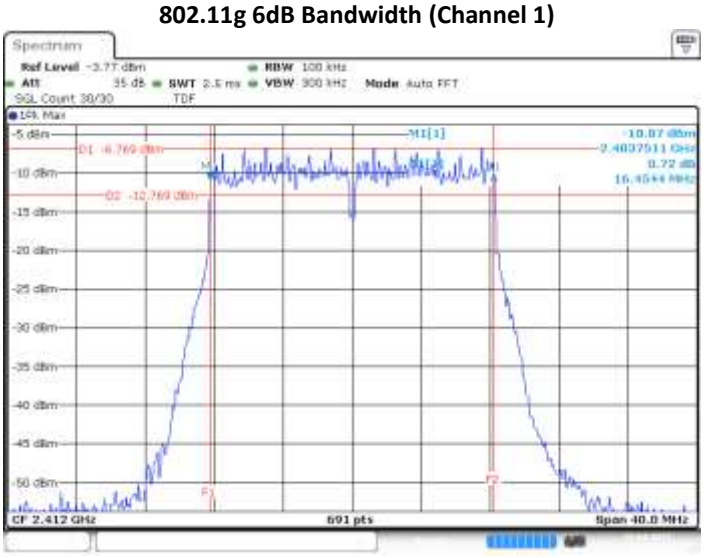
802.11b 6dB Bandwidth (Channel 6)



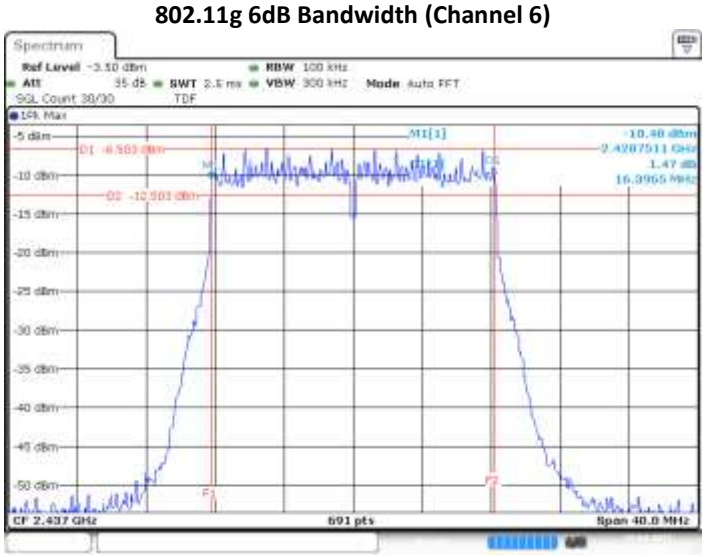
802.11b 6dB Bandwidth (Channel 11)



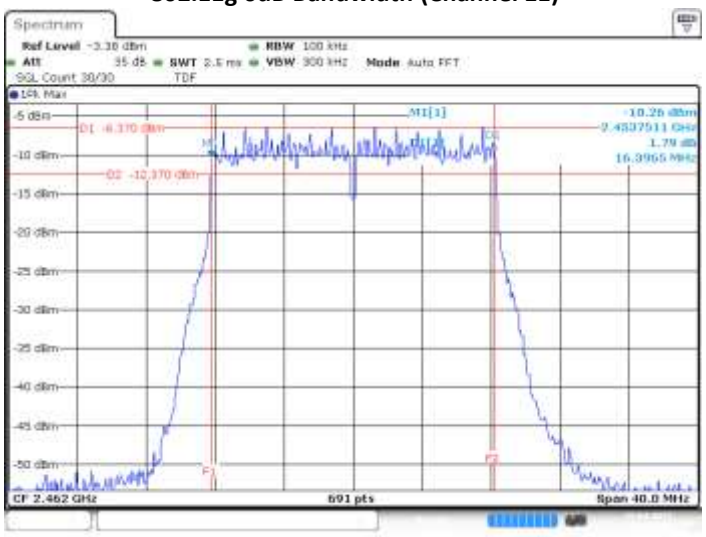
802.11g 6dB Bandwidth (Channel 1)



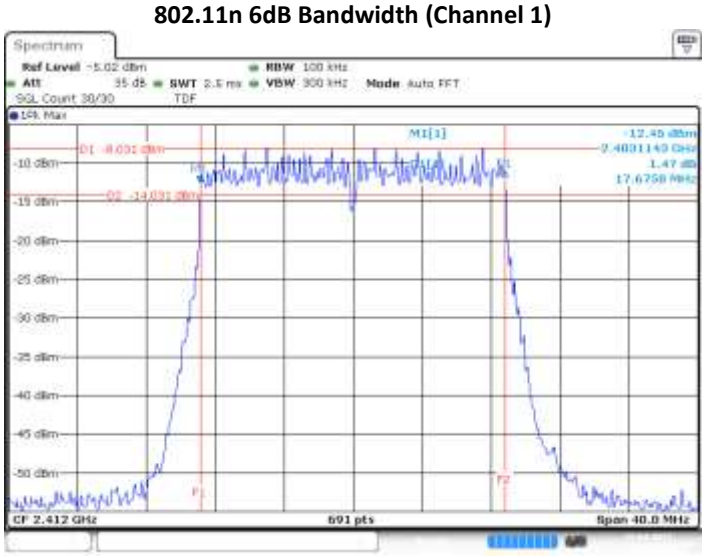
802.11g 6dB Bandwidth (Channel 6)



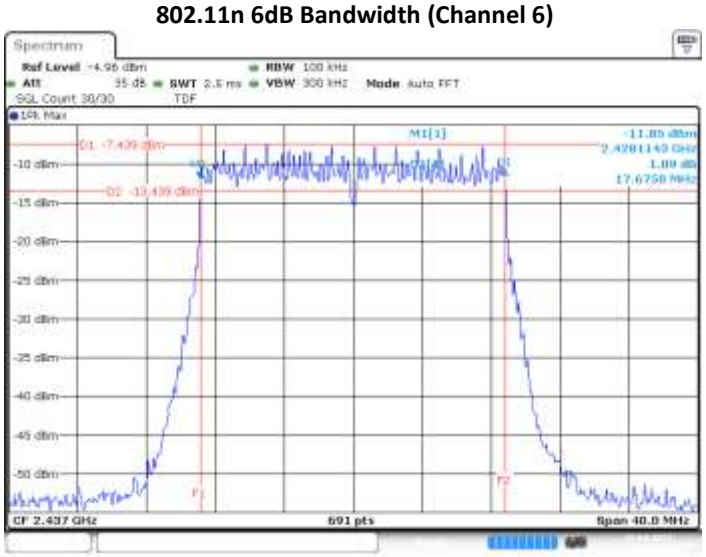
802.11g 6dB Bandwidth (Channel 11)



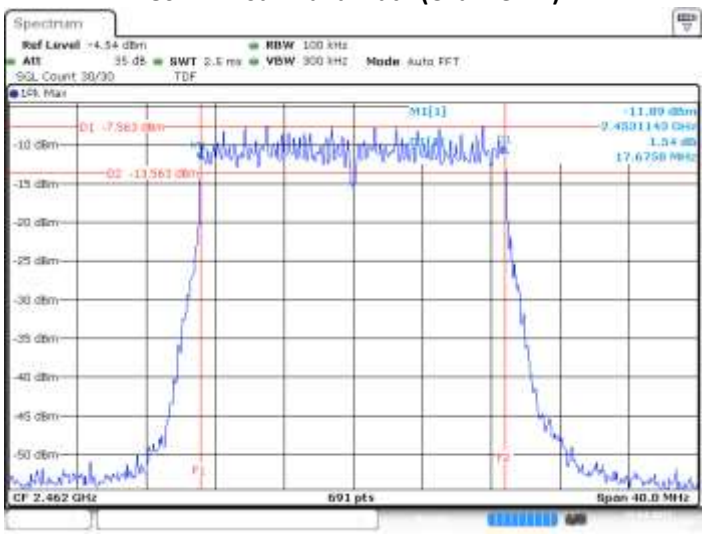
802.11n 6dB Bandwidth (Channel 1)



802.11n 6dB Bandwidth (Channel 6)



802.11n 6dB Bandwidth (Channel 11)



3.2 99% Occupied Bandwidth

3.2.1 Limit

According to RSS-Gen 6.6.

3.2.2 Measurement instruments

The measurement instruments are listed in chapter 2.5 of this report.

3.2.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.2.4 Test procedure

IRN 017_10 Occupied bandwidth (Hz), method 1.

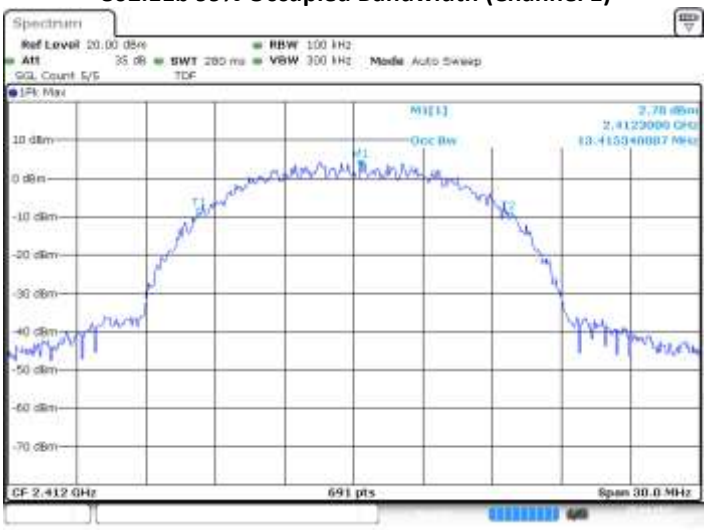
1 Set the centre frequency to the nominal EUT channel centre frequency.
2 Set span = 1.5 times to 0.5 times the Occupied Bandwidth.
3 Set VBW ≥ 3 x RBW.
4 Video averaging is not permitted. Where practical detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode(until the trace stabilizes) shall be used.

3.2.5 Test results of the 99% Occupied Bandwidth Measurement

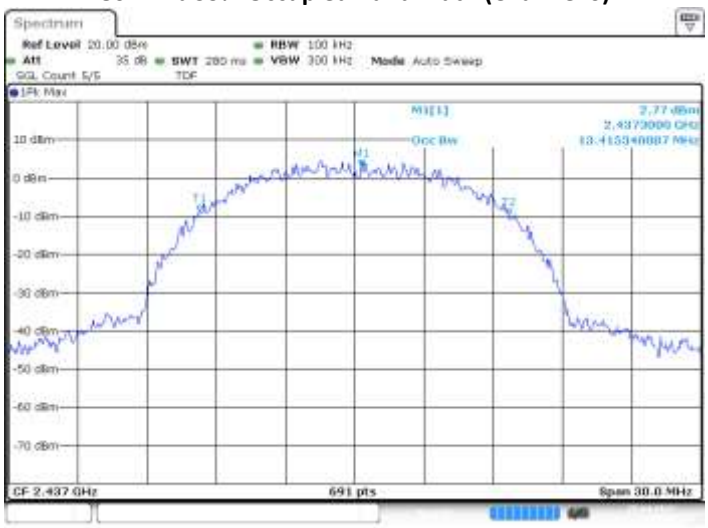
Technology Std.	Channel	Frequency (MHz)	Data rate	99% bandwidth (kHz)
IEEE 802.11b	1	2412	11 Mbps	13415
	6	2437	11 Mbps	13415
	11	2462	11 Mbps	13459
IEEE 802.11g	1	2412	54 Mbps	16454
	6	2437	54 Mbps	16498
	11	2462	54 Mbps	16498
IEEE 802.11n	1	2412	MCS7	17627
	6	2437	MCS7	17627
	11	2462	MCS7	17627
Uncertainty	± 370 kHz			

3.2.6 Plots of the 99% Occupied Bandwidth Measurement

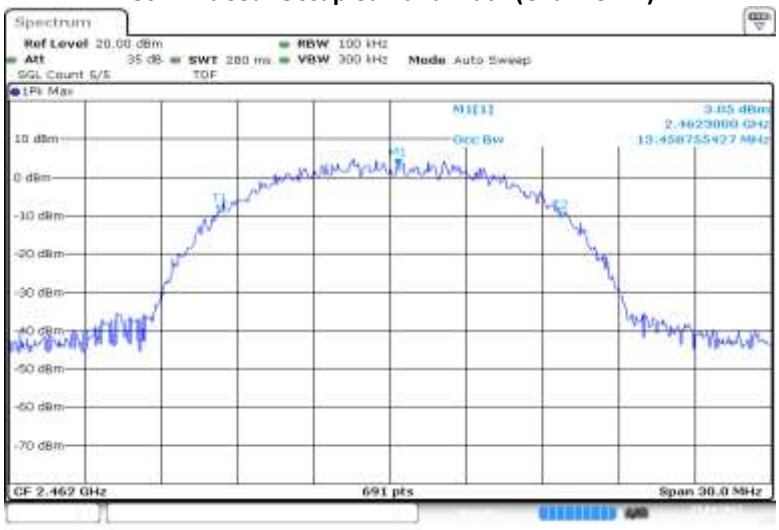
802.11b 99% Occupied Bandwidth (Channel 1)



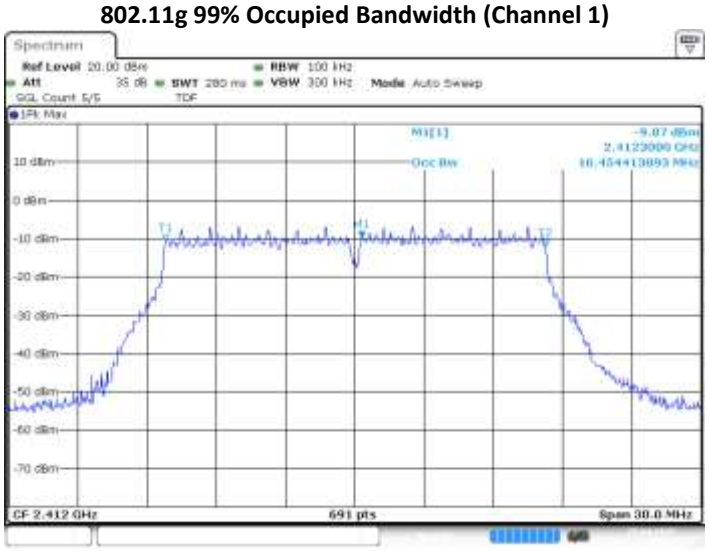
802.11b 99% Occupied Bandwidth (Channel 6)



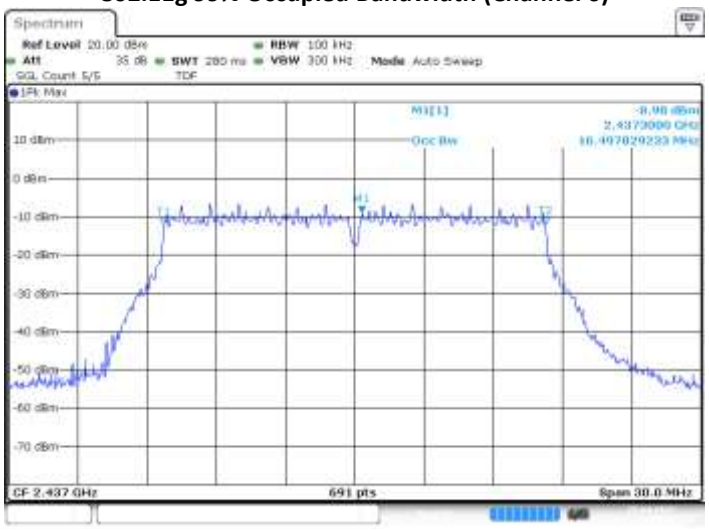
802.11b 99% Occupied Bandwidth (Channel 11)



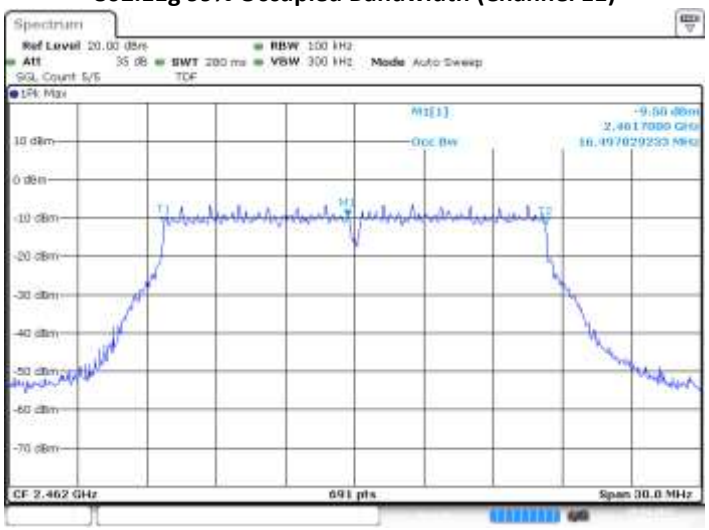
802.11g 99% Occupied Bandwidth (Channel 1)



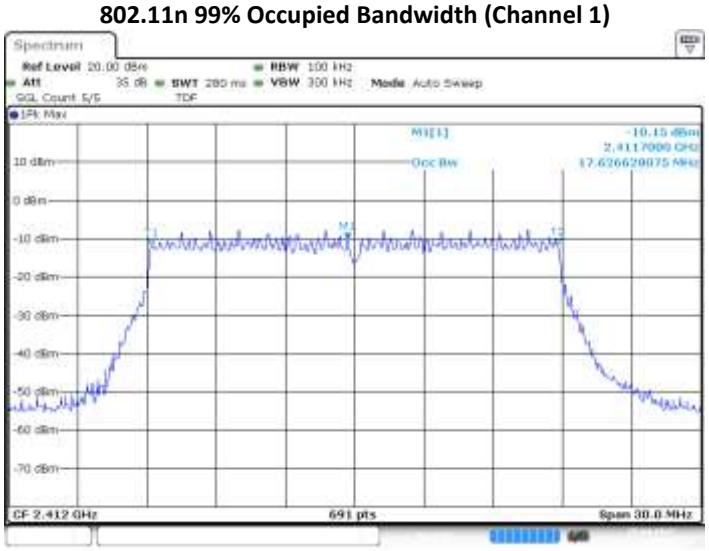
802.11g 99% Occupied Bandwidth (Channel 6)



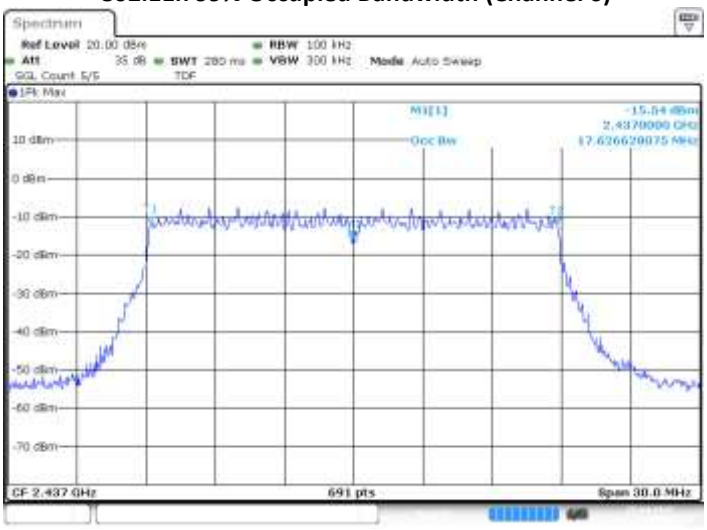
802.11g 99% Occupied Bandwidth (Channel 11)



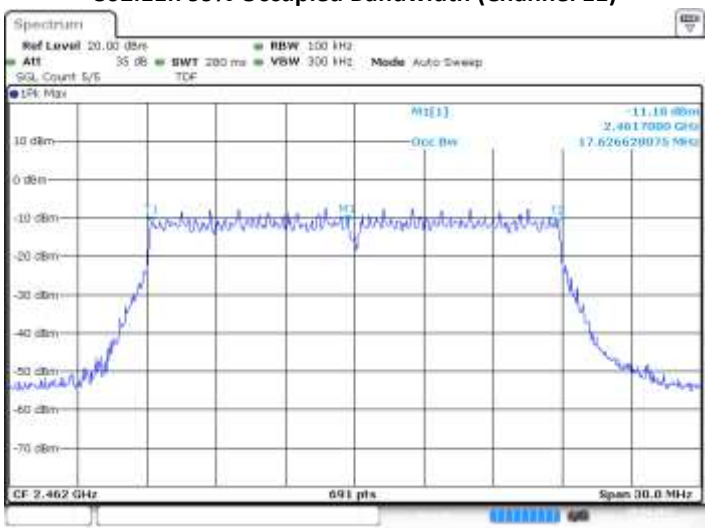
802.11n 99% Occupied Bandwidth (Channel 1)



802.11n 99% Occupied Bandwidth (Channel 6)



802.11n 99% Occupied Bandwidth (Channel 11)



3.3 Output Power Measurement

3.3.1 Limit

For systems using digital modulation in the 2400-2483.5 MHz, the limit for the peak output power is 30 dBm. If transmitting antenna of directional gain greater than 6 dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point to point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measurement instruments

The measurement instruments are listed in chapter 2.5 of this report.

