

# 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)<br>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 /<br>Band edge       | 15.247(d)          | RSS-247 S5.5                     | NS (1)      |
| Radiated Spurious Emissions /<br>Restricted Bands | 15.35(b),15.209    | RSS-GEN S6.13<br>RSS-GEN S8.10   | Compliant   |
| AC Powerline Conducted<br>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  $10 \cdot \log(1/D)$  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 10<sup>th</sup> 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 <sup>(1)</sup> |                     | Peak Limits<br>dBuV/m |
|----------------|-----------------------|---------------------|-----------------------|
|                | Microvolts/m          | dBuV/m              |                       |
| 30 - 88 MHz    | 100                   | 40 <sup>(2)</sup>   | --                    |
| 88 - 216 MHz   | 150                   | 43.5 <sup>(2)</sup> | --                    |
| 216 - 960 MHz  | 200                   | 46 <sup>(2)</sup>   | --                    |
| 960 - 1000 MHz | 500                   | 54 <sup>(2)</sup>   | --                    |
| 1 - 40 GHz     | 500                   | 54 <sup>(3)</sup>   | 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

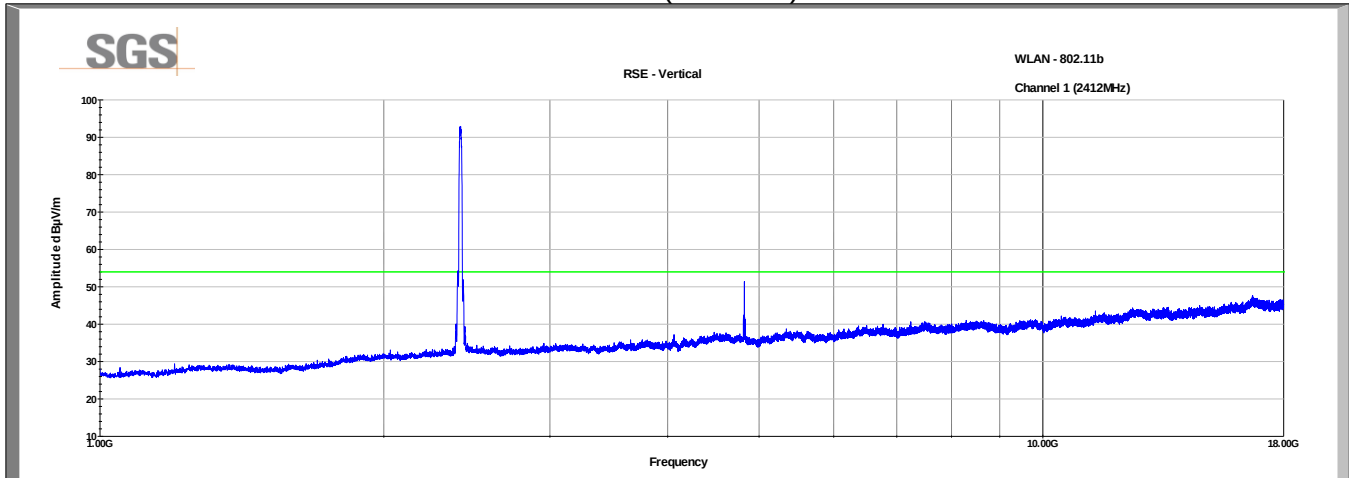
Tester: JOP

| 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  |

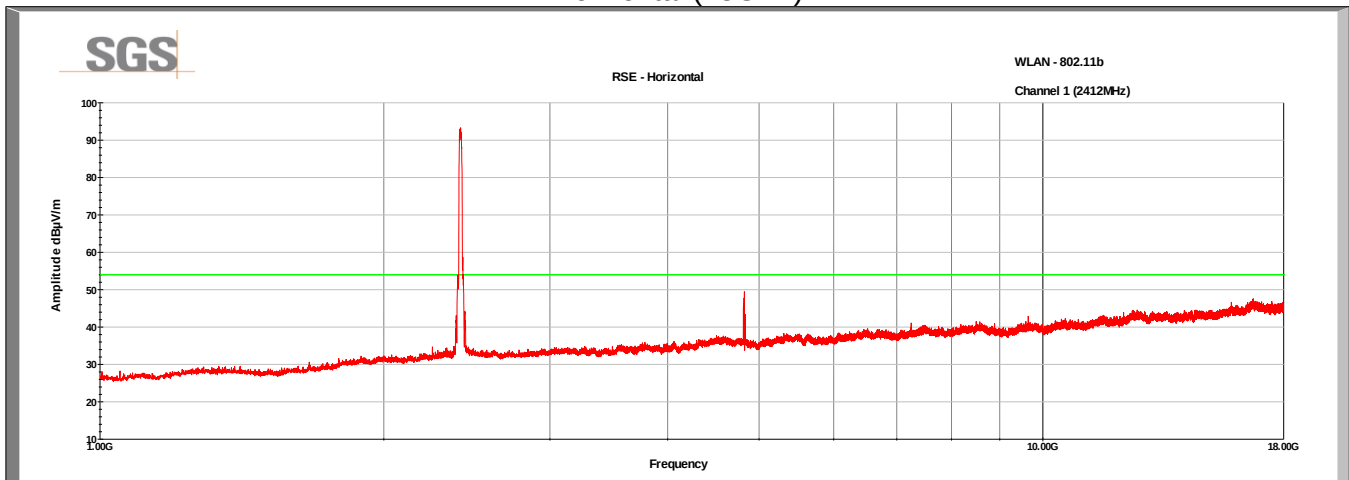
Note: The equipment calibration period is 1 year.

### 3.5 Peak Plots

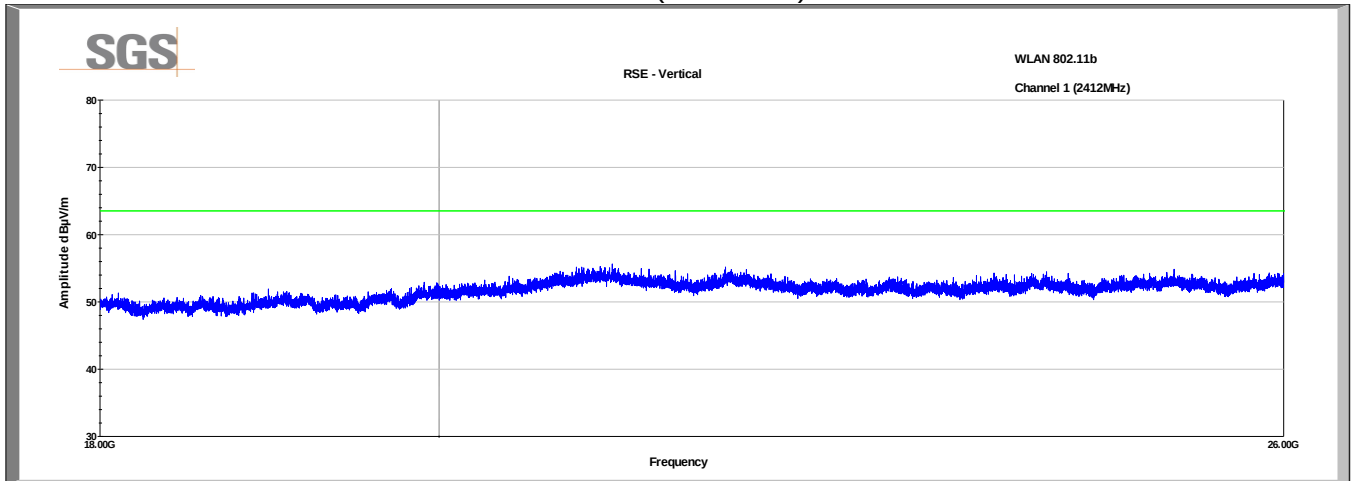
Channel 1  
Vertical (1-18GHz)



