



|                            |                  |
|----------------------------|------------------|
| Test Report Serial Number: | 45461482R2.0     |
| Test Report Date:          | 26 February 2019 |
| Project Number:            | 1441             |

## EMC Test Report - New Filing

Applicant:



**President Electronics USA**  
**1007 Collier Center Way**  
**Naples, FL, 34110**  
**USA**

FCC ID:

**2AEOCPC203**

Product Model Number / HVIN

**Walker II FCC**

IC Registration Number

**20240-PC203**

Product Name / PMN

**Walker II FCC**

In Accordance With:

**FCC 47 CFR Part 95 Subpart D, Part 15 Subpart B**  
 Licensed Non-Broadcast Station Transmitter (TNB)  
**RSS-GEN, RSS-236 Issue 1**  
 Citizen Band (26.960 to 27.410 MHz)

Approved By:

---

**Ben Hewson, President**  
 Celltech Labs Inc.  
 21-364 Lougheed Rd.  
 Kelowna, BC, V1X 7R8  
 Canada



Test Lab Certificate: 2470.01



**Industry  
Canada**

IC Registration 3874A-1



FCC Registration: CA3874

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**1.0 DOCUMENT CONTROL**

| Revision History           |                               |                  |                               |                  |                     |
|----------------------------|-------------------------------|------------------|-------------------------------|------------------|---------------------|
| <b>Samples Tested By:</b>  |                               | Art Voss, P.Eng. | <b>Date(s) of Evaluation:</b> |                  | 5 - 7 February 2019 |
| <b>Report Prepared By:</b> |                               | Art Voss, P.Eng. | <b>Report Reviewed By:</b>    |                  | Ben Hewson          |
| Report Revision            | Description of Revision       | Revised Section  | Revised By                    | Revision Date    |                     |
| 1.0                        | Initial Release               | n/a              | Art Voss                      | 7 February 2019  |                     |
| 2.0                        | Revised HVIN to Walker II FCC | Cover, 2         | Art Voss                      | 26 February 2019 |                     |

## 2.0 CLIENT AND DUT INFORMATION

| Client Information                    |   |
|---------------------------------------|---|
| Applicant Name                        | President Electronics USA                   |
| Applicant Address                     | 1007 Collier Center Way                     |
|                                       | Naples, FL, 34110                           |
|                                       | USA   |
| DUT Information                       |   |
| Device Identifier(s):                 | <b>FCC ID:</b> 2AEOCPC203                   |
|                                       | <b>IC:</b> 20240-PC203                      |
| Device Type:                          | Mobile CB Radio Transceiver                 |
| Type of Equipment:                    | Analog Transceiver                          |
| Device Model(s) / HVIN:               | Walker II FCC                               |
| Device Marketing Name / PMN:          | Walker II FCC                               |
| Firmware Version ID Number / FVIN:    | n/a   |
| Host Marketing Name / HMN:            | n/a   |
| Test Sample Serial No.:               | T/A Sample - Identical Prototype            |
| Transmit Frequency Range:             | 26.965 - 27.405 MHz (Chan. 1-40)            |
| Number of Channels:                   | 40  |
| Manuf. Max. Rated Output Power:       | 4.0W AM                                     |
| Manuf. Max. Rated BW/Data Rate:       | 8kHz  |
| Antenna Make and Model:               | n/a   |
| Antenna Type and Gain:                | External Whip, 0dBi nominal (3dBi maximum). |
| Modulation:                           | AM  |
| Mode:                                 | n/a   |
| Emission Designator:                  | 5K50A3E                                     |
| DUT Power Source:                     | 12 VDC External                             |
| Deviation(s) from standard/procedure: | None  |
| Modification of DUT:                  | None  |

**3.0 SCOPE**



This Certification Report was prepared on behalf of:

**President Electronics USA**

(the 'Applicant'), in accordance with the applicable Federal Communications Commission (FCC) CFR 47 and Innovation, Scientific and Economic Development (ISED) Canada rules parts and regulations (the 'Rules'). The scope of this investigation was limited to only the equipment, devices and accessories (the 'Equipment') supplied by the Applicant. The tests and measurements performed on this Equipment were only those set forth in the applicable Rules and/or the Test and Measurement Standards they reference. The Rules applied and the Test and Measurement Standards used during this evaluation appear in the Normative References section of this report. The limits set forth in the technical requirements of the applicable Rules were applied to the measurement results obtained during this evaluation and, unless otherwise noted, these limits were used as the Pass/Fail criteria. The Pass/Fail statements made in this report apply to only the tests and measurements performed on only the Equipment tested during this evaluation. Where applicable and permissible, information including test and measurement data and/or results from previous evaluations of same or similar equipment, devices and/or accessories may be cited in this report.

As per FCC CFR 47 Part §2.1091 and §2.1093, an RF Exposure evaluation report is required for this Equipment and the results of the RF Exposure evaluation appear in a separate exhibit from this report.

This Equipment is subject to FCC Declaration of Conformity (DoC). DoC evaluations were performed on this Equipment and the results of the DoC evaluation appear in a separate exhibit from this report.

|   |  |
|---|--|
| <p>I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.</p> |  <p>Art Voss, P.Eng.<br/>Technical Manager<br/>Celltech Labs Inc.<br/>26 February 2019<br/>Date</p>  |
|---|--|

**4.0 TEST RESULT SUMMARY**

| <b>TEST SUMMARY</b>     |                                 |   |                             |                               |             |          |
|-------------------------|---------------------------------|---|-----------------------------|-------------------------------|-------------|----------|
| Referenced Standard(s): |                                 | FCC CFR Title 47 Parts 2, 95D, 15B, ISED RSS-Gen, RSS-236 |                             |                               |             |          |
| Section                 | Description of Test             | Procedure Reference                                       | Applicable Rule Part(s) FCC | Applicable Rule Part(s) ISEDC | Test Date   | Result   |
| 7.0                     | Conducted Power (Fundamental)   | ANSI/TIA/EIA-382-A  | §2.1046                     | RSS-Gen                       | 5 Feb 2019  | Complies |
|                         |                                 | ANSI C63.4:2014   | §2.1033(c )(8)<br>§95.967   | RSS-236 5.2                   |             |          |
| 8.0                     | Modulation Response             | ANSI/TIA/EIA-382-A  | §2.1047                     | RSS-Gen                       | 5 Feb 2019  | Complies |
|                         |                                 | ANSI C63.4:2014   | §95.975<br>§95.977          |                               |             |          |
| 9.0                     | Occupied Bandwidth              | ANSI/TIA/EIA-382-A  | §2.1049                     | RSS-Gen                       | 5 Feb 2019  | Complies |
|                         |                                 | ANSI C63.4:2014   | §95.973                     | RSS-236 5.3.2                 |             |          |
|                         | Emission Mask                   | ANSI/TIA/EIA-382-A  | §2.1049                     | RSS-Gen                       | 5 Feb 2019  | Complies |
|                         |                                 | ANSI C63.4:2014   | §95.979                     | RSS-236 5.4.4                 |             |          |
| 10.0                    | Conducted TX Spurious Emissions | ANSI/TIA/EIA-382-A  | §2.1051                     | RSS-Gen                       | 5 Feb 2019  | Complies |
|                         |                                 | ANSI C63.4:2014   | §95.979                     | RSS-236 5.4.4                 |             |          |
| 11.0                    | Radiated TX Spurious Emissions  | ANSI/TIA/EIA-382-A  | §2.1053                     | RSS-Gen                       | 29 Feb 2018 | Complies |
|                         |                                 | ANSI C63.4:2014   | §95.979                     | RSS-236 5.4.4                 |             |          |
| 12.0                    | Frequency Stability             | ANSI/TIA/EIA-382-A  | §2.1055                     | RSS-Gen                       | 6 Feb 2019  | Complies |
|                         |                                 | ANSI C63.4:2014   | §95.965                     |                               |             |          |
| 13.0                    | Radiated Receiver Emissions     | ANSI C63.4:2014   | §15 Subpart B               | RSS-Gen                       | 29 Feb 2018 | Complies |

| Test Station Day Log |                   |                       |                           |              |                            |
|----------------------|-------------------|-----------------------|---------------------------|--------------|----------------------------|
| Date                 | Ambient Temp (°C) | Relative Humidity (%) | Barometric Pressure (kPa) | Test Station | Tests Performed Section(s) |
| 5 Feb 2019           | 20.6              | 18                    | 102.1                     | EMC          | 7, 8, 9, 10                |
| 6 Feb 2019           | 21.1              | 17                    | 103.2                     | EMC          | 11, 13                     |
| 6 Feb 2019           | 20.5              | 17                    | 103.2                     | SAC          |                            |
| 6 Feb 2019           | 16.4              | 19                    | 103.1                     | TC           | 12                         |
| 7 Feb 2019           | 17.9              | 18                    | 103.5                     | TC           |                            |
| 8 Feb 2019           | -3.0              | 23                    | 102.4                     | OATS         | 11, 13                     |

**EMC** - EMC Test Bench

**SAC** - Semi-Anechoic Chamber

**OATS** - Open Area Test Site

**TC** - Temperature Chamber

In accordance with ANSI C63.4:

### 6.2.11 Temperature and humidity

a) The ambient air temperature of the test site shall be within the range of 10 °C to 40 °C (50 °F to 104 °F), unless the EUT requirements specify testing over a different temperature range. The EUT and the measuring equipment shall be operated until temperature stabilizes before the testing proceeds. The warm-up time shall be included along with the measurement results if the ambient conditions are outside of the range stated above, and evidence shall be given that the measuring equipment is accurate at the temperatures used.

The EUT was wrapped with non-conductive insulation material to maintain an operating temperature above 10 °C and monitored periodically during evaluation. The antenna and cabling have been evaluated in this temperature range in accordance with ANSI C63.4, 4.7.6 Cable Insertion Loss, and the measurement results compensated for any variations. All other measurement equipment was maintained at ambient indoor room temperature.



## 5.0 NORMATIVE REFERENCES

| <b>Normative References</b> |  |
|-----------------------------|--|
| ISO/IEC 17025:2017          | General requirements for the competence of testing and calibration laboratories  |
| IEEE/ANSI C63.4:2014        | Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz   |
| ANSI/EIA/TIA-382-A-1989     | Minimum Standards - Citizens Band Radio Service Amplitude Modulated (AM) Transceivers Operating in the 27MHz Band  |
| CFR                         | Code of Federal Regulations<br>Title 47: Telecommunication<br>Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations  |
| CFR                         | Code of Federal Regulations<br>Title 47: Telecommunication<br>Part 95: Personal Radio Service<br>Subpart D: Citizens Band Radio Service (CBRS)   |
| CFR Title 47 Part 15        | Code of Federal Regulations<br>Title 47: Telecommunication<br>Part 15: Radio Frequency Devices<br>Subpart B: Unintentional Radiators   |
| ISED                        | Innovation, Science and Economic Development Canada<br>Spectrum Management and Telecommunications Radio Standards Specification<br>RSS-Gen Issue 5: General Requirements and Information for the Certification of Radiocommunication Equipment |
| ISED                        | Innovation, Science and Economic Development Canada<br>Spectrum Management and Telecommunications Radio Standards Specification<br>RSS-236 Issue 1: General Radio Service Equipment Operating in the Band 26.960 to 27.410 MHz (Citizens Band) |

## 6.0 FACILITIES AND ACCREDITATIONS

### Facility and Accreditation:

The facilities used to evaluate this device outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site (OATS) conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC under Test Firm Registration Number CA3874A-1 and Industry Canada under Test Site File Number IC 3874A-1. Celltech is accredited to ISO 17025, through accrediting body A2LA and with certificate 2470.01.



**7.0 CONDUCTED POWER**

**Test Procedure**

|                            |   |
|----------------------------|---|
| <b>Normative Reference</b> | <b>FCC 47 CFR §2.1046, §2.1033(c )(8), §95.967, RSS-236<br/>EIA/TIA-382-A</b> |
|----------------------------|---|

**Limits**

|                |   |
|----------------|---|
| 47 CFR §95.967 | Each CBRS transmitter type must be designed such that the transmitter power can not exceed the following limits:<br>(1) 4 W Carrier power when transmitting emission type A1D or A3E; |
| RSS-236 5.2    | The transmitter output power shall not exceed 4.0 watts for a DSB mode of operations.   |

**General Procedure**

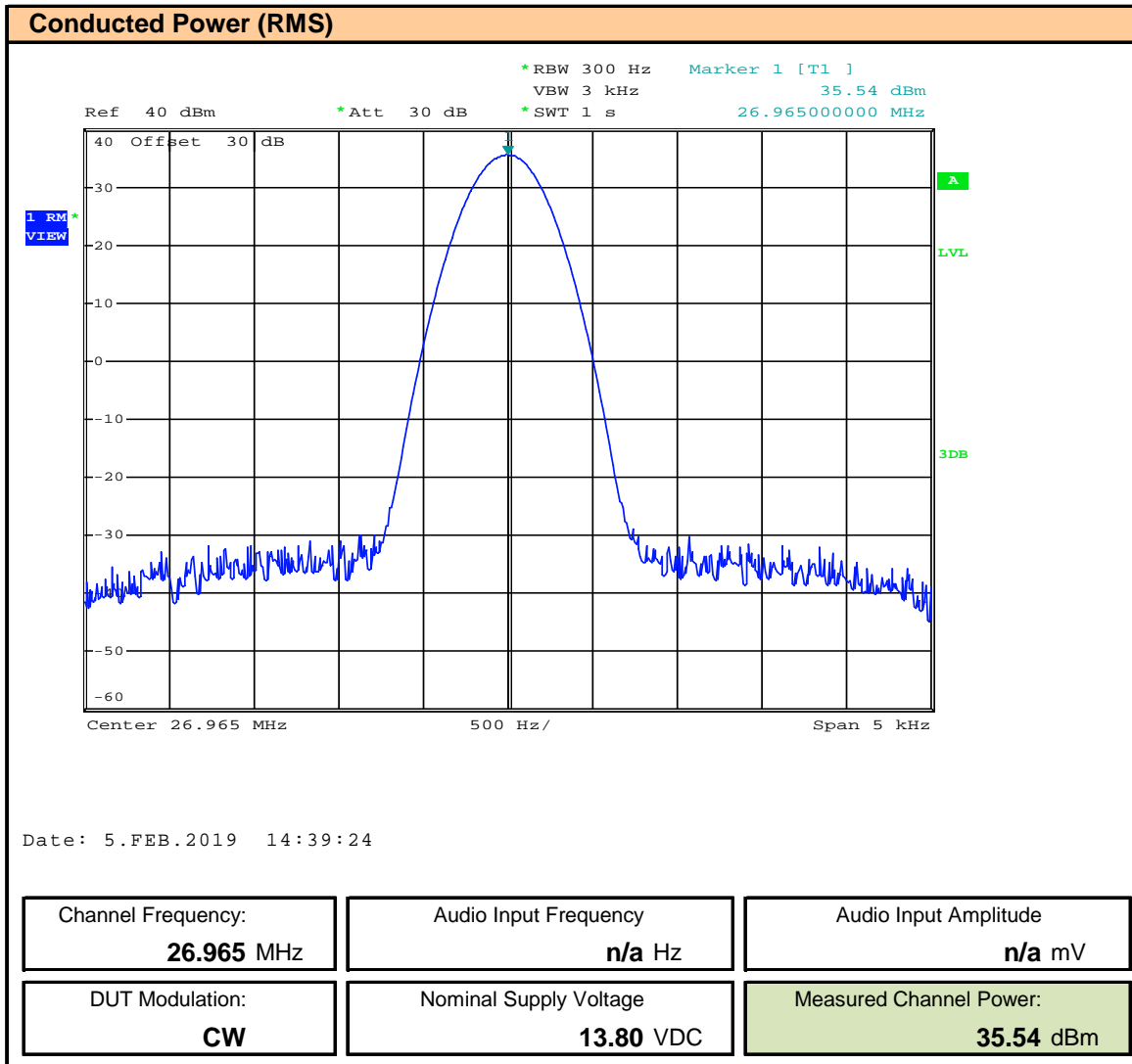
|               |   |
|---------------|---|
| EIA/TIA-382-A | <b>19. TRANSMITTER CARRIER POWER OUTPUT</b><br>Transmitter Carrier Power Output for this service is the power (rms) available at the output terminals of the transmitter when the output terminals are connected to a standard output load. This measurement shall be performed without modulation, at standard test. conditions. |
|---------------|---|

|                   |                                |
|-------------------|--------------------------------|
| <b>Test Setup</b> | <b>Appendix A - Figure A.1</b> |
|-------------------|--------------------------------|

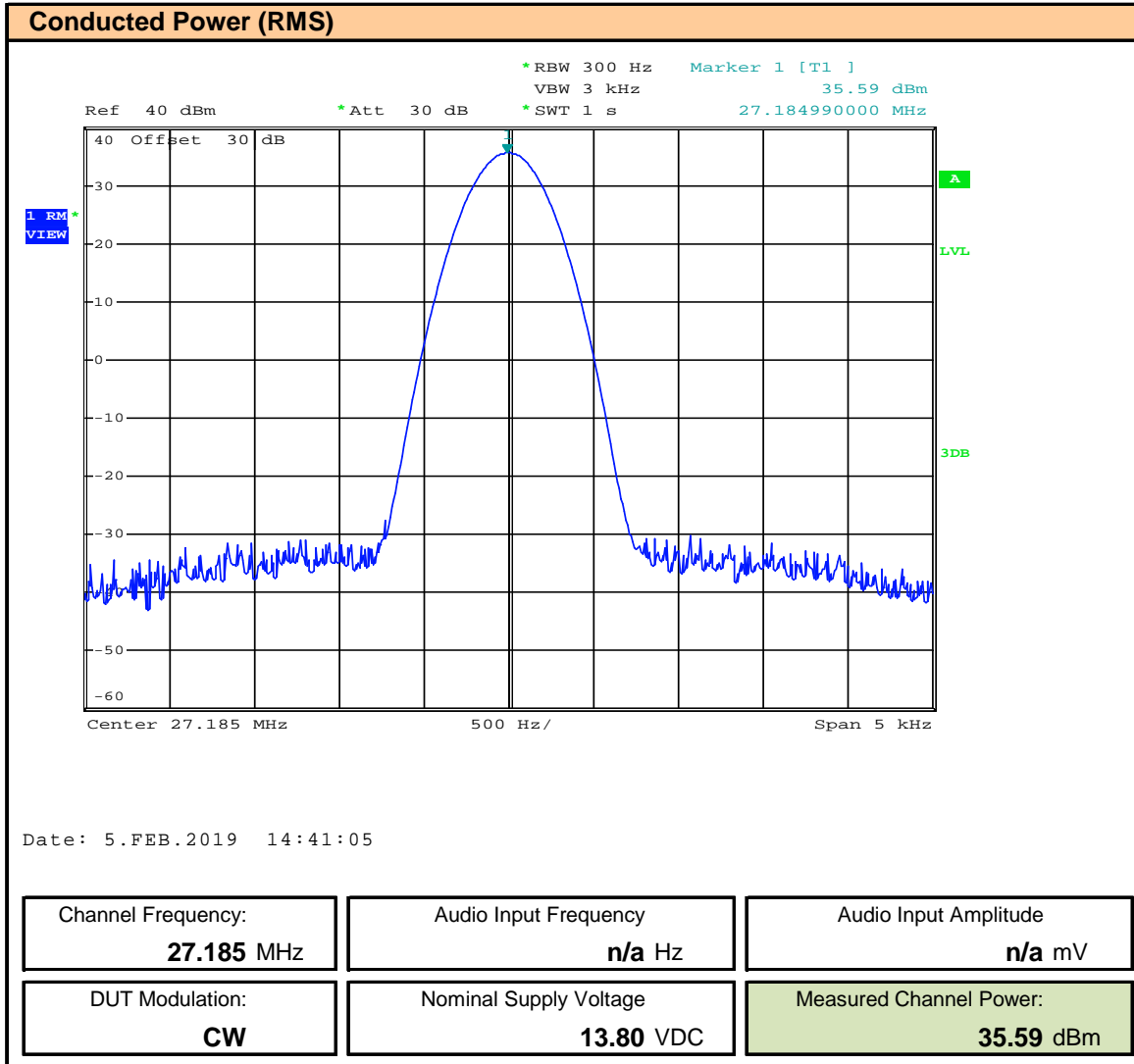
**Measurement Procedure**

The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the Automatic 6dB Cursor Bandwidth measurement. The output power of the DUT was set to the manufacturer's highest output power setting at the Low, Mid and High frequency channels as permitted by the device. The DUT was set to transmit at its maximum Duty Cycle.