3.3.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.3.4 Test procedure

The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
IRN 014_14 RF Power (W), method 1.

3.3.5 Test results of Output Power Measurement

Duty cycle

Technology Std.	Channel	Frequency (MHz)	Data rate	Duty cycle (%)
IEEE 802.11b	1	2412	11 Mbps	96.67
	6	2437	11 Mbps	96.67
	11	2462	11 Mbps	96.55
IEEE 802.11g	1	2412	54 Mbps	77.42
	6	2437	54 Mbps	80.00
	11	2462	54 Mbps	76.67
IEEE 802.11n	1	2412	MCS7	75.86
	6	2437	MCS7	75.86
	11	2462	MCS7	75.86

Peak method

Technology Std.	Channel	Frequency (MHz)	Data rate	Peak output power (dBm)
IEEE 802.11b	1	2412	11 Mbps	17.20
	6	2437	11 Mbps	18.00
	11	2462	11 Mbps	18.00
Uncertainty	±0.63 dB			

Average method

Technology Std.	Channel	Frequency (MHz)	Data rate	Average output power (dBm)
IEEE 802.11g	1	2412	54 Mbps	-9.08
	6	2437	54 Mbps	-8.00
	11	2462	54 Mbps	-7.91
Uncertainty	±0.63 dB			

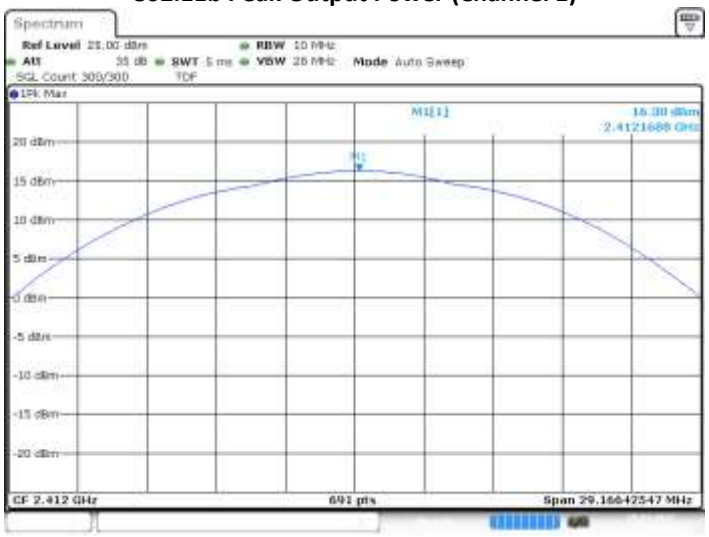
Average method

Technology Std.	Channel	Frequency (MHz)	Data rate	Average output power (dBm)
IEEE 802.11n	1	2412	MCS7	-7.65
	6	2437	MCS7	-6.47
	11	2462	MCS7	-6.79
Uncertainty	±0.63 dB			

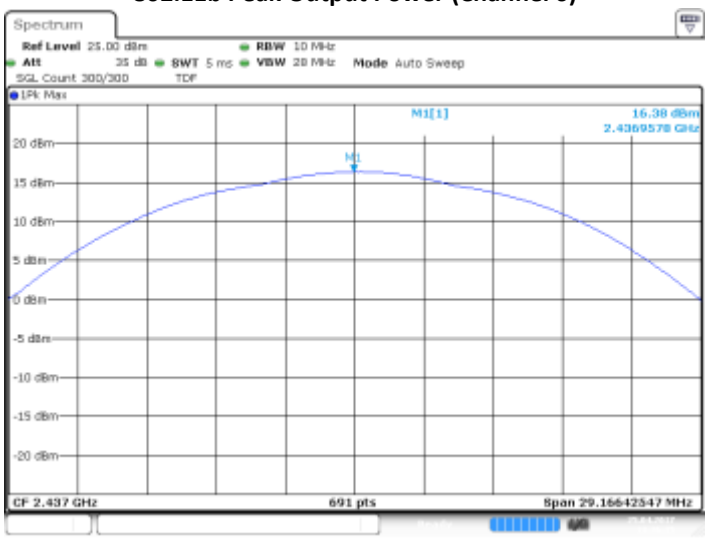
Note: Output power (dBm) =Conducted output power(dBm) + antenna gain (dBi)

3.3.6 Plots of Output Power Measurement

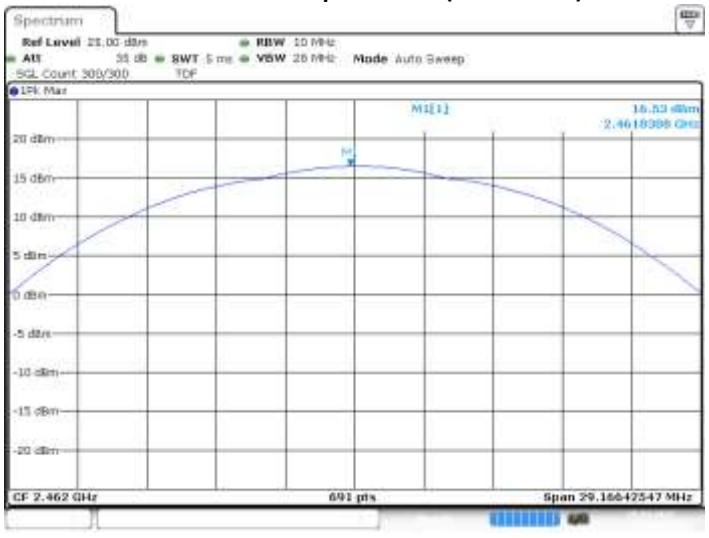
802.11b Peak Output Power (Channel 1)



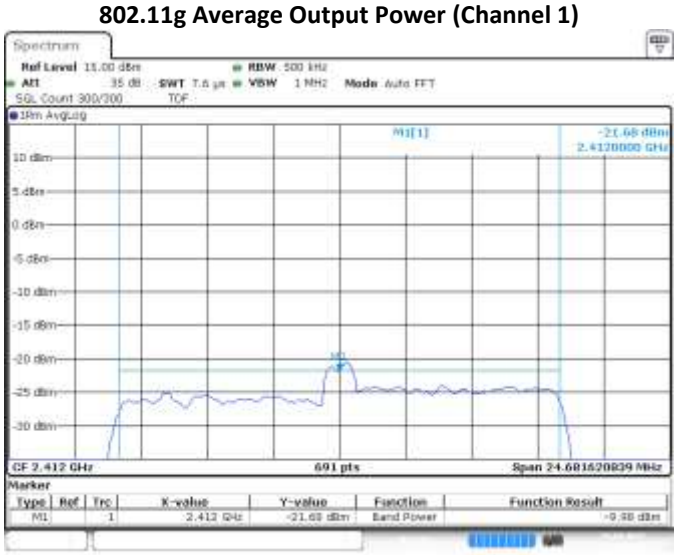
802.11b Peak Output Power (Channel 6)



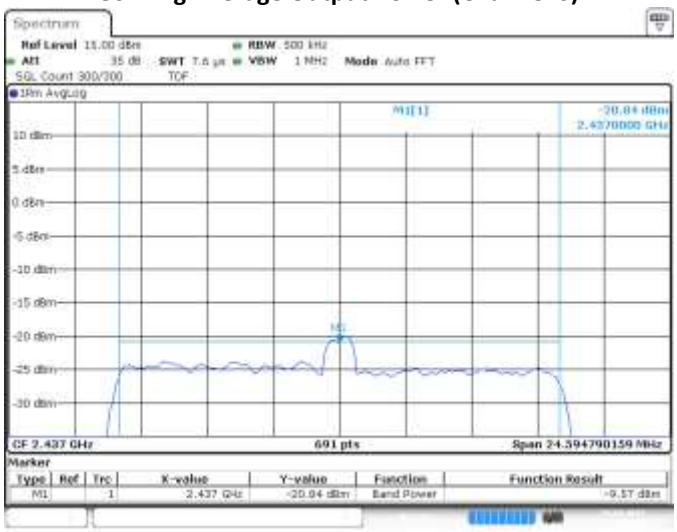
802.11b Peak Output Power (Channel 11)



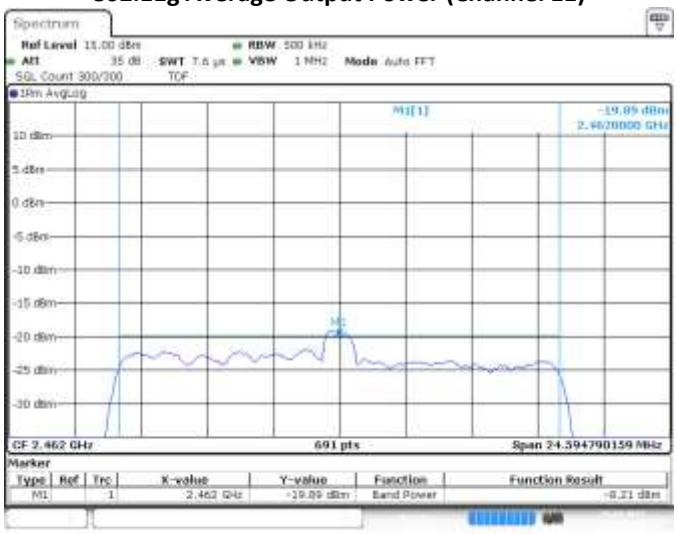
802.11g Average Output Power (Channel 1)



802.11g Average Output Power (Channel 6)

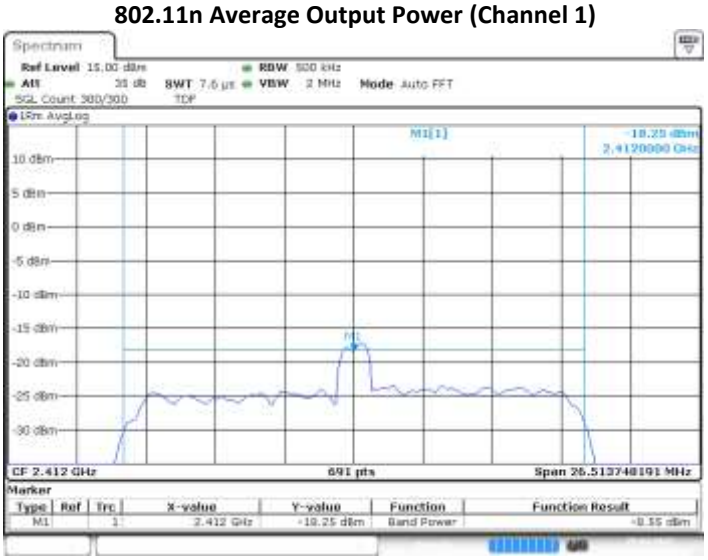


802.11g Average Output Power (Channel 11)

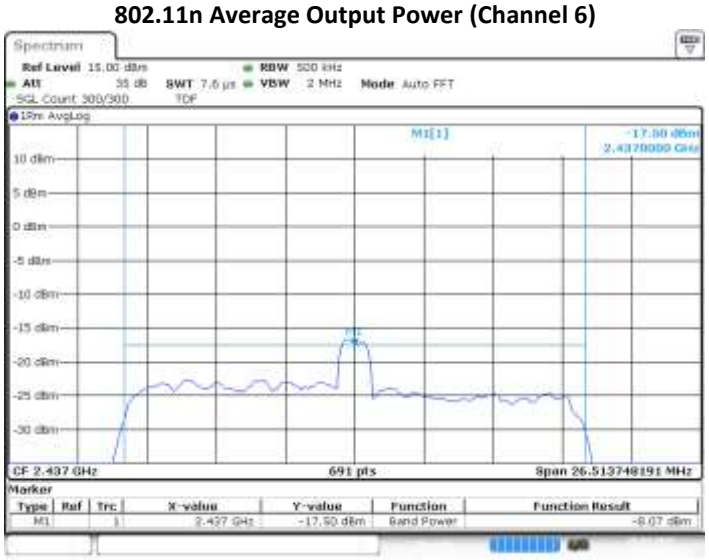


IEEE802_11g_6M, channel: 11 Maximum conducted output power
Date: 25.APR.2017 13:43:19

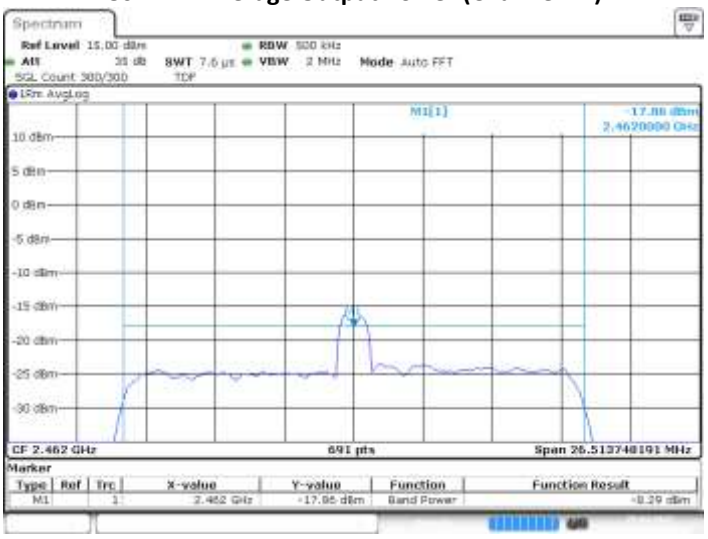
802.11n Average Output Power (Channel 1)



802.11n Average Output Power (Channel 6)



802.11n Average Output Power (Channel 11)



3.4 Power Spectral Density

3.4.1 Limit

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

3.4.2 Measurement instruments

The measurement instruments are listed in chapter 2.5 of this report.

3.4.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.4.4 Test procedure

The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
IRN 030_14 Power Spectral Density (W vs. Hz), method 6.

3.4.5 Test results of Power Spectral Density Measurement

Peak Power spectral density

Technology Std.	Channel	Frequency (MHz)	Data rate	PSD/3 kHz (dBm)
IEEE 802.11b	1	2412	11 Mbps	-9.06
	6	2437	11 Mbps	-9.06
	11	2462	11 Mbps	-8.80
Uncertainty	±0.63 dB			

Average Power spectral density

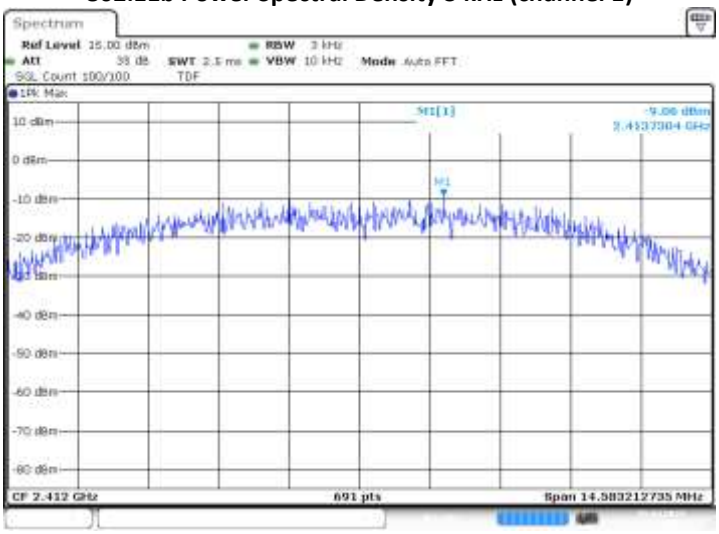
Technology Std.	Channels	Frequency (MHz)	Data rate	PSD/100 kHz (dBm)
IEEE 802.11g	1	2412	54 Mbps	-20.24
	6	2437	54 Mbps	-19.80
	11	2462	54 Mbps	-19.38
Uncertainty	±0.63 dB			

Average Power spectral density

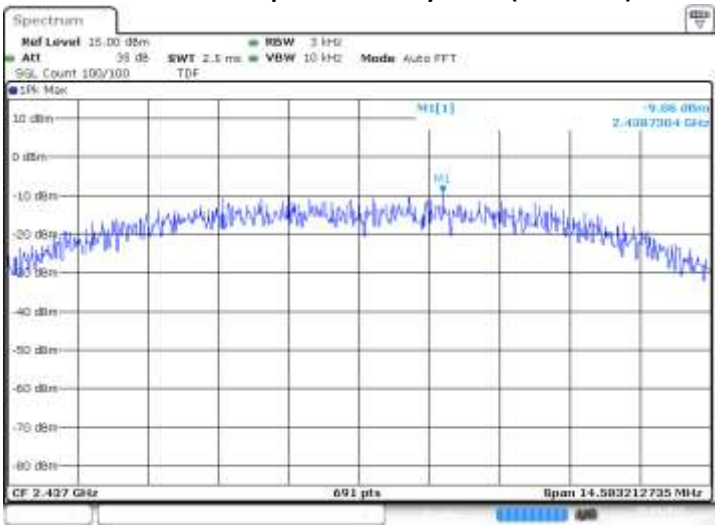
Technology Std.	Channels	Frequency (MHz)	Data rate	PSD/100 kHz (dBm)
IEEE 802.11n	1	2412	MCS7	-23.49
	6	2437	MCS7	-21.23
	11	2462	MCS7	-23.02
Uncertainty	±0.63 dB			

