

Global United Technology Services Co., Ltd.

Report No.: GTS2023020187F03

TEST REPORT

Applicant: Attenti US, Inc.

Address of Applicant: 1838 Gunn Highway, Odessa, Florida, United States, 33556

Manufacturer: Attenti US, Inc.

Address of Manufacturer: 1838 Gunn Highway, Odessa, Florida, United States, 33556

Equipment Under Test (EUT)

Product Name: Tracker 200

Model No.: TRC-200-NA-9-00

FCC ID: NC3TRACKER-200

Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22
FCC CFR Title 47 Part 24
FCC CFR Title 47 Part 27

Date of sample receipt: February 13, 2023

Date of Test: February 13, 2023-April 14, 2023

Date of report issued: April 14, 2023

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



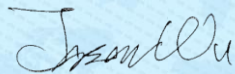
Robinson Luo
Laboratory Manager



2 Version

| Version No. | Date | Description |
|-------------|----------------|-------------|
| 00 | April 14, 2023 | Original |
| | | |
| | | |
| | | |
| | | |

Prepared By:

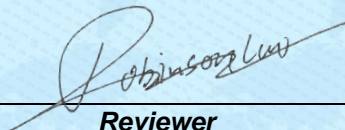


Date:

April 14, 2023

Project Engineer

Check By:



Reviewer

Date:

April 14, 2023

3 Contents

| | Page |
|--|------|
| 1 COVER PAGE | 1 |
| 2 VERSION | 2 |
| 3 CONTENTS | 3 |
| 4 TEST SUMMARY | 4 |
| 5 GENERAL INFORMATION | 5 |
| 5.1 GENERAL DESCRIPTION OF EUT | 5 |
| 5.2 RELATED SUBMITTAL(S) / GRANT (S)..... | 7 |
| 5.3 TEST METHODOLOGY | 7 |
| 5.4 TEST FACILITY..... | 7 |
| 5.5 TEST LOCATION | 7 |
| 6 TEST INSTRUMENTS LIST | 8 |
| 7 SYSTEM TEST CONFIGURATION | 9 |
| 7.1 TEST MODE | 9 |
| 7.2 CONFIGURATION OF TESTED SYSTEM | 9 |
| 7.3 CONDUCTED OUTPUT POWER & E.R.P. & E.I.R.P..... | 10 |
| 7.4 PEAK-TO-AVERAGE RATIO..... | 11 |
| 7.5 OCCUPY BANDWIDTH..... | 12 |
| 7.6 MODULATION CHARACTERISTIC..... | 13 |
| 7.7 OUT OF BAND EMISSION AT ANTENNA TERMINALS | 13 |
| 7.8 SPURIOUS RADIATION EMISSIONS | 14 |
| 7.9 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT | 45 |
| 7.10 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT | 46 |
| 8 TEST SETUP PHOTO | 47 |
| 9 EUT CONSTRUCTIONAL DETAILS | 47 |

4 Test Summary

| Test Item | Section in CFR 47 | Result |
|--|---|--------|
| RF Output Power | Part 2.1033 Part 2.1046 Part 2.1055 Part 22.913 Part 24.232 Part 27.50 Part 27.54 | Pass |
| Peak-to-Average Ratio | Part 2.1046 Part 22.913 Part 24.232 Part 27.50 | Pass |
| Modulation Characteristics | Part 2.1047 | N/A |
| 99% & -26 dB Occupied Bandwidth | Part 2.1033 Part 2.1046 Part 2.1049 Part 27.50 | Pass |
| Spurious Emissions at Antenna Terminal | Part 2.1053 Part 22.917 Part 24.238 Part 27.53 | Pass |
| Spurious Radiation Emissions | Part 2.1053 Part 22.917 Part 24.238 Part 27.53 | Pass |
| Out of band emission, Band Edge | Part 22.917 Part 24.238 Part 27.53 | Pass |
| Frequency stability vs. temperature | Part 2.1055 | Pass |
| Frequency stability vs. voltage | Part 2.1055 | Pass |

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. N/A: Not applicable.

5 General Information

5.1 General Description of EUT

| | |
|----------------------|---|
| Product Name: | Tracker 200 |
| Model No.: | TRC-200-NA-9-00 |
| S/N: | 2PC1039A00300042220002 |
| Tested Sample(s) ID: | GTS2023020187-1 |
| Sample(s) Status: | Engineer sample |
| Support Networks: | LTE |
| Support Bands: | LTE Band 2/4/5/12/13 |
| Channel Bandwidth: | LTE Band 2: 1.4MHz; 3MHz; 5MHz; 10MHz; 15MHz; 20MHz LTE Band 4: 1.4MHz; 3MHz; 5MHz; 10MHz; 15MHz; 20MHz LTE Band 5: 1.4MHz; 3MHz; 5MHz; 10MHz LTE Band 12: 1.4MHz; 3MHz; 5MHz; 10MHz LTE Band 13: 5MHz; 10MHz |
| TX Frequency: | LTE band 2: 1850~1910MHz LTE band 4: 1710~1755MHz LTE band 5: 824~849MHz LTE band 12: 699~716MHz LTE band 13: 777~787MHz |
| Modulation type: | QPSK, 16QAM |
| Antenna type: | Terminal Antenna |
| Antenna gain: | LTE band 2: 2.9dBi LTE band 4: 2.9dBi LTE band 5: 1.0dBi LTE band 12: 1.0dBi LTE band 13: 1.0dBi |
| Power supply: | DC 3.6V, 2280mAh 8.20wh Battery |

Test Frequency

| Test Mode | Channel Bandwidth | Frequency [MHz] | | |
|------------|-------------------|-----------------|----------------|-----------------|
| | | Lowest channel | Middle channel | Highest channel |
| LTE Band 2 | 1.4M | 1850.7 | 1880.0 | 1909.3 |
| | 3M | 1851.5 | 1880.0 | 1908.5 |
| | 5M | 1852.5 | 1880.0 | 1907.5 |
| | 10M | 1855.0 | 1880.0 | 1905.0 |
| | 15M | 1857.5 | 1880.0 | 1902.5 |
| | 20M | 1860.0 | 1880.0 | 1900.0 |

| Test Mode | Channel Bandwidth | Frequency [MHz] | | |
|------------|-------------------|-----------------|----------------|-----------------|
| | | Lowest channel | Middle channel | Highest channel |
| LTE Band 4 | 1.4M | 1710.7 | 1732.5 | 1754.3 |
| | 3M | 1711.5 | 1732.5 | 1753.5 |
| | 5M | 1712.5 | 1732.5 | 1752.5 |
| | 10M | 1715.0 | 1732.5 | 1750.0 |
| | 15M | 1717.5 | 1732.5 | 1747.5 |
| | 20M | 1720.0 | 1732.5 | 1745.0 |

| Test Mode | Channel Bandwidth | Frequency [MHz] | | |
|------------|-------------------|-----------------|----------------|-----------------|
| | | Lowest channel | Middle channel | Highest channel |
| LTE Band 5 | 1.4M | 824.7 | 836.5 | 848.3 |
| | 3M | 825.5 | 836.5 | 847.5 |
| | 5M | 826.5 | 836.5 | 846.5 |
| | 10M | 829.0 | 836.5 | 844.0 |

| Test Mode | Channel Bandwidth | Frequency [MHz] | | |
|-------------|-------------------|-----------------|----------------|-----------------|
| | | Lowest channel | Middle channel | Highest channel |
| LTE Band 12 | 1.4M | 699.7 | 707.5 | 715.3 |
| | 3M | 700.5 | 707.5 | 714.5 |
| | 5M | 701.5 | 707.5 | 713.5 |
| | 10M | 704.0 | 707.5 | 711.0 |

| Test Mode | Channel Bandwidth | Frequency [MHz] | | |
|-------------|-------------------|-----------------|----------------|-----------------|
| | | Lowest channel | Middle channel | Highest channel |
| LTE Band 13 | 5M | 779.5 | 782.0 | 784.5 |
| | 10M | / | 782.0 | / |

5.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22/24/27 of the FCC CFR 47 Rules.