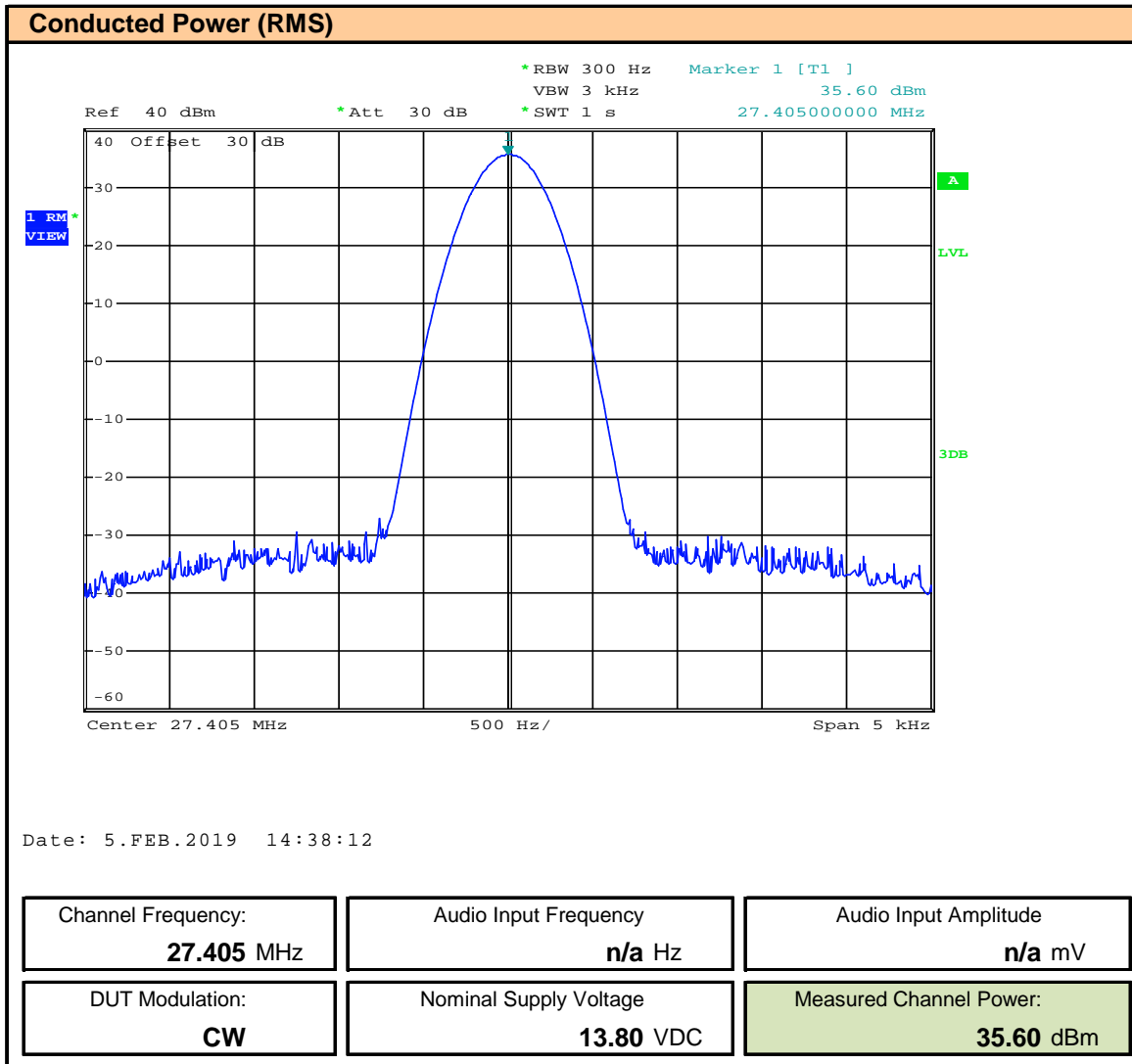
Plot 7.1 – Conducted Output Power – Channel 1



**Plot 7.2 – Conducted Output Power – Channel 19**



**Plot 7.3 – Conducted Output Power – Channel 40**



**Table 7.1 – Summary of Conducted Power Measurements (RMS)**

| <b>Conducted Power Measurement Results</b> |                    |            |                                      |  |  |                 |                |
|--|--------------------|------------|--------------------------------------|--|--|-----------------|----------------|
| Channel                                    | Frequency<br>(MHz) | Modulation | Nominal<br>Input<br>Voltage<br>(VDC) | Measured<br>Power<br>[E <sub>Meas</sub> ]<br>(dBm) | Measured<br>Power<br>[E <sub>Meas</sub> ]<br>(W) | Limit<br>(W)    | Margin<br>(dB) |
| 1  | 26.965             | CW         | 13.8                                 | 35.54  | 3.58   | 4.0             | <b>0.5</b>     |
| 19   | 27.185             |            |                                      | 35.59  | 3.62   |                 | <b>0.4</b>     |
| 40   | 27.405             |            |                                      | 35.60  | 3.63   |                 | <b>0.4</b>     |
| <b>Result:</b>                             |                    |            |                                      |  |  | <b>Complies</b> |                |

(1) The output power is factory set to maximum  
 $\text{Margin} = 10 \cdot \log(\text{Limit} / E_{\text{meas}})$

**Table 7.2 – Compliance to §2.1033(c)(8)**

| <b>FCC CFR 47 §2.1033( c )(8): Power to Transmitter:</b> |                          |
|--|--------------------------|
| Measured Receiver Current:                               | IRx = 0.21A              |
| Measured Total Current:                                  | ITx = 1.27A              |
| Transmitter Current (ITx - IRx):                         | IXmitter = 1.06A         |
| Power to Transmitter:                                    | (13.8VDC)(1.06) = 14.63W |
| <b>Result:</b>   | <b>Complies</b>          |

## 8.0 MODULATION RESPONSE

### Test Conditions

|                            |  |
|----------------------------|--|
| <b>Normative Reference</b> | FCC 47 CFR §2.1047, §95.975, RSS-236 5.3.2 |
|----------------------------|--|

### Limits

|                |   |
|----------------|---|
| 47 CFR §2.1047 | a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.  |
| 47 CFR §95.975 | Each CBRS transmitter type must be designed such that the modulation characteristics are in compliance with the rules in this section.<br>(a) When emission type A3E is transmitted with voice modulation, the modulation percentage must be at least 85%, but not more than 100%.<br>(b) When emission type A3E is transmitted by a CBRS transmitter having a transmitter output power of more than 2.5 W, the transmitter must contain a circuit that automatically prevents the modulation percentage from exceeding 100%. |
| RSS-236        | 5.3.2) When emission type A3E is transmitted by a CB transmitter having a total power of greater than 2.5 W, the CB transmitter must automatically prevent the modulation from exceeding 100%.  |

### Measurement Procedure

#### TIA 382 25.2 Transmitter Audio Frequency Response

Operate the transmitter under standard test conditions and monitor the output with a modulation monitor or calibrated test receiver. The audio input signal applied through a suitable impedance matching network, as specified by the manufacturer, shall be adjusted to obtain 50% modulation at the maximum audio frequency response of the transmitter, and this point shall be taken as the 0 dB reference level. Vary the modulating frequency from 100 Hz to 10,000 Hz and record the input levels necessary to maintain a constant 50% modulation.

Graph the audio level in dB relative to the 0 dB reference level as a function of the modulating frequency. Record any audio frequency where it is impossible to perform the measurement.

#### TIA 382 24.2.2 Transmitter Modulation Limiting

The transmitter is modulated by a sinusoidal audio signal applied to the microphone input jack. First the audio input frequency is adjusted to deliver 50% modulation at the audio frequency that produces the maximum modulation level. Record the modulation input level (mV) and use this level as 0 dB for plotting modulation limiting. Increment the audio signal level to 40 dB above the reference level. Record the modulation level (%). Repeat the measurements using a 400 Hz and a 2500 Hz sinusoidal audio signal. Record the modulation level (%). Perform for both positive and negative modulation.

|                   |                   |                   |
|-------------------|-------------------|-------------------|
| <b>Test Setup</b> | <b>Appendix A</b> | <b>Figure A.2</b> |
|-------------------|-------------------|-------------------|

### Statement - Compliance to §95.977

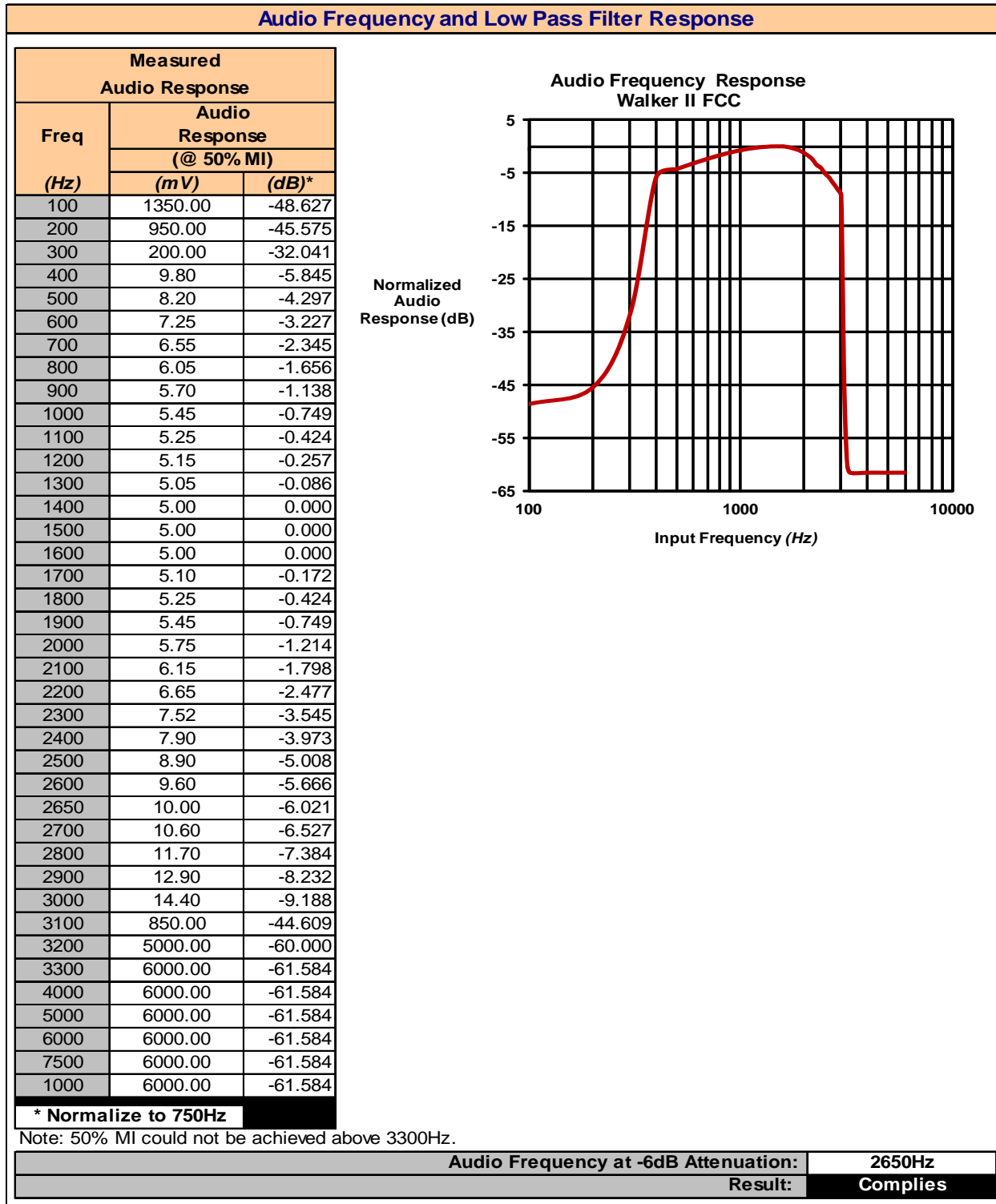
#### §95.977 CBRS tone transmissions.

In addition to the tones permitted under §95.377, CBRS transmitter types may be designed to transmit brief tones to indicate the beginning or end of a transmission.

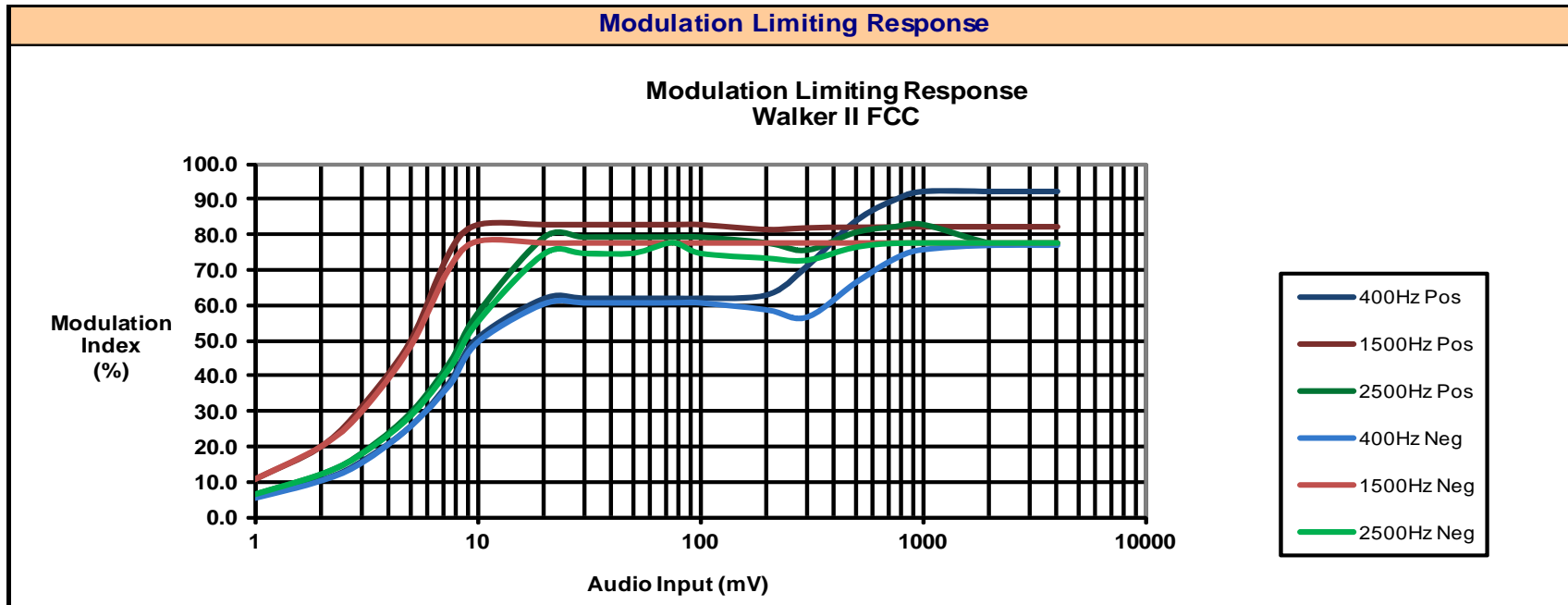
This device is capable of transmitting a brief (less than one second) audio tone, "Roger Beep", when the PTT button is released on the microphone indicating end of transmission. This function is user selectable and complies with the requirements of §95.377. See User's Manual page 11.