3.4.6 Plots of the Power Spectral Density Measurements

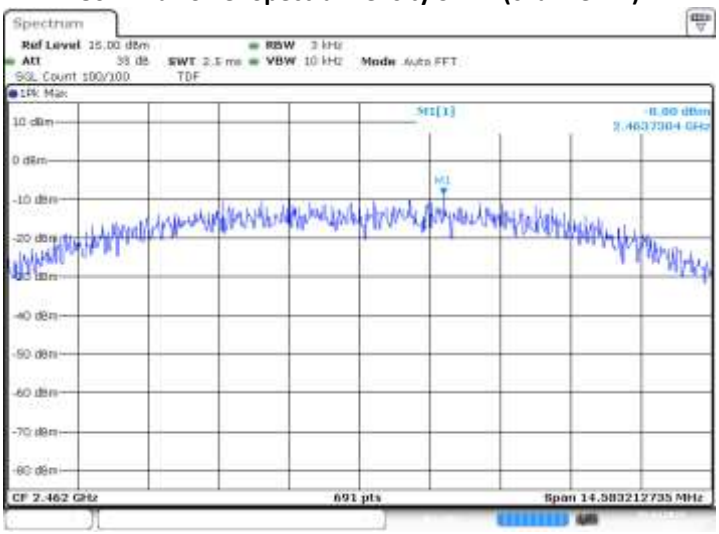
802.11b Power Spectral Density 3 kHz (channel 1)



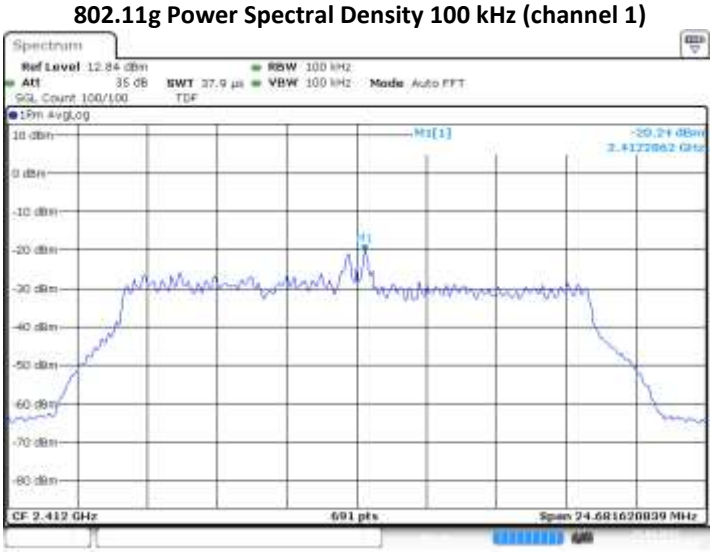
802.11b Power Spectral Density 3 kHz (channel 6)



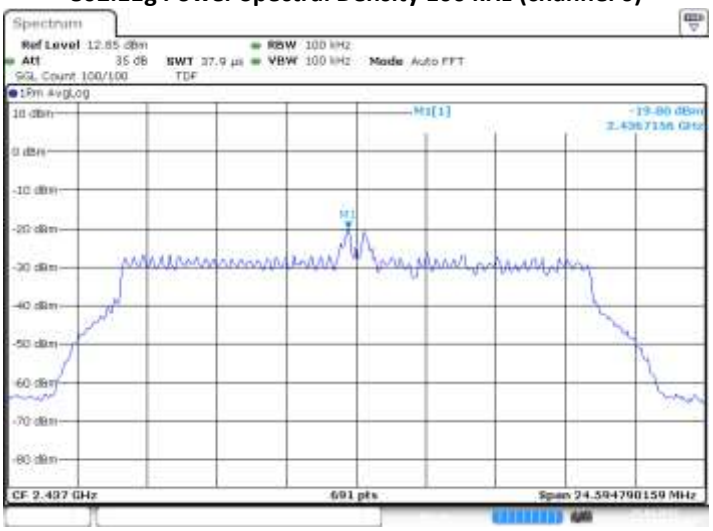
802.11b Power Spectral Density 3 kHz (channel 11)



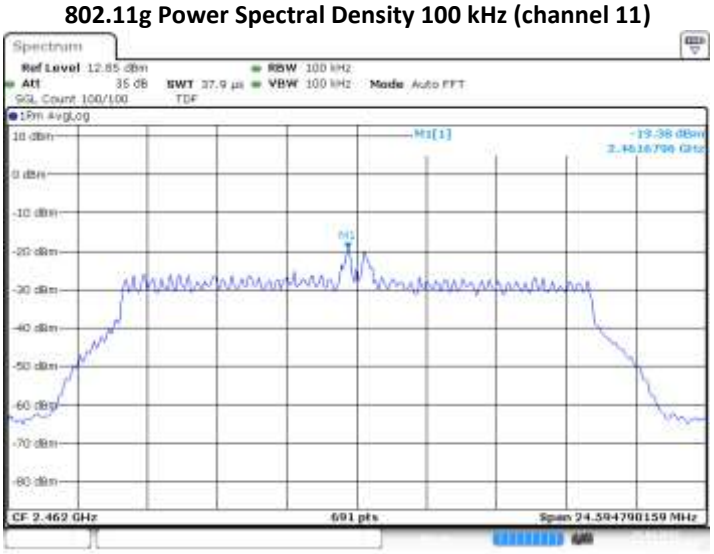
802.11g Power Spectral Density 100 kHz (channel 1)



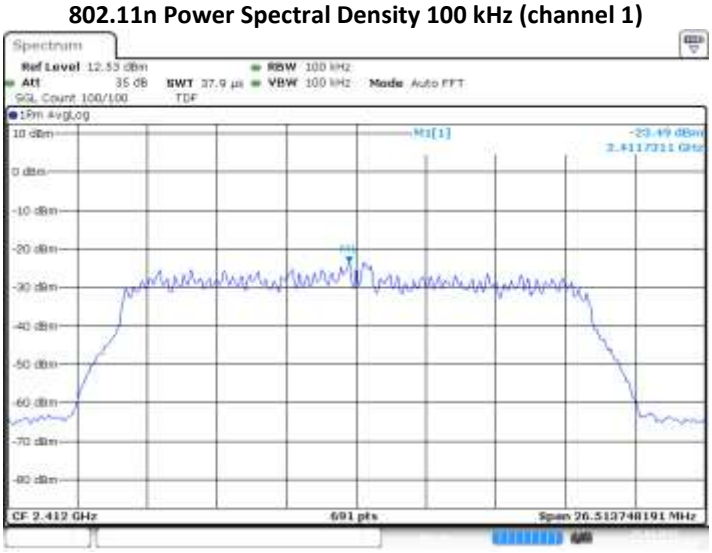
802.11g Power Spectral Density 100 kHz (channel 6)



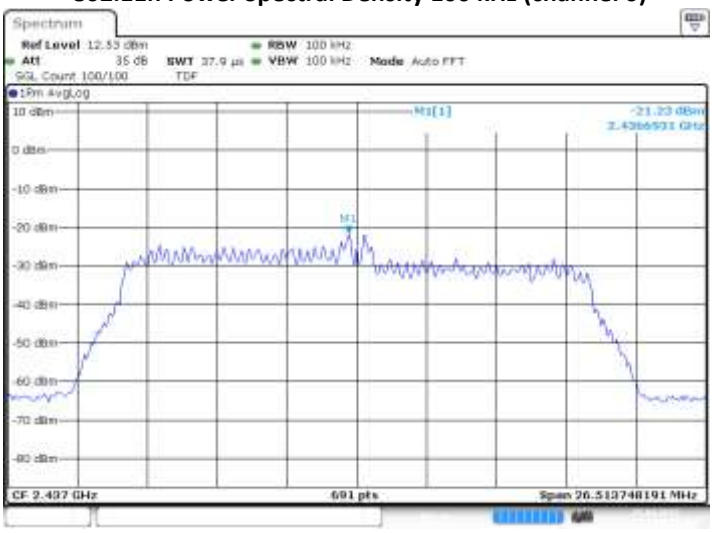
802.11g Power Spectral Density 100 kHz (channel 11)



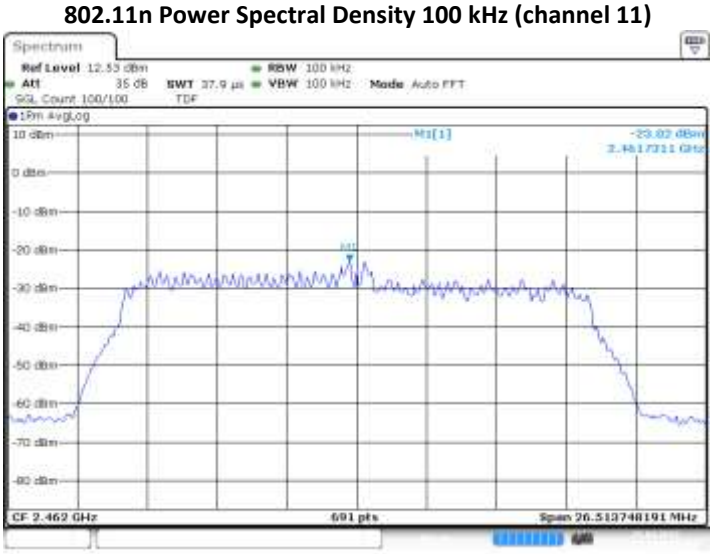
802.11n Power Spectral Density 100 kHz (channel 1)



802.11n Power Spectral Density 100 kHz (channel 6)



802.11n Power Spectral Density 100 kHz (channel 11)



3.5 Conducted Band edge and Spurious Emissions Measurement

3.5.1 Limit

Spurious Emissions:
In any 100 kHz bandwidth outside the operating frequency band, the RF power shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either a RF conducted or a radiated measurement.

Band edge:
At the edge of the authorized band the RF power shall be at least 20 dB down.

3.5.2 Measurement instruments

The measurement instruments are listed in chapter 2.5 of this report.

3.5.3 Test setup

The test setup is as shown in chapter 2.3 of this report.

3.5.4 Test procedure

According to KDB Publication 558074 V04, sections 11.3 and 12.1.
IRN 016_10 Spurious emission (W), method 14.

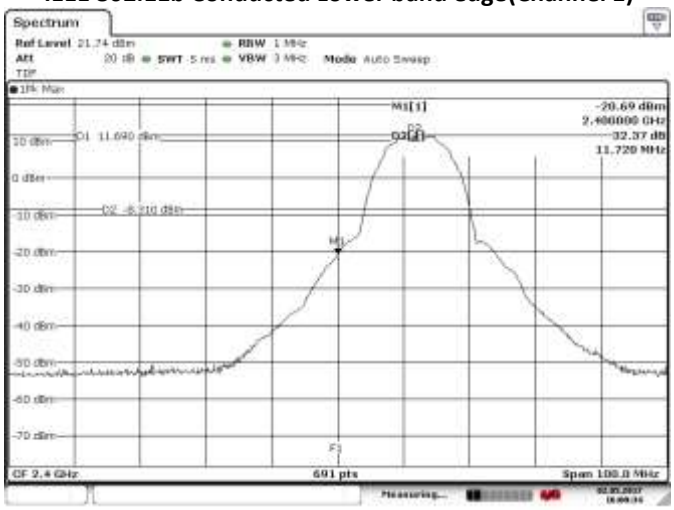
3.5.5 Test results of conducted Band Edge Measurements

Band edge

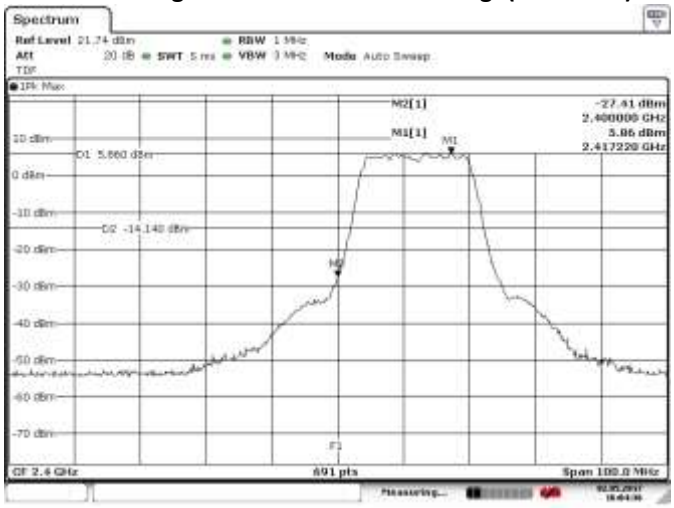
Technology Std.	Channels	Frequency (MHz)	Data rate	Band edge (dBm)	Limit (dBm)
IEEE 802.11b	1	2412	11 Mbps	-20.69	-8.310
IEEE 802.11g	1	2412	54 Mbps	-27.41	-14.410
IEEE 802.11n	1	2412	MCS7	-30.40	-18.760
Uncertainty	±0.63 dB				

3.5.6 Plots of the Conducted Spurious an Band edge Measurements

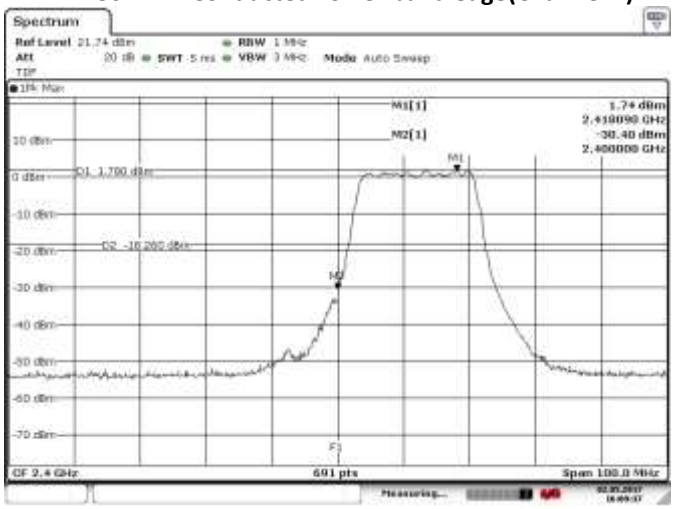
IEEE 802.11b Conducted Lower band edge(Channel 1)



IEEE 802.11g Conducted Lower band edge(Channel 1)

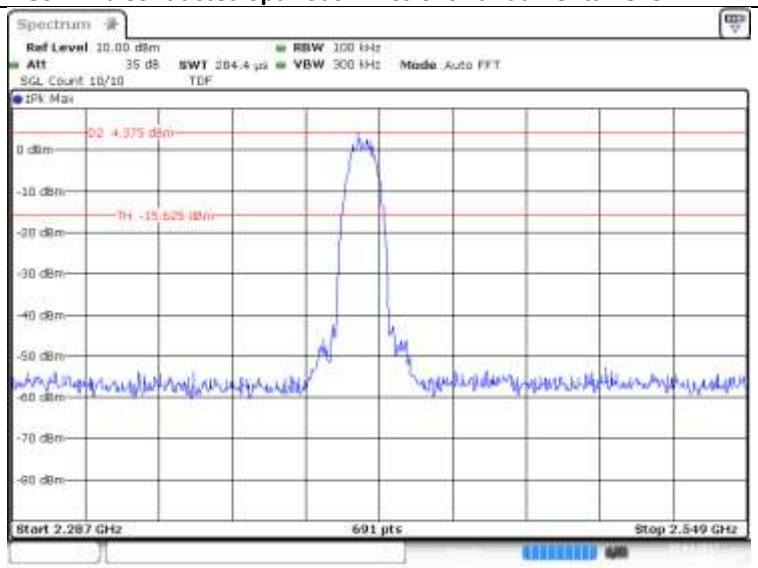
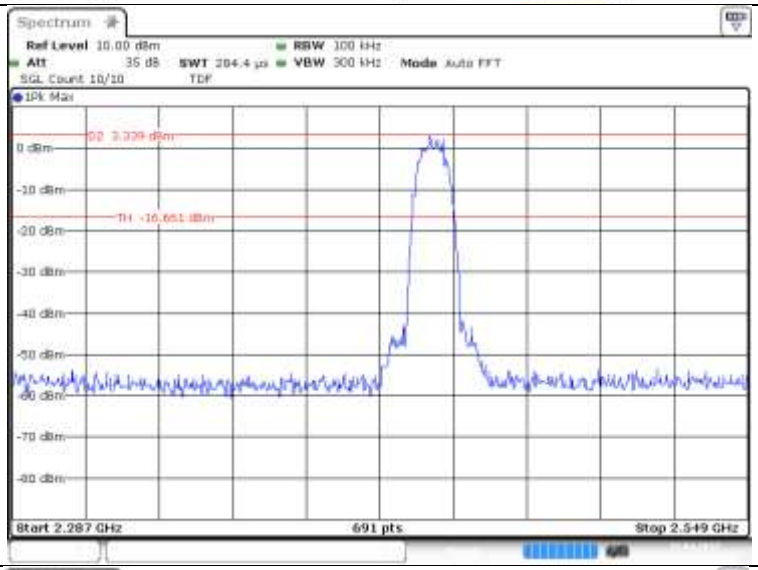
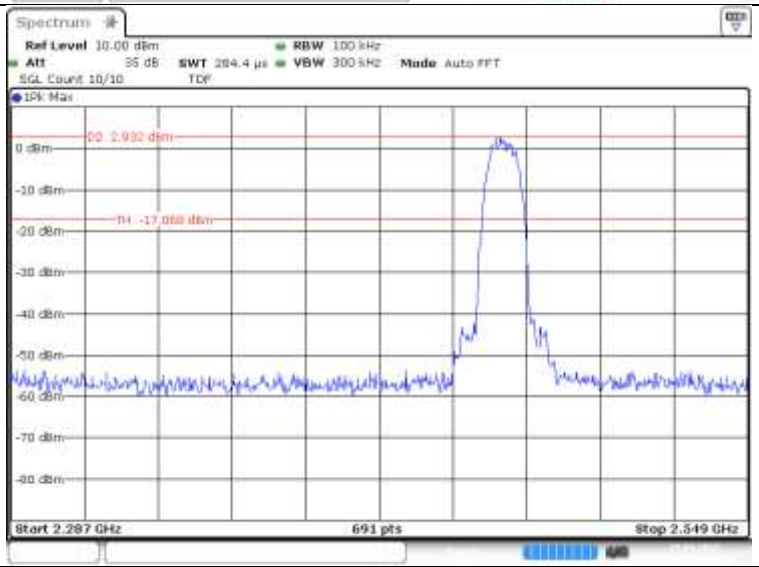


IEEE 802.11n Conducted Lower band edge(Channel 1)