5.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on ANSI C63.26:2015 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

- **IC —Registration No.: 9079A**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

| Radiated Emission: | | | | | | |
|--------------------|-------------------------------------|-----------------------------|--------------------------|---------------|---------------------|-------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS250 | July 02, 2020 | July 01, 2025 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | April 22, 2022 | April 21, 2023 |
| 4 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9168 | GTS640 | March 20, 2023 | March 19, 2025 |
| 5 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9120 D | GTS208 | June 12, 2022 | June 11, 2023 |
| 6 | Horn Antenna | ETS-LINDGREN | 3160 | GTS217 | June 23, 2022 | June 22, 2023 |
| 7 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 8 | Coaxial Cable | GTS | N/A | GTS213 | April 22, 2022 | April 21, 2023 |
| 9 | Coaxial Cable | GTS | N/A | GTS211 | April 22, 2022 | April 21, 2023 |
| 10 | Coaxial cable | GTS | N/A | GTS210 | April 22, 2022 | April 21, 2023 |
| 11 | Coaxial Cable | GTS | N/A | GTS212 | April 22, 2022 | April 21, 2023 |
| 12 | Amplifier(100kHz-3GHz) | HP | 8347A | GTS204 | April 22, 2022 | April 21, 2023 |
| 13 | Amplifier (18-26GHz) | Rohde & Schwarz | AFS33-18002 650-30-8P-44 | GTS218 | June 23, 2022 | June 22, 2023 |
| 14 | Band filter | Amindeon | 82346 | GTS219 | June 23, 2022 | June 22, 2023 |
| 15 | Power Meter | Anritsu | ML2495A | GTS540 | June 23, 2022 | June 22, 2023 |
| 16 | Power Sensor | Anritsu | MA2411B | GTS541 | June 23, 2022 | June 22, 2023 |
| 17 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | GTS575 | April 22, 2022 | April 21, 2023 |
| 18 | Splitter | Agilent | 11636B | GTS237 | June 23, 2022 | June 22, 2023 |
| 19 | Loop Antenna | ZHINAN | ZN30900A | GTS534 | Nov. 29, 2022 | Nov. 28, 2023 |
| 20 | Broadband Preamplifier | SCHWARZBECK | BBV9718 | GTS535 | April 22, 2022 | April 21, 2023 |
| 21 | Breitband hornantenna | SCHWARZBECK | BBHA 9170 | GTS579 | Oct. 16, 2022 | Oct. 15, 2023 |
| 22 | Amplifier | TDK | PA-02-02 | GTS574 | Oct. 16, 2022 | Oct. 15, 2023 |
| 23 | Amplifier | TDK | PA-02-03 | GTS576 | Oct. 16, 2022 | Oct. 15, 2023 |
| 24 | PSA Series Spectrum Analyzer | Rohde & Schwarz | FSP | GTS578 | June 23, 2022 | June 22, 2023 |
| 25 | Amplifier(1GHz-26.5GHz) | HP | 8449B | GTS601 | April 22, 2022 | April 21, 2023 |

| General used equipment: | | | | | | |
|-------------------------|---------------------------------|--------------|-----------|---------------|---------------------|-------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1 | Humidity/ Temperature Indicator | KTJ | TA328 | GTS243 | April 25, 2022 | April 24, 2023 |
| 2 | Barometer | KUMAO | SF132 | GTS647 | July 26, 2022 | July 25, 2023 |

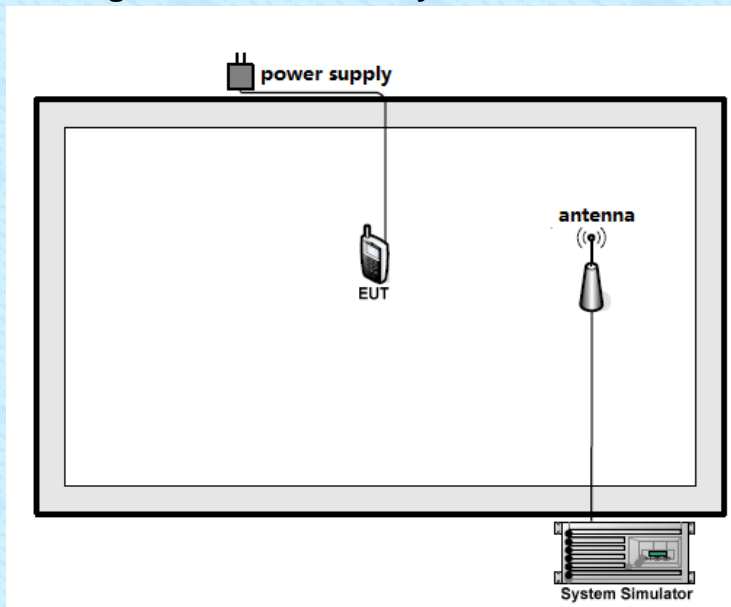
7 System test configuration

7.1 Test mode

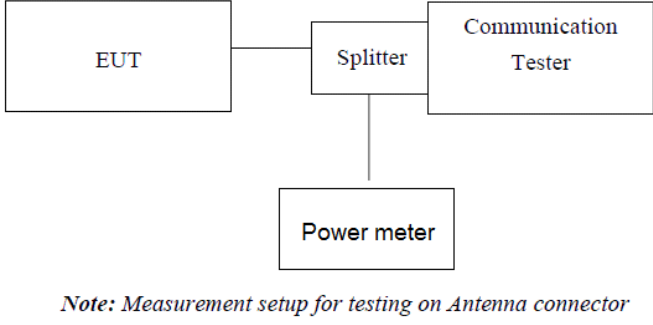
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission. For 16QAM modulation with 10/15/20MHz bandwidth, the maximum RB supported by the product is:27.

| Test modes | | |
|-------------|-----------------------|-----------------------|
| Band | Radiated | Conducted |
| LTE Band 2 | ■ QPSK and 16QAM link | ■ QPSK and 16QAM link |
| LTE Band 4 | ■ QPSK and 16QAM link | ■ QPSK and 16QAM link |
| LTE Band 5 | ■ QPSK and 16QAM link | ■ QPSK and 16QAM link |
| LTE Band 12 | ■ QPSK and 16QAM link | ■ QPSK and 16QAM link |
| LTE Band 13 | ■ QPSK and 16QAM link | ■ QPSK and 16QAM link |

7.2 Configuration of Tested System



7.3 Conducted Output Power

| | |
|-------------------|---|
| Test Requirement: | FCC part2.1033 & part2.1046 & Part2.1055 & Part22.913 & Part24.232, Part 27.50 |
| Test Method: | FCC KDB 971168 D01 V03r01 & ANSI C63.26 |
| Limit: | LTE Band 2: 2W LTE Band 4: 1W LTE Band 5: 7W LTE Band 12/13: 3W |
| Test setup: |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p> |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 7.1 for details |
| Test results: | Pass |

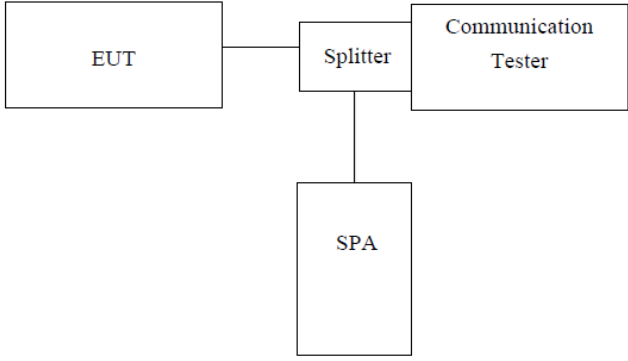
Measurement Data: The detailed test data see Appendix

7.4 Peak-to-Average Ratio

| | |
|-------------------|---|
| Test Requirement: | FCC part2.1046 & part 22.913 & part & 24.232 & Part 27.50 |
| Test Method: | FCC KDB 971168 D01 V03r01 & ANSI C63.26 |
| Limit: | 13db |
| Test setup: | <pre> graph LR CC[Control Computer] --> EUT[EUT Control port(s) Antenna port(s)] PS[Power Supply] --> EUT EUT --> PD[Power Divider] PD --> WC[Wireless Communication] PD --> SA[Spectrum Analyzer] </pre> |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 7.1 for details |
| Test results: | Pass |

Measurement data: The detailed test data see Appendix

7.5 Occupy Bandwidth

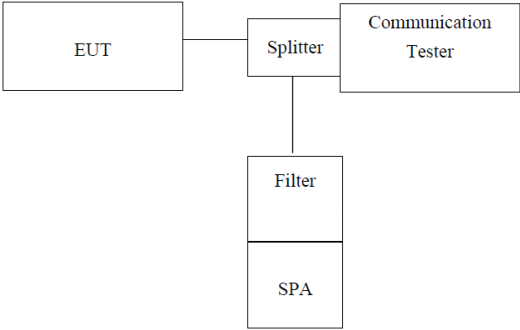
| | |
|-------------------|--|
| Test Requirement: | FCC Part 24.238 & Part 27.53 & part 22.917 FCC & part2.1049 |
| Test Method: | FCC KDB 971168 D01 V03r01 |
| Test setup: |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p> |
| Test Procedure: | <ol style="list-style-type: none"> 1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 7.1 for details |
| Test results: | Pass |