Plot 8.1 – Audio Frequency and Low Pass Filter Response



Plot 8.2 – Modulation Limiting Response



| Measured Modulation Response [Modulation Index (%)] |                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                 |           |
|---|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------|-----------|
| Freq (Hz)   | Audio Input (mV) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                 | Deviation |
|   | 1                | 2    | 3    | 5    | 7.5  | 10   | 20   | 30   | 50   | 75   | 100  | 200  | 300  | 500  | 750  | 1000 | 2000 | 3000 | 4000            |           |
| 400   | 5.7              | 10.4 | 15.5 | 25.6 | 38.2 | 50.7 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 63.0 | 71.1 | 84.1 | 90.1 | 92.4 | 92.4 | 92.4 | 92.4            | Positive  |
| 1500  | 10.6             | 20.1 | 31.0 | 50.0 | 75.3 | 83.0 | 83.0 | 83.0 | 83.0 | 83.0 | 83.0 | 81.6 | 82.1 | 82.3 | 82.3 | 82.4 | 82.4 | 82.4 | 82.4            |           |
| 2500  | 6.3              | 12.1 | 17.8 | 29.3 | 43.5 | 57.4 | 79.1 | 79.0 | 79.0 | 79.0 | 79.0 | 77.4 | 75.3 | 80.4 | 82.0 | 82.6 | 77.3 | 77.3 | 77.3            |           |
| 400   | 5.4              | 10.4 | 15.3 | 25.7 | 37.5 | 49.5 | 60.5 | 60.7 | 60.7 | 60.7 | 60.7 | 58.7 | 56.6 | 66.5 | 73.3 | 75.8 | 77.0 | 77.0 | 77.0            | Negative  |
| 1500  | 10.5             | 20.0 | 29.5 | 48.2 | 70.5 | 78.0 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5 | 77.5            |           |
| 2500  | 6.3              | 12.1 | 17.6 | 28.5 | 42.0 | 55.0 | 74.4 | 74.4 | 74.4 | 74.4 | 74.4 | 74.4 | 73.0 | 72.4 | 76.2 | 77.2 | 77.3 | 77.3 | 77.3            |           |
| Audio Frequency @ Maximum Deviation:                |                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 400Hz           |           |
| Audio Input @ Maximum Deviation:                    |                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 4000mV          |           |
| Maximum Measured Modulation Index:                  |                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 92.4%           |           |
| Result:   |                  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | <b>Complies</b> |           |

**9.0 OCCUPIED BANDWIDTH AND EMISSION MASKS**

**Test Conditions**

|                            |   |
|----------------------------|---|
| <b>Normative Reference</b> | <b>FCC 47 CFR §2.1049, §95.973, RSS-236</b> |
|----------------------------|---|

**Limits**

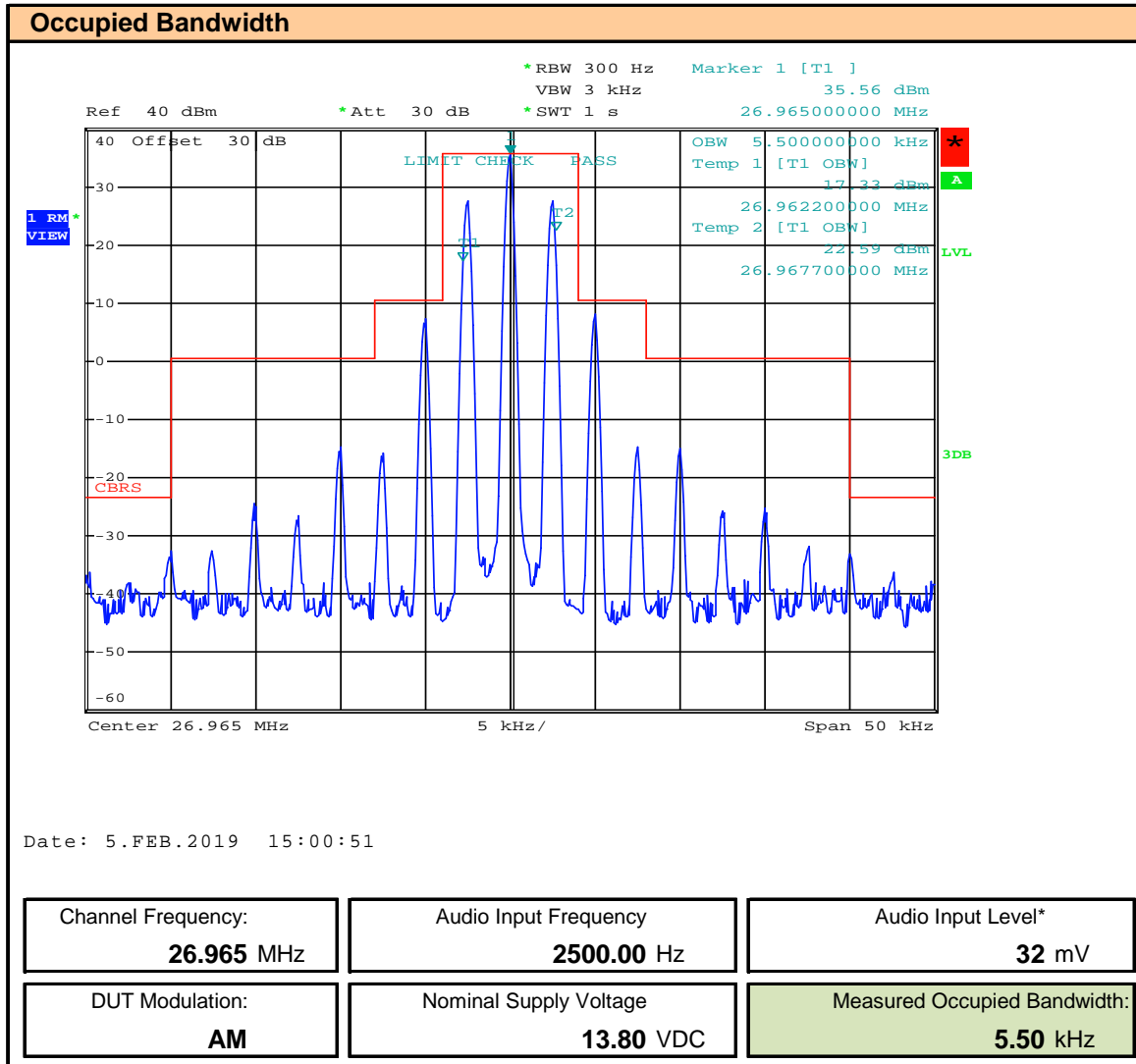
|                |   |
|----------------|---|
| 47 CFR §95.973 | Each CBRS transmitter type must be designed such that the occupied bandwidth does not exceed the authorized bandwidth for the emission type under test.<br>(a) AM. The authorized bandwidth for emission type A3E is 8 kHz.   |
| RSS-236 5.3.2  | The authorized bandwidth for emission type A1D or A3E is 8 kHz.   |
| 47 CFR §95.979 | Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.<br>(a) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs listed in the following table:<br>For A3E (1), (3), (5), (6)<br>(1) 25 dB (decibels) in the frequency band 4 kHz to 8 kHz removed from the channel center frequency;<br>(3) 35 dB in the frequency band 8 kHz to 20 kHz removed from the channel center frequency;<br>(5) 53 + 10 log (P) dB in any frequency band removed from the channel center frequency by more than 250% of the authorized bandwidth.<br>(6) 60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency. |
| RSS-236 4.4.4  | For A1D and A3E:<br>_ At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.<br>_ At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.<br>_ At least 53 + 10 log <sub>10</sub> (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.<br>_ At least 60 dB on any frequency twice or greater than twice the fundamental frequency.  |

**Measurement Procedure**

|   |  |
|---|--|
| <b>TIA 382 23.2</b>   | <b>Transmitter Modulation Occupied Bandwidth</b> |
| The transmitter is modulated by a sinusoidal audio signal applied to the microphone input jack. First, the frequency is adjusted to deliver 50% modulation at the highest audio response level (minimum applied audio level). Then the audio signal level is increased 16 dB and the audio frequency is readjusted to 2500 Hz. The analyzer is adjusted to display each of the discrete modulation sidebands and their respective harmonic products within +/- 50 kHz of the carrier frequency. |  |

|                   |                   |                   |
|-------------------|-------------------|-------------------|
| <b>Test Setup</b> | <b>Appendix A</b> | <b>Figure A.1</b> |
|-------------------|-------------------|-------------------|

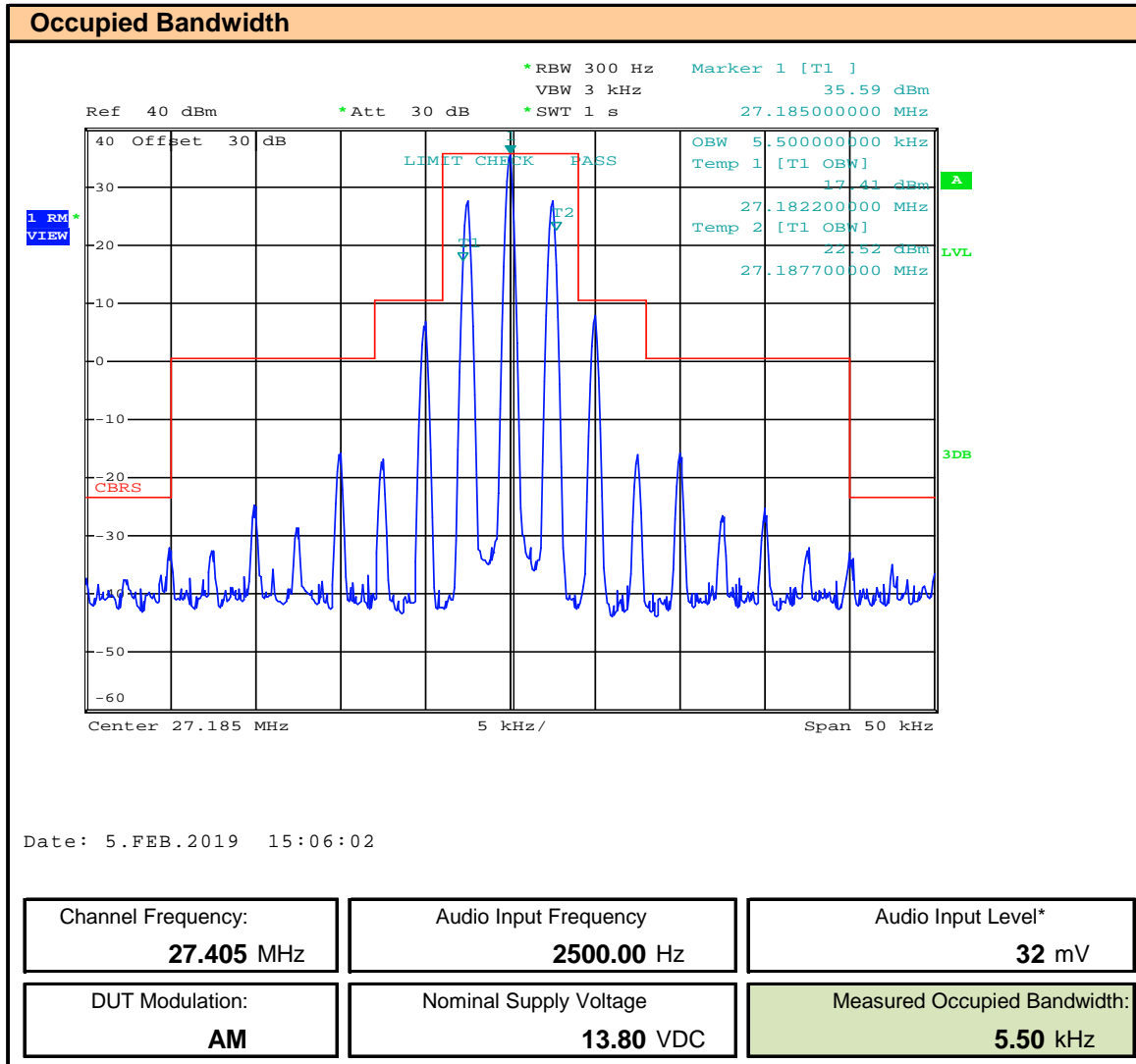
Plot 9.1 – Occupied Bandwidth Channel 1



\* Audio Input Level > 16dB of Level Required for 50% Modulation Index



**Plot 9.3 – Occupied Bandwidth Channel 40**



\* Audio Input Level > 16dB of Level Required for 50% Modulation Index

**Table 9.1 - Summary of Occupied Bandwidth and Emission Mask Results**

| <b>Occupied Bandwidth Measurement Results</b> |                            |                           |  |   |                         |                          |                                |
|---|----------------------------|---------------------------|--|---|-------------------------|--------------------------|--------------------------------|
| <b>Channel</b>                                | <b>Frequency<br/>(MHz)</b> | <b>DUT<br/>Modulation</b> | <b>Measured<br/>Occupied<br/>Bandwidth<br/>(kHz)</b> | <b>Authorized<br/>Bandwidth<br/>(kHz)</b> | <b>Margin<br/>(kHz)</b> | <b>Emission<br/>Mask</b> | <b>Emission<br/>Designator</b> |
| 1   | 26.965                     | AM                        | 5.5  | 8.0                                       | 2.5                     | PASS                     | 5K50A3E                        |
| 19  | 27.185                     |                           | 5.5  |   | 2.5                     | PASS                     | 5K50A3E                        |
| 40  | 27.405                     |                           | 5.5  |   | 2.5                     | PASS                     | 5K50A3E                        |
| Margin = Authorized BW - Measured BW          |                            |                           |  |   | <b>Result:</b>          | <b>Complies</b>          |                                |

**§95.971 CBRS emission types.**

Each CBRS transmitter type must be designed such that its capabilities are in compliance with the emission type rules in this section.

(a) Permitted emission types. CBRS transmitter types may transmit only AM voice emission type A3E and SSB voice

This device only transmits AM voice emission type A3E

**Result:** **Complies**

## 10 CONDUCTED OUT OF BAND SPURIOUS EMISSIONS

### Test Conditions

|                            |                                    |
|----------------------------|------------------------------------|
| <b>Normative Reference</b> | <b>FCC 47 CFR §95.979, RSS-236</b> |
|----------------------------|------------------------------------|

### Limits

|                |   |
|----------------|---|
| 47 CFR §95.979 | <p>Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.</p> <p>(a) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs listed in the following table:</p> <p>For A3E (1), (3), (5), (6)</p> <p>(1) 25 dB (decibels) in the frequency band 4 kHz to 8 kHz removed from the channel center frequency;</p> <p>(3) 35 dB in the frequency band 8 kHz to 20 kHz removed from the channel center frequency;</p> <p>(5) <math>53 + 10 \log(P)</math> dB in any frequency band removed from the channel center frequency by more than 250% of the authorized bandwidth.</p> <p>(6) 60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency.</p> |
| RSS-236 4.4.4  | <p>For A1D and A3E:</p> <p>_ At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.</p> <p>_ At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.</p> <p>_ At least <math>53 + 10 \log_{10}(T)</math> dB on any frequency removed from the center of the authorized bandwidth by more than 250%.</p> <p>_ At least 60 dB on any frequency twice or greater than twice the fundamental frequency.</p>   |

### Measurement Procedure

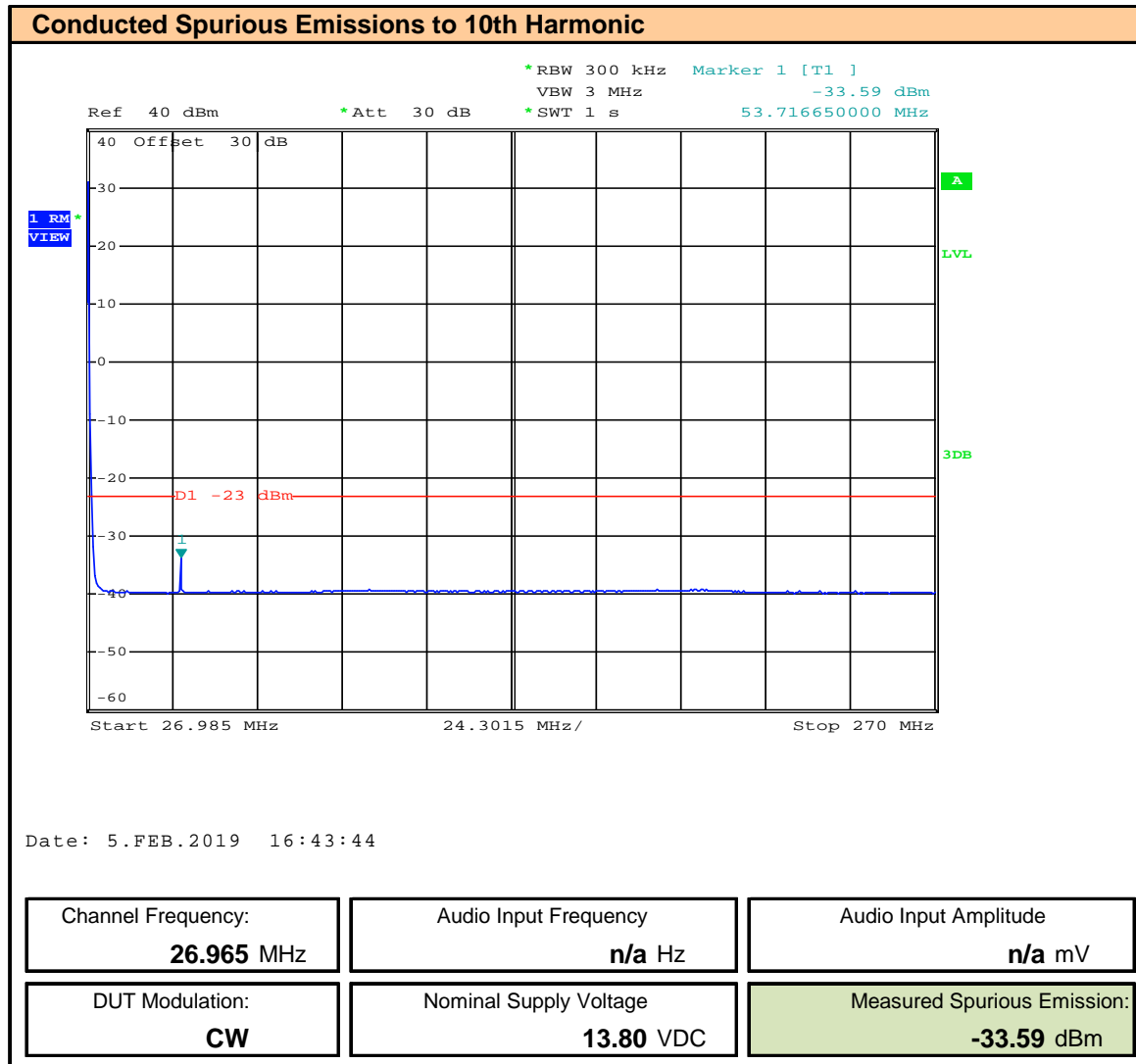
#### **TIA 382 21.2 Transmitter Conducted Spurious and Harmonic Emissions**

The transmitter RF output shall be connected to the standard nonradiating output load. The output shall be sampled and displayed using spectrum analysis techniques. 2500 Hz modulation shall be applied at a level 16 dB above that required to produce 50% modulation at the frequency of maximum response. The sampled output shall be analyzed from the lowest frequency generated in the equipment to the 10th harmonic of the fundamental signal and the levels of all spurious outputs attenuated not more than 20 dB below the maximum required attenuation shall be recorded.