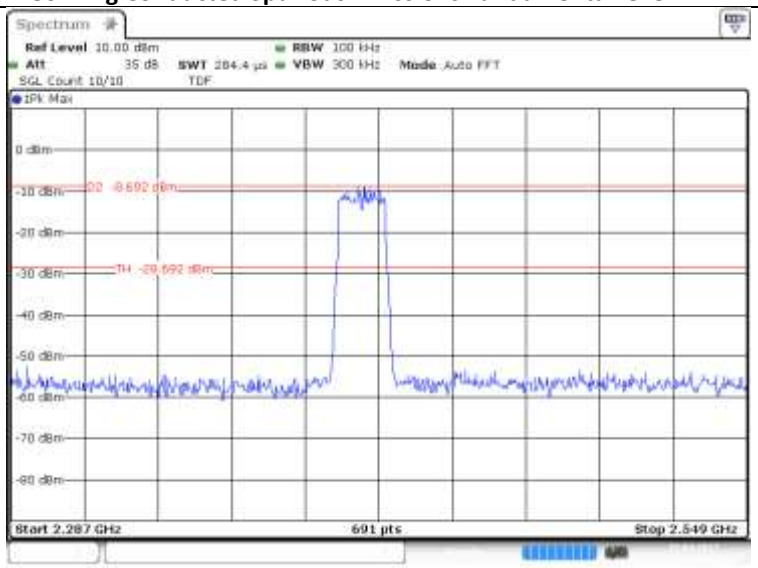
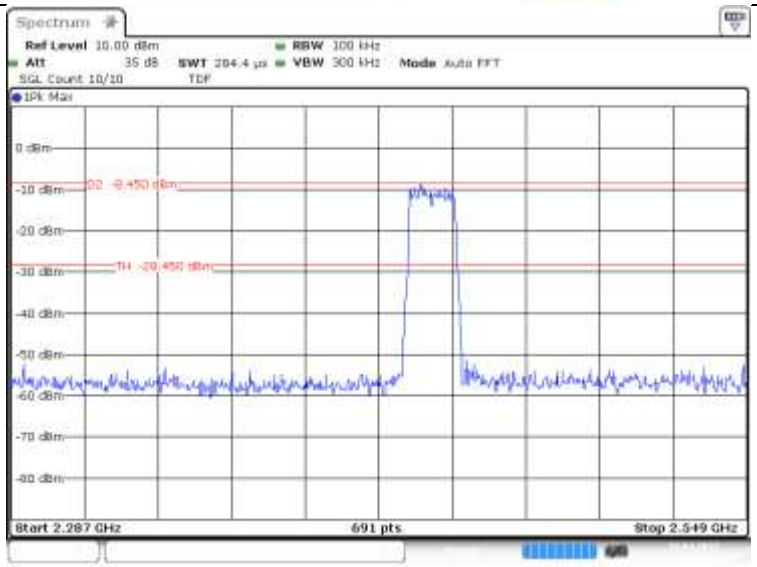
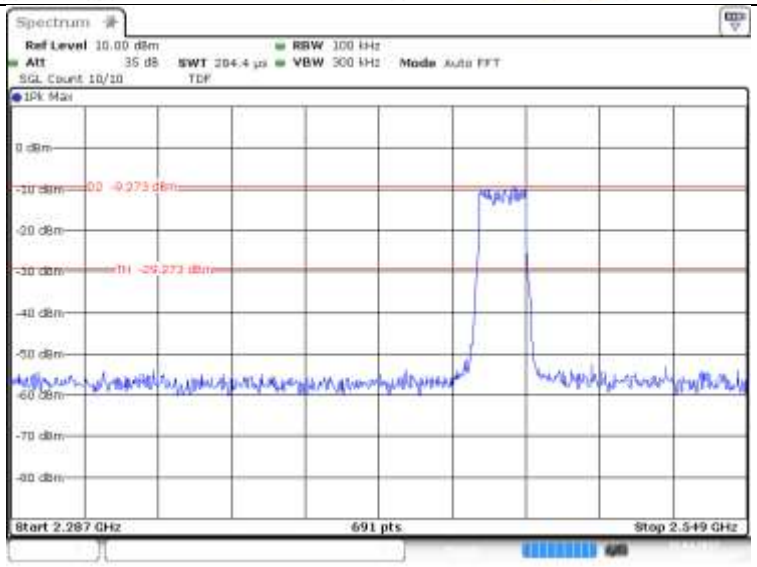


As channel 11 is more than 20 MHz away from the band edge, no measurements were performed for channel 11

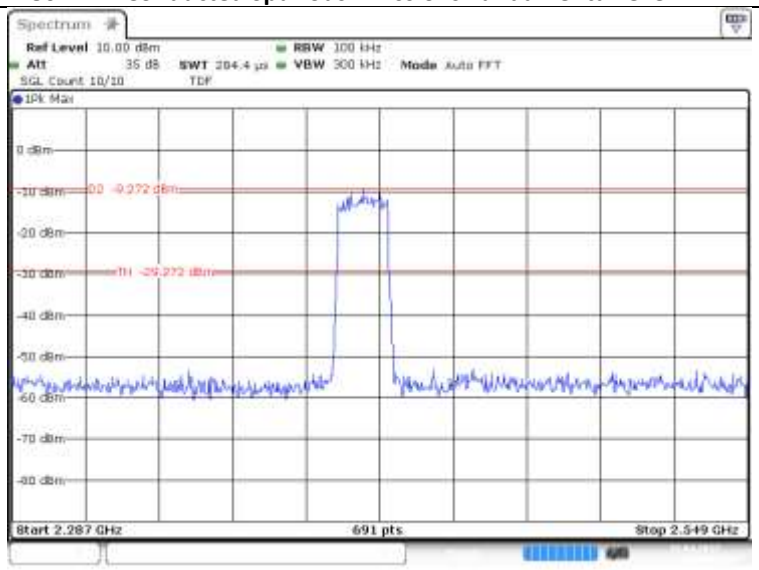
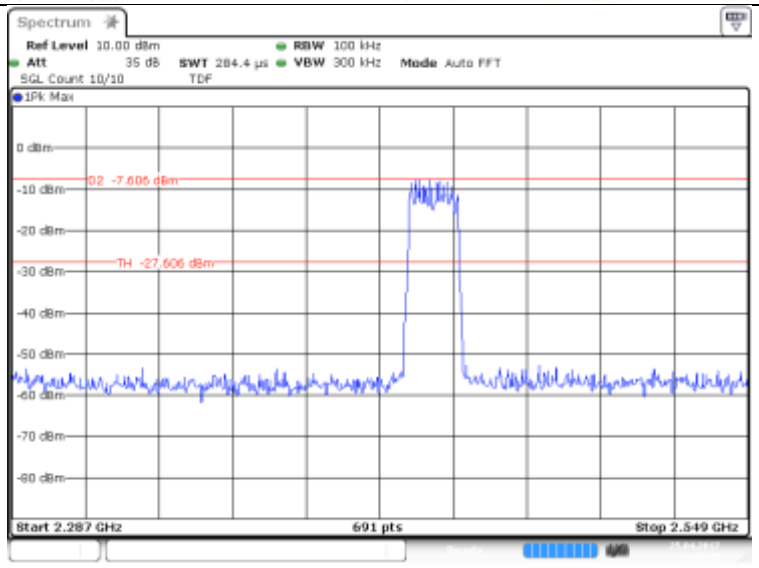
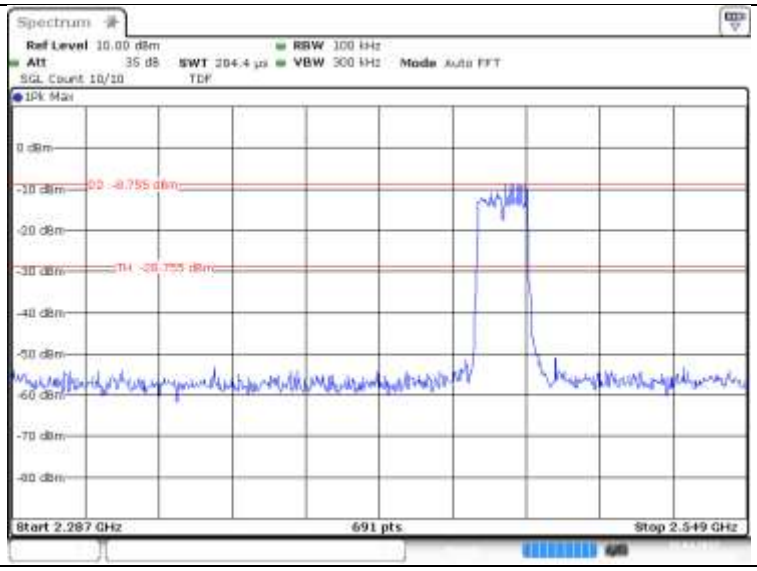
IEEE 802.11b Conducted Spurious Emissions Fundamental level

Low ch	
Mid ch	
High ch	

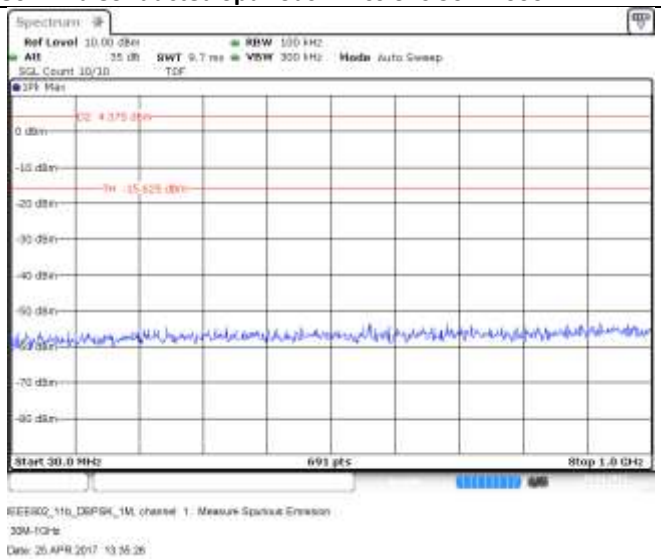
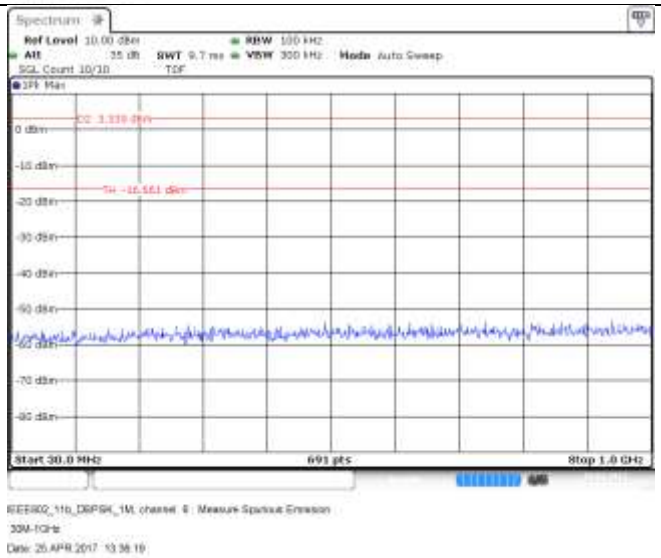
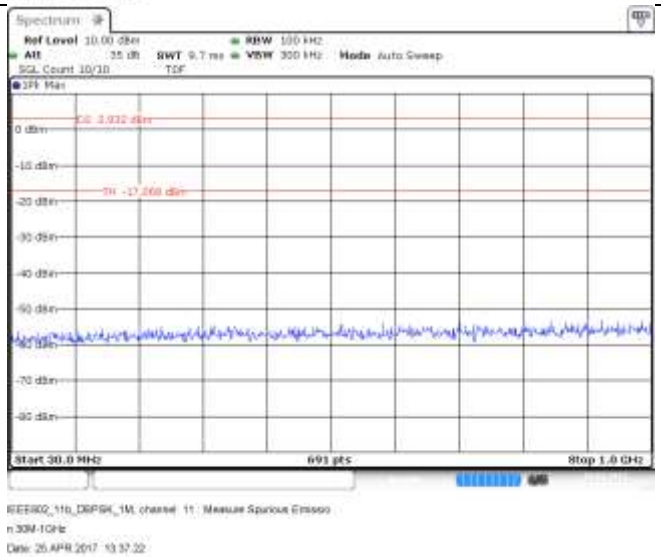
IEEE 802.11g Conducted Spurious Emissions Fundamental level

Low ch	
Mid ch	
High ch	

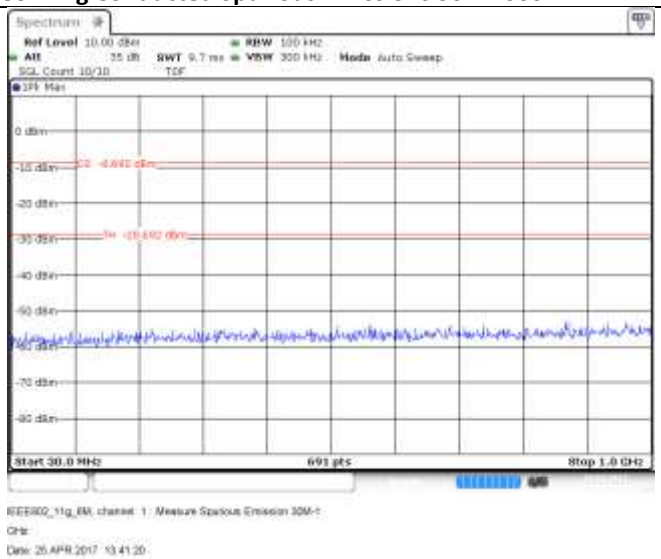
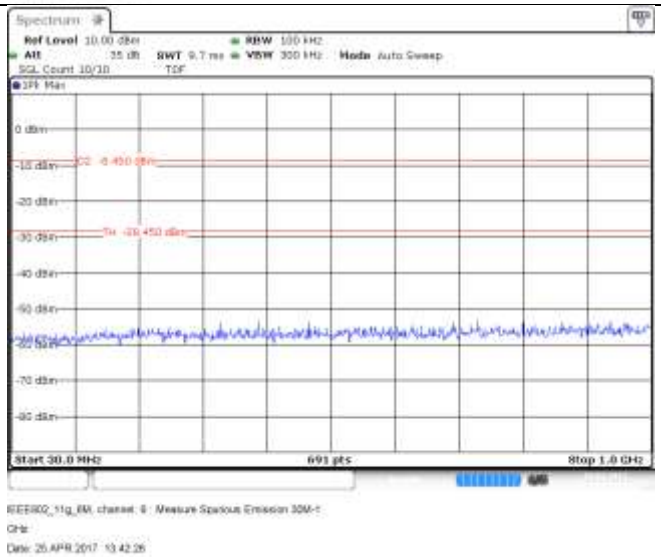
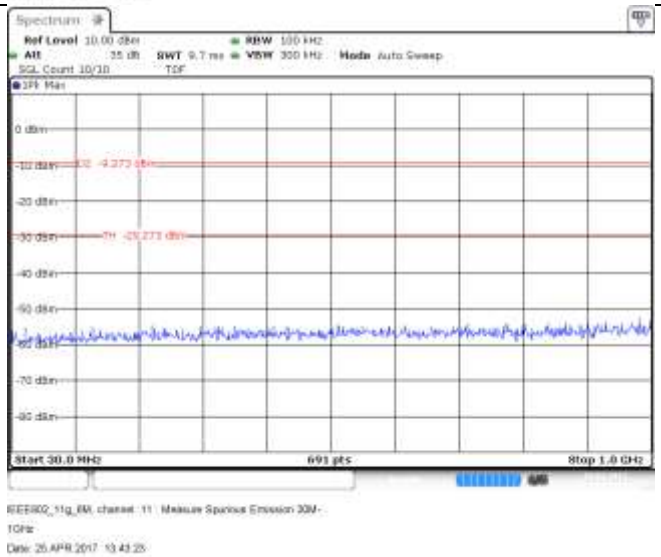
IEEE 802.11n Conducted Spurious Emissions Fundamental level

Low ch	
Mid ch	
High ch	

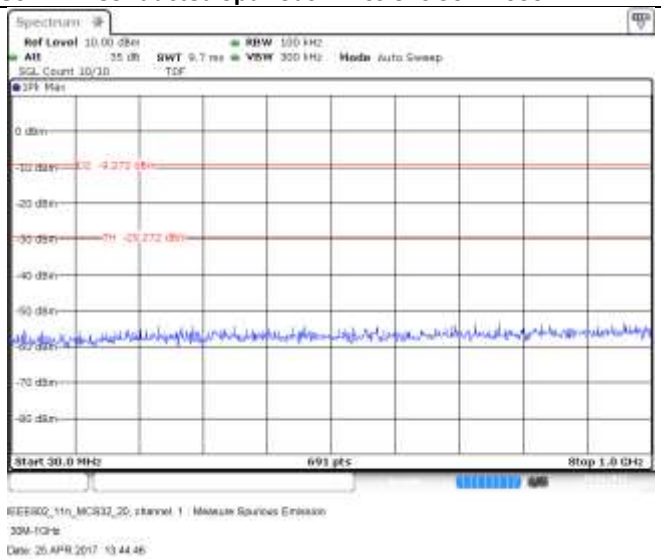
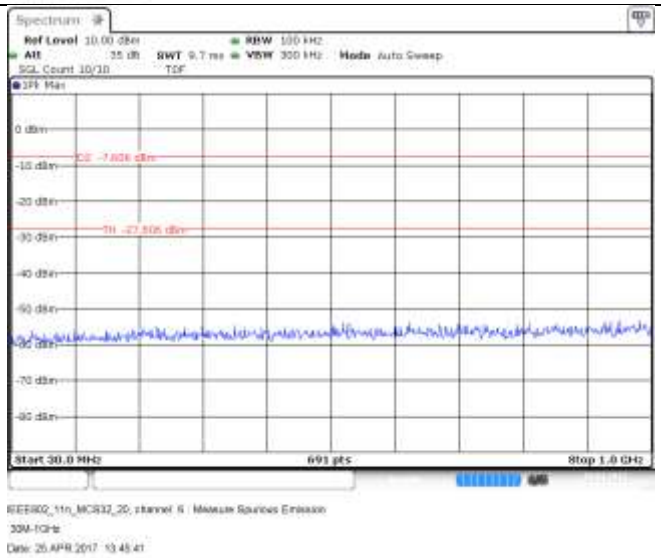
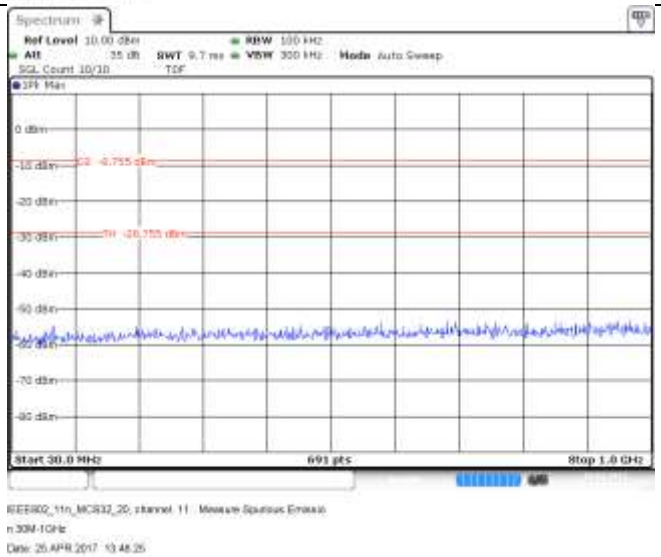
IEEE 802.11b Conducted Spurious Emissions 30 – 1000 MHz