Measurement Data: The detailed test data see Appendix

7.6 MODULATION CHARACTERISTIC

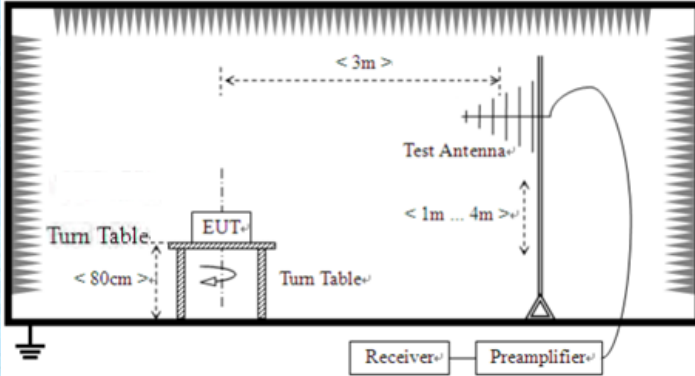
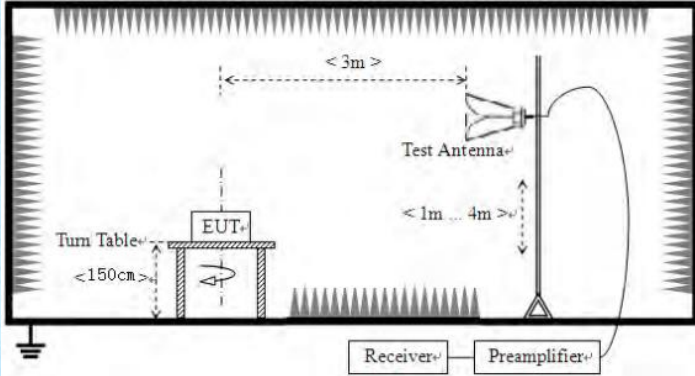
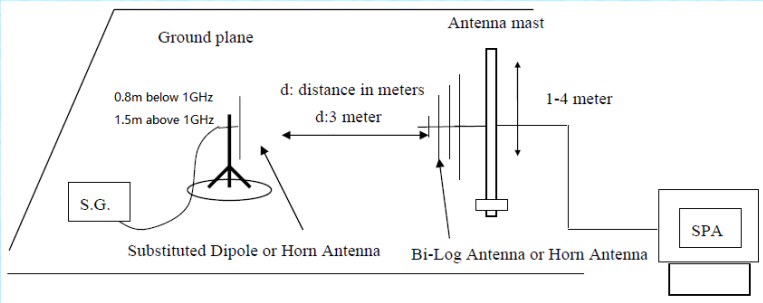
According to FCC § 2.1047(d), Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

7.7 Out of band emission at antenna terminals

| | |
|-------------------|--|
| Test Requirement: | FCC Part 24.238; Part 27.53; Part 22.917 |
| Test Method: | FCC part2.1051 & FCC KDB 971168 D01 V03r01 |
| Test setup: |  <p><i>Note: Measurement setup for testing on Antenna connector</i></p> |
| Test Procedure: | <ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 7.1 for details |
| Test results: | Pass |

Measurement Data: The detailed test data see Appendix

7.8 Spurious Radiation Emissions

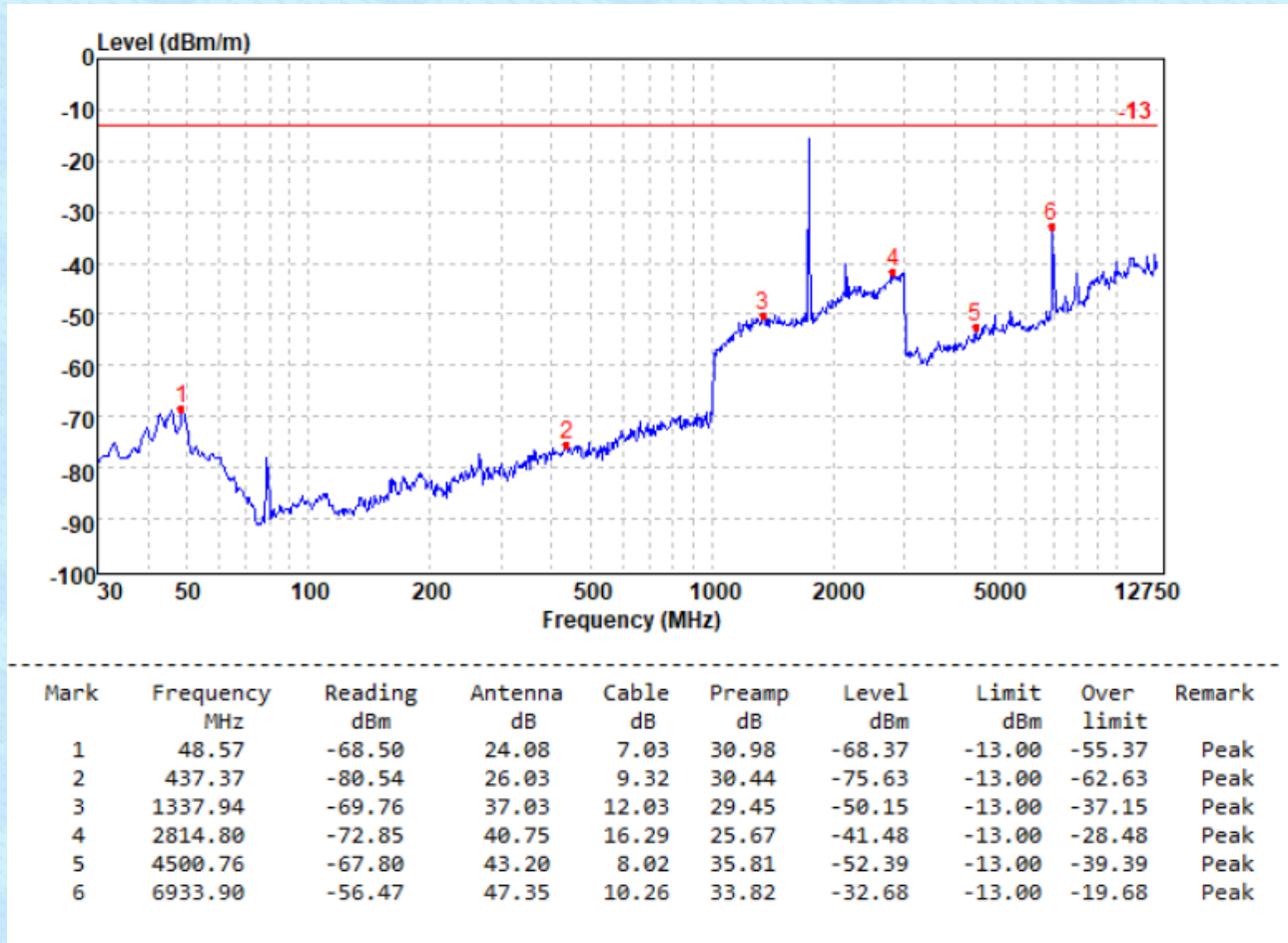
| | |
|-------------------|--|
| Test Requirement: | Part 22.917; Part 24.238; Part 27.53 |
| Test Method: | FCC part 2.1053 and ANSI C63.26:2015 |
| Test setup: | <p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p>  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 7.1 for details |
| Test results: | Pass |

Measurement Data:

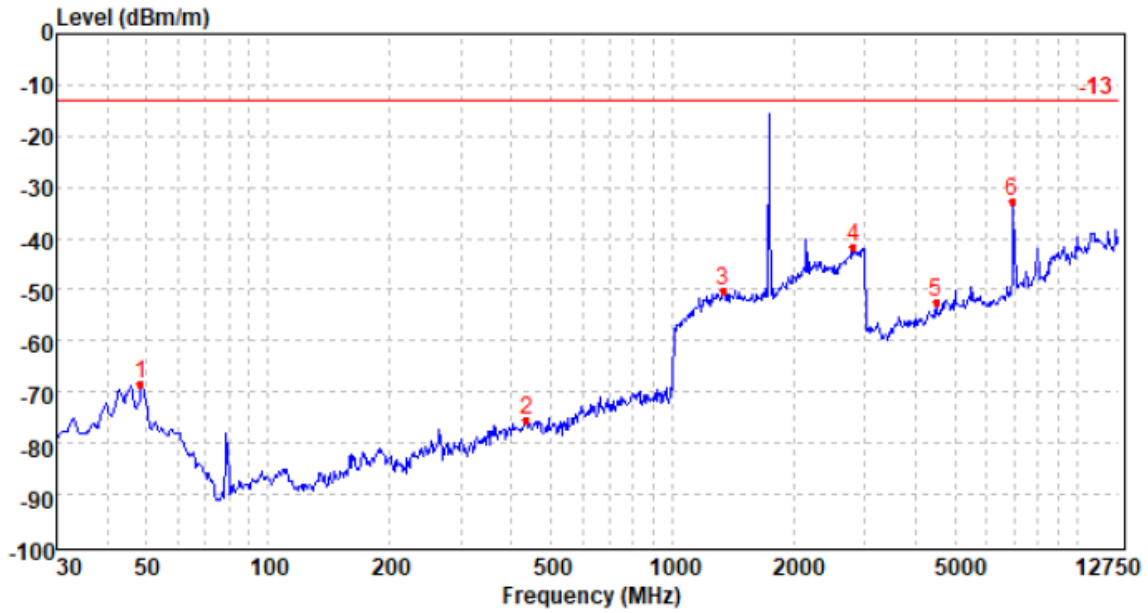
Pre-scan all test modes, found worst case at Band 2@10M, Band 4@10M, Band 5@10M, Band 12@10M, Band 13@5M, and so only show the test result of worst case

| | | | |
|------------|--------|---------------|--------|
| Test mode: | Band 2 | Test channel: | Lowest |
|------------|--------|---------------|--------|

Horizontal:



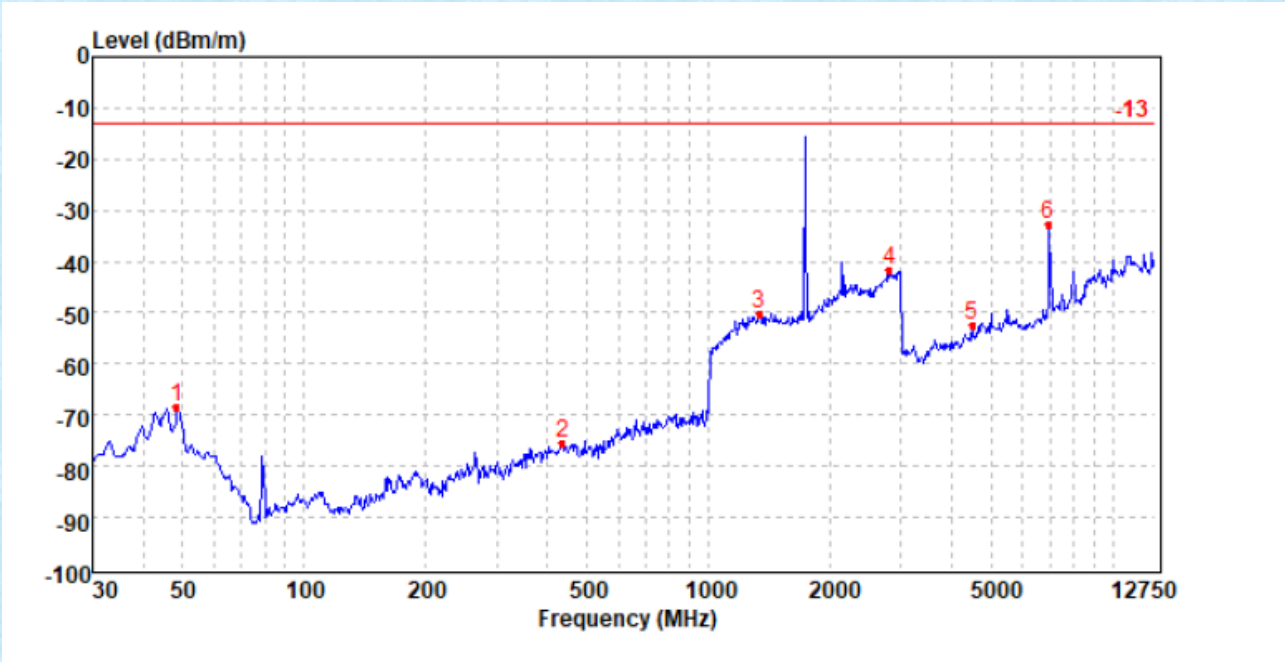
Vertical:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 48.57 | -68.50 | 24.08 | 7.03 | 30.98 | -68.37 | -13.00 | -55.37 | Peak |
| 2 | 437.37 | -80.54 | 26.03 | 9.32 | 30.44 | -75.63 | -13.00 | -62.63 | Peak |
| 3 | 1337.94 | -69.76 | 37.03 | 12.03 | 29.45 | -50.15 | -13.00 | -37.15 | Peak |
| 4 | 2814.80 | -72.85 | 40.75 | 16.29 | 25.67 | -41.48 | -13.00 | -28.48 | Peak |
| 5 | 4500.76 | -67.80 | 43.20 | 8.02 | 35.81 | -52.39 | -13.00 | -39.39 | Peak |
| 6 | 6933.90 | -56.47 | 47.35 | 10.26 | 33.82 | -32.68 | -13.00 | -19.68 | Peak |

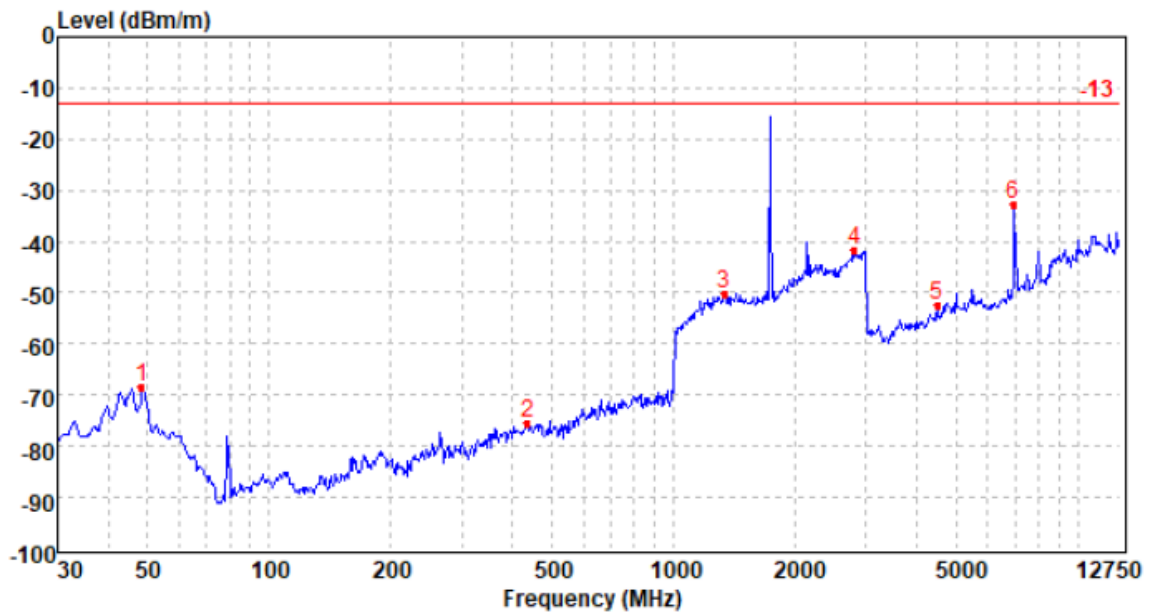
| | | | |
|------------|--------|---------------|--------|
| Test mode: | Band 2 | Test channel: | Middle |
|------------|--------|---------------|--------|

Horizontal:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 48.57 | -68.50 | 24.08 | 7.03 | 30.98 | -68.37 | -13.00 | -55.37 | Peak |
| 2 | 437.37 | -80.54 | 26.03 | 9.32 | 30.44 | -75.63 | -13.00 | -62.63 | Peak |
| 3 | 1337.94 | -69.76 | 37.03 | 12.03 | 29.45 | -50.15 | -13.00 | -37.15 | Peak |
| 4 | 2814.80 | -72.85 | 40.75 | 16.29 | 25.67 | -41.48 | -13.00 | -28.48 | Peak |
| 5 | 4500.76 | -67.80 | 43.20 | 8.02 | 35.81 | -52.39 | -13.00 | -39.39 | Peak |
| 6 | 6933.90 | -56.47 | 47.35 | 10.26 | 33.82 | -32.68 | -13.00 | -19.68 | Peak |