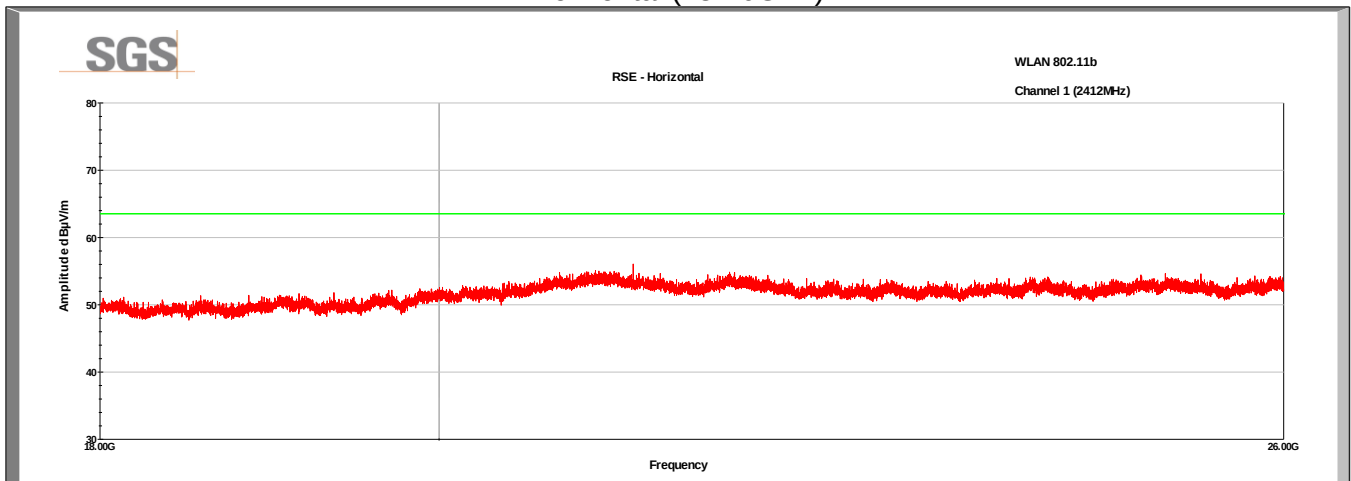
Horizontal (18GHz)



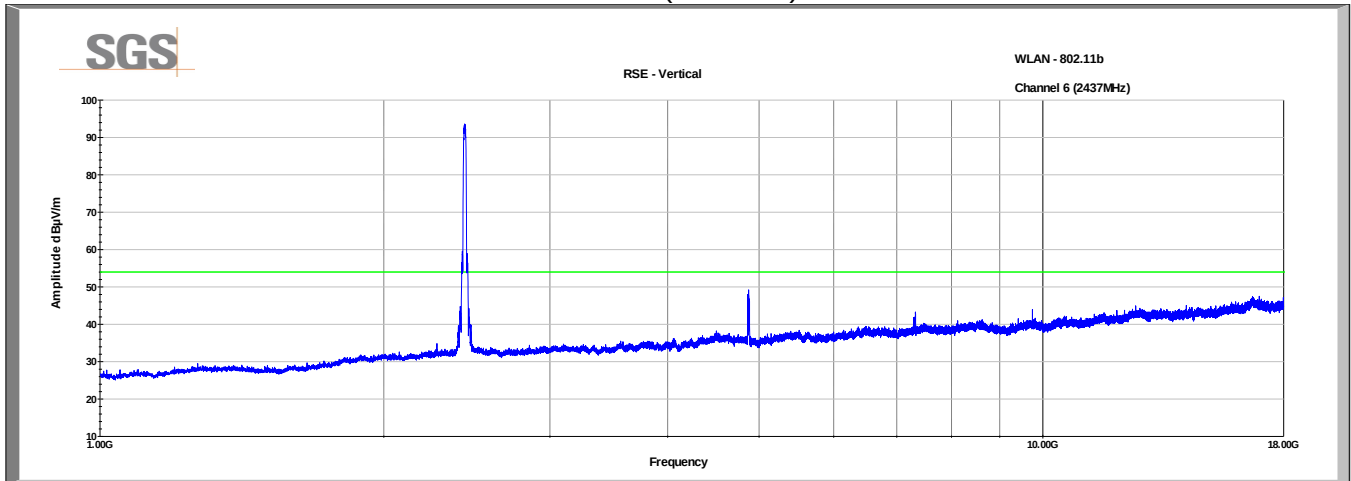
### Channel 1 Vertical (18-26GHz)