Low ch	
Mid ch	
High ch	

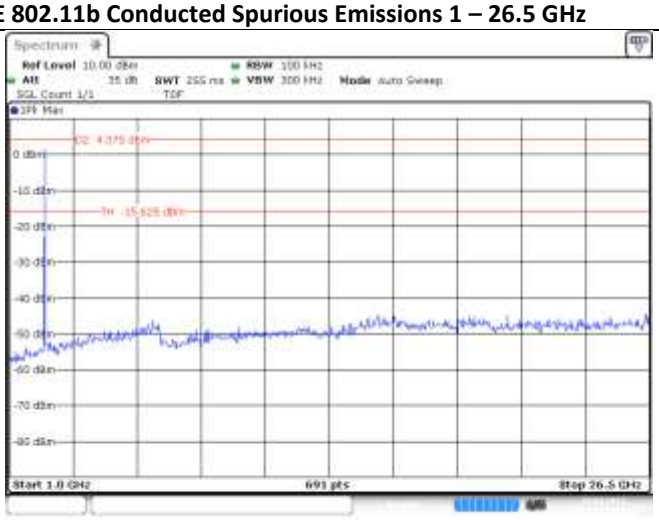
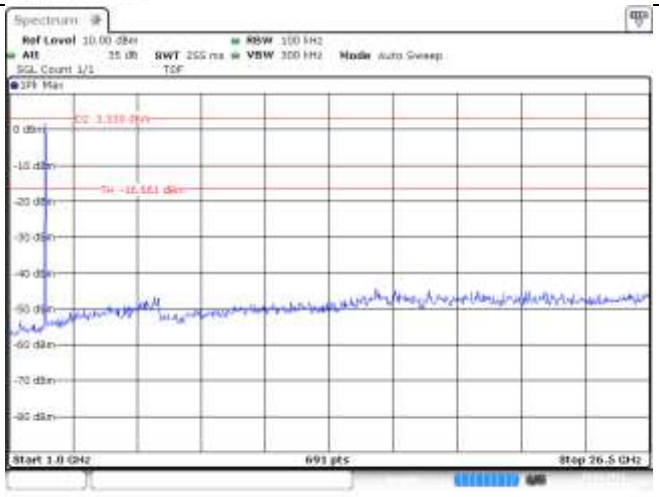
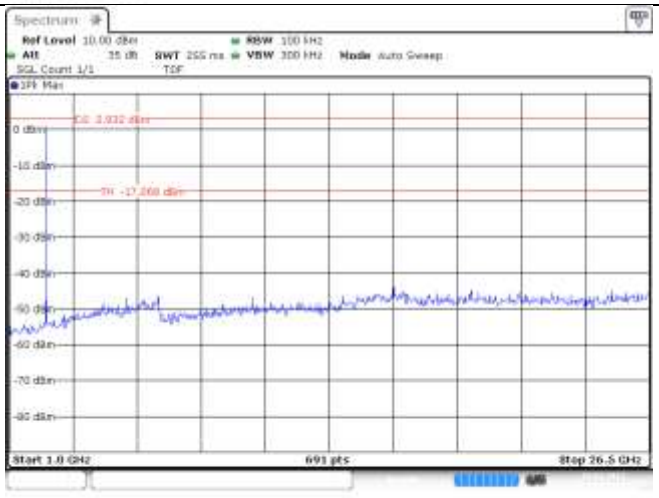
IEEE 802.11g Conducted Spurious Emissions 30 – 1000 MHz

Low ch	
Mid ch	
High ch	

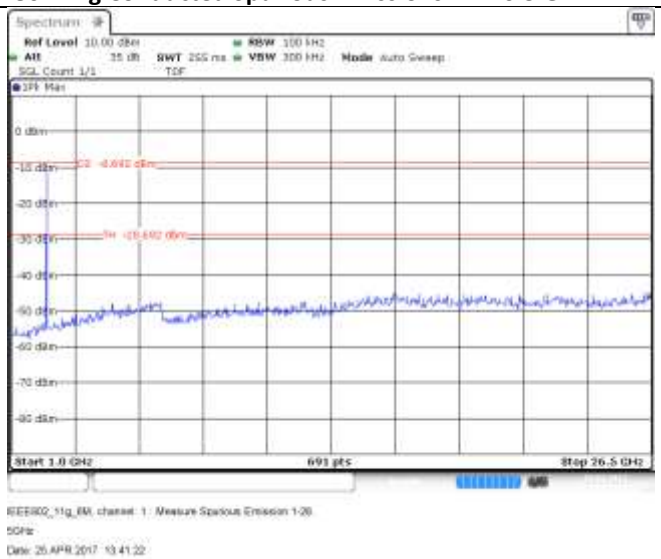
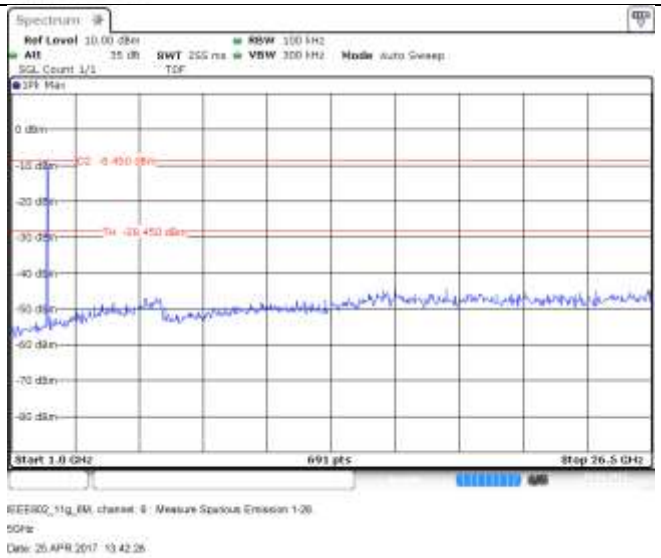
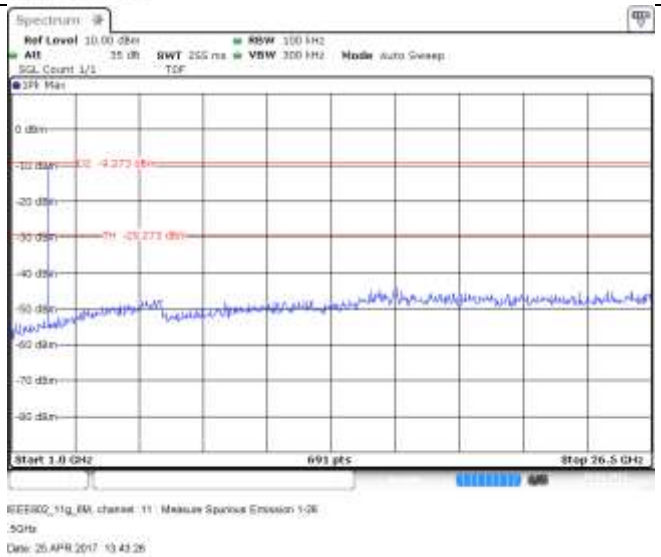
IEEE 802.11n Conducted Spurious Emissions 30 – 1000 MHz

Low ch	
Mid ch	
High ch	

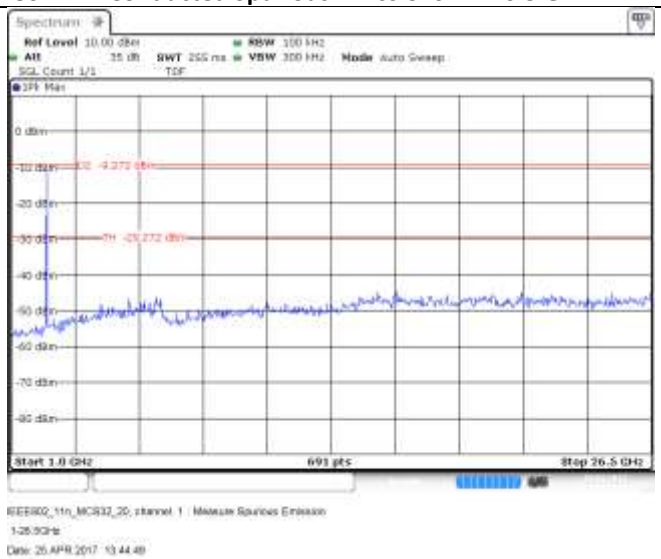
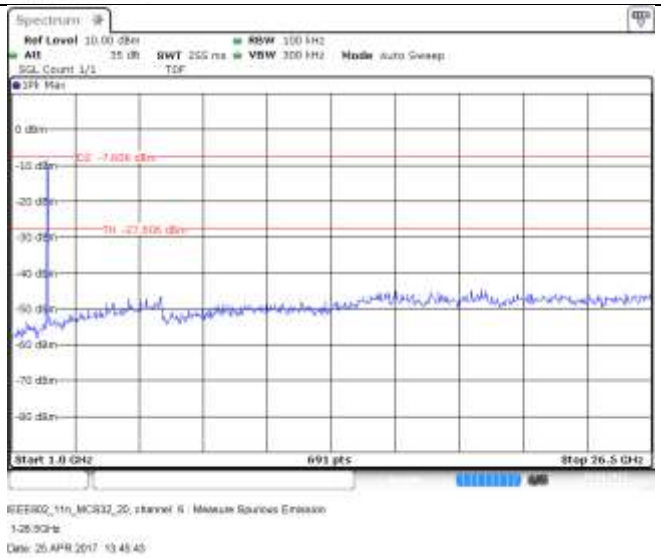
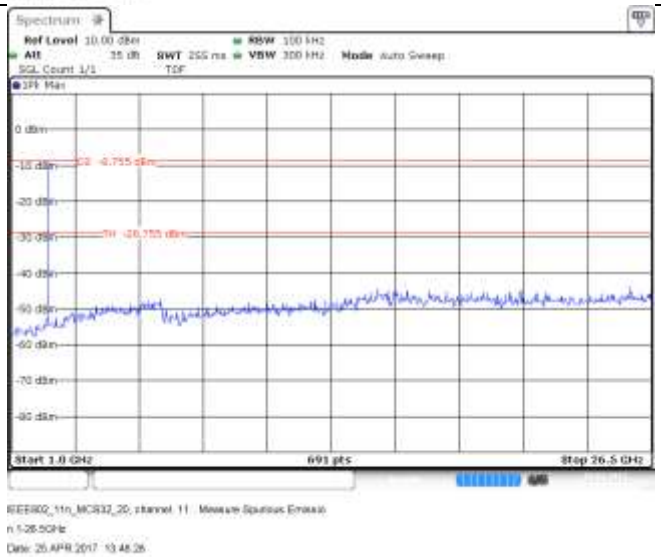
IEEE 802.11b Conducted Spurious Emissions 1 – 26.5 GHz

Low ch	
Mid ch	
High ch	

IEEE 802.11g Conducted Spurious Emissions 1 – 26.5 GHz

Low ch	
Mid ch	
High ch	

IEEE 802.11n Conducted Spurious Emissions 1 – 26.5 GHz

Low ch	
Mid ch	
High ch	

3.6 Radiated Spurious Emissions Measurement

3.6.1 Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

15.209

Frequency (MHz)	Field strength (µV/m)	Measurement distance(m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 - 30	30	30
30 -88	100	3
88 - 216	150	3
216-960	200	3
Above 960	500	3

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz.
Radiated emission limits in these three bands are based on measurements employing an average detector.

3.6.2 Measurement instruments

The measurement instruments are listed in chapter 2.5 of this report.

3.6.3 Test setup

The test setup is as shown in chapter 2.4 of this report.

3.6.4 Test procedure

The procedure follows KDB Publication 558074 V04, sections 11.3 and 12.1
IRN 026_14 Radiated electrical disturbance (V per m), methods 1, 2 and 3.

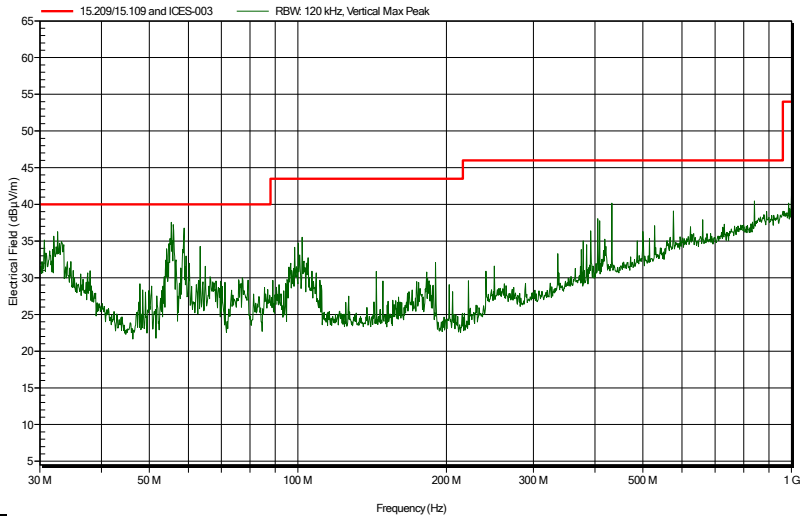
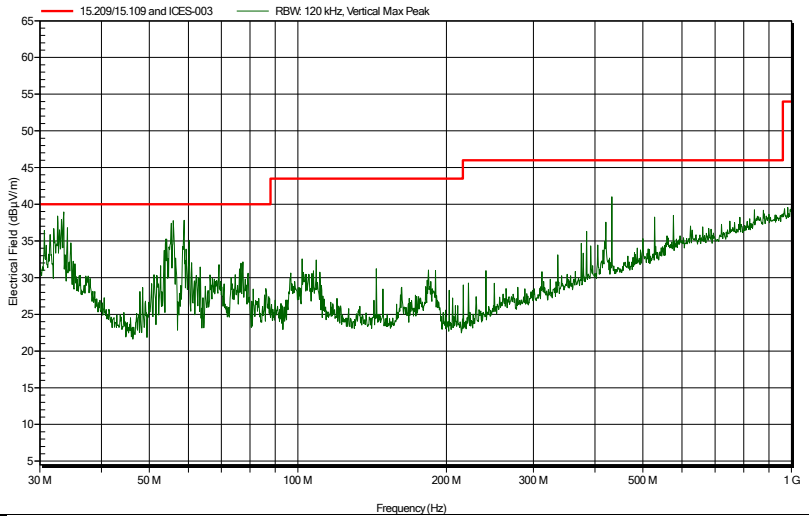
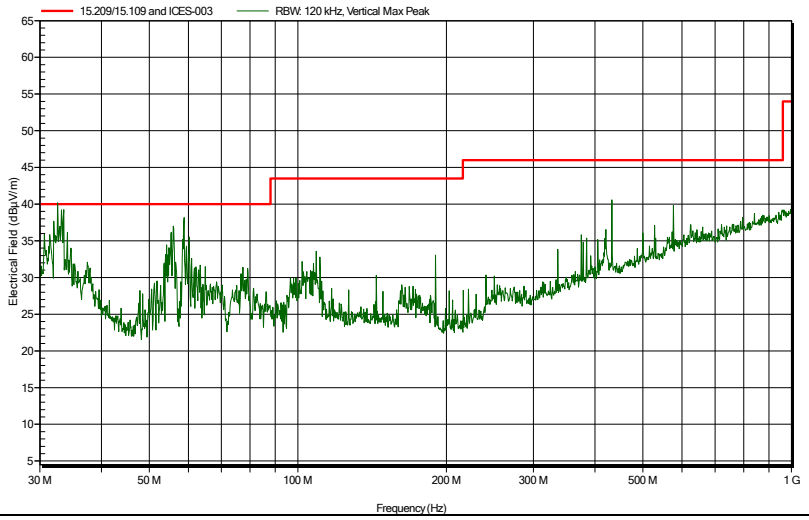
3.6.5 Note to the plots (next pages)

- In the frequency range of 1 – 18 GHz the green trace is measured using a peak detector and the red trace is measured using an average detector. The top limit line represent the peak limit and the bottom limit represents the average limit.
  In general, the peak measurement has been omitted, except for the first two plots which show that the peak results are well below the peak limit (15 dB or more).

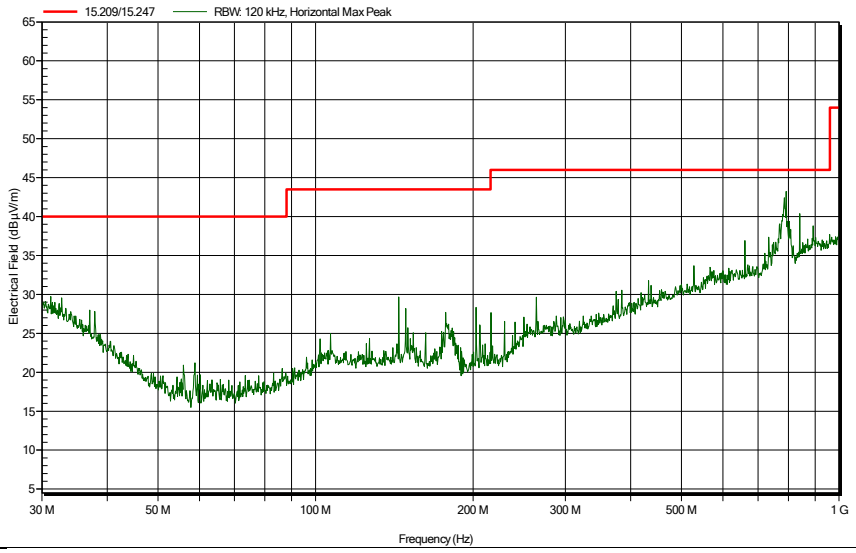
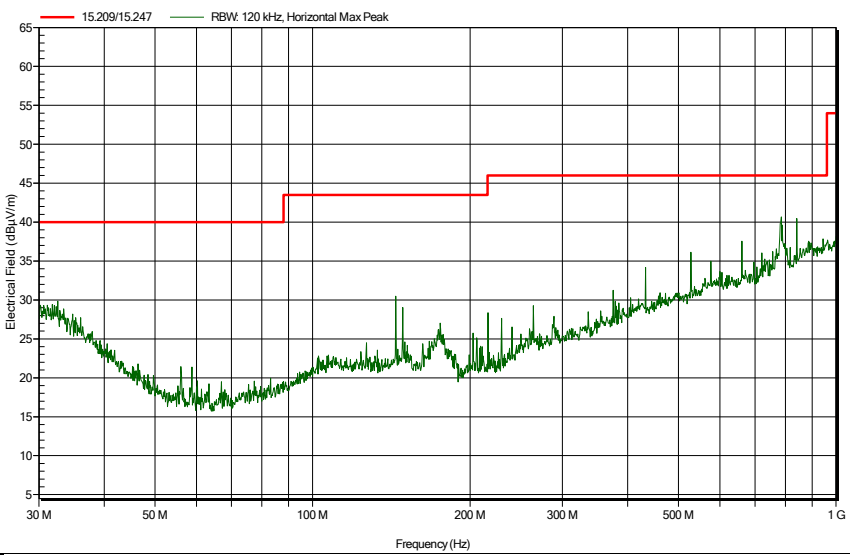
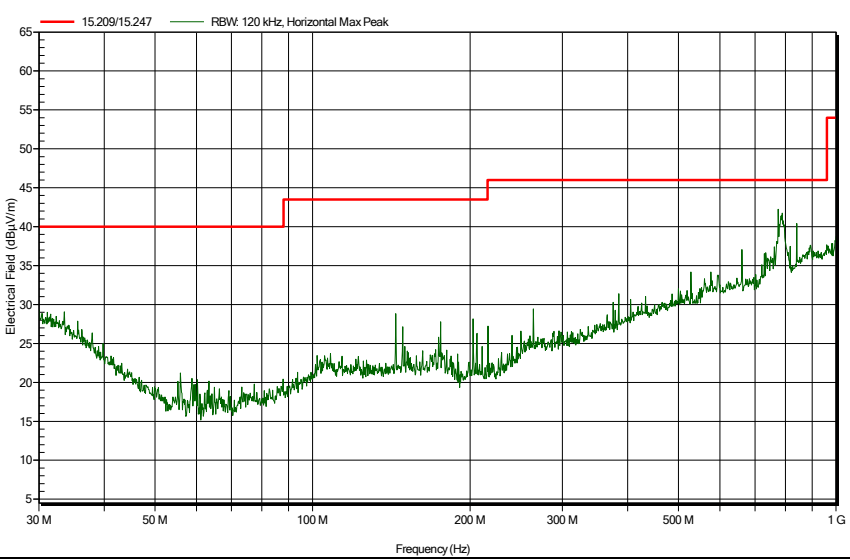
3.6.6 Plots of the Radiated Spurious Emissions Measurement