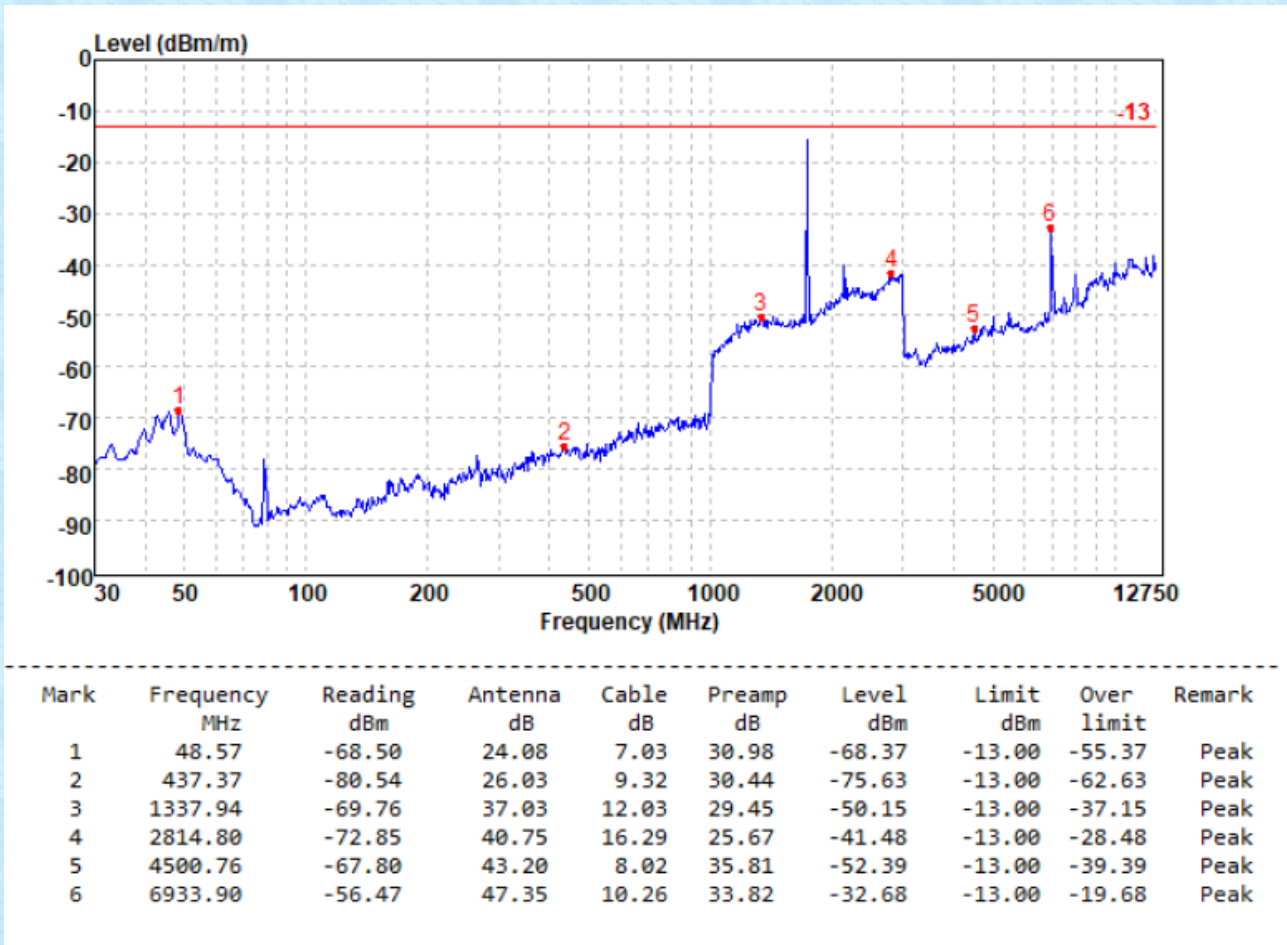
Vertical:



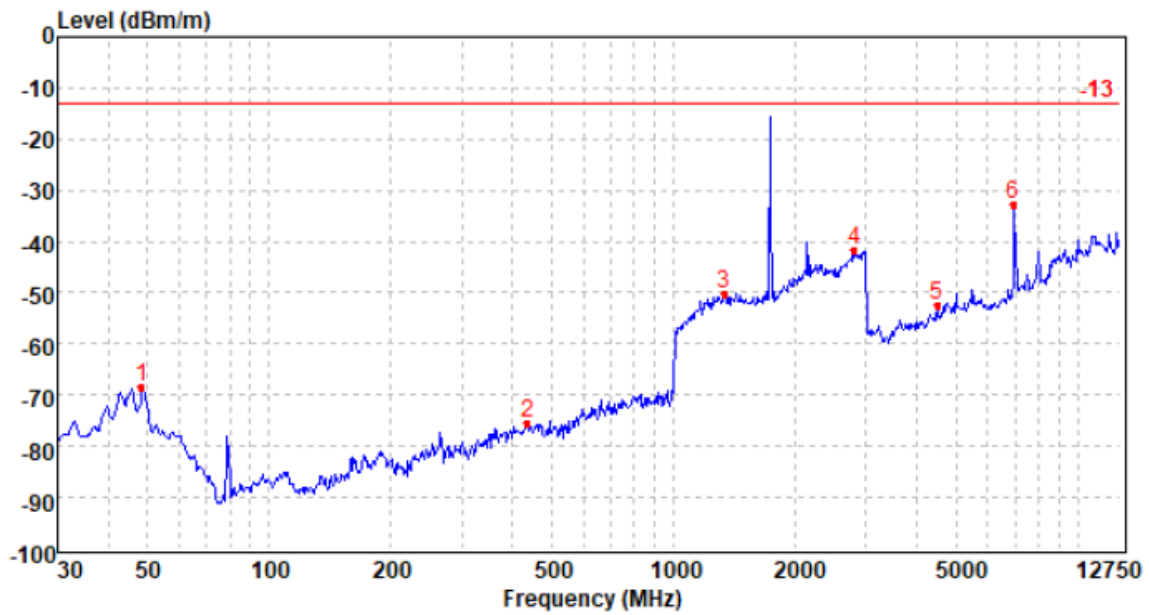
| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 48.57 | -68.50 | 24.08 | 7.03 | 30.98 | -68.37 | -13.00 | -55.37 | Peak |
| 2 | 437.37 | -80.54 | 26.03 | 9.32 | 30.44 | -75.63 | -13.00 | -62.63 | Peak |
| 3 | 1337.94 | -69.76 | 37.03 | 12.03 | 29.45 | -50.15 | -13.00 | -37.15 | Peak |
| 4 | 2814.80 | -72.85 | 40.75 | 16.29 | 25.67 | -41.48 | -13.00 | -28.48 | Peak |
| 5 | 4500.76 | -67.80 | 43.20 | 8.02 | 35.81 | -52.39 | -13.00 | -39.39 | Peak |
| 6 | 6933.90 | -56.47 | 47.35 | 10.26 | 33.82 | -32.68 | -13.00 | -19.68 | Peak |

| | | | |
|------------|--------|---------------|---------|
| Test mode: | Band 2 | Test channel: | Highest |
|------------|--------|---------------|---------|

Horizontal:



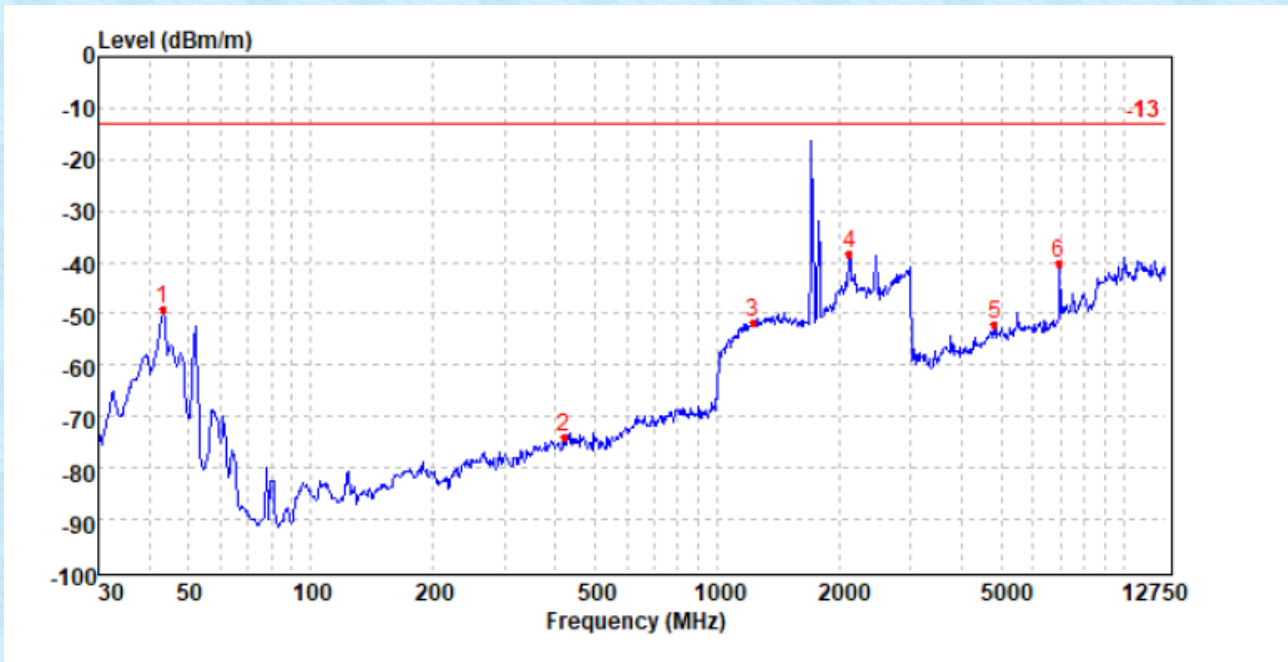
Vertical:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 48.57 | -68.50 | 24.08 | 7.03 | 30.98 | -68.37 | -13.00 | -55.37 | Peak |
| 2 | 437.37 | -80.54 | 26.03 | 9.32 | 30.44 | -75.63 | -13.00 | -62.63 | Peak |
| 3 | 1337.94 | -69.76 | 37.03 | 12.03 | 29.45 | -50.15 | -13.00 | -37.15 | Peak |
| 4 | 2814.80 | -72.85 | 40.75 | 16.29 | 25.67 | -41.48 | -13.00 | -28.48 | Peak |
| 5 | 4500.76 | -67.80 | 43.20 | 8.02 | 35.81 | -52.39 | -13.00 | -39.39 | Peak |
| 6 | 6933.90 | -56.47 | 47.35 | 10.26 | 33.82 | -32.68 | -13.00 | -19.68 | Peak |

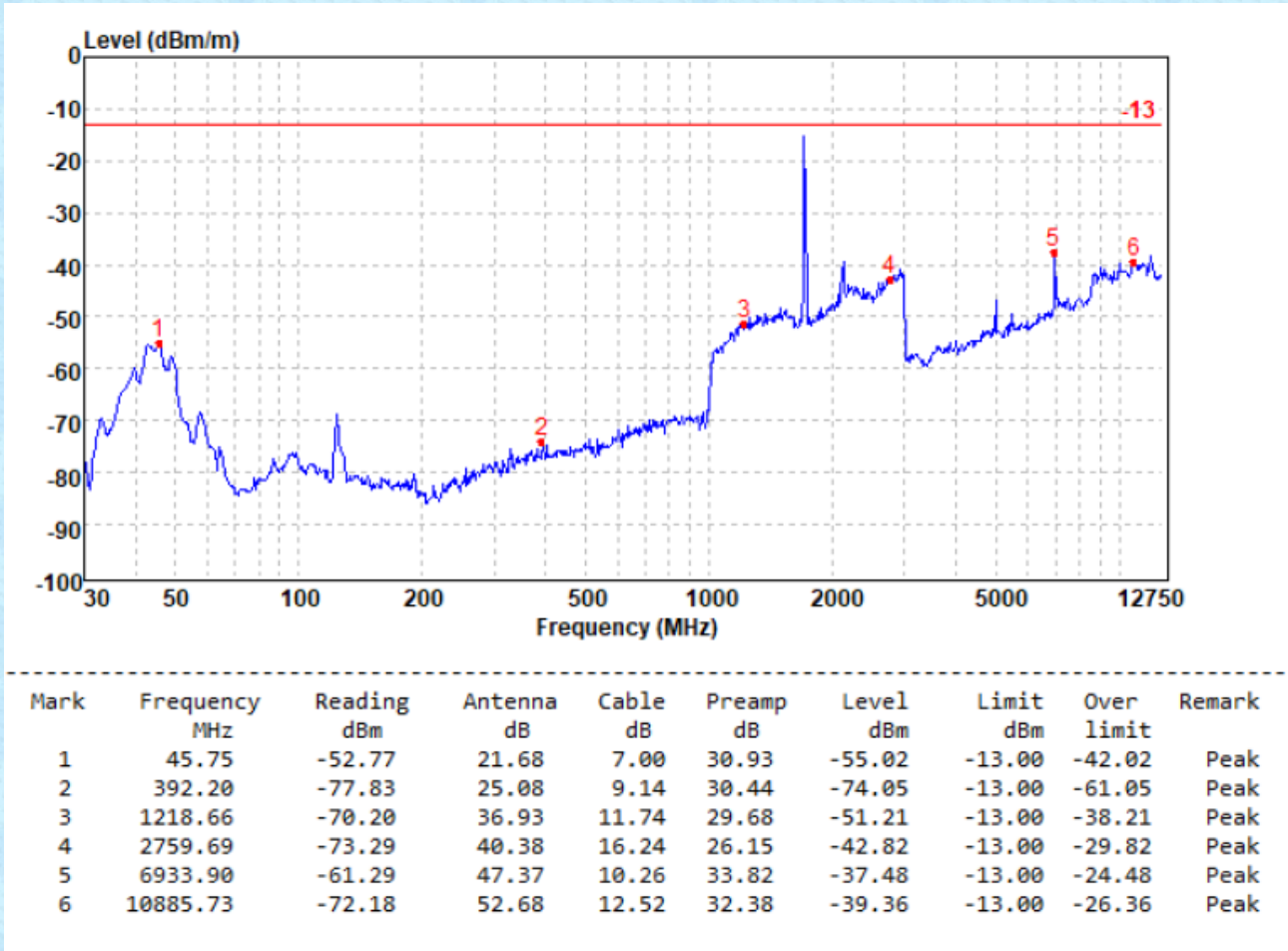
| | | | |
|------------|--------|---------------|--------|
| Test mode: | Band 4 | Test channel: | Lowest |
|------------|--------|---------------|--------|

Horizontal:



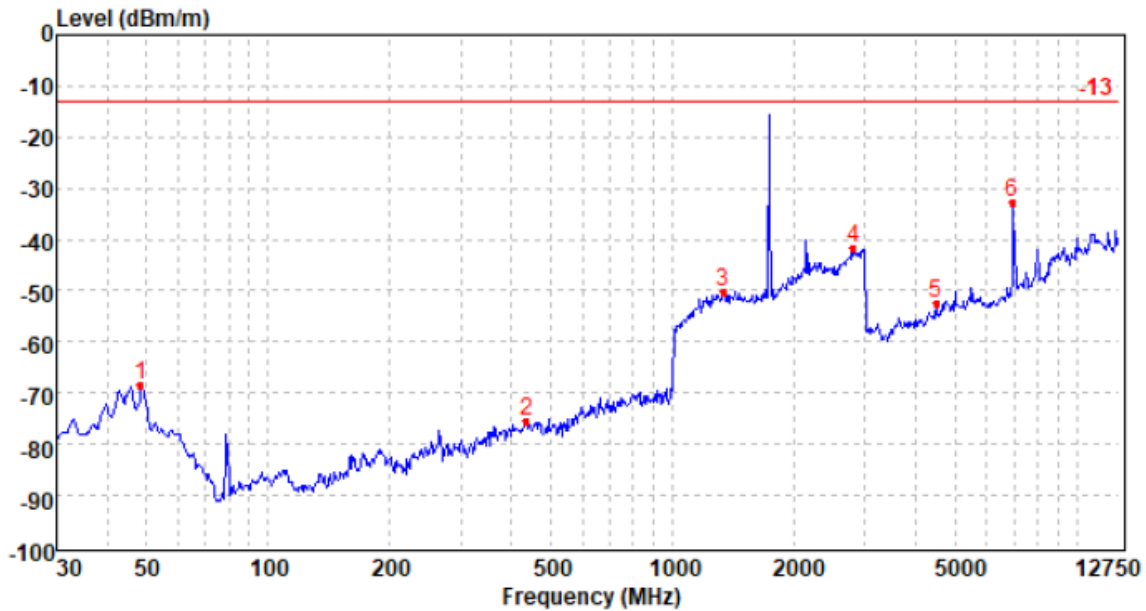
| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 43.25 | -51.57 | 26.29 | 6.97 | 30.89 | -49.20 | -13.00 | -36.20 | Peak |
| 2 | 420.77 | -78.76 | 25.98 | 9.24 | 30.44 | -73.98 | -13.00 | -60.98 | Peak |
| 3 | 1224.03 | -70.39 | 36.79 | 11.75 | 29.69 | -51.54 | -13.00 | -38.54 | Peak |
| 4 | 2117.75 | -62.79 | 40.23 | 13.82 | 29.58 | -38.32 | -13.00 | -25.32 | Peak |
| 5 | 4832.23 | -70.06 | 43.77 | 8.53 | 34.15 | -51.91 | -13.00 | -38.91 | Peak |
| 6 | 6933.90 | -63.78 | 47.35 | 10.26 | 33.82 | -39.99 | -13.00 | -26.99 | Peak |