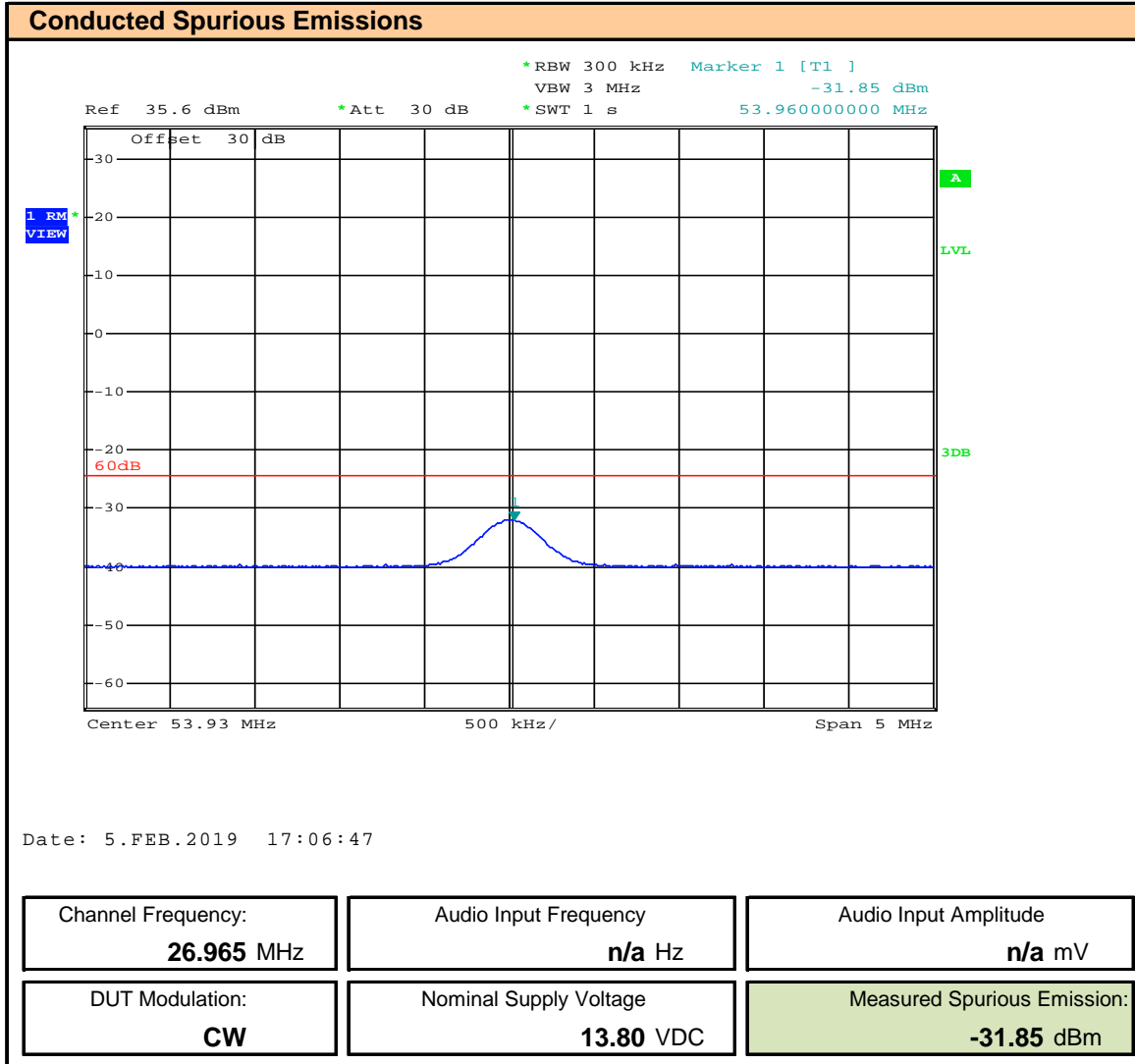
|                   |                   |            |
|-------------------|-------------------|------------|
| <b>Test Setup</b> | <b>Appendix A</b> | <b>A.1</b> |
|-------------------|-------------------|------------|



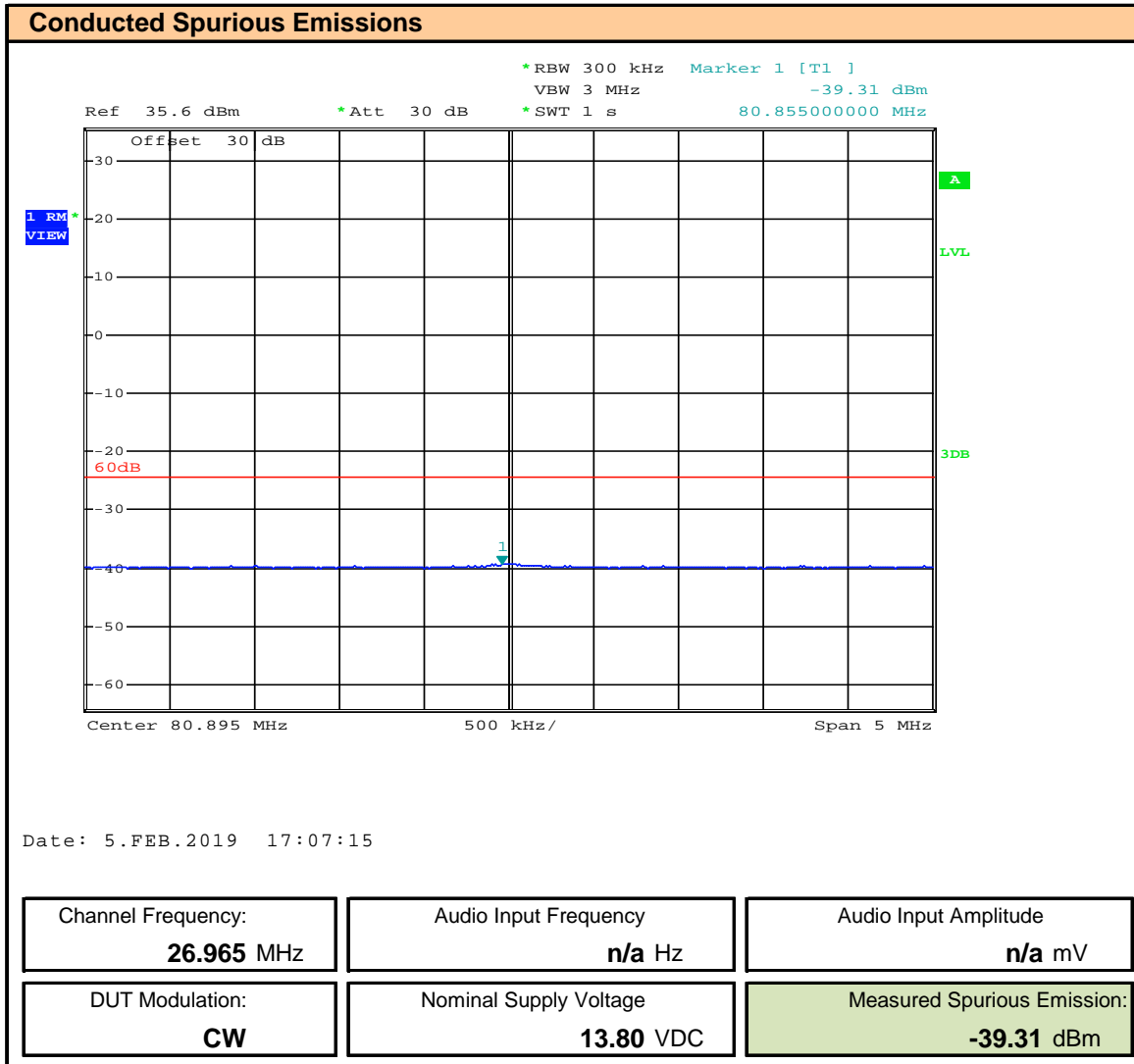
**Plot 10.1 – Conducted Out of Band Emissions, 30MHz – 300MHz, Channel 1**



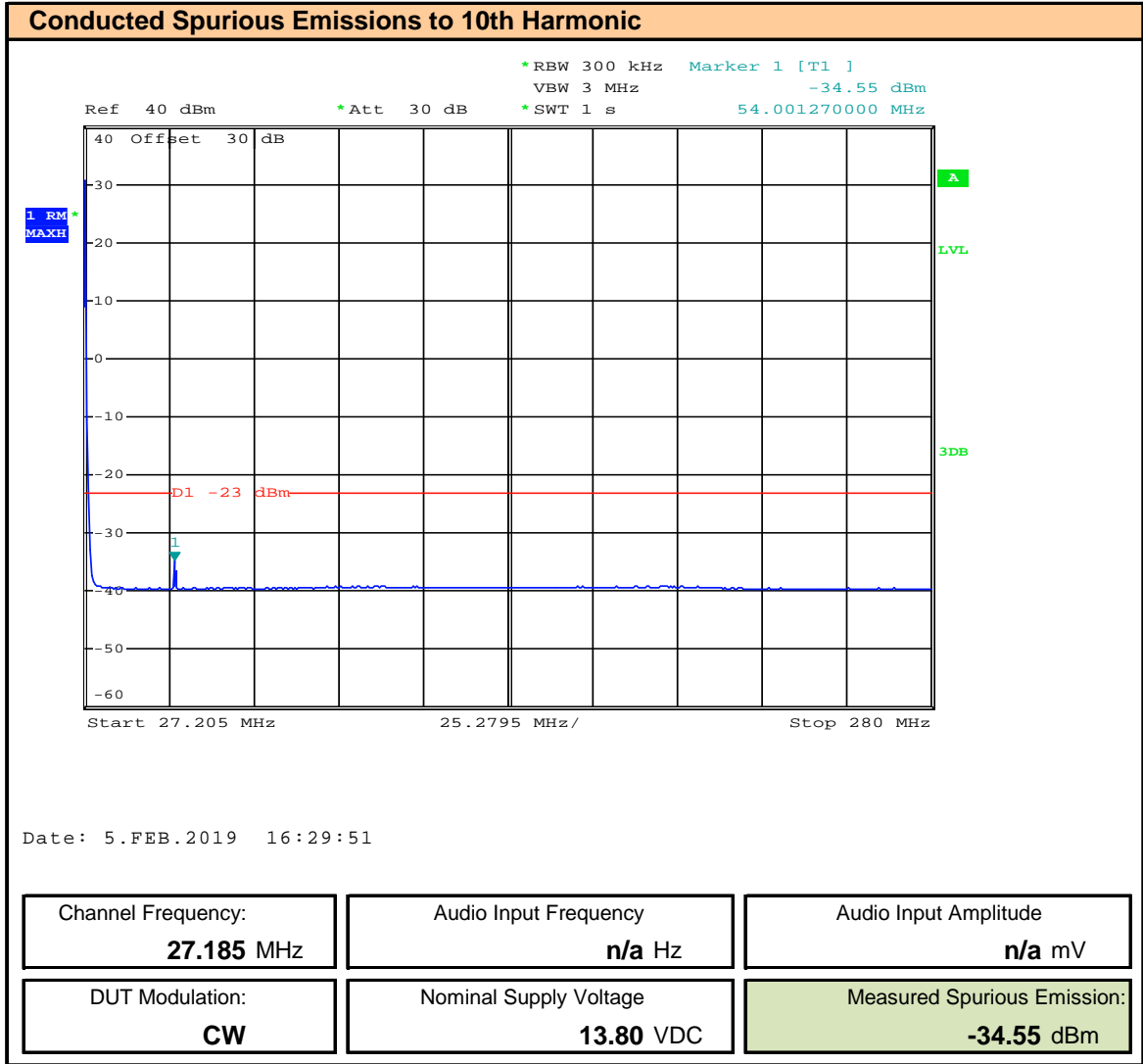
Plot 10.2 – Conducted Out of Band Emissions, Channel 1, 2<sup>nd</sup> Harmonic



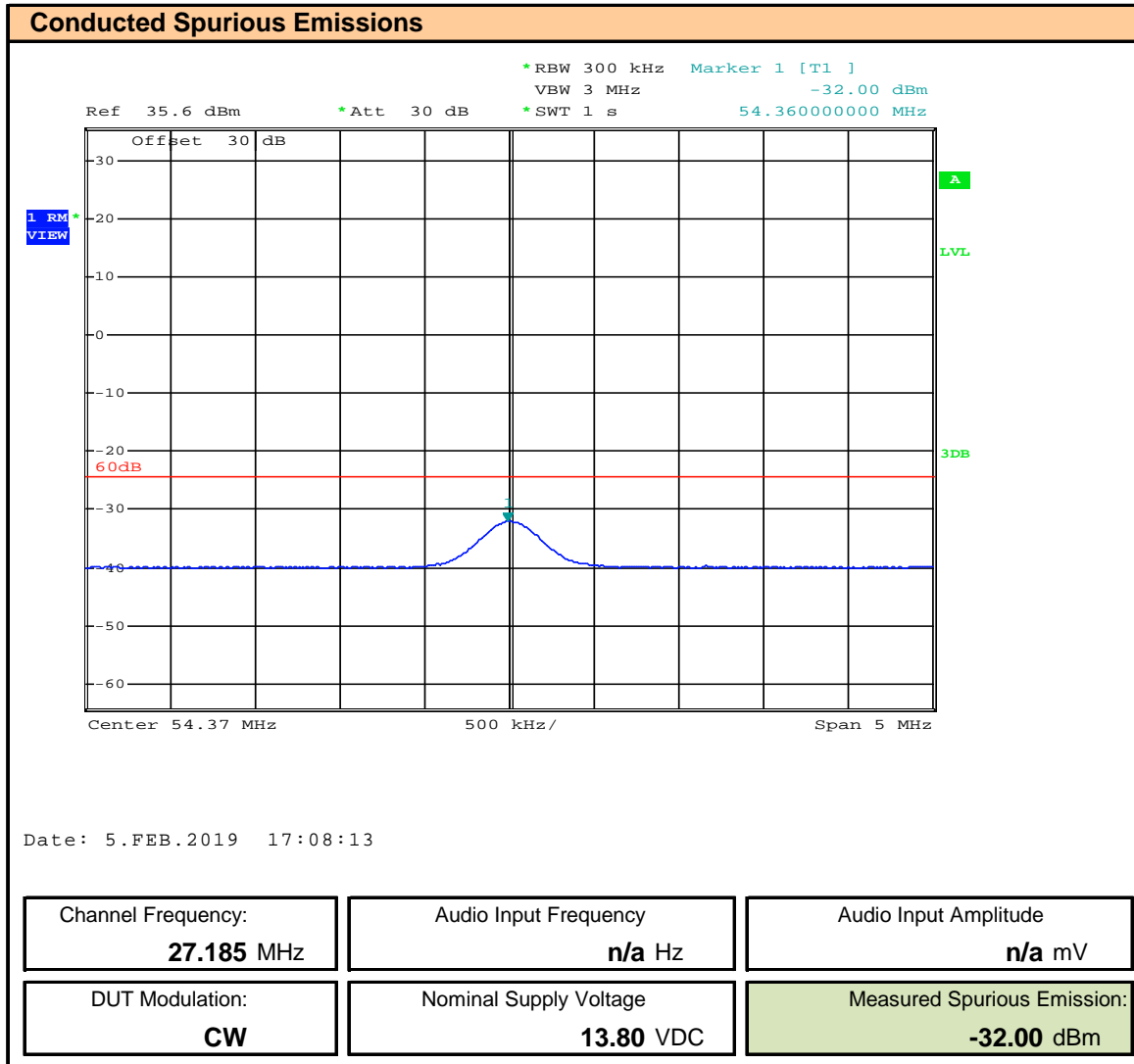
**Plot 10.3 – Conducted Out of Band Emissions, Channel 1, 3<sup>rd</sup> Harmonic**



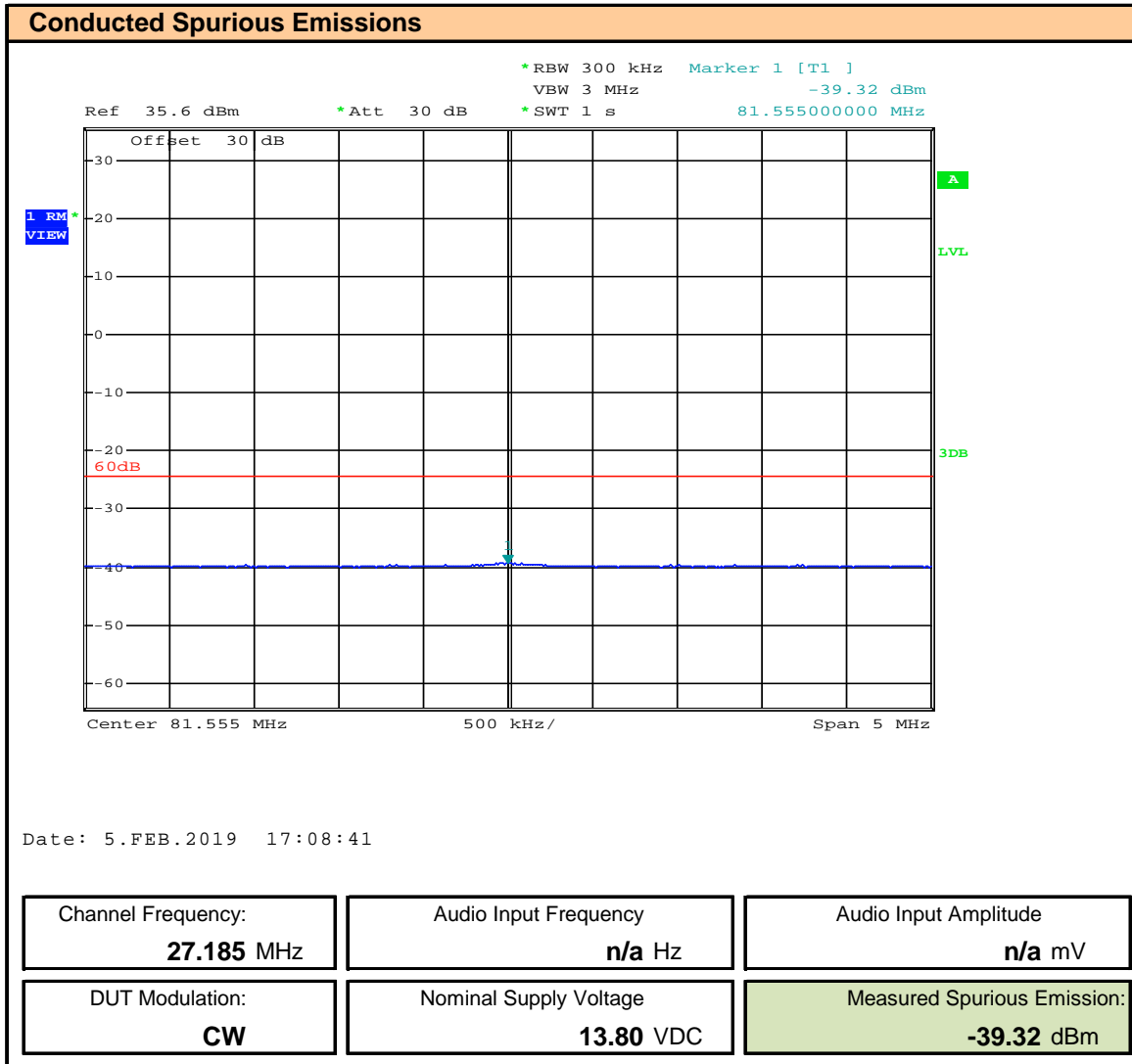
**Plot 10.4 – Conducted Out of Band Emissions, 30MHz – 300MHz, Channel 19**