30 – 1000 MHz

Vertical polarization, 802.11b

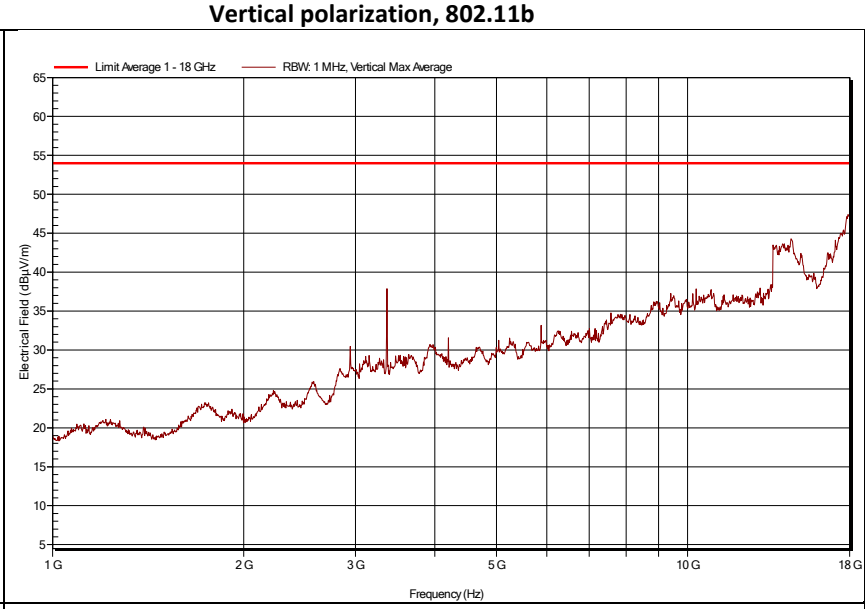
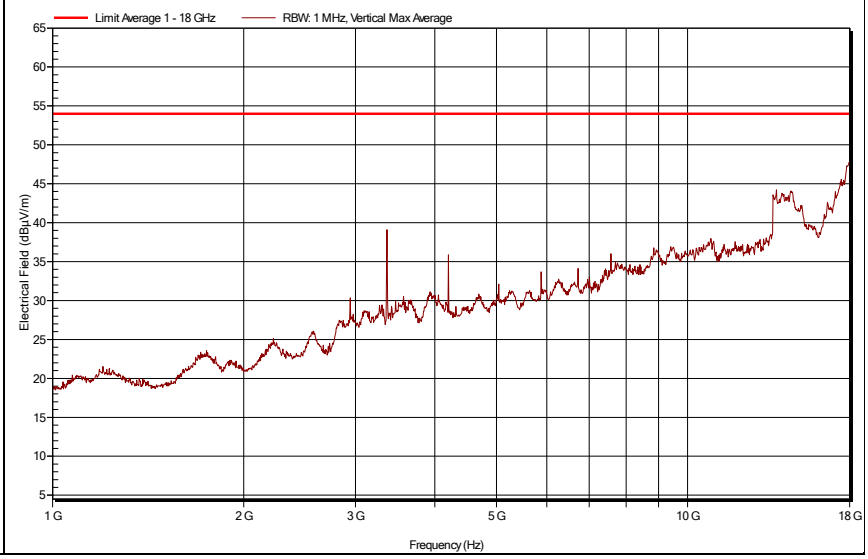
Low ch	
Mid ch	
High ch	

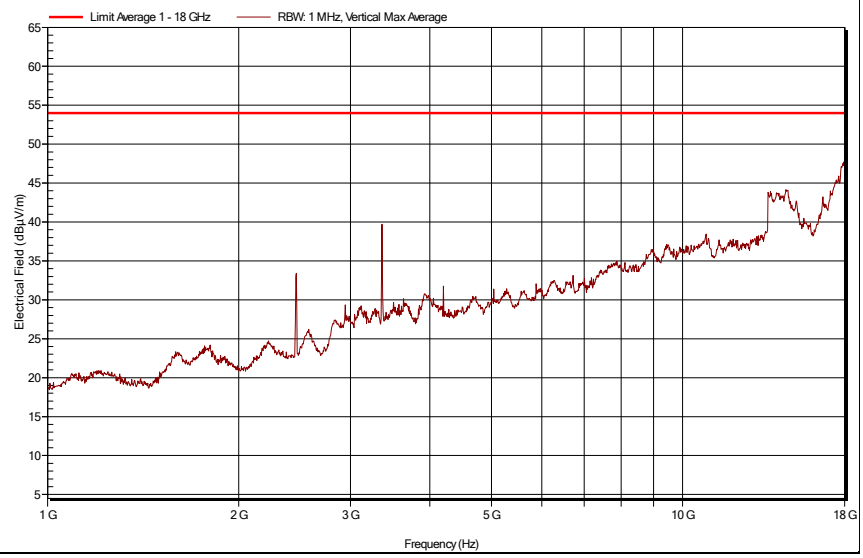
Horizontal polarization, 802.11b

Low ch	
Mid ch	
High ch	

1 – 18 GHz

Vertical polarization, 802.11b

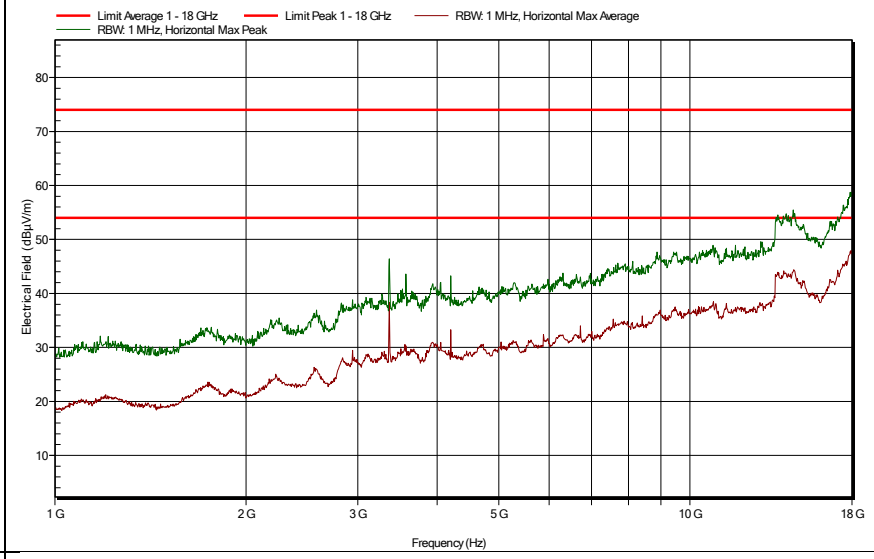
Low ch	
Mid ch	

High ch	

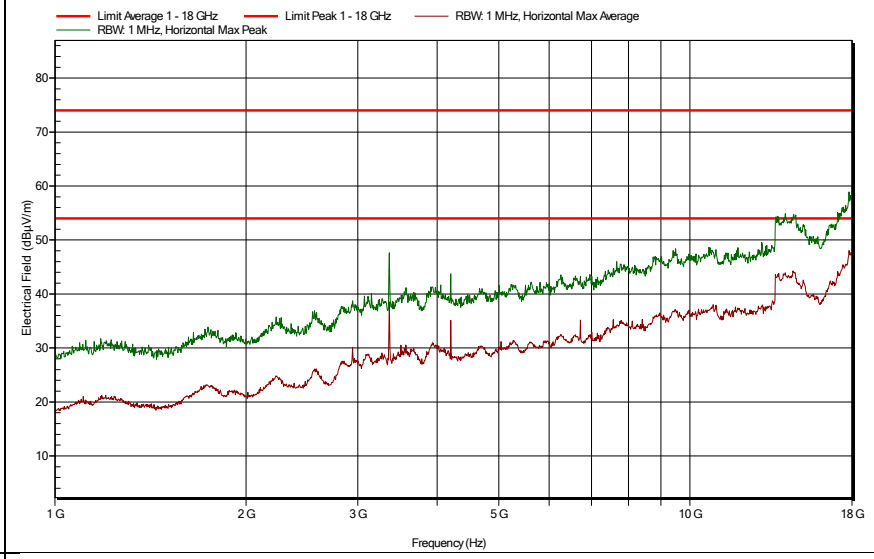
Limit Average 1 - 18 GHz
RBW: 1 MHz, Vertical Max Average
Electrical Field (dBµV/m)
65
60
55
50
45
40
35
30
25
20
15
10
5
1 G
2 G
3 G
5 G
10 G
18 G
Frequency (Hz)

Horizontal polarization, 802.11b

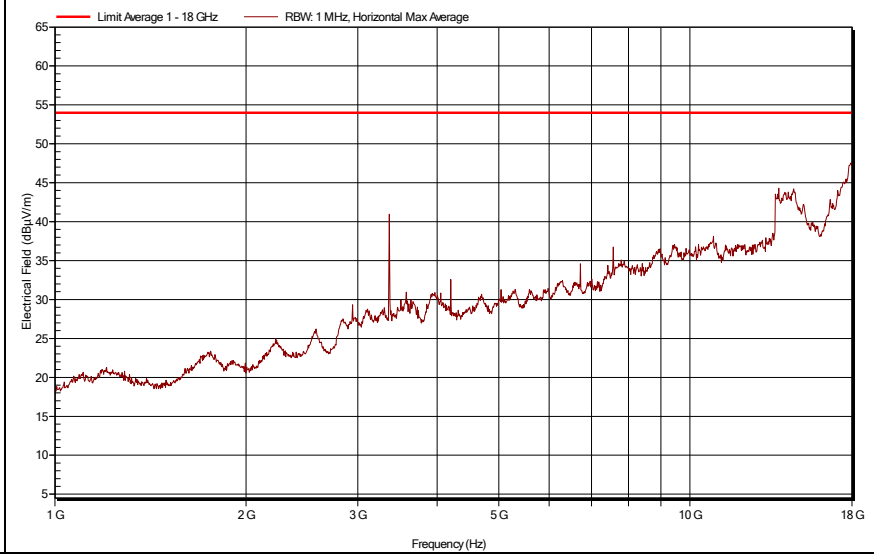
Low ch



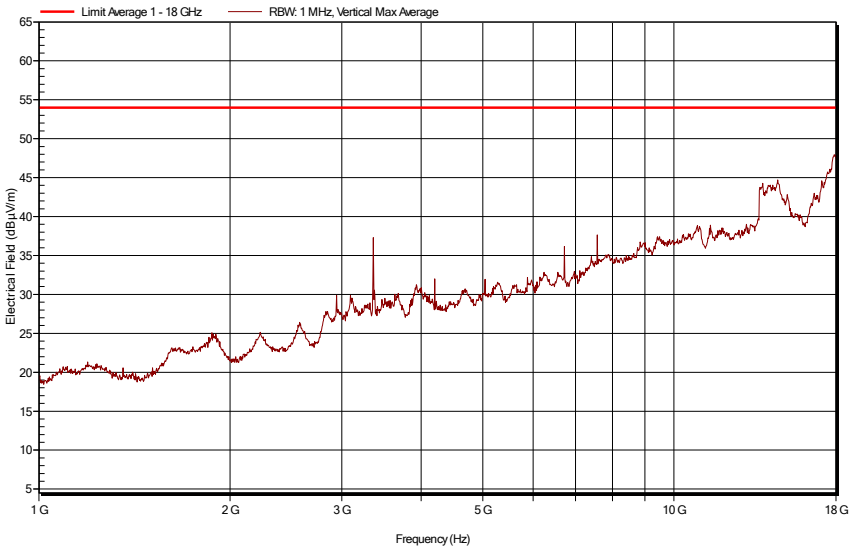
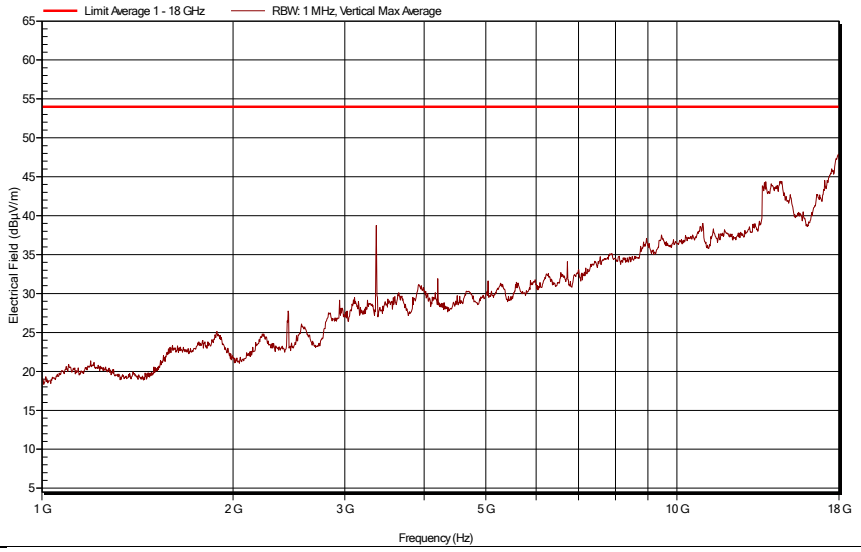
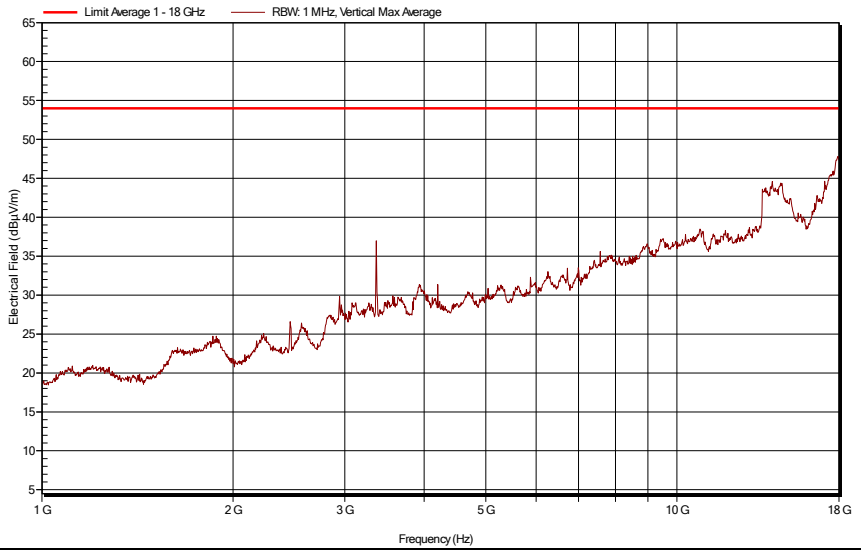
Mid ch



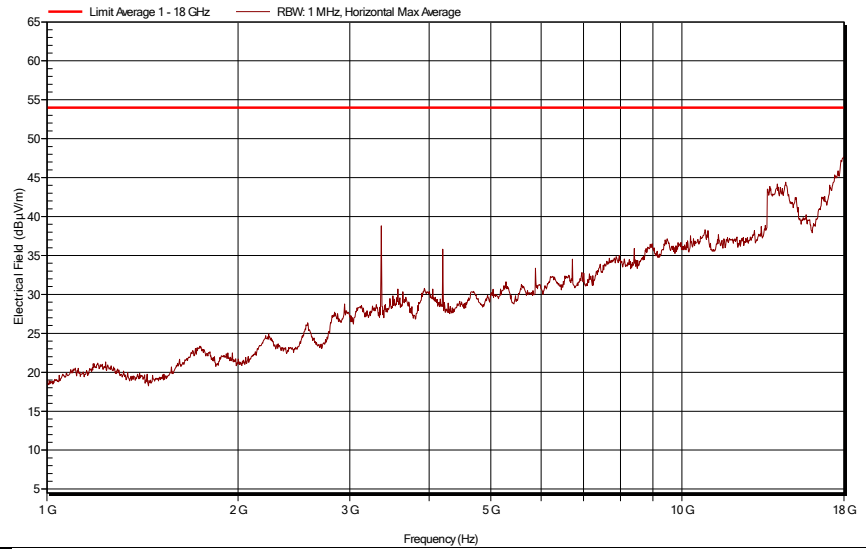
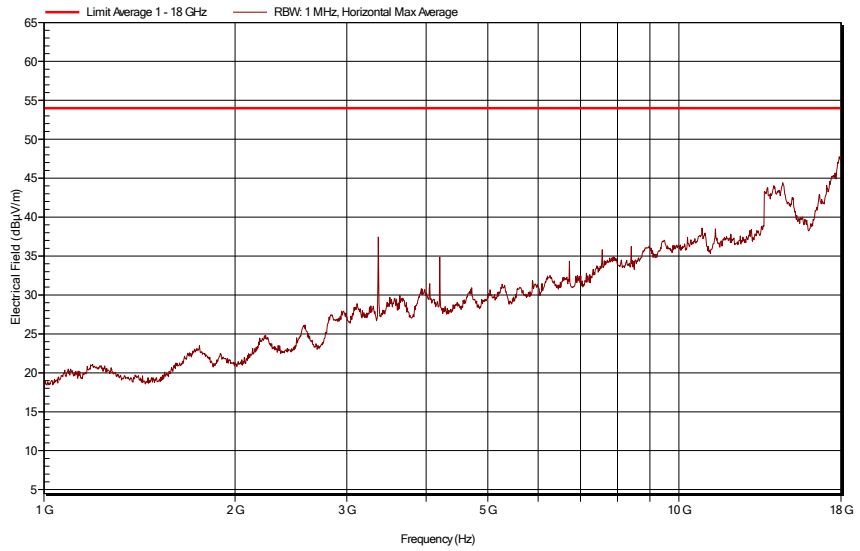
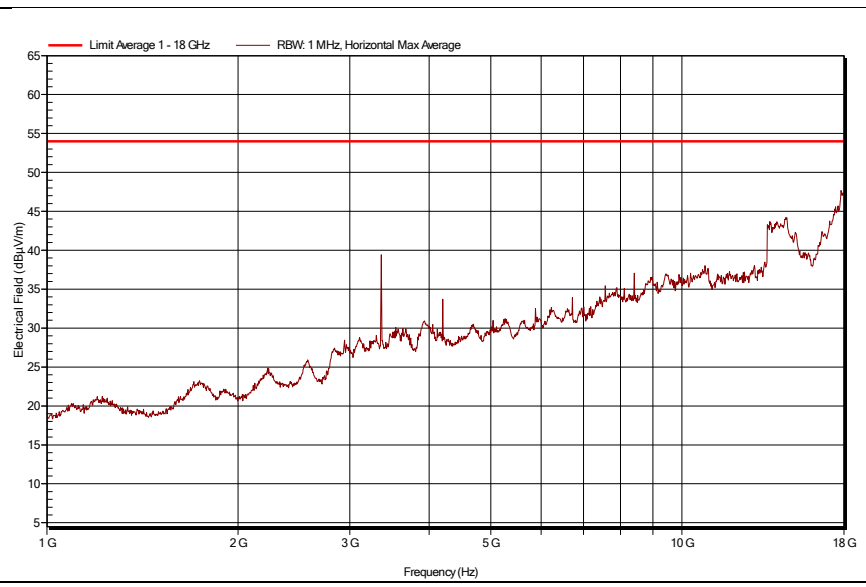
High ch