Vertical:



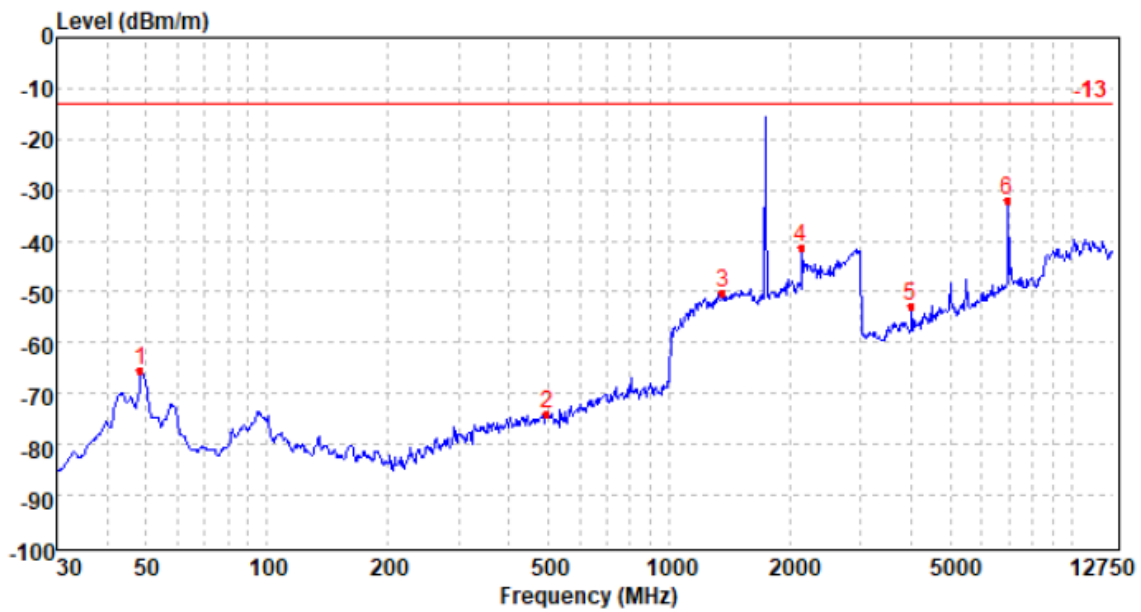
| | | | |
|------------|--------|---------------|--------|
| Test mode: | Band 4 | Test channel: | Middle |
|------------|--------|---------------|--------|

Horizontal:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 48.57 | -68.50 | 24.08 | 7.03 | 30.98 | -68.37 | -13.00 | -55.37 | Peak |
| 2 | 437.37 | -80.54 | 26.03 | 9.32 | 30.44 | -75.63 | -13.00 | -62.63 | Peak |
| 3 | 1337.94 | -69.76 | 37.03 | 12.03 | 29.45 | -50.15 | -13.00 | -37.15 | Peak |
| 4 | 2814.80 | -72.85 | 40.75 | 16.29 | 25.67 | -41.48 | -13.00 | -28.48 | Peak |
| 5 | 4500.76 | -67.80 | 43.20 | 8.02 | 35.81 | -52.39 | -13.00 | -39.39 | Peak |
| 6 | 6933.90 | -56.47 | 47.35 | 10.26 | 33.82 | -32.68 | -13.00 | -19.68 | Peak |

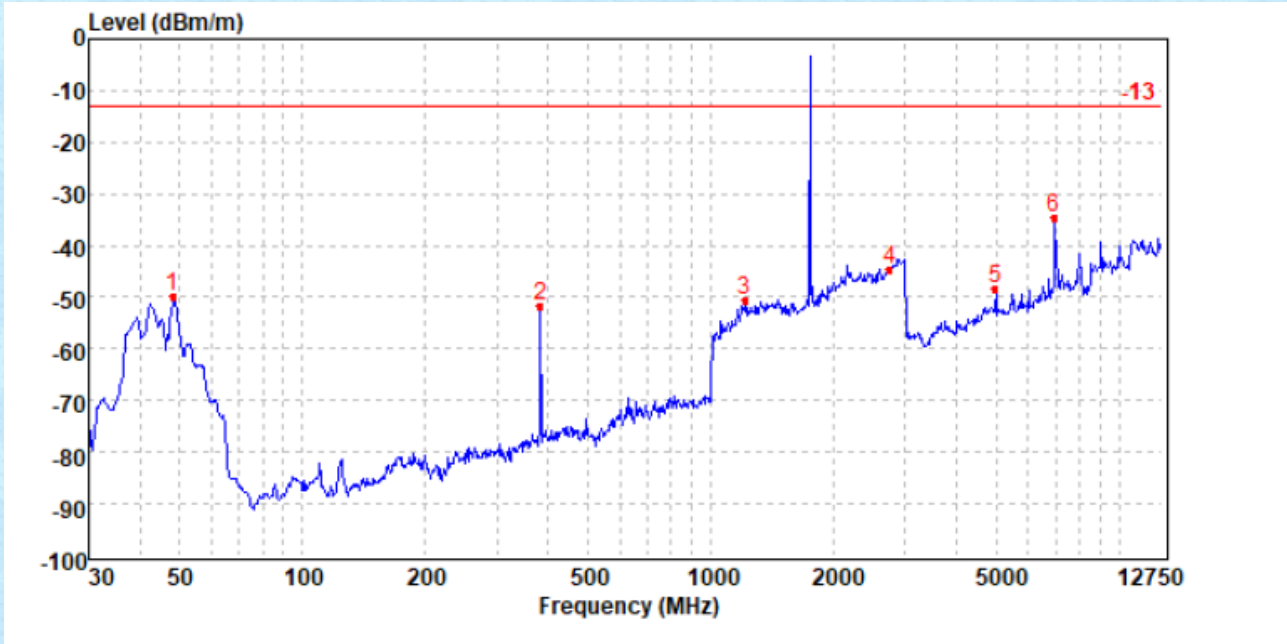
Vertical:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 48.57 | -63.24 | 21.94 | 7.03 | 30.98 | -65.25 | -13.00 | -52.25 | Peak |
| 2 | 496.39 | -79.27 | 26.17 | 9.54 | 30.48 | -74.04 | -13.00 | -61.04 | Peak |
| 3 | 1360.17 | -70.60 | 37.59 | 12.08 | 29.41 | -50.34 | -13.00 | -37.34 | Peak |
| 4 | 2134.09 | -66.21 | 40.64 | 13.87 | 29.46 | -41.16 | -13.00 | -28.16 | Peak |
| 5 | 3996.12 | -65.38 | 41.54 | 7.38 | 36.48 | -52.94 | -13.00 | -39.94 | Peak |
| 6 | 6933.90 | -55.89 | 47.37 | 10.26 | 33.82 | -32.08 | -13.00 | -19.08 | Peak |