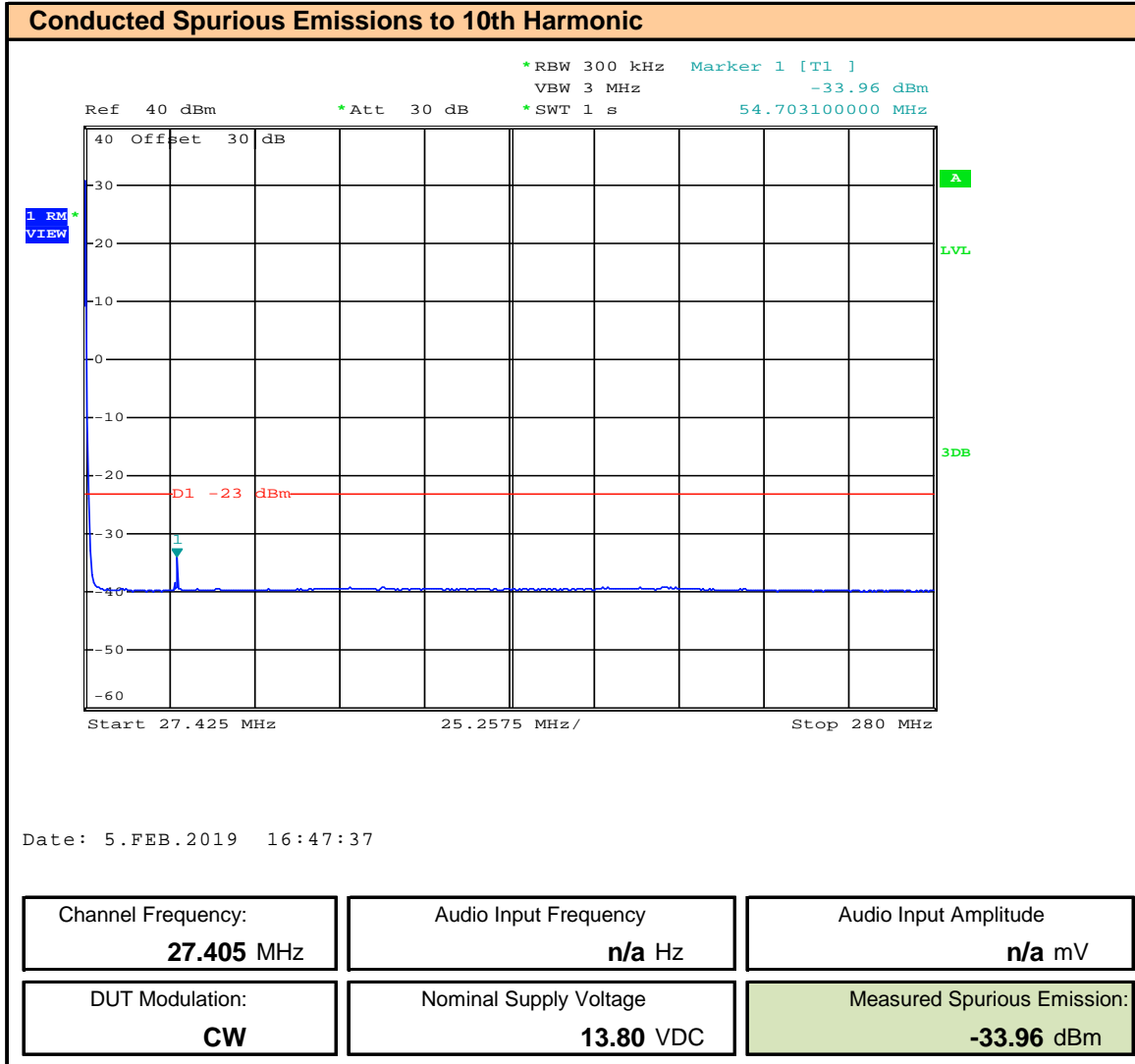
**Plot 10.5 – Conducted Out of Band Emissions, Channel 19, 2<sup>nd</sup> Harmonic**



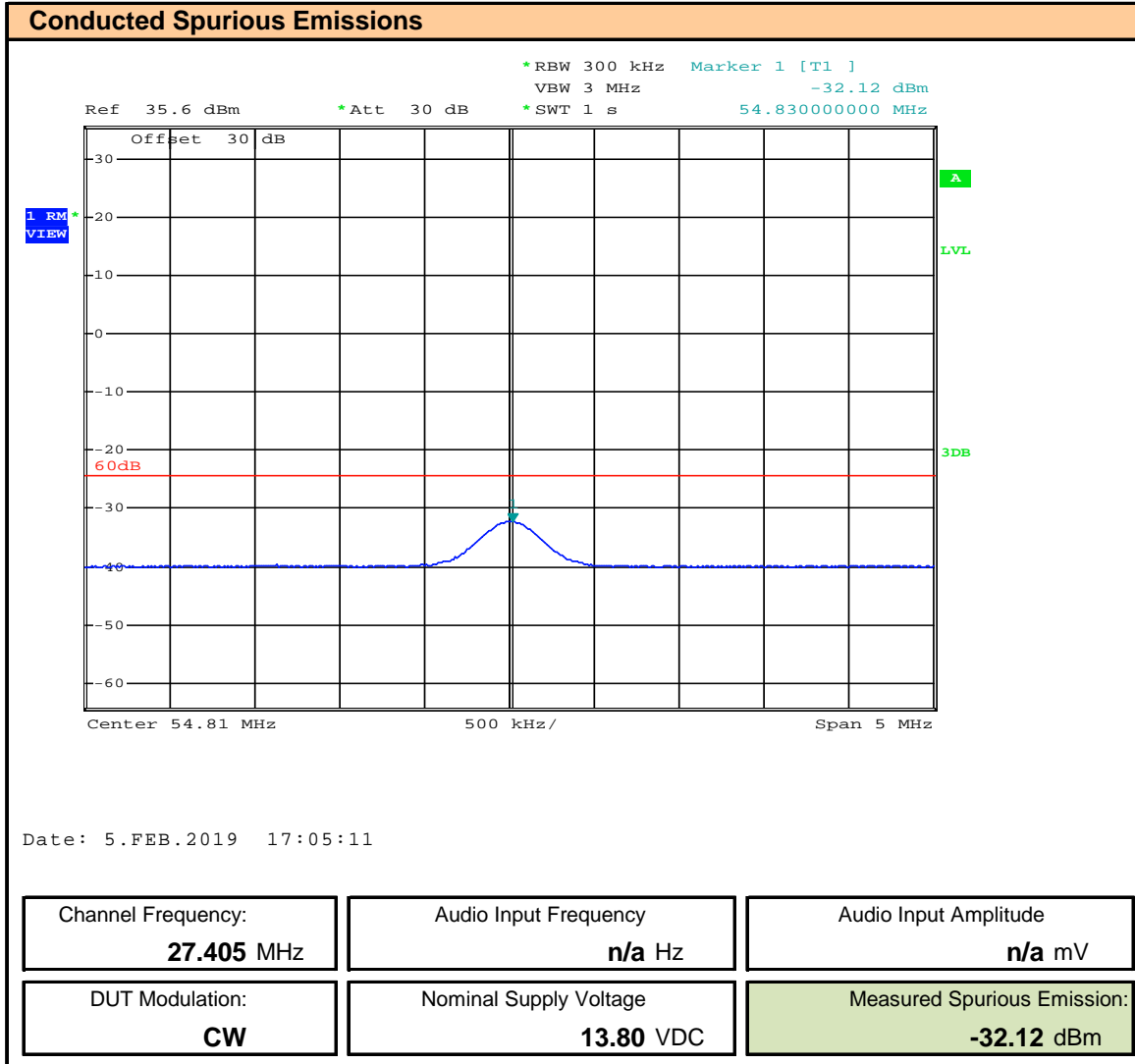
**Plot 10.6 – Conducted Out of Band Emissions, Channel 19, 3<sup>rd</sup> Harmonic**



**Plot 10.7 – Conducted Out of Band Emissions, 30MHz – 300MHz, Channel 40**



Plot 10.8 – Conducted Out of Band Emissions, Channel 40, 2<sup>nd</sup> Harmonic







**Table 10.1 – Summary of Conducted Out of Band Emissions**

| <b>Conducted Spurious Emissions</b>  |                                 |                       |                                    |   |                         |                   |                    |
|--|---------------------------------|-----------------------|------------------------------------|---|-------------------------|-------------------|--------------------|
| <b>Channel Frequency (MHz)</b>   | <b>Emission Frequency (MHz)</b> | <b>DUT Modulation</b> | <b>Fundamental Power [P] (dBm)</b> | <b>Out of Band Emission [P<sub>E</sub>] (dBm)</b> | <b>Attenuation [dB]</b> | <b>Limit (dB)</b> | <b>Margin (dB)</b> |
| 26.965   | 53.93                           | CW                    | 35.5                               | -31.9   | 67.4                    | 60.0              | 7.39               |
|  | 80.89                           |                       | 35.5                               | -39.3   | 74.9                    |                   | 14.85              |
| 27.185   | 54.37                           |                       | 35.6                               | -32.0   | 67.6                    |                   | 7.59               |
|  | 81.55                           |                       | 35.6                               | -39.3   | 74.9                    |                   | 14.91              |
| 27.405   | 54.83                           |                       | 35.6                               | -32.1   | 67.7                    |                   | 7.72               |
|  | 82.21                           |                       | 35.6                               | -39.3   | 74.9                    |                   | 14.88              |
| Attenuation = P - P <sub>E</sub><br>Margin = Limit - Attenuation   |                                 |                       |                                    |   |                         |                   |                    |
| <b>Result:</b>   |                                 |                       |                                    |   |                         | <b>Complies</b>   |                    |
| All Spurious Emissions were evaluated to the 10th harmonic (280MHz). No other emissions were observed.<br>Data for fundamental and spurious emissions presented using an RMS detector. |                                 |                       |                                    |   |                         |                   |                    |

## 11.0 RADIATED SPURIOUS EMISSIONS

### Test Conditions

|                            |                                    |
|----------------------------|------------------------------------|
| <b>Normative Reference</b> | <b>FCC 47 CFR §95.979, RSS-236</b> |
|----------------------------|------------------------------------|

### Limits

|                |   |
|----------------|---|
| 47 CFR §95.979 | <p>Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.</p> <p>(a) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs listed in the following table:</p> <p>For A3E (1), (3), (5), (6)</p> <p>(1) 25 dB (decibels) in the frequency band 4 kHz to 8 kHz removed from the channel center frequency;</p> <p>(3) 35 dB in the frequency band 8 kHz to 20 kHz removed from the channel center frequency;</p> <p>(5) <math>53 + 10 \log(P)</math> dB in any frequency band removed from the channel center frequency by more than 250% of the authorized bandwidth.</p> <p>(6) 60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency.</p> |
| RSS-236 4.4.4  | <p>For A1D and A3E:</p> <p>_ At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.</p> <p>_ At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.</p> <p>_ At least <math>53 + 10 \log_{10}(T)</math> dB on any frequency removed from the center of the authorized bandwidth by more than 250%.</p> <p>_ At least 60 dB on any frequency twice or greater than twice the fundamental frequency.</p>   |

### Measurement Procedure

#### TIA 382 22.2 Transmitter Radiated Spurious and Harmonic Emissions

The transmitter shall be terminated in a nonradiating dummy load and shall be keyed but not modulated.

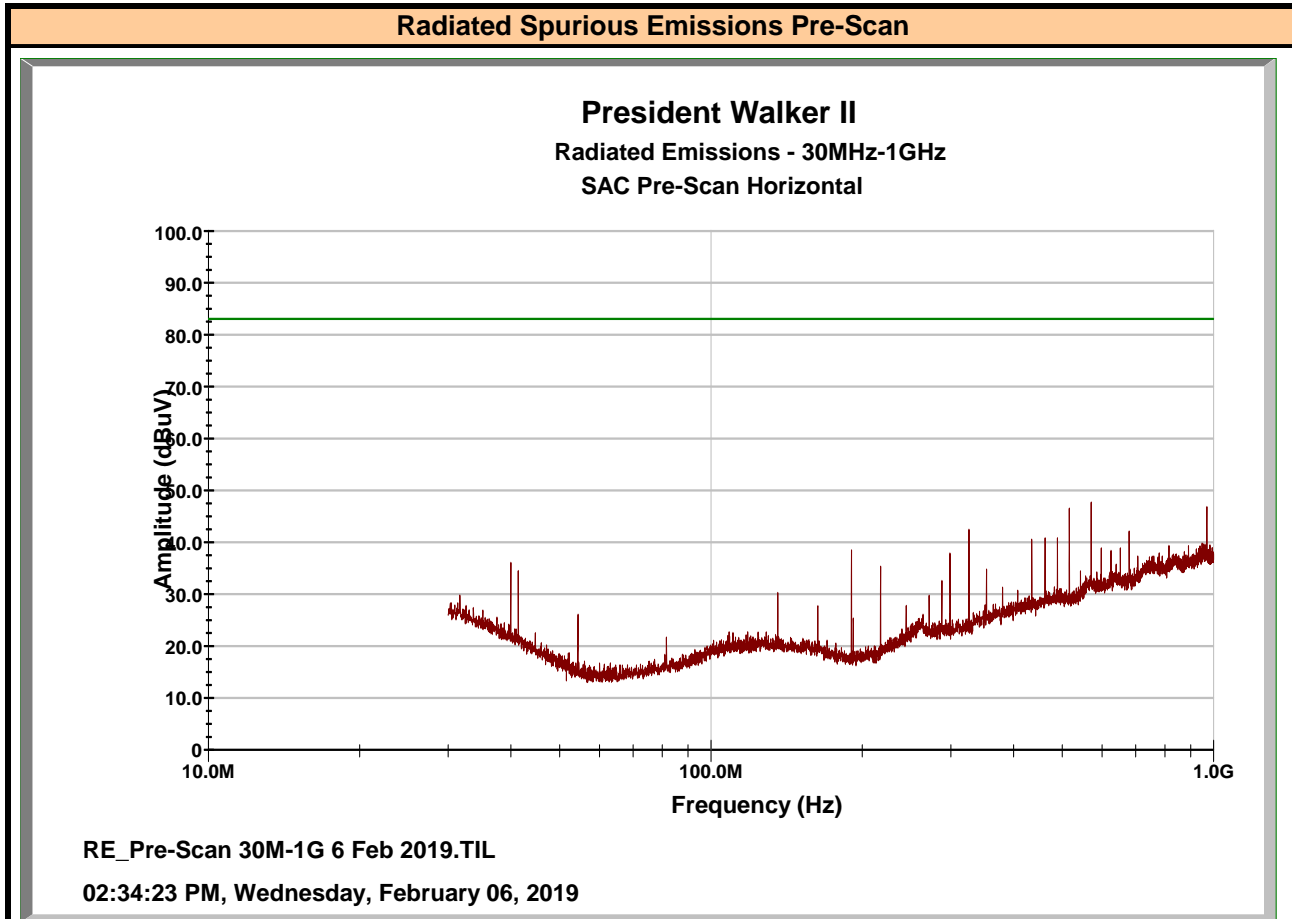
For each spurious frequency, raise and lower the receiver antenna to obtain a maximum reading on the FIM with the antenna at horizontal polarity. Then the turntable should be rotated to further increase this maximum reading. Repeat this procedure of raising and lowering the antenna and rotating the turntable until the highest possible signal has been obtained. The effect of the simulated accessory connections shall be noted, so that the measurement series producing the maximum radiation level can be recorded.