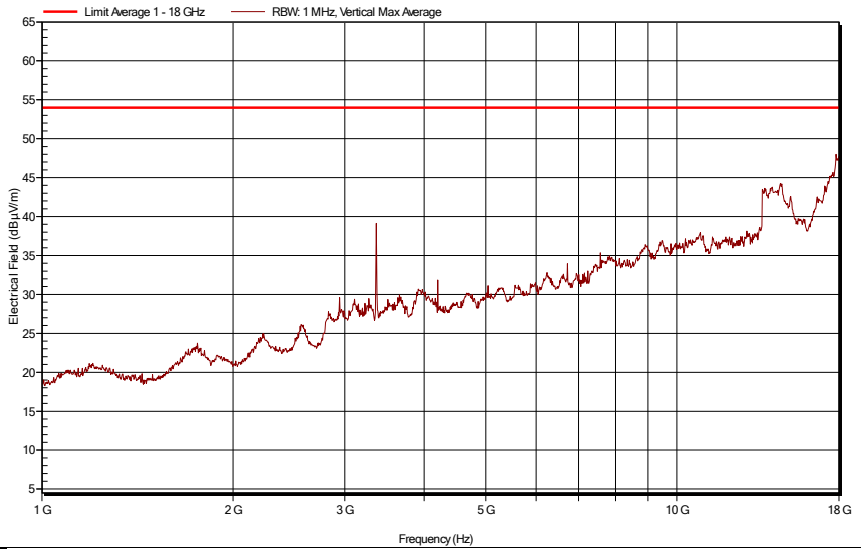
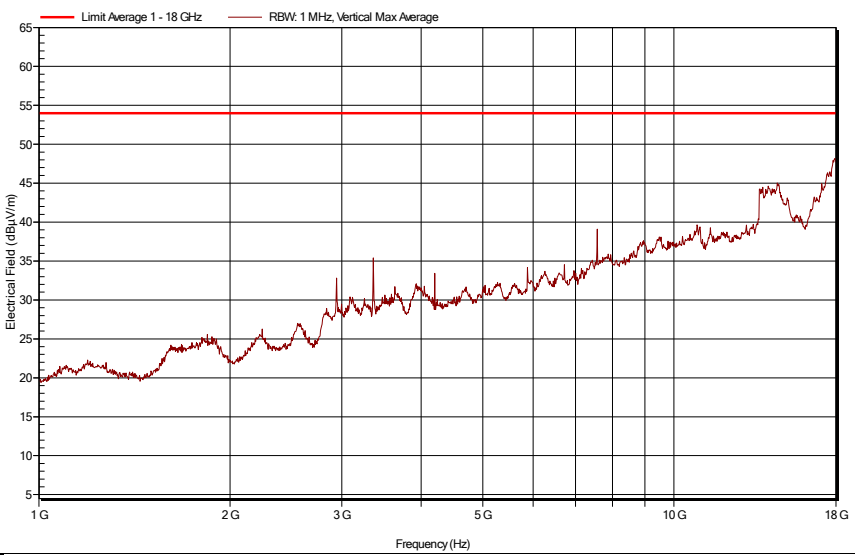
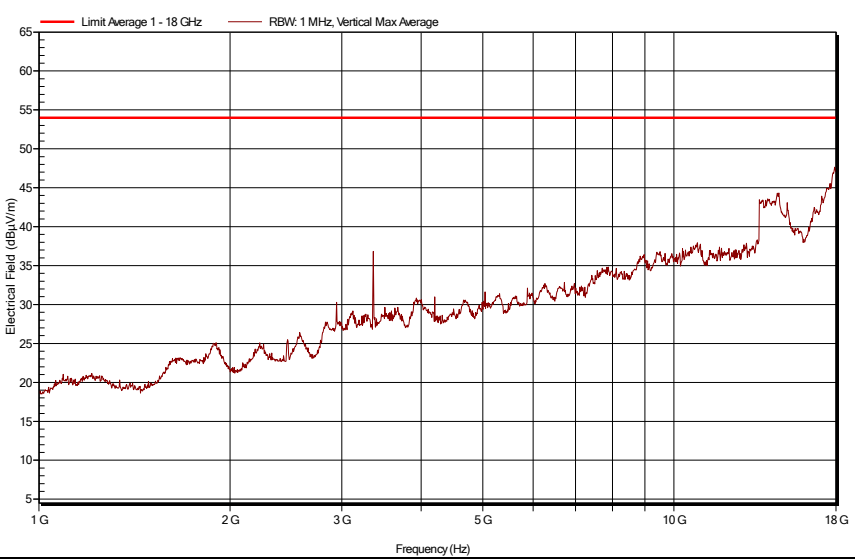
Vertical polarization, 802.11g

Low ch	
Mid ch	
High ch	

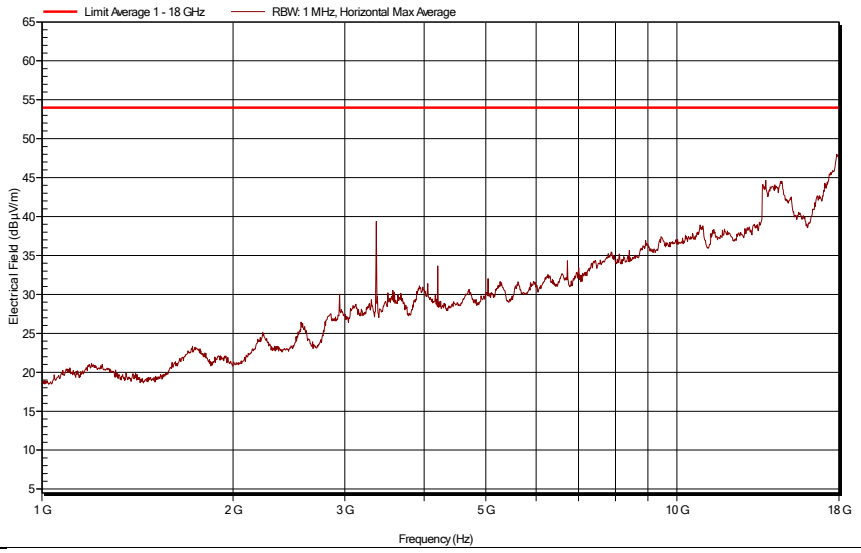
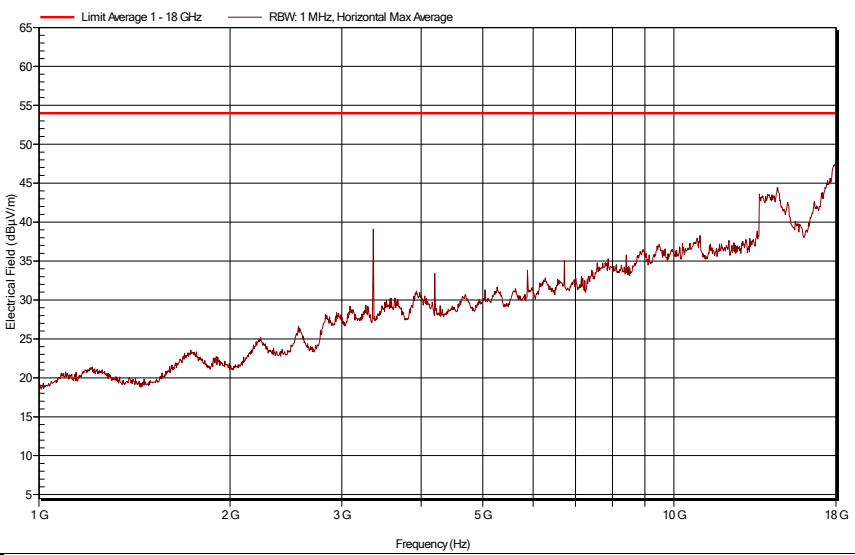
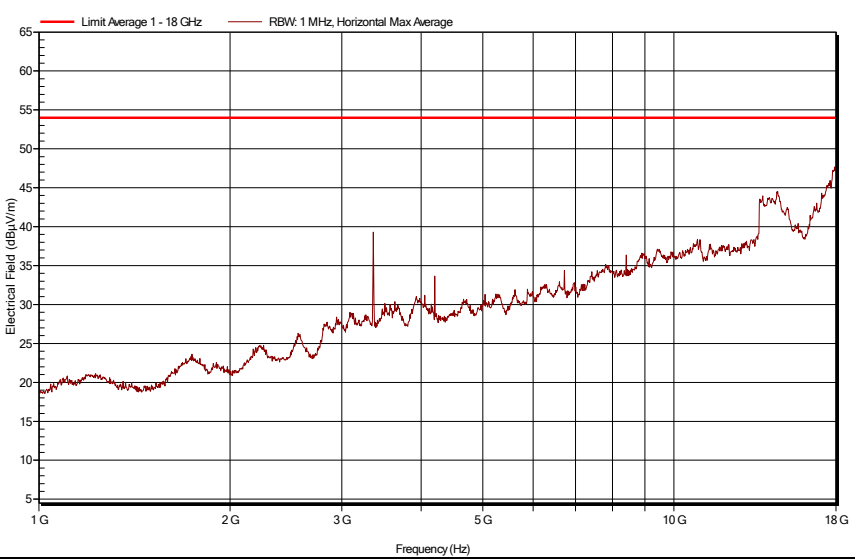
Horizontal polarization, 802.11g

Low ch	
Mid ch	
High ch	

Vertical polarization, 802.11n

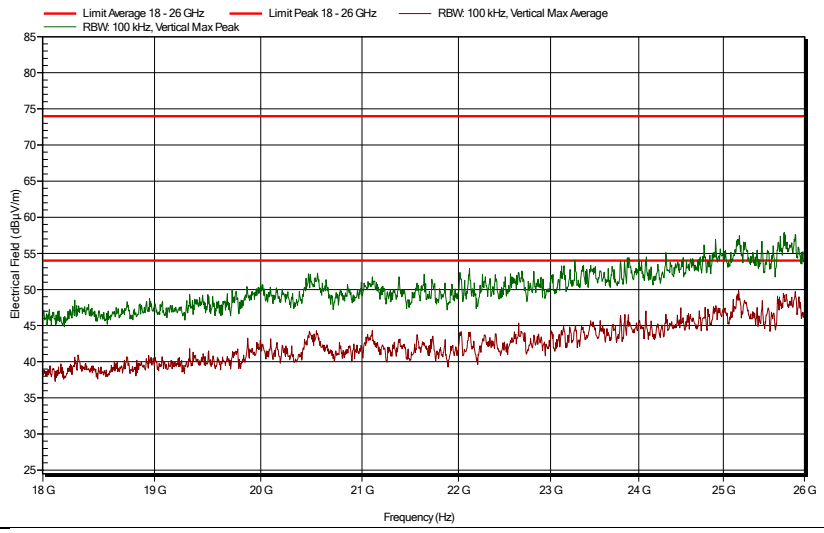
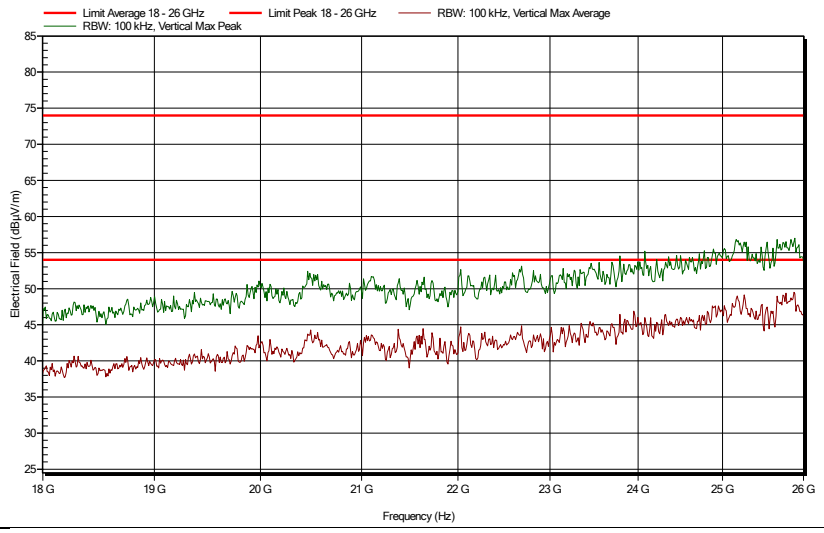
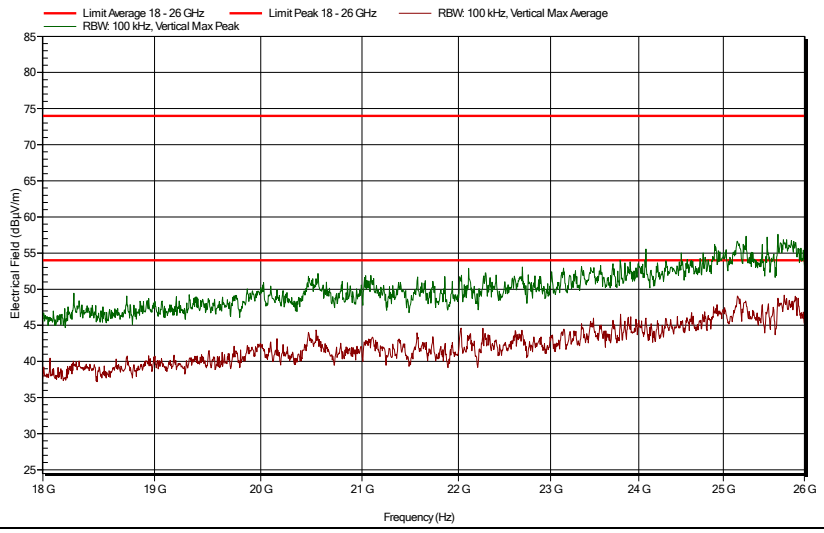
Low ch	
Mid ch	
High ch	

Horizontal polarization, 802.11n

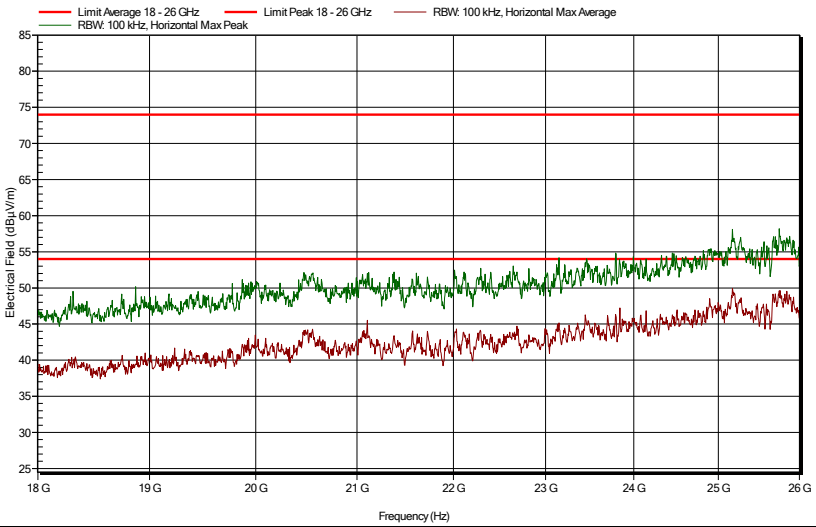
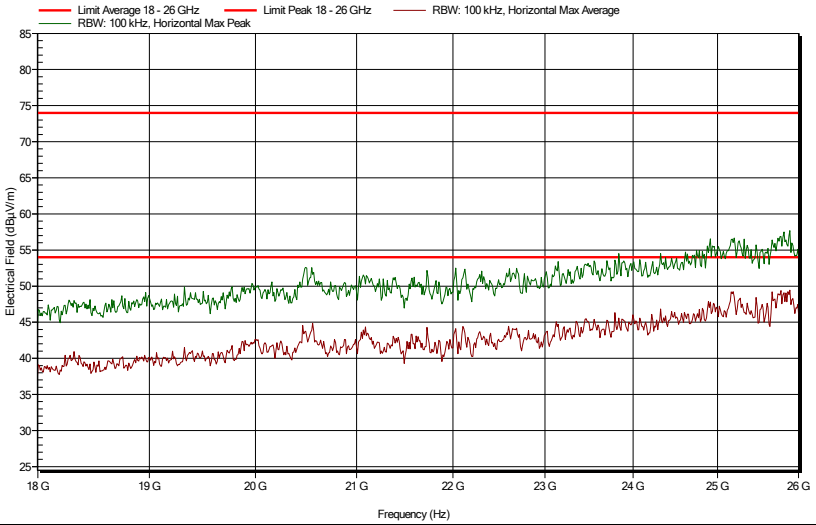
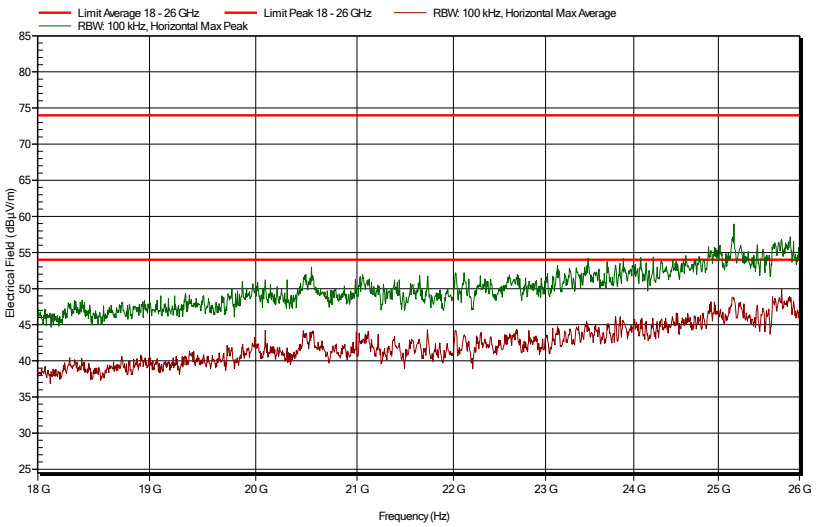
Low ch	
Mid ch	
High ch	

18 GHz to 26.5 GHz

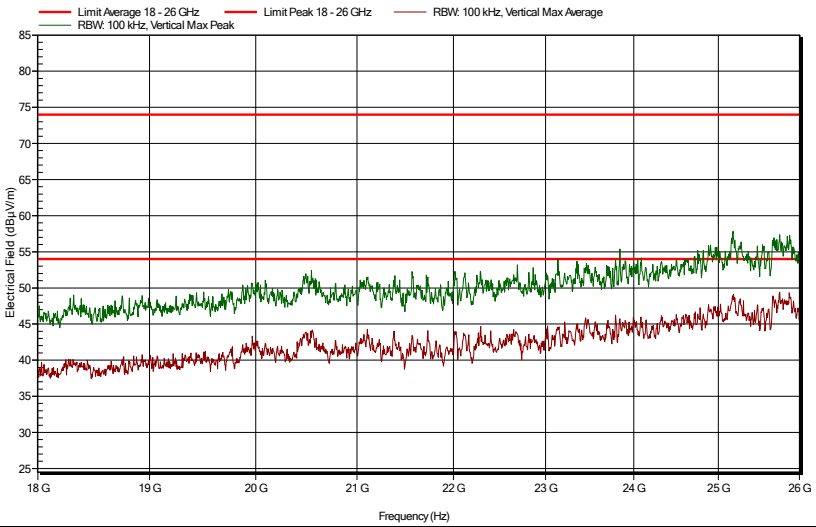
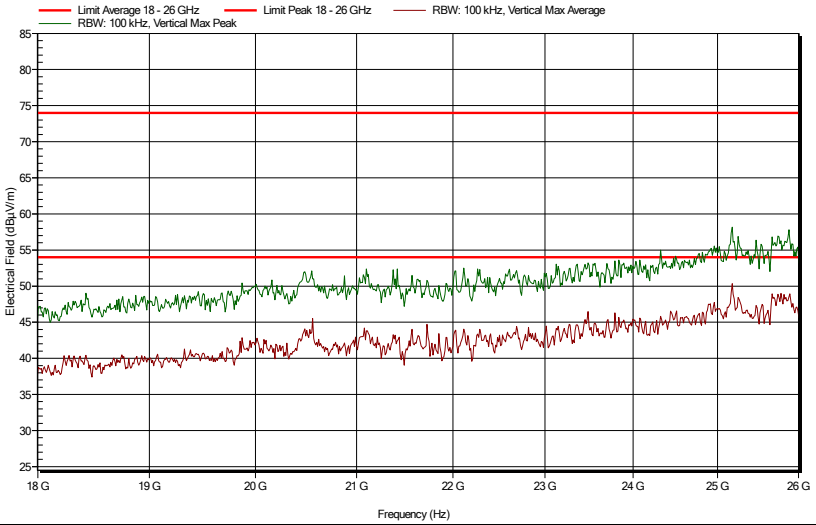
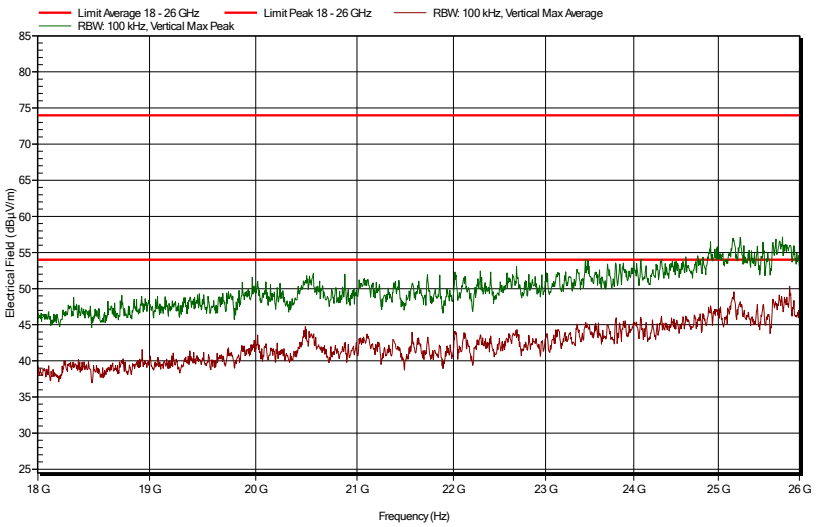
Vertical polarization, 802.11b

Low ch	
Mid ch	
High ch	

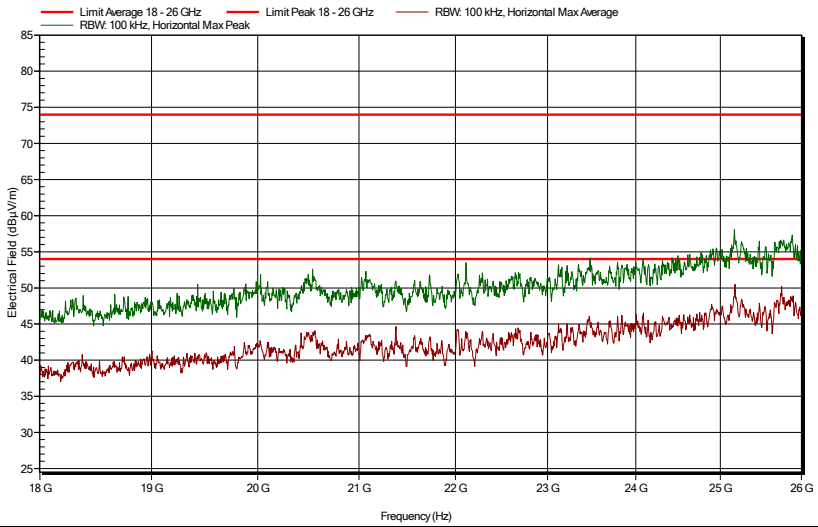
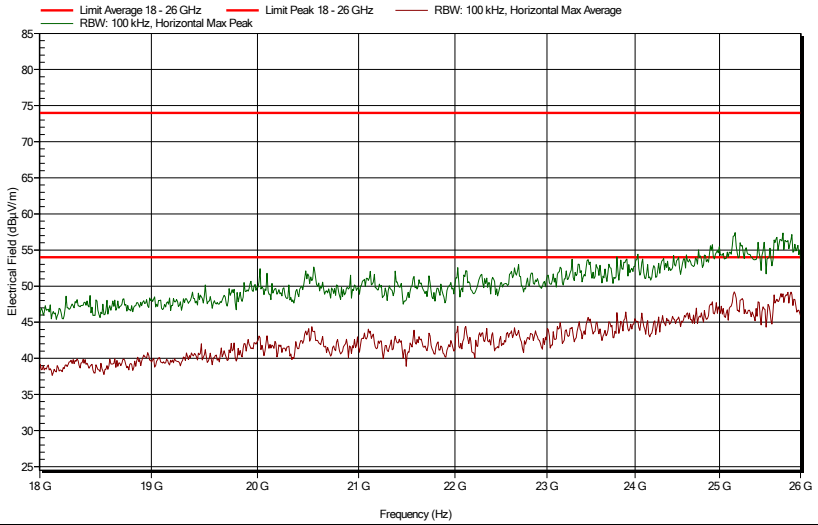
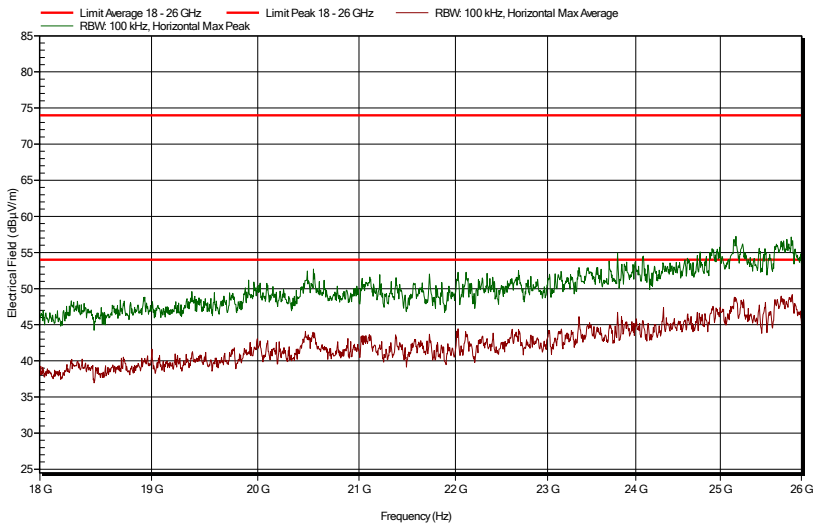
Horizontal polarization, 802.11b

Low ch	
Mid ch	
High ch	

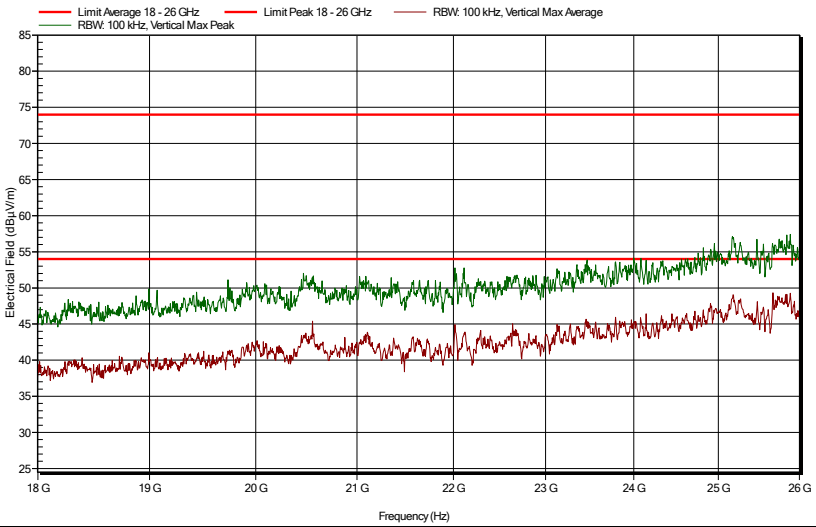
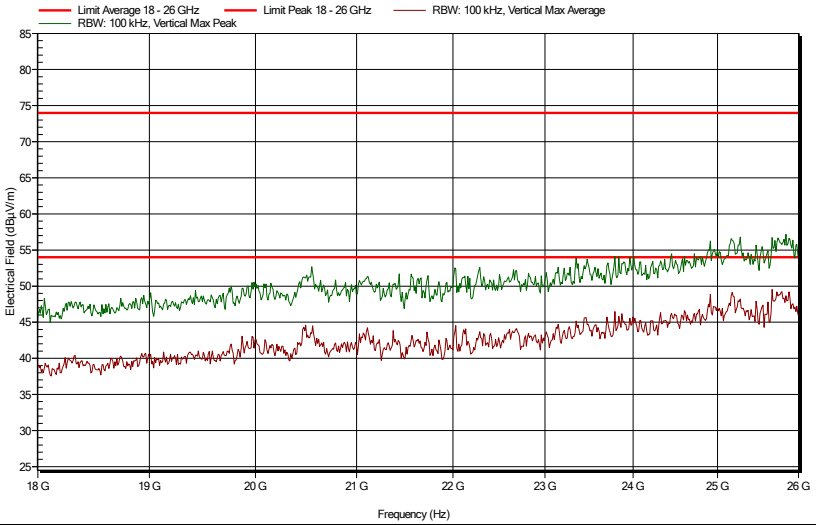
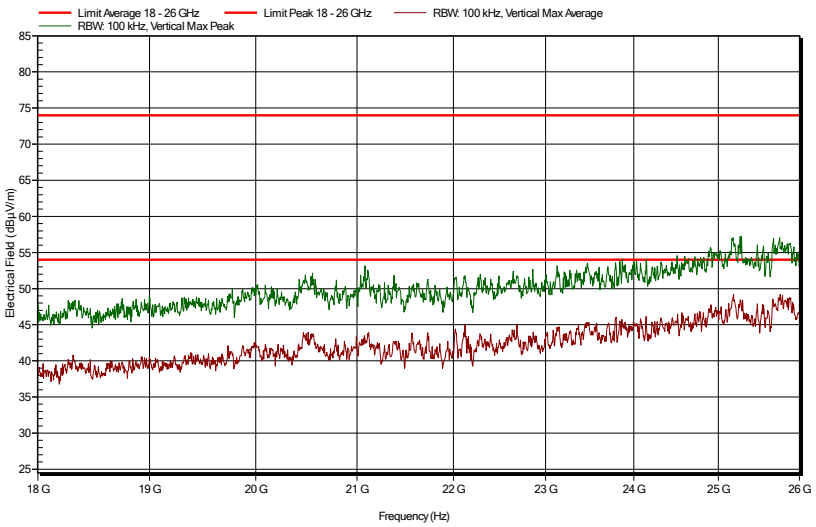
Vertical polarization, 802.11g

Low ch	
Mid ch	
High ch	

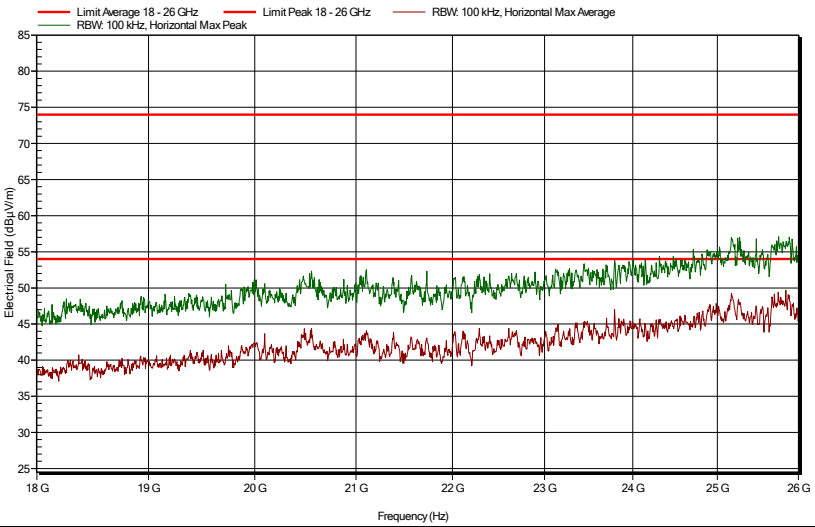
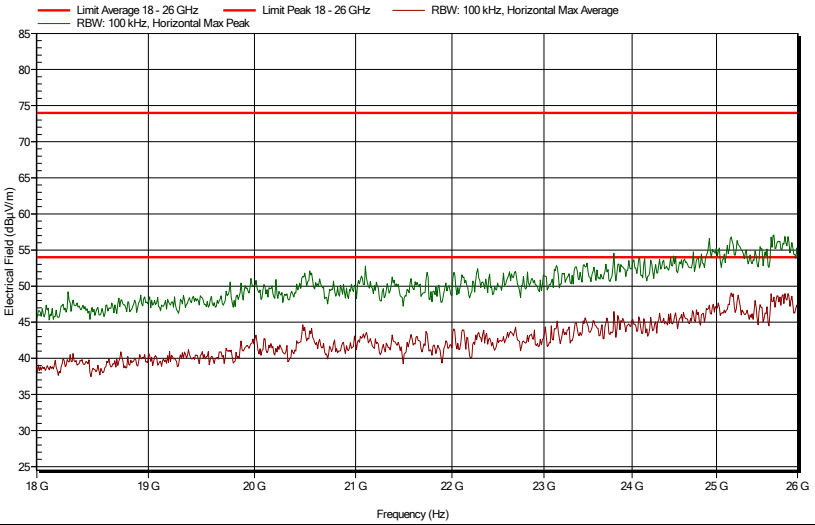
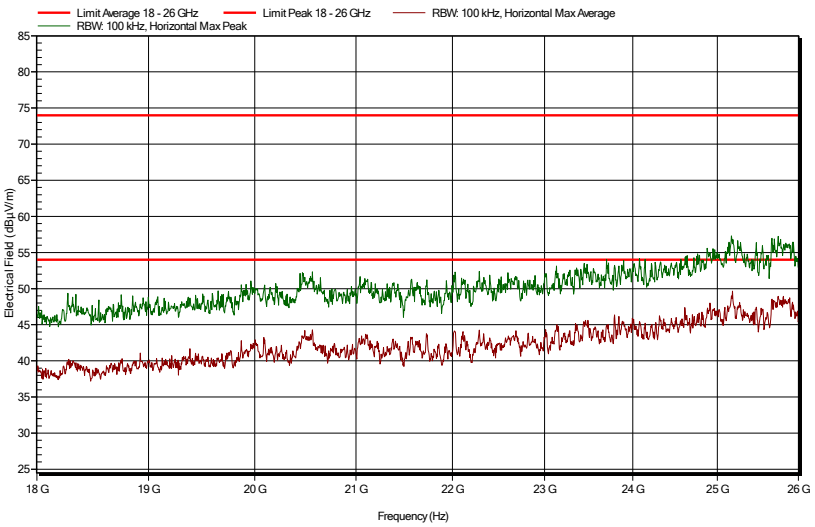
Horizontal polarization, 802.11g

Low ch	
Mid ch	
High ch	

Vertical polarization, 802.11n

Low ch	
Mid ch	
High ch	

Horizontal polarization, 802.11n

Low ch	
Mid ch	
High ch	

3.6.7 Measurement Uncertainty

Measurement uncertainty Radiated emissions below 1 GHz

Horizontal polarization	
30 – 200 MHz	4.5 dB
200 – 1000 MHz	3.6 dB
Vertical polarization	
30 – 200 MHz	5.4 dB
200 – 1000 MHz	4.6 dB

Measurement uncertainty Radiated emissions above 1 GHz

1000- 18000 MHZ	5.7 dB
18000 – 26000 MHZ	3.9 dB

3.7 AC conducted mains measurement

3.7.1 Limit

According to 15.207 (c).

Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

3.7.2 Measurement instruments

The measurement instruments are listed in chapter 2.5 of this report.

3.7.3 Test setup

The test setup is as shown in chapter 2.4 of this report.

3.7.4 Test procedure

According to ANSI C63.4: 2014, section 13.3.
IRN 029_07 Conducted disturbance (V), method 1.

3.7.5 Test results and plots of the AC conducted mains measurement

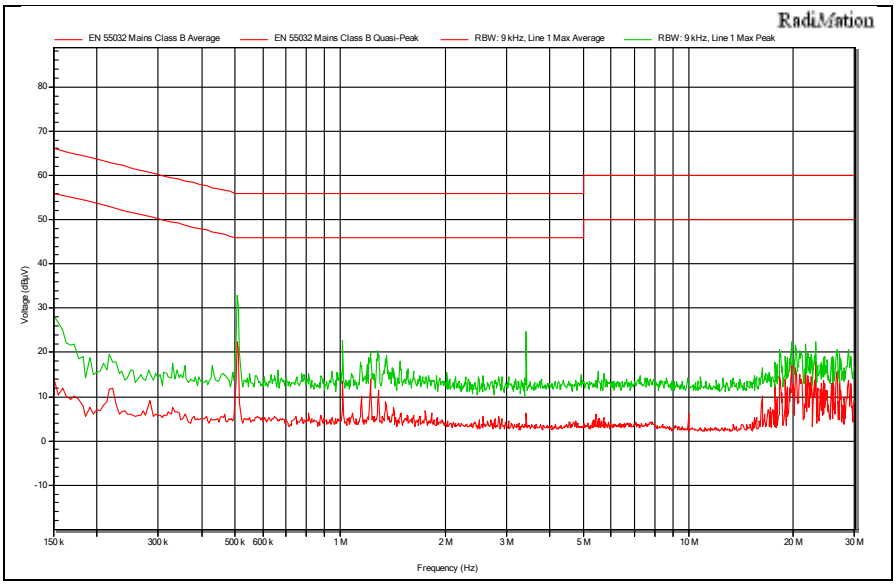
See next page.

3.7.6 Measurement uncertainty

+/- 3.6 dB.

3.7.7 Plots of the AC conducted spurious measurement

Phase



Neutral