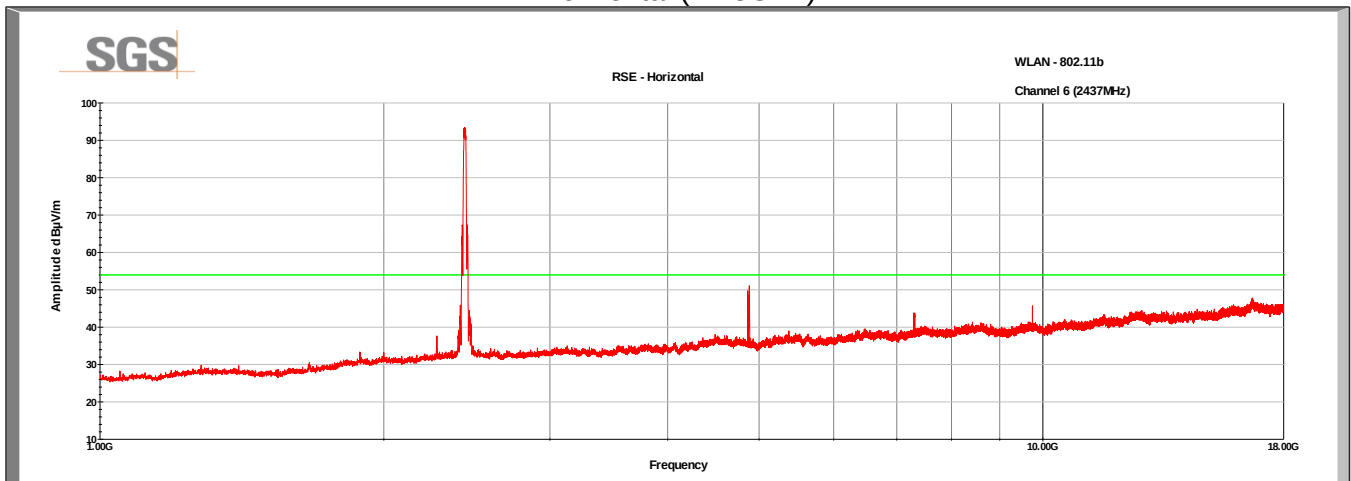
### Horizontal (18-26GHz)



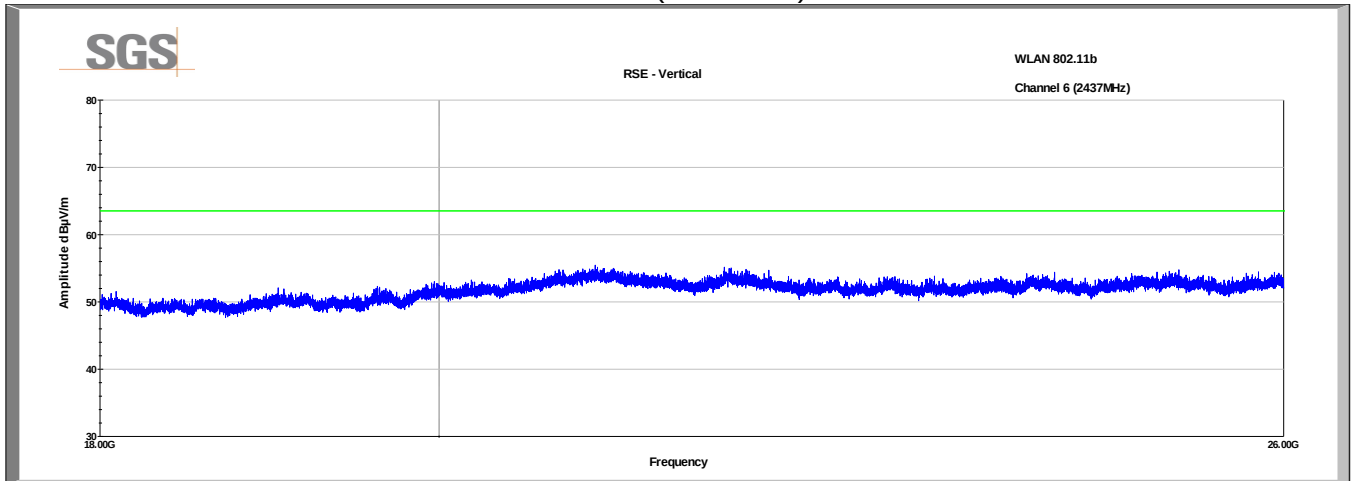
### Channel 6 Vertical (1-18GHz)



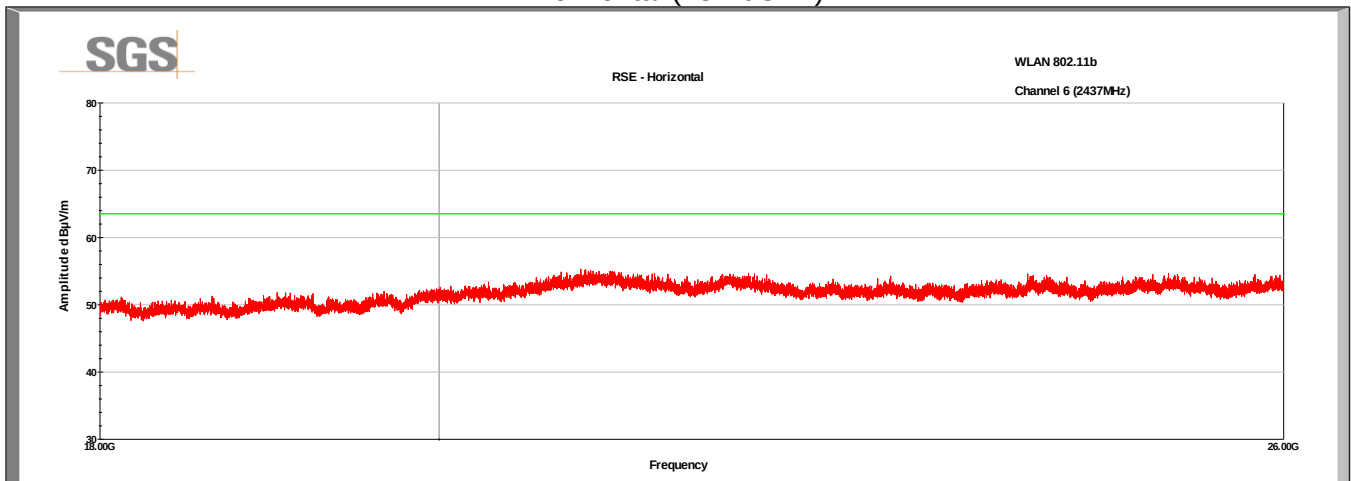
### Horizontal (1-18GHz)