### Test Setup

**Appendix A**

**Figure A.3**

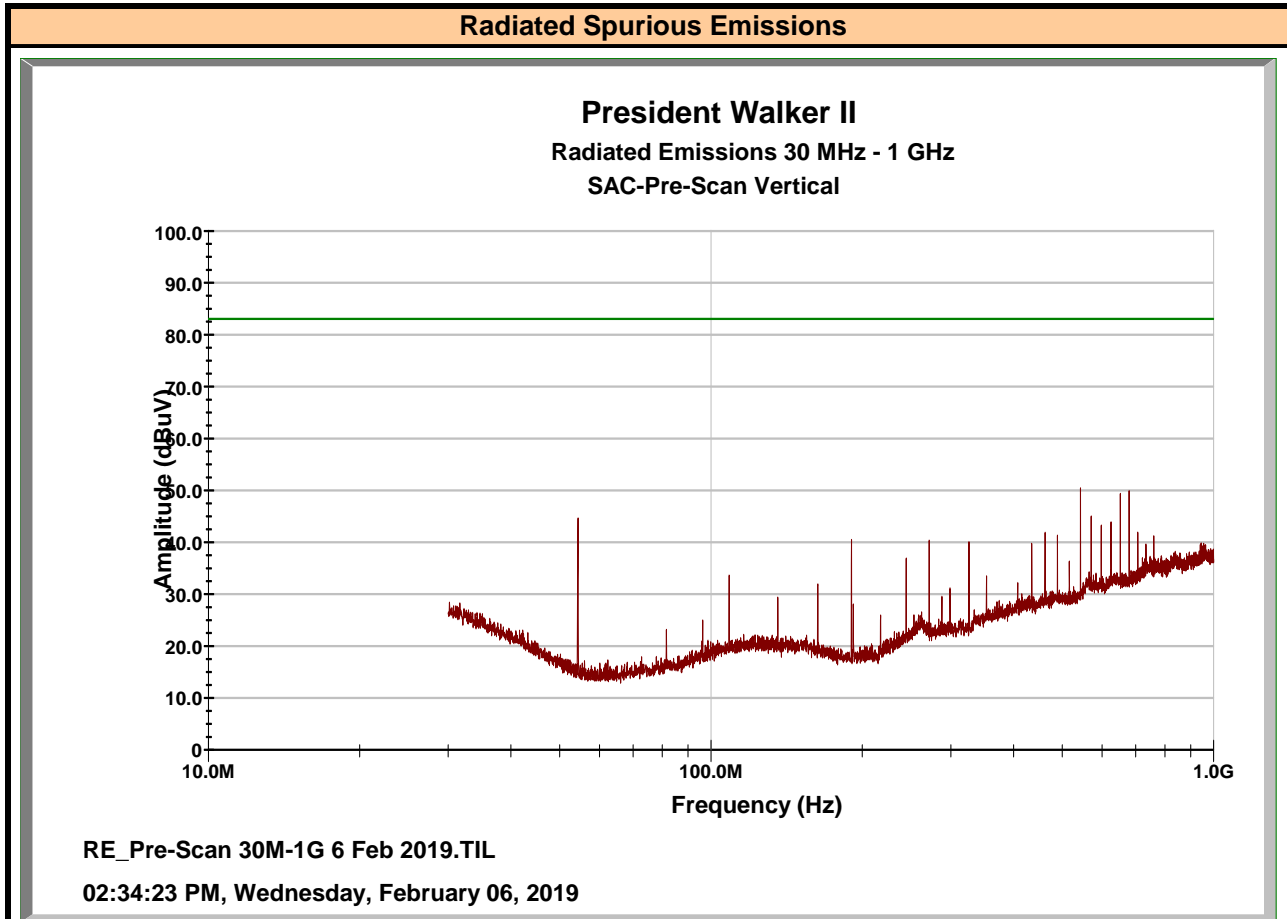
Plot 11.1 – Radiated Spurious Emissions Pre-Scan, 30MHz – 1000MHz, Horizontal



No Emissions within 20dB of limit were observed.

|                           |                  |
|---------------------------|------------------|
| Frequency Span:           | 30MHz to 1000MHz |
| Channel Frequency (Ch 1): | 26.965MHz        |
| Modulation:               | CW               |
| Polarization:             | Horizontal       |

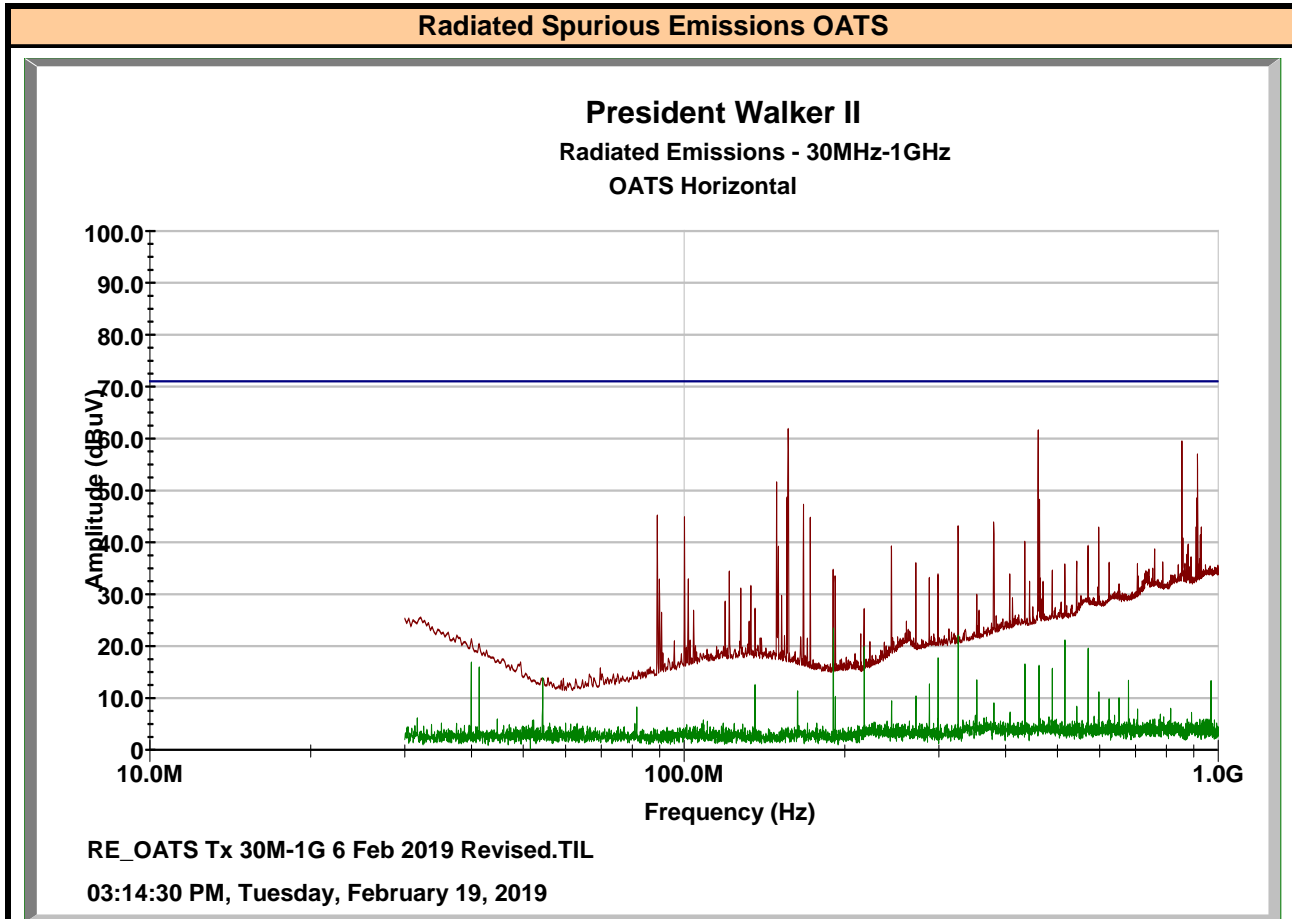
Plot 11.2 – Radiated Spurious Emissions Pre-Scan, 30MHz – 1000MHz, Vertical



No Emissions within 20dB of limit were observed.

|                           |                  |
|---------------------------|------------------|
| Frequency Span:           | 30MHz to 1000MHz |
| Channel Frequency (Ch 1): | 26.965MHz        |
| Modulation:               | CW               |
| Polarization:             | Vertical         |

Plot 11.2 – Radiated Spurious Emissions OATS, 30MHz – 1000MHz, Horizontal

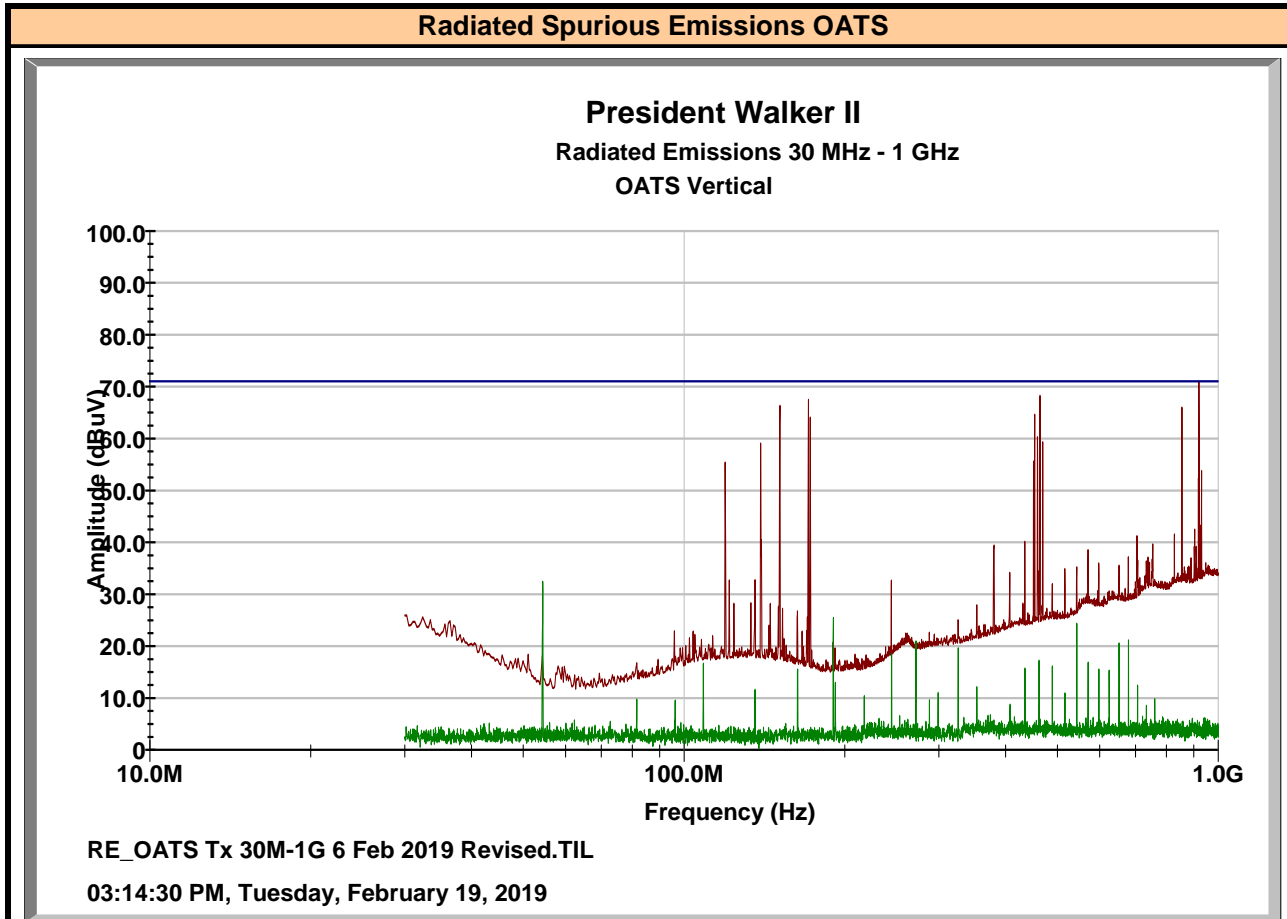


Trace 1 (Red): OATS Emission  
Trace 2 (Green): Uncorrected SAC Emission

|                                  |                  |
|----------------------------------|------------------|
| <b>Frequency Span:</b>           | 30MHz to 1000MHz |
| <b>Channel Frequency (Ch 1):</b> | 26.965MHz        |
| <b>Modulation:</b>               | CW               |
| <b>Polarization:</b>             | Horizontal       |

Trace 2: Uncorrected SAC (Semi Anechoic Chamber) emission indicates the DUT emissions observed in the pre-scan without the presence of ambient noise and is not corrected for antenna factor, etc. FOR REFERENCE ONLY. Trace 1: OATS Emission includes ambient noise. Emissions measured with peak detector applied to QP limits. Emissions other than those identified in Trace 2 are ambient.

Plot 11.2 – Radiated Spurious Emissions OATS, 30MHz – 1000MHz, Vertical



Trace 1 (Red): OATS Emission  
 Trace 2 (Green): Uncorrected SAC Emission

|                                  |                  |
|----------------------------------|------------------|
| <b>Frequency Span:</b>           | 30MHz to 1000MHz |
| <b>Channel Frequency (Ch 1):</b> | 26.965MHz        |
| <b>Modulation:</b>               | CW               |
| <b>Polarization:</b>             | Vertical         |

Trace 2: Uncorrected SAC (Semi Anechoic Chamber) emission indicates the DUT emissions observed in the pre-scan without the presence of ambient noise and is not corrected for antenna factor, etc. FOR REFERENCE ONLY. Trace 1: OATS Emission includes ambient noise. Emissions measured with peak detector applied to QP limits. Emissions other than those identified in Trace 2 are ambient.

**Table 11.1 – Summary of Radiated Spurious Emissions**

| <b>Radiated Spurious Emissions</b>   |   |                       |   |  |                                   |                             |                              |
|--|---|-----------------------|---|--|-----------------------------------|-----------------------------|------------------------------|
| <b>Channel Frequency</b><br><i>(MHz)</i>   | <b>Emission Frequency</b><br><i>(MHz)</i> | <b>DUT Modulation</b> | <b>Fundamental Power</b><br>[P]<br><i>(dBm)</i> | <b>Out of Band Emission</b><br>[P <sub>E</sub> ]<br><i>(dBm)</i> | <b>Attenuation</b><br><i>[dB]</i> | <b>Limit</b><br><i>(dB)</i> | <b>Margin</b><br><i>(dB)</i> |
| 26.965   | n/a                                       | CW                    | 36.0  | n/a  | n/a                               | 60.0                        | n/a                          |
| Attenuation = P - P <sub>E</sub>   |   |                       |   |  | Margin = Limit - Attenuation      |                             |                              |
|  |   |                       |   |  | <b>Result:</b>                    | <b>Complies</b>             |                              |
| No emissions within 20dB of the limit were observed.<br>Data for spurious emissions presented using a peak detector. |   |                       |   |  |                                   |                             |                              |



## 12.0 FREQUENCY STABILITY

### Test Conditions

|                            |   |
|----------------------------|---|
| <b>Normative Reference</b> | <b>FCC 47 CFR §2.1055, §95.965, RSS-Gen</b> |
|----------------------------|---|

### Limits

|                |   |
|----------------|---|
| 47 CFR §95.965 | Each CBRS transmitter type must be designed such that the transmit carrier frequency (or in the case of SSB transmissions, the reference frequency) remains within 50 parts-per-million of the channel center frequencies specified in §95.963 under all normal operating conditions. |
|----------------|---|

### Measurement Procedure

#### 47 CFR §2.1055 Frequency Stability

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

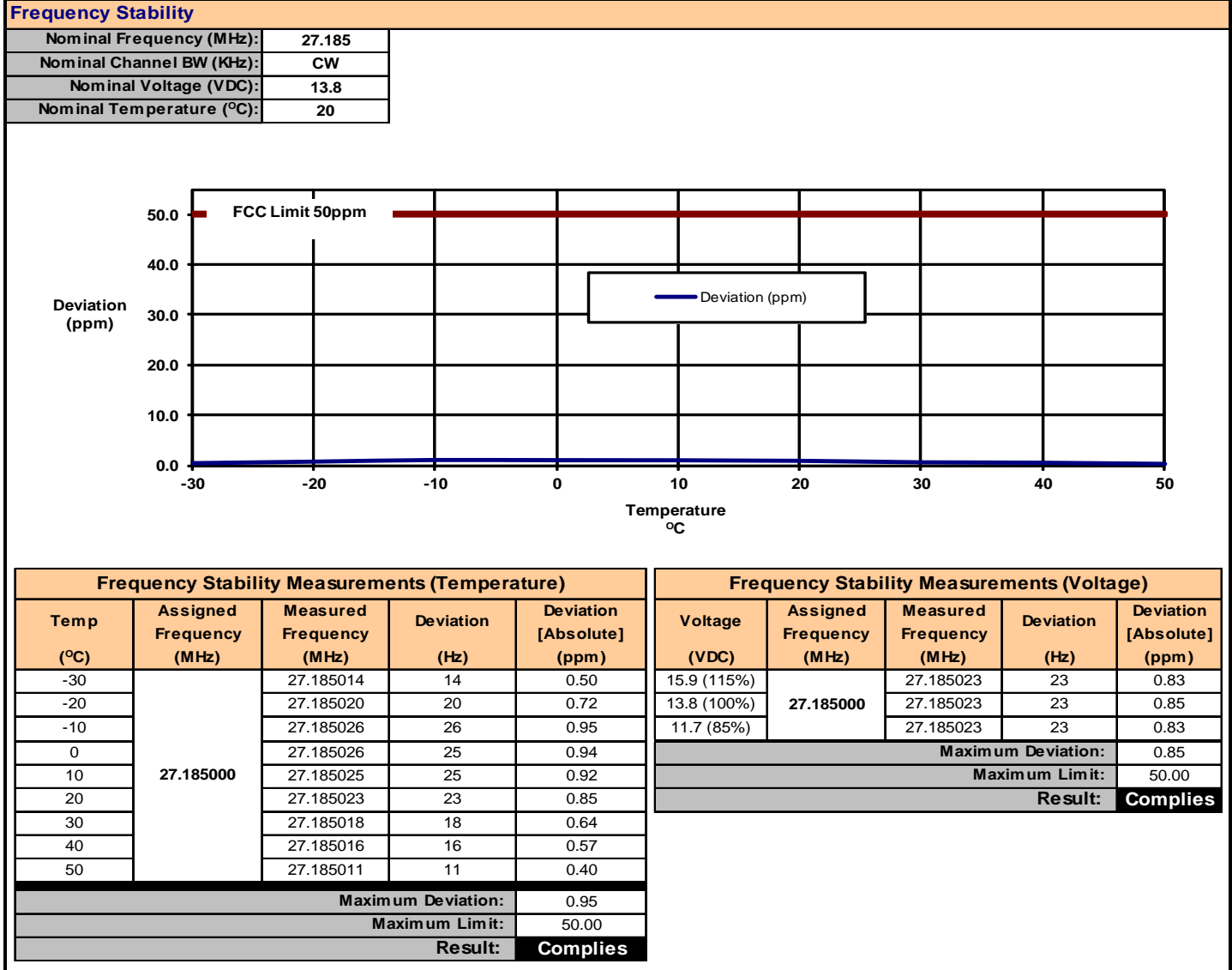
(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

|                   |                   |                   |
|-------------------|-------------------|-------------------|
| <b>Test Setup</b> | <b>Appendix A</b> | <b>Figure A.4</b> |
|-------------------|-------------------|-------------------|