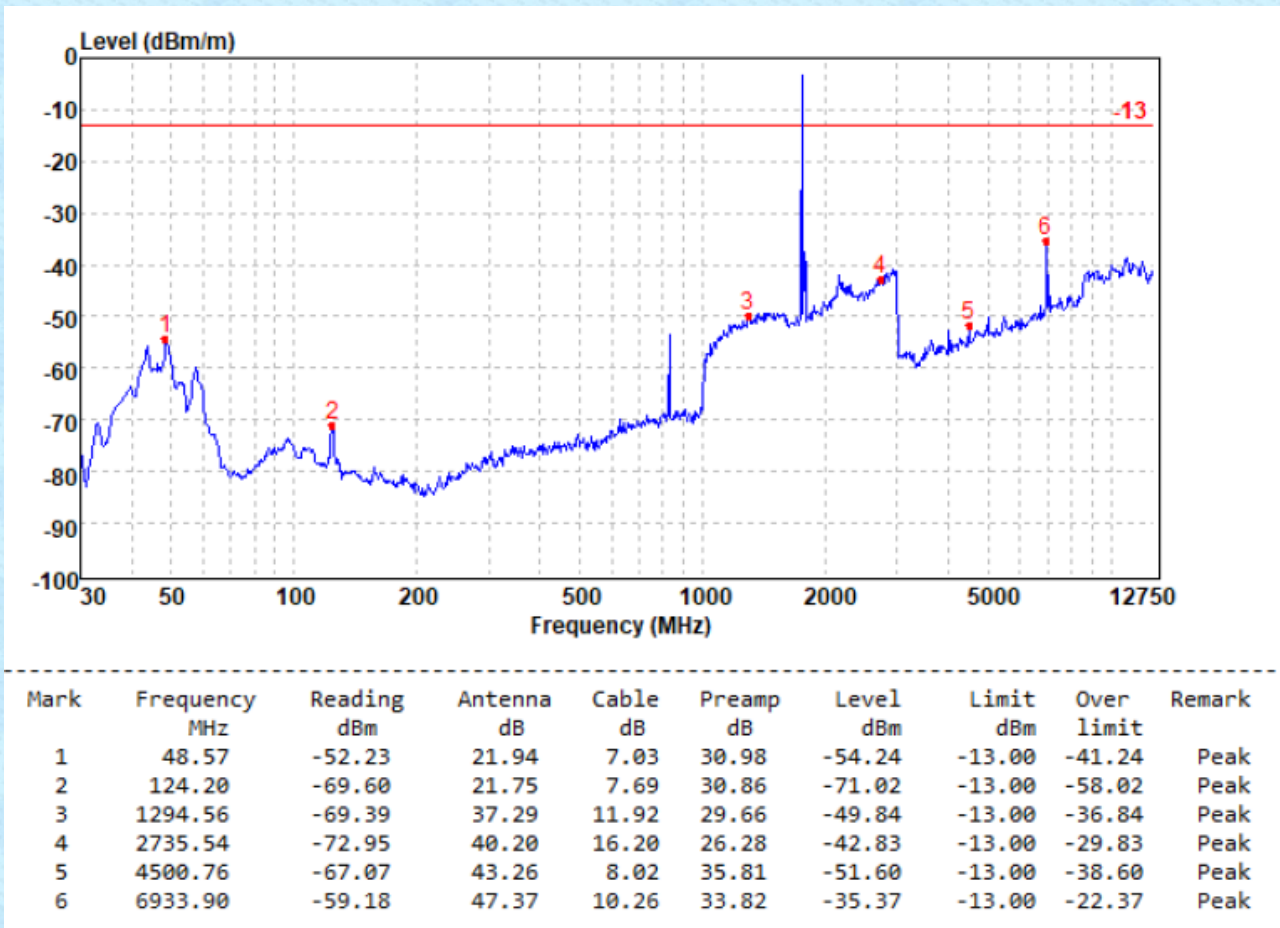
| | | | |
|------------|--------|---------------|---------|
| Test mode: | Band 4 | Test channel: | Highest |
|------------|--------|---------------|---------|

Horizontal:



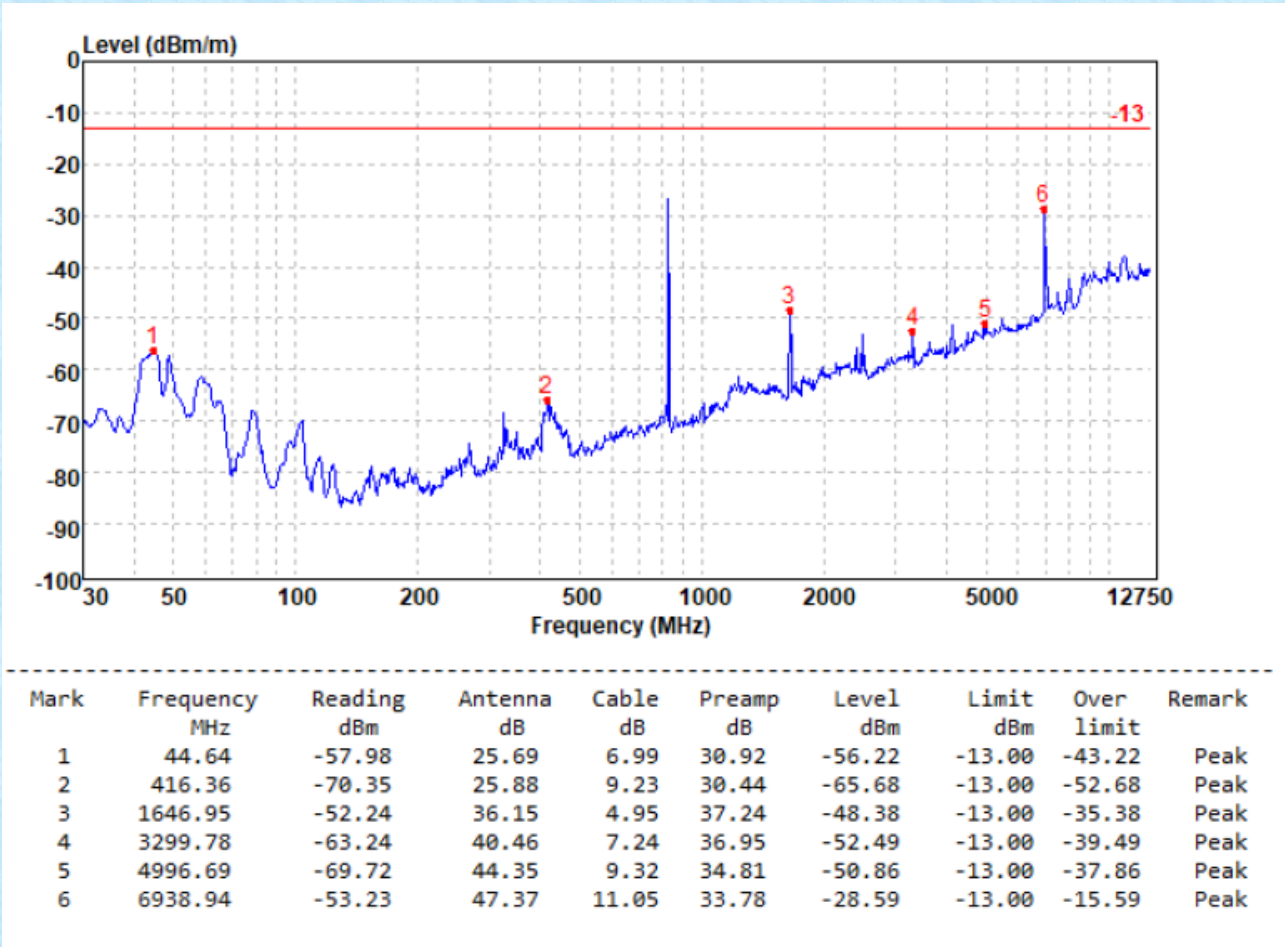
| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|---------------|-------------|------------|----------|-----------|-----------|-----------|------------|--------|
| 1 | 48.23 | -50.11 | 24.22 | 7.02 | 30.97 | -49.84 | -13.00 | -36.84 | Peak |
| 2 | 384.01 | -55.61 | 25.09 | 9.10 | 30.42 | -51.84 | -13.00 | -38.84 | Peak |
| 3 | 1215.98 | -69.55 | 36.77 | 11.73 | 29.68 | -50.73 | -13.00 | -37.73 | Peak |
| 4 | 2744.57 | -74.66 | 40.20 | 16.22 | 26.27 | -44.51 | -13.00 | -31.51 | Peak |
| 5 | 4996.14 | -66.68 | 44.35 | 8.81 | 34.81 | -48.33 | -13.00 | -35.33 | Peak |
| 6 | 6933.90 | -58.52 | 47.35 | 10.26 | 33.82 | -34.73 | -13.00 | -21.73 | Peak |

Vertical:

