

RF Test Report

Project Number: 4266230

Report Number: 4266230EMC03

Revision Level: 0

Client: Attenti

Equipment Under Test: 2-Piece Electronic Monitor

Model Name: RTCVZ

Model Number (HVIN): 24014VL

FCC ID: NC3-24014VL

IC ID: 23669-24014VL

Applicable Standards: ANSI C63.10: 2013 (FCC Part 15 Subpart C, § 15.247)

RSS-247, Issue 2

RSS-GEN Issue 4

Report issued on: 10 April 2018

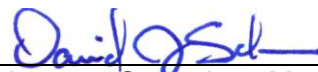
Test Result: Compliant

Tested by:



Jeremy Pickens, Senior EMC Engineer

Reviewed by:



David Schramm, Operations 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
Bandwidth	15.247(d)	RSS-247 S5.2 (1) RSS-GEN S6.6	NS (1)
Transmitter Output Power	15.247(b)(3)	RSS-247 S5.4 (4)	NS (1)
Power Spectral Density	15.247(e)	RSS-247 S5.2 (2)	NS (1)
Conducted Spurious Emissions / Band edge	15.247(d)	RSS-247 S5.5	NS (1)
Radiated Spurious Emissions / Restricted Bands	15.35(b), 15.209	RSS-GEN S6.13 RSS-GEN S8.10	Compliant
AC Powerline Conducted Emission	15.107, 15.207	RSS-GEN S8.8	Compliant

- 1) This evaluation covered only spurious emissions to show continued compliance with the certified module integrated and co-located with other radios.

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 Client Information

Name: Attenti
Address: 1838 Gunn Highway
City, State, Zip, Country: Odessa, FL 33556

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

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

2.3 General Information of EUT

Type of Product: 2-Piece Electronic Monitor
Model Name: RTCVZ
Model Number: 24014VL
Serial Number: Unit P23

Frequency Range: 2400-2483.5MHz
Data Modes: 802.11b, 802.11g, 802.11n (HT20)
Antenna: Integral

Rated Voltage: 12Vdc (Supplied via 100-120Vac, 60Hz AC Adapter)
Test Voltage: 12Vdc, (120Vac, 60Hz)

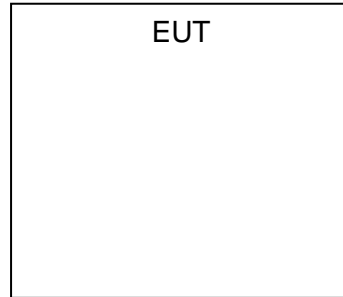
Sample Received Date: 29 January 2018
Dates of testing: 29 March 2018

2.4 Operating Modes and Conditions

For spurious emissions measurements, only the worst-case mode with respect to peak power was investigated: 802.11b, 1Mbps. Investigations covered the low, middle, and high channels in the 2400-2483.5MHz band.

Continuous traffic was generated using test commands. Where the duty cycle measured below 99% and an RMS detector was employed, corrections of $10 \cdot \text{LOG}(1/D)$ were applied according to KDB publication 558074 D01 DTS Meas Guidance v04.

2.5 EUT Connection Block Diagram – Radiated Measurements



2.6 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Attenti	2-Piece Electronic Monitor	24014VL	Unit P23

3 Field Strength of Spurious Radiation

3.1 Test Result

Test Description	Test Specification		Test Result
Spurious Emissions	15.247 (d) and 15.209	RSS-247 S5.5	Compliant

3.2 Test Method

Radiated spurious emissions measurements were recorded with the device configured to transmit at the lowest, middle, and highest channels. The frequency range investigated was up through the 10th harmonic of the fundamental transmit frequency. The methods defined in ANSI C63.10: 2013 were used.

Lowest, middle, and highest channels were investigated. Only the worst-case (802.11b, 1Mbps) was reported except at the restricted band edges where all three modulations were measured.

Test distance:

1 to 18 GHz - The EUT to measurement antenna distance was 3 meters

18 to 26 GHz - The EUT to measurement antenna distance was 1 meter

Note: Only spurious emissions above 1000MHz were investigated to ensure harmonics of the WLAN radio remained in compliance.

Limits within restricted bands of operation:

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

(1) These limits are applicable to emissions outside of the intentional transmit frequency band.

(2) Quasi-peak limit

(3) Average limit

3.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.9 °C

Relative Humidity: 38.4 %

3.4 Test Equipment

Test End Date: 29-Mar-2018

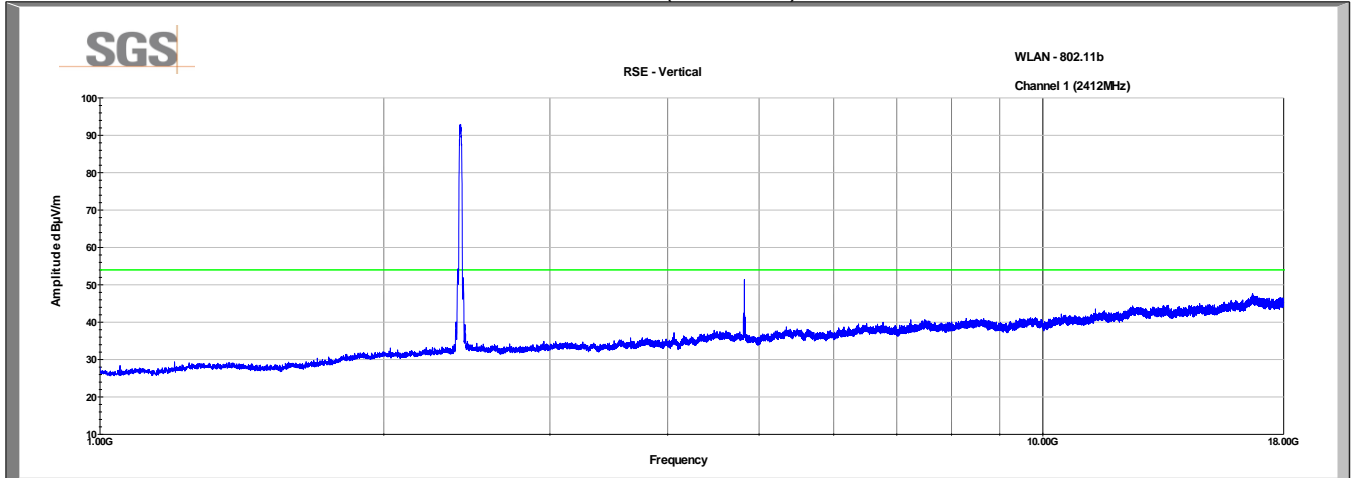
Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079699	16-May-2018
RF CABLE	SF106	HUBER & SUHNER	B079712	24-Jul-2018
RF CABLE	104PE	HUBER & SUHNER	B079793	24-Jul-2018
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	B094463	6-Mar-2019
ANTENNA, DRG HORN (SMALL)	3116B	ETS LINDGREN	B079695	27-Jul-2018
RF CABLE	SF102	HUBER & SUHNER	B079822	27-Jul-2018
RF CABLE	SF102	HUBER & SUHNER	B079824	26-Jul-2018
LOW NOISE AMPLIFIER	NSP1840-HG	MITEQ	B087572	28-Jul-2018

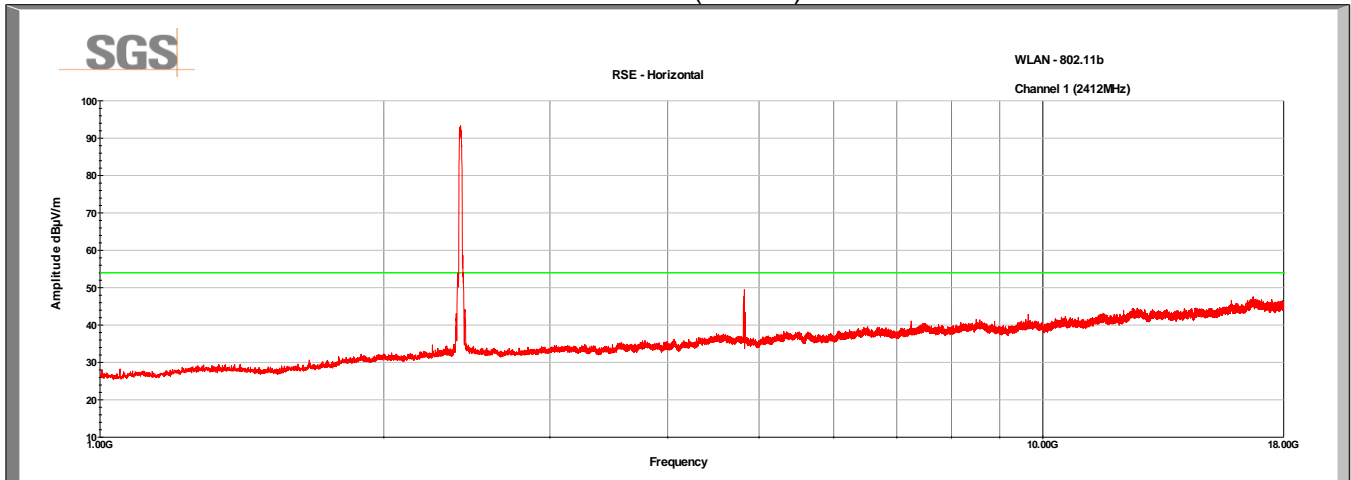
Note: The equipment calibration period is 1 year.

3.5 Peak Plots

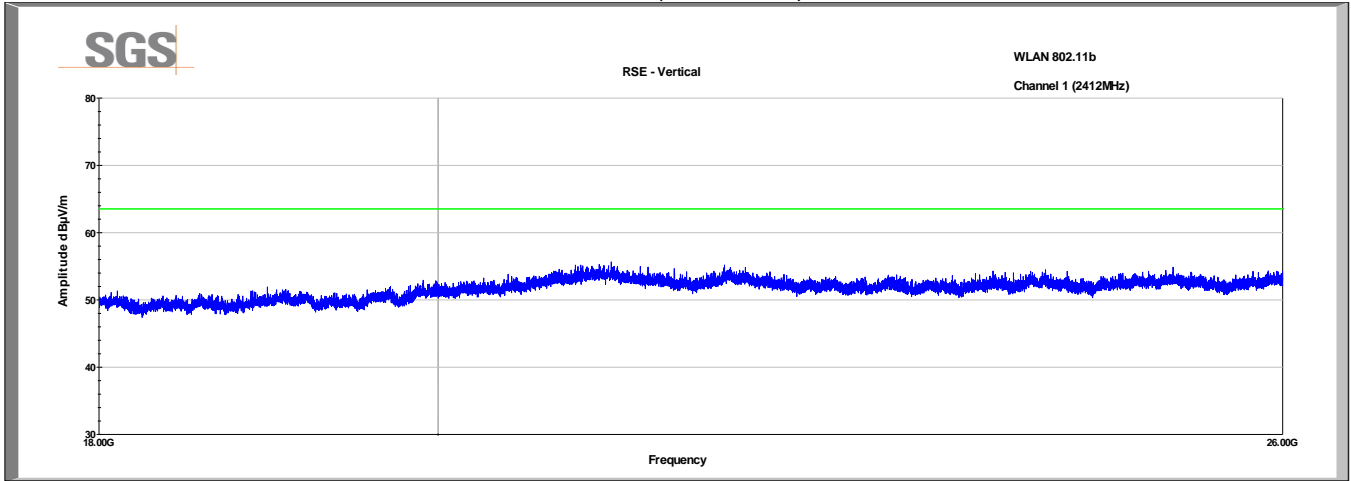
Channel 1
Vertical (1-18GHz)



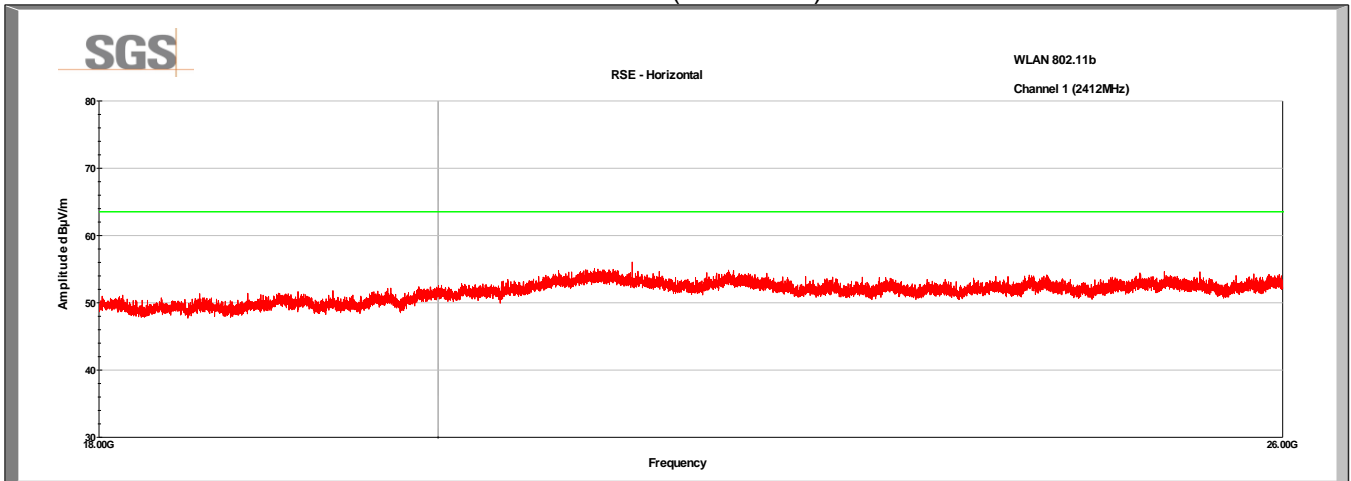
Horizontal (18GHz)



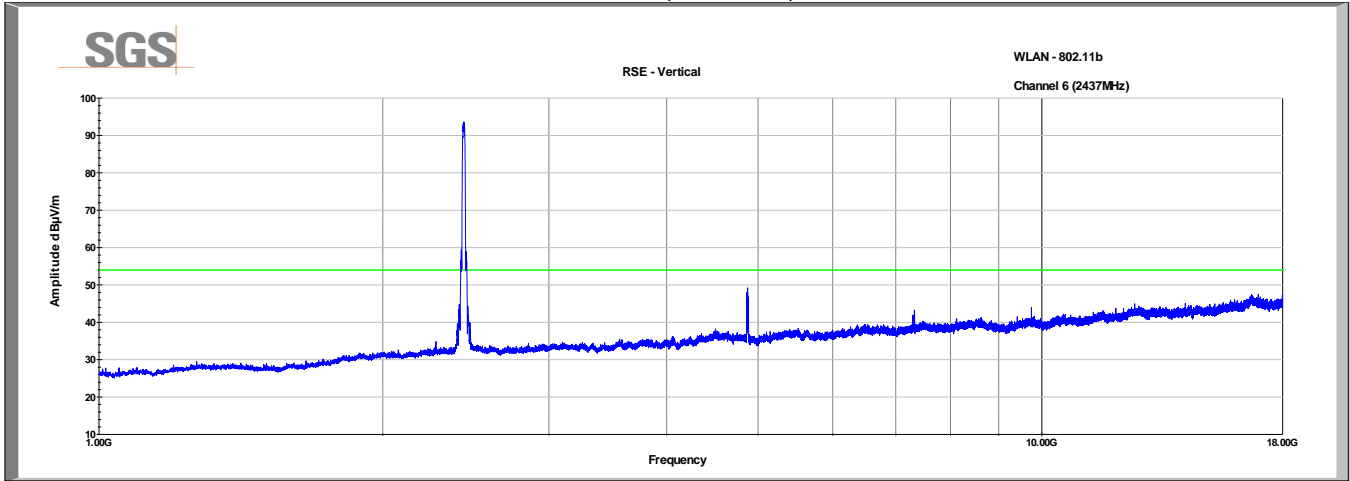
Channel 1
Vertical (18-26GHz)



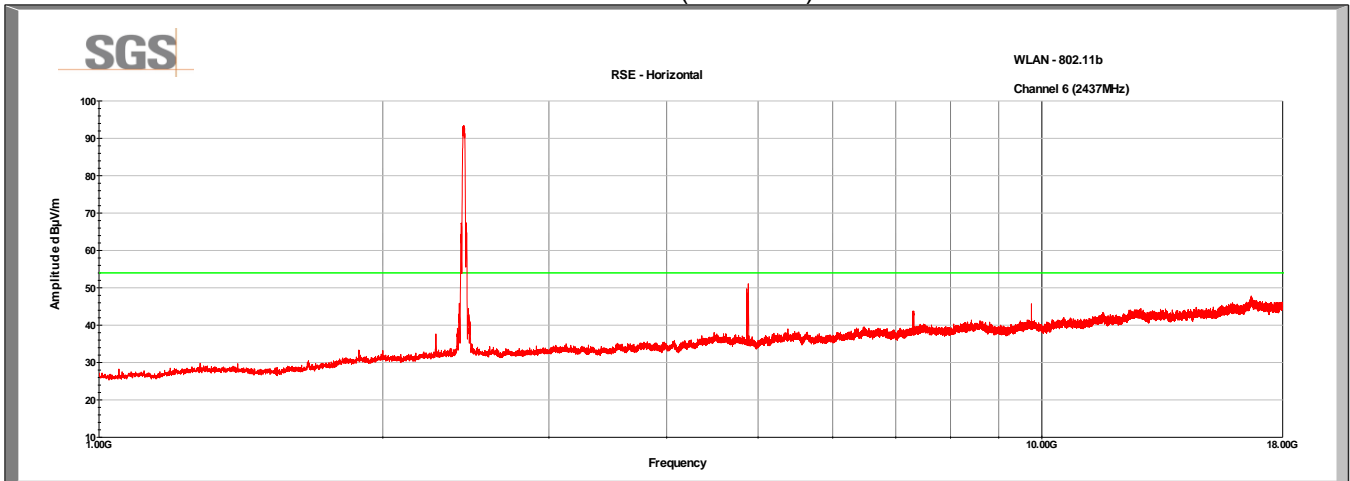
Horizontal (18-26GHz)



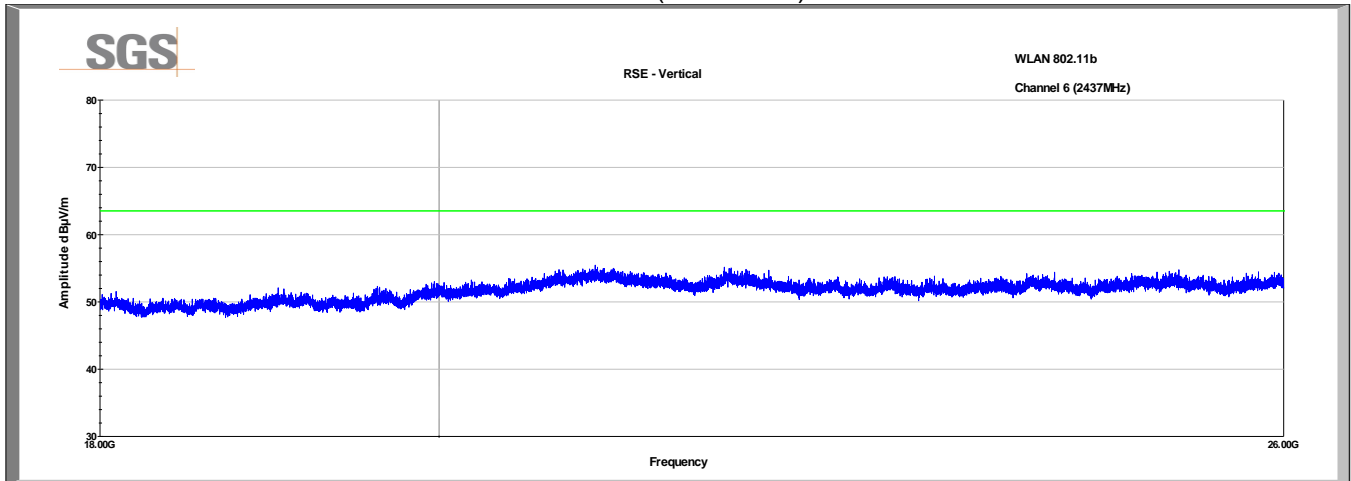
Channel 6 Vertical (1-18GHz)



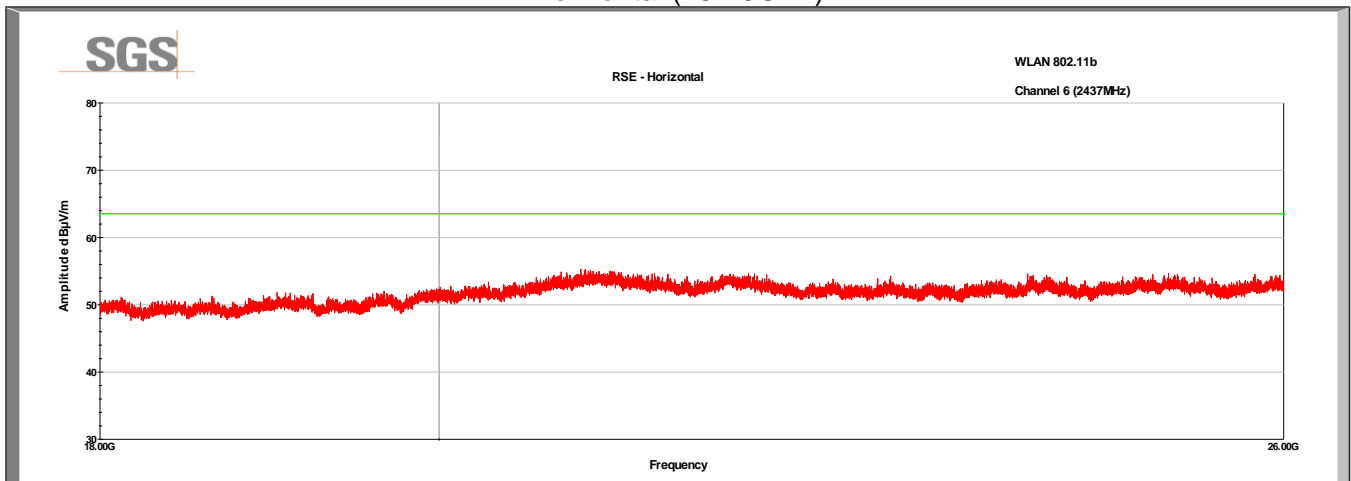
Horizontal (1-18GHz)



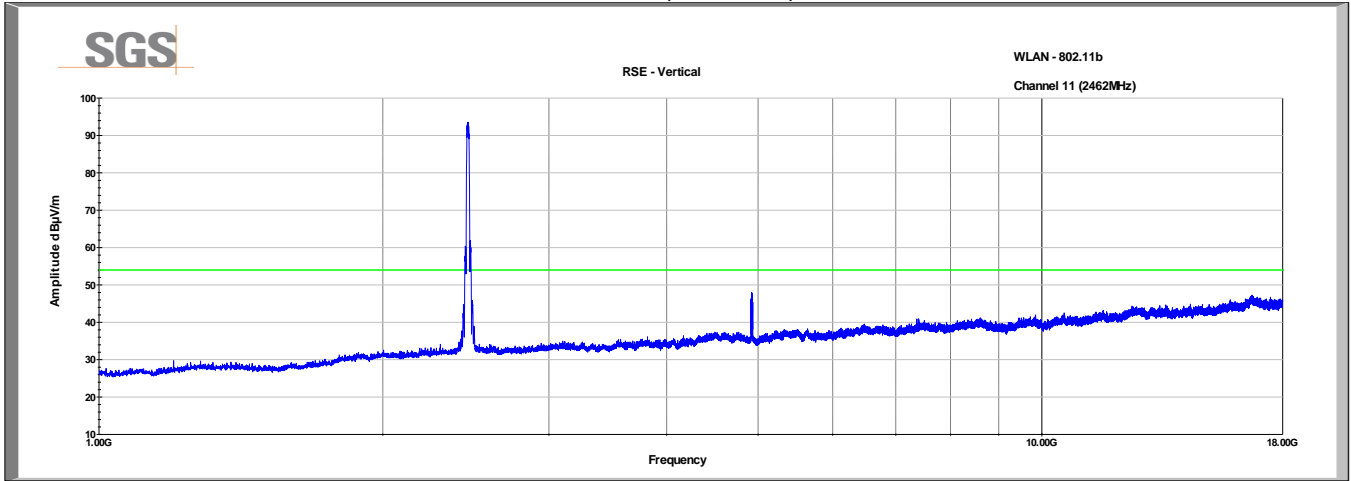
Channel 6 Vertical (18-26GHz)