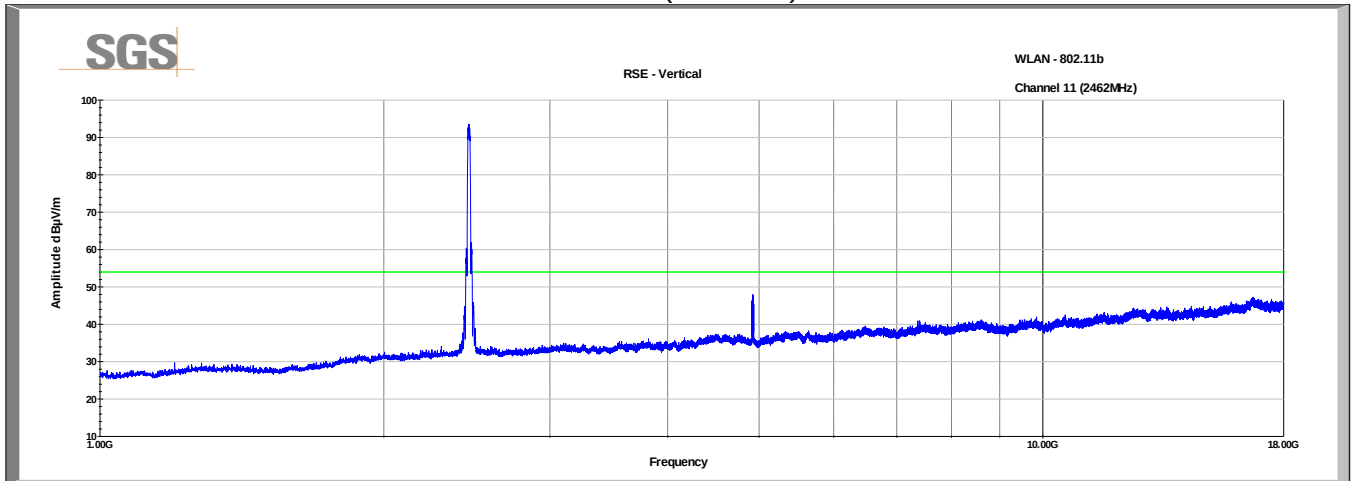
### Channel 6 Vertical (18-26GHz)



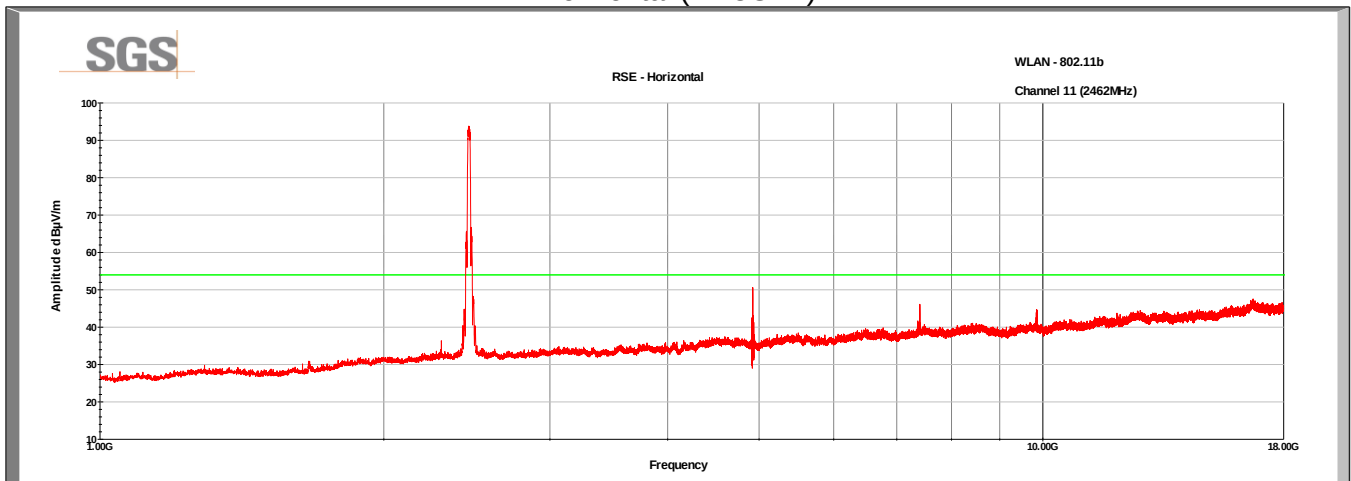
### Horizontal (18-26GHz)



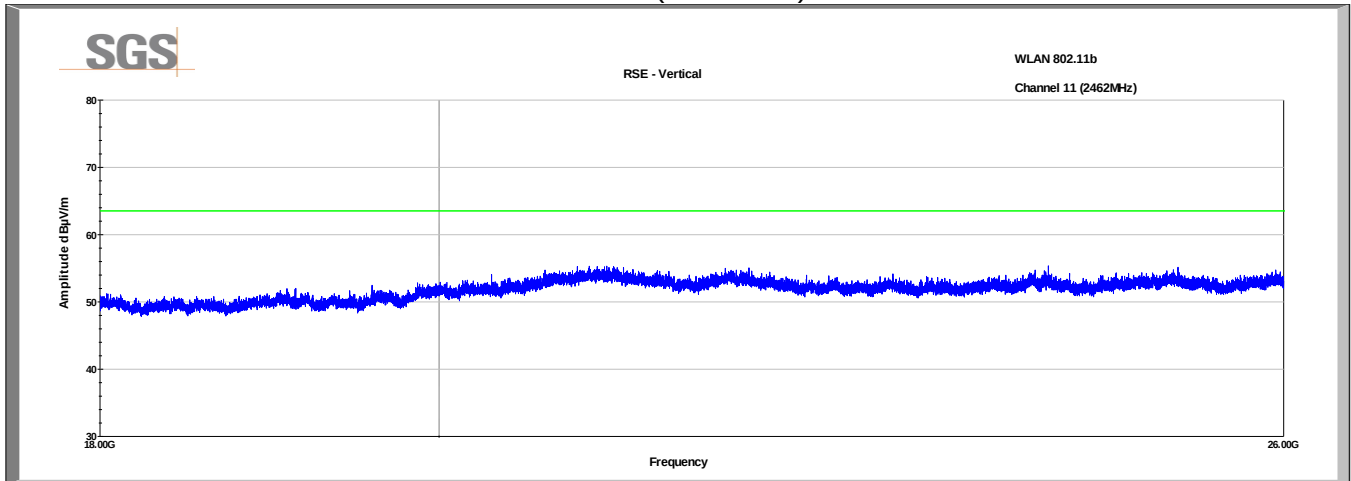
### Channel 11 Vertical (1-18GHz)



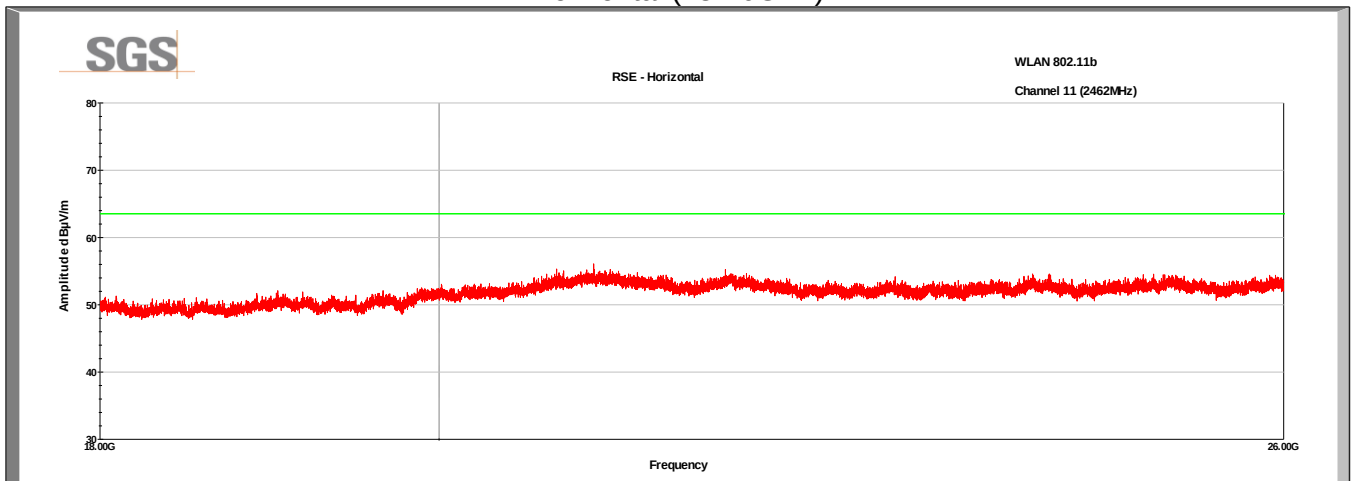
### Horizontal (1-18GHz)



### 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 |
|                |                        |               |
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