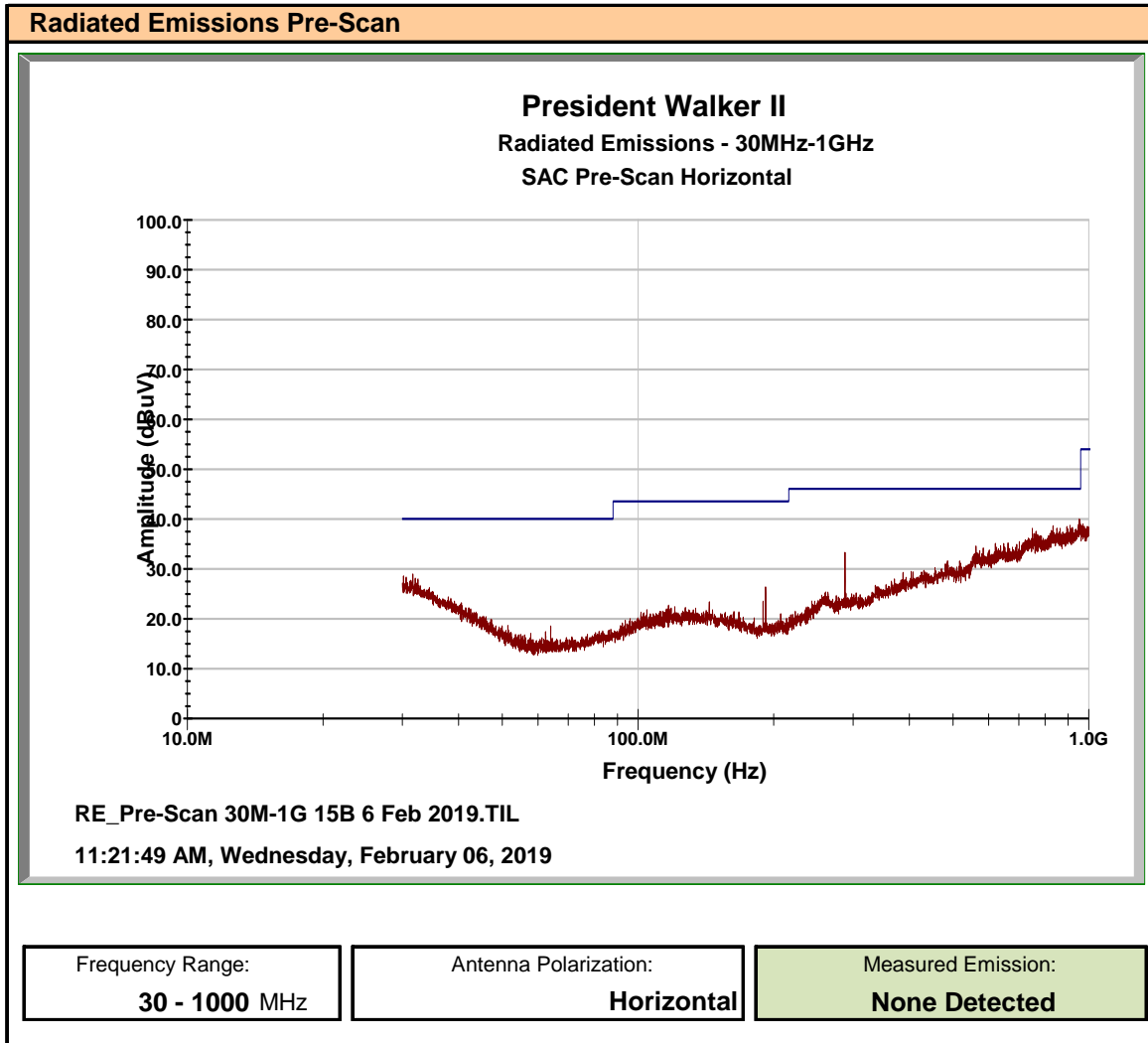
**Table 12.1 – Summary of Frequency Stability Results**



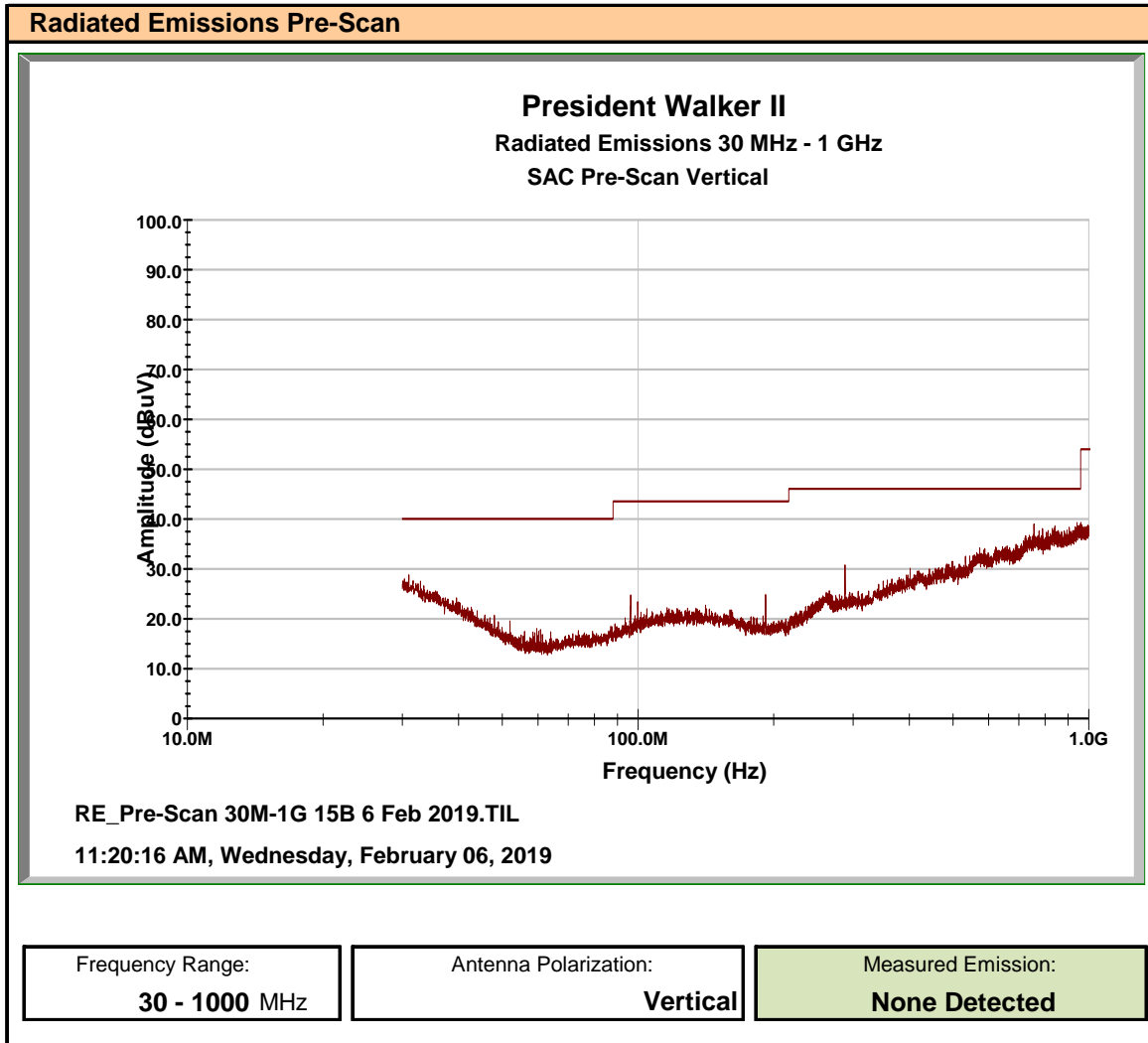
### 13.0 RECEIVER RADIATED EMISSIONS - DOC

| Test Procedure  |   |
|---|---|
| <b>Normative Reference</b>  | FCC 47 CFR §15.109, ICES-003(6.2)<br>ANSI C63.4:2014  |
| Limits  |   |
| 47 CFR §15.109  | (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:<br>30-88MHz: 40dBuV/m<br>88-216MHz:<br>216-960MHz:<br>> 960MHz: 54dBuV/m   |
| ICES-003(6.2.1)   | 6.2.1 - Radiated Emissions Limits Below 1 GHz<br>Class B: ITE that does not meet the conditions for Class A operation shall comply with the Class B radiated limits set out in Table 5 determined at a distance of 3 metres.<br>30-88MHz: 40dBuV/m<br>88-216MHz:<br>216-960MHz:<br>> 960MHz: 54dBuV/m |
| <b>Test Setup</b>   | <b>Appendix A                      Figure A.3</b>   |
| Measurement Procedure   |   |
| The DUT was set up as per ANSI C63.4:2014. Emissions were scanned between 30MHz and 1000MHz. The turntable was rotated 360 degrees and the antenna was elevated to 4m to optimize the measured emissions. |   |

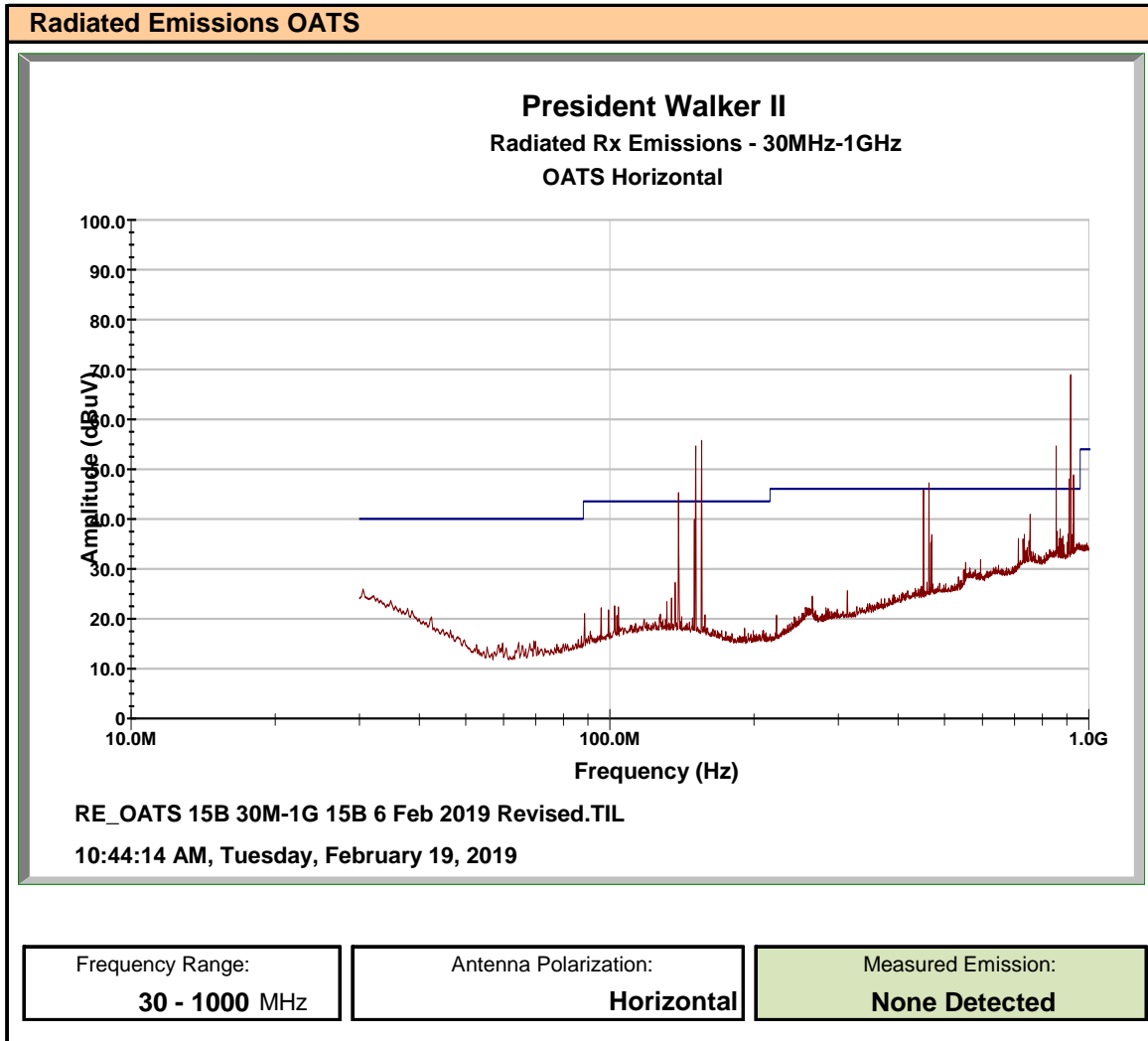
Plot 13.1 – Receiver Radiated Emissions Pre-Scan - Horizontal



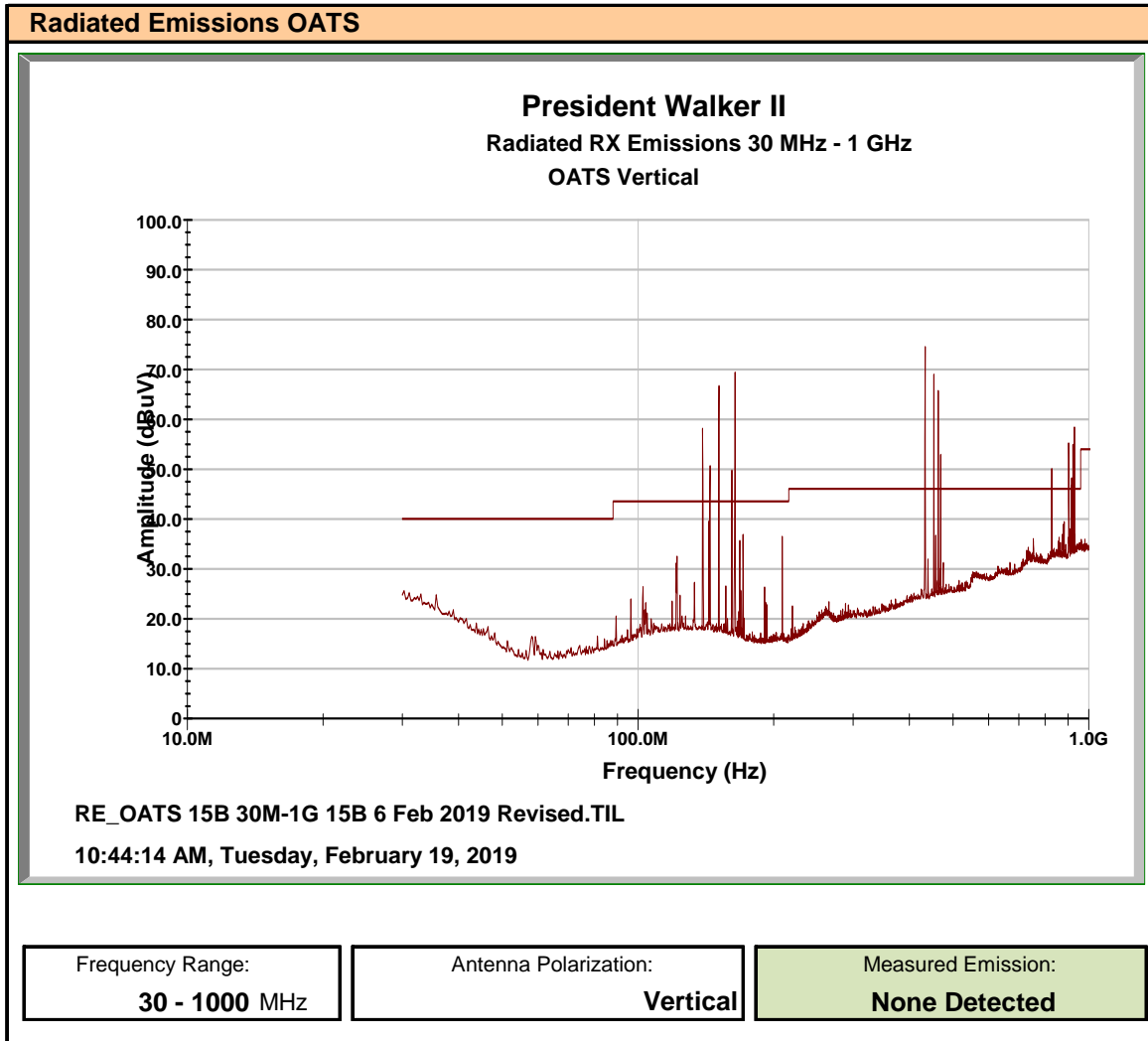
Plot 13.2 – Receiver Radiated Emissions Pre-Scan - Vertical



Plot 13.3 – Receiver Radiated Emissions - Horizontal



Plot 13.4 – Receiver Radiated Emissions - Vertical



**Table 13.1 – Summary of Receiver Radiated Emissions**

| <b>§15.109, ICES-003 (6.2)</b> |                             |                           |                           |                 |                 |
|--------------------------------|-----------------------------|---------------------------|---------------------------|-----------------|-----------------|
| <b>Emission Frequency</b>      | <b>Antenna Polarization</b> | <b>Measured Emission</b>  | <b>Corrected Emission</b> | <b>Limit</b>    | <b>Margin</b>   |
| <b>(MHz)</b>                   |                             | <b>[E<sub>Meas</sub>]</b> | <b>[E<sub>Corr</sub>]</b> |                 |                 |
|                                |                             | <b>(dBuV)</b>             | <b>(W)</b>                | <b>(W)</b>      | <b>(dB)</b>     |
| 30-1000                        | Horizontal                  | n/a                       | n/a                       | -               | -               |
| 30-1000                        | Vertical                    | n/a                       | n/a                       | -               | -               |
|                                |                             |                           |                           | <b>Results:</b> | <b>Complies</b> |

No emissions detected above ambient noise.

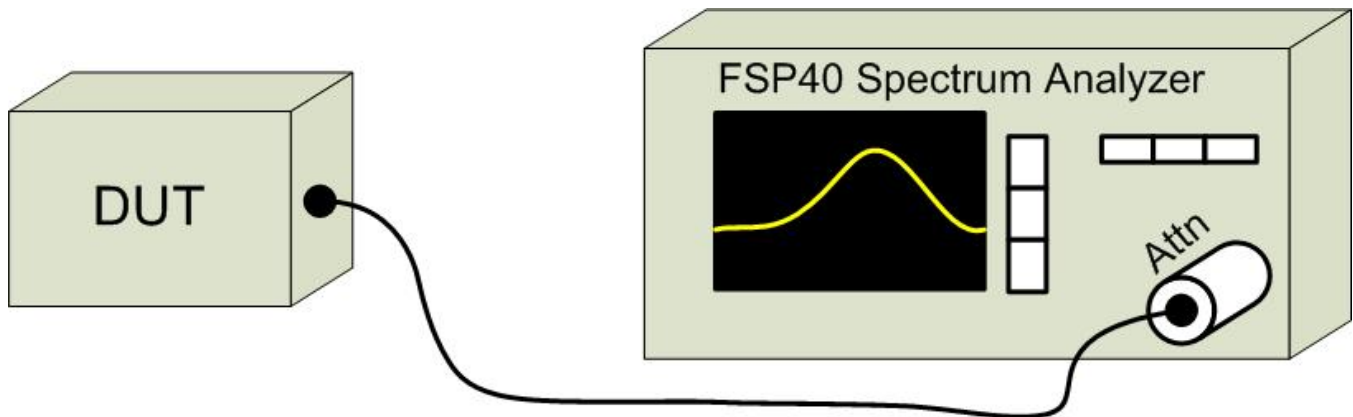


**APPENDIX A – TEST SETUP DRAWINGS AND EQUIPMENT**

**Table A.1 – Setup - Conducted Measurements Equipment**

| Equipment List |              |              |                   |
|----------------|--------------|--------------|-------------------|
| Asset Number   | Manufacturer | Model Number | Description       |
| 00241          | R&S          | FSU40        | Spectrum Analyzer |

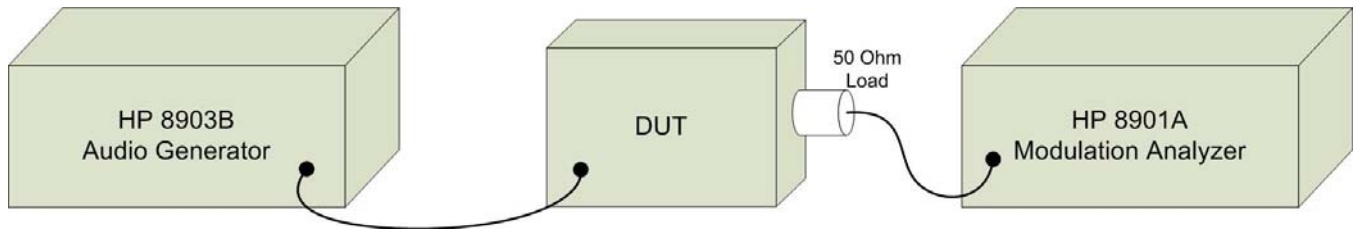
**Figure A.1 – Test Setup Conducted Measurements**



**Table A.2 – Setup - Audio Modulation Equipment**

| <b>Equipment List</b> |                     |                     |                          |
|-----------------------|---------------------|---------------------|--------------------------|
| <b>Asset Number</b>   | <b>Manufacturer</b> | <b>Model Number</b> | <b>Description</b>       |
| 00028                 | HP                  | 8901A               | Modulation Analyzer      |
| 00027                 | HP                  | 8903B               | Audio Analyzer/Generator |

**Figure A.2 – Test Setup Audio Modulation Response Measurements**

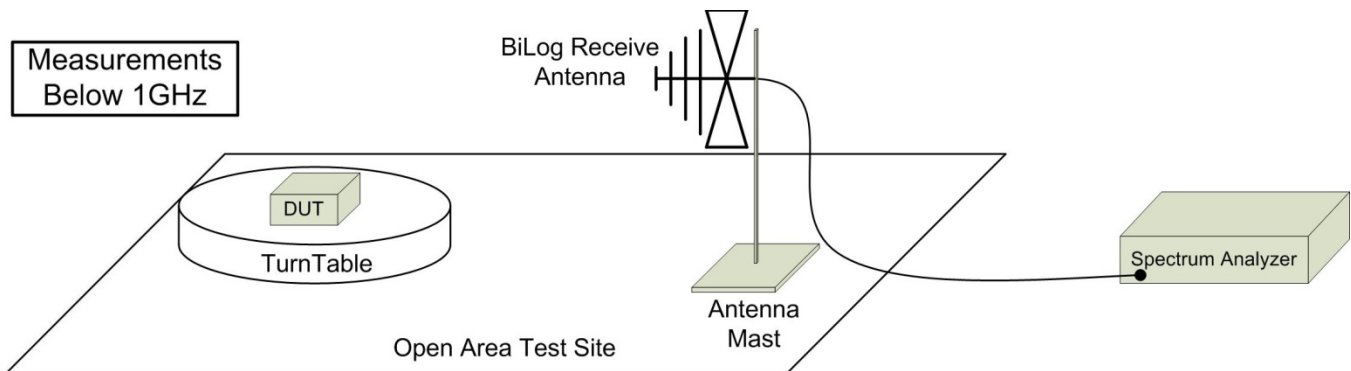


**Table A.3 – Setup - Radiated Emissions Equipment**

| <b>Equipment List</b> |                     |                     |                          |
|-----------------------|---------------------|---------------------|--------------------------|
| <b>Asset Number</b>   | <b>Manufacturer</b> | <b>Model Number</b> | <b>Description</b>       |
| 00051                 | HP                  | 8566B               | Spectrum Analyzer        |
| 00049                 | HP                  | 85650A              | Quasi-peak Adapter       |
| 00047                 | HP                  | 85685A              | RF Preselector           |
| 00072                 | EMCO                | 2075                | Mini-mast                |
| 00073                 | EMCO                | 2080                | Turn Table               |
| 00071                 | EMCO                | 2090                | Multi-Device Controller  |
| 00265                 | Miteq               | JS32-00104000-58-5P | Microwave L/N Amplifier  |
| 00241                 | R&S                 | FSU40               | Spectrum Analyzer        |
| 00050                 | Chase               | CBL-6111A           | BiLog Antenna            |
| 00275                 | Coaxis              | LMR400              | 25m Cable                |
| 00276                 | Coaxis              | LMR400              | 4m Cable                 |
| 00278                 | TILE                | 34G3                | TILE Test Software       |
| 00034                 | ETS                 | 3115                | Double Ridged Guide Horn |

CNR: Calibration Not Required  
 COU: Calibrate On Use

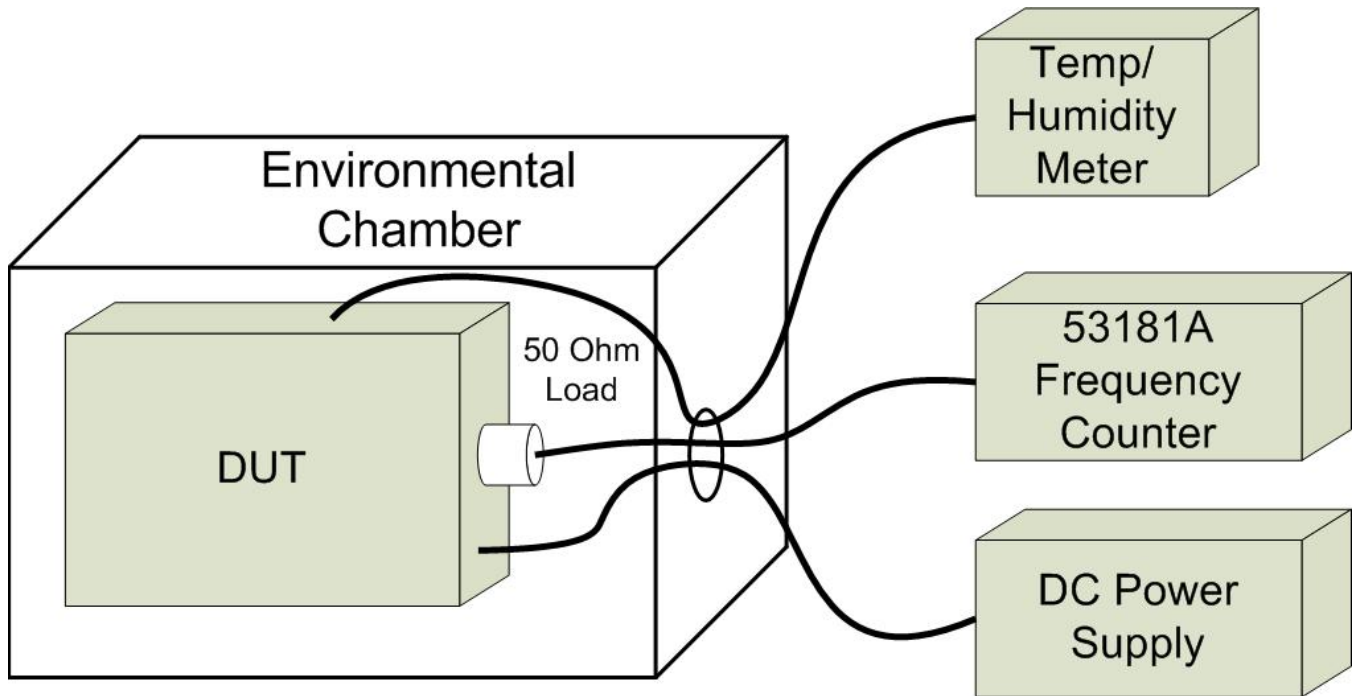
**Figure A.3 – Test Setup Radiated Emissions Measurements**



**Table A.4 – Setup - Frequency Stability Measurement Equipment**

| Equipment List |              |              |                       |
|----------------|--------------|--------------|-----------------------|
| Asset Number   | Manufacturer | Model Number | Description           |
| n/a            | ESPEC        | ECT-2        | Environmental Chamber |
| 00003          | HP           | 53181A       | Frequency Counter     |
| n/a            | HP           | E3611A       | Power Supply          |
| 00234          | VWR          | 61161-378    | Temp/Humidity Meter   |

**Figure A.4 – Test Setup Frequency Stability Measurements**



**APPENDIX B – EQUIPMENT LIST AND CALIBRATION**

| Equipment List   |              |              |                     |                |                          |                 |                      |                 |
|------------------|--------------|--------------|---------------------|----------------|--------------------------|-----------------|----------------------|-----------------|
| (*)              | Asset Number | Manufacturer | Model Number        | Serial Number  | Description              | Last Calibrated | Calibration Interval | Calibration Due |
| *                | 00050        | Chase        | CBL-6111A           | 1607           | Bilog Antenna            | 3 Jan 2019      | Triennial            | 3 Jan 2022      |
| *                | 00034        | ETS          | 3115                | 6267           | Double Ridged Guide Horn | 26 Nov 2018     | Triennial            | 26 Nov 2021     |
|                  | 00035        | ETS          | 3115                | 6276           | Double Ridged Guide Horn | 2 Dec 2015      | Triennial            | 2 Dec 2018      |
|                  | 00085        | EMCO         | 6502                | 9203-2724      | Loop Antenna             | 8 Jun 2016      | Triennial            | 8 Jun 2019      |
| *                | 00047        | HP           | 85685A              | 2837A00826     | RF Preselector           | 23 Jun 2017     | Triennial            | 23 Jun 2020     |
| *                | 00049        | HP           | 85650A              | 2043A00162     | Quasi-peak Adapter       | 23 Jun 2017     | Triennial            | 23 Jun 2020     |
| *                | 00051        | HP           | 8566B               | 2747A05510     | Spectrum Analyzer        | 23 Jun 2017     | Triennial            | 23 Jun 2020     |
|                  | 00223        | HP           | 8901A               | 3749A07154     | Modulation Analyzer      | 27 Dec 2017     | Triennial            | 27 Dec 2020     |
|                  | 00224        | HP           | 8903B               | 3729A18691     | Audio Analyzer           | 28 Dec 2017     | Triennial            | 28 Dec 2020     |
| *                | 00241        | R&S          | FSU40               | 100500         | Spectrum Analyzer        | 15 May 2018     | Triennial            | 15 May 2021     |
| *                | 00005        | HP           | 8648D               | 3847A00611     | Signal Generator         | 21 Jun 2017     | Triennial            | 21 Jun 2020     |
|                  | 00006        | R&S          | SMR20               | 100104         | Signal Generator         | 29 May 2017     | Triennial            | 29 May 2020     |
|                  | 00243        | Rigol        | DS1102E             | DS1ET150502164 | Oscilloscope             | 7 Nov 2017      | Triennial            | 7 Nov 2020      |
|                  | 00254        | LeCroy       | WM8600A             | 532            | Oscilloscope             | NCR             | n/a                  | NCR             |
|                  | 00110        | Gigatronics  | 8652A               | 1875801        | Power Meter              | 29 Feb 2016     | Triennial            | 29 Feb 2019     |
|                  | 00237        | Gigatronics  | 80334A              | 1837001        | Power Sensor             | 23 Jun 2014     | Triennial            | 23 Jun 2017     |
|                  | 00232        | ETS Lindgren | HI-6005             | 91440          | Isotropic E-Field Probe  | 18 Dec 2017     | Triennial            | 18 Dec 2020     |
|                  | 00003        | HP           | 53181A              | 3736A05175     | Frequency Counter        | 21 Jun 2017     | Triennial            | 21 Jun 2020     |
|                  | 00257        | Com-Power    | LI-215A             | 191934         | LISN                     | 5 Jan 2018      | Triennial            | 5 Jan 2021      |
|                  | 00041        | AR           | 10W1000C            | 27887          | Power Amplifier          | NCR             | n/a                  | NCR             |
|                  | 00106        | AR           | 5SIG4               | 26235          | Power Amplifier          | NCR             | n/a                  | NCR             |
|                  | 00280        | AR           | 25A250AM6           | 22702          | Power Amplifier          | NCR             | n/a                  | NCR             |
|                  | 00265        | Miteq        | JS32-00104000-58-5P | 1939850        | Microwave L/N Amplifier  | COU             | n/a                  | COU             |
|                  | 00071        | EMCO         | 2090                | 9912-1484      | Multi-Device Controller  | n/a             | n/a                  | n/a             |
| *                | 00072        | EMCO         | 2075                | 0001-2277      | Mini-mast                | n/a             | n/a                  | n/a             |
| *                | 00073        | EMCO         | 2080                | 0002-1002      | Turn Table               | n/a             | n/a                  | n/a             |
|                  | 00081        | ESPEC        | ECT-2               | 0510154-B      | Environmental Chamber    | CNR             | n/a                  | CNR             |
|                  | 00234        | VWR          | 61161-378           | 140320430      | Temp/Humidity Meter      | New             | Triennial            | New             |
|                  | 00236        | Nokia        | -                   | 236            | ESD Table                | NCR             | n/a                  | NCR             |
|                  | 00255        | Expert ESD   | A4001               | A4001-155      | ESD Target               | COU             | n/a                  | COU             |
|                  | 00064        | NARDA        | 3020A               | n/a            | Bi-Directional Coupler   | COU             | n/a                  | COU             |
|                  | 00263        | Koaxis       | KP10-1.00M-TD       | 263            | 1m Armoured Cable        | COU             | n/a                  | COU             |
| *                | 00263B       | Koaxis       | KP10-1.00M-TD       | 263B           | 1m Armoured Cable        | COU             | n/a                  | COU             |
| *                | 00264        | Koaxis       | KP10-7.00M-TD       | 264            | 7m Armoured Cable        | COU             | n/a                  | COU             |
| *                | 00275        | TMS          | LMR400              | n/a            | 25m Cable                | COU             | n/a                  | COU             |
| *                | 00276        | TMS          | LMR400              | n/a            | 4m Cable                 | COU             | n/a                  | COU             |
| *                | 00277        | TMS          | LMR400              | n/a            | 4m Cable                 | COU             | n/a                  | COU             |
| *                | 00278        | TILE         | 34G3                | n/a            | TILE Test Software       | NCR             | n/a                  | NCR             |
| Rented Equipment |              |              |                     |                |                          |                 |                      |                 |
|                  |              |              |                     |                |                          |                 |                      |                 |

\* Used during the course of this investigation  
 CNR: Calibration Not Required  
 COU: Calibrate On Use

**APPENDIX C – MEASUREMENT INSTRUMENT UNCERTAINTY**

| <b>CISPR 16-4 Measurement Uncertainty ( <math>U_{LAB}</math> )</b>  |  |
|---|--|
| This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence interval using a coverage factor of k=2 |  |
| <b>30MHz - 200MHz</b>   |  |
| $U_{LAB} = 5.14dB$ $U_{CISPR} = 6.3dB$  |  |
| <b>200MHz - 1000MHz</b>   |  |
| $U_{LAB} = 5.90dB$ $U_{CISPR} = 6.3dB$  |  |
| <b>1GHz - 6GHz</b>  |  |
| $U_{LAB} = 4.80dB$ $U_{CISPR} = 5.2dB$  |  |
| <b>6GHz - 18GHz</b>   |  |
| $U_{LAB} = 5.1dB$ $U_{CISPR} = 5.5dB$   |  |
| If the calculated uncertainty $U_{lab}$ is <b>less</b> than $U_{CISPR}$ then:   |  |
| 1   | Compliance is deemed to occur if <b>NO</b> measured disturbance exceeds the disturbance limit  |
| 2   | Non-Compliance is deemed to occur if <b>ANY</b> measured disturbance <b>EXCEEDS</b> the disturbance limit  |
| If the calculated uncertainty $U_{lab}$ is <b>greater</b> than $U_{CISPR}$ then:  |  |
| 3   | Compliance is deemed to occur if <b>NO</b> measured disturbance, increased by ( $U_{lab} - U_{CISPR}$ ), exceeds the disturbance limit             |
| 4   | Non-Compliance is deemed to occur if <b>ANY</b> measured disturbance, increased by ( $U_{lab} - U_{CISPR}$ ), <b>EXCEEDS</b> the disturbance limit |