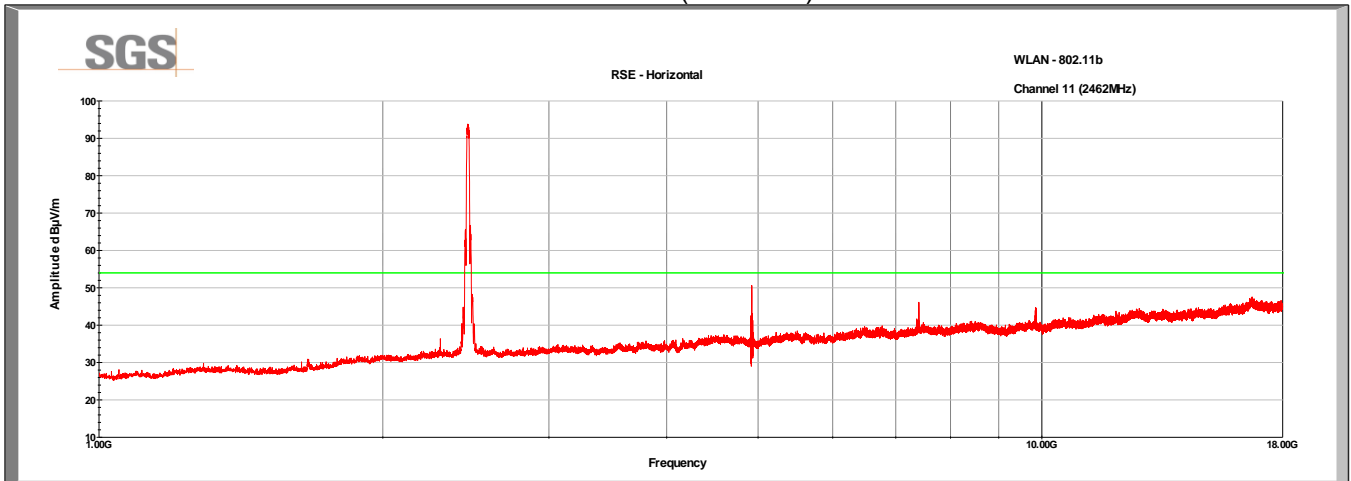
Horizontal (18-26GHz)



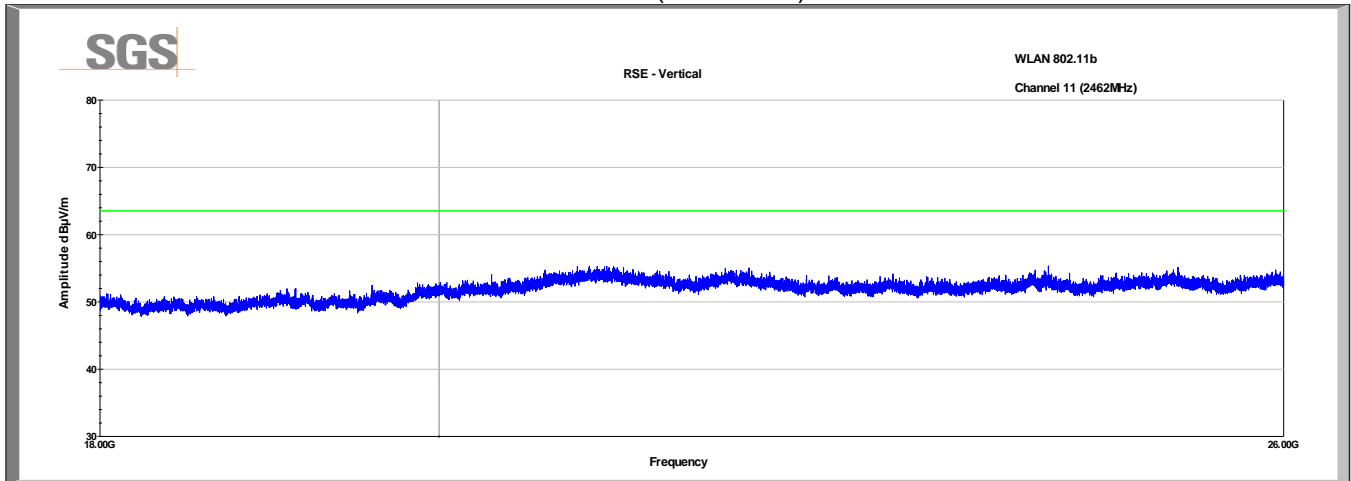
Channel 11 Vertical (1-18GHz)



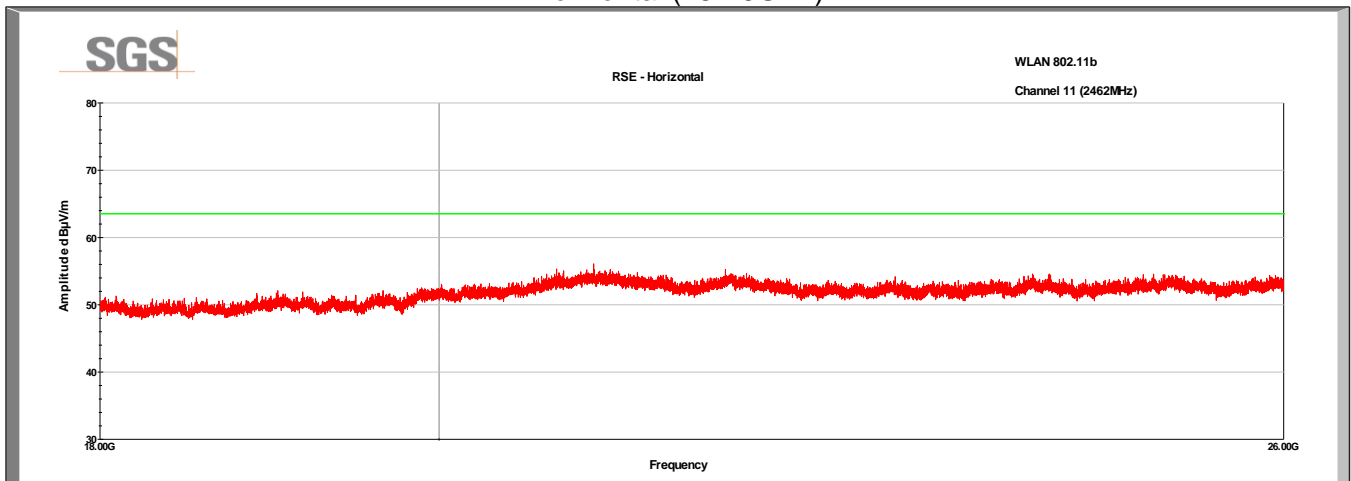
Horizontal (1-18GHz)



Channel 11 Vertical (18-26GHz)



Horizontal (18-26GHz)



3.6 Test Data

Channel Number	Polarity (V/H)	Frequency MHz	Raw Peak dBuV	AF (dB/m)	CL (dB)	Amp (dB)	Peak Value (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	DCCF (dB)	Avg Value (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)
1	V	4824.00	47.1	34.7	3.1	33.5	51.3	74.0	-22.7	-4.5	46.8	54.0	-7.2
1	H	4824.00	44.9	34.7	3.1	33.5	49.1	74.0	-24.9	-4.5	44.6	54.0	-9.4
6	V	4875.00	45.0	34.6	3.1	33.5	49.2	74.0	-24.8	-4.5	44.7	54.0	-9.3
6	H	4875.00	46.8	34.6	3.1	33.5	51.0	74.0	-23.0	-4.5	46.5	54.0	-7.5
11	V	4924.00	44.8	34.4	3.1	33.5	48.9	74.0	-25.1	-4.5	44.4	54.0	-9.6
11	H	4924.00	43.2	34.4	3.1	33.5	47.3	74.0	-26.7	-4.5	42.8	54.0	-11.2
Avg Value = Raw Peak + AF + CL - Amp + DCCF													
Avg Margin = Avg Value - Limit													
Peak Value = Raw Peak + AF + CL - Amp													
Peak Margin = Peak Value - Limit													

3.7 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	10 April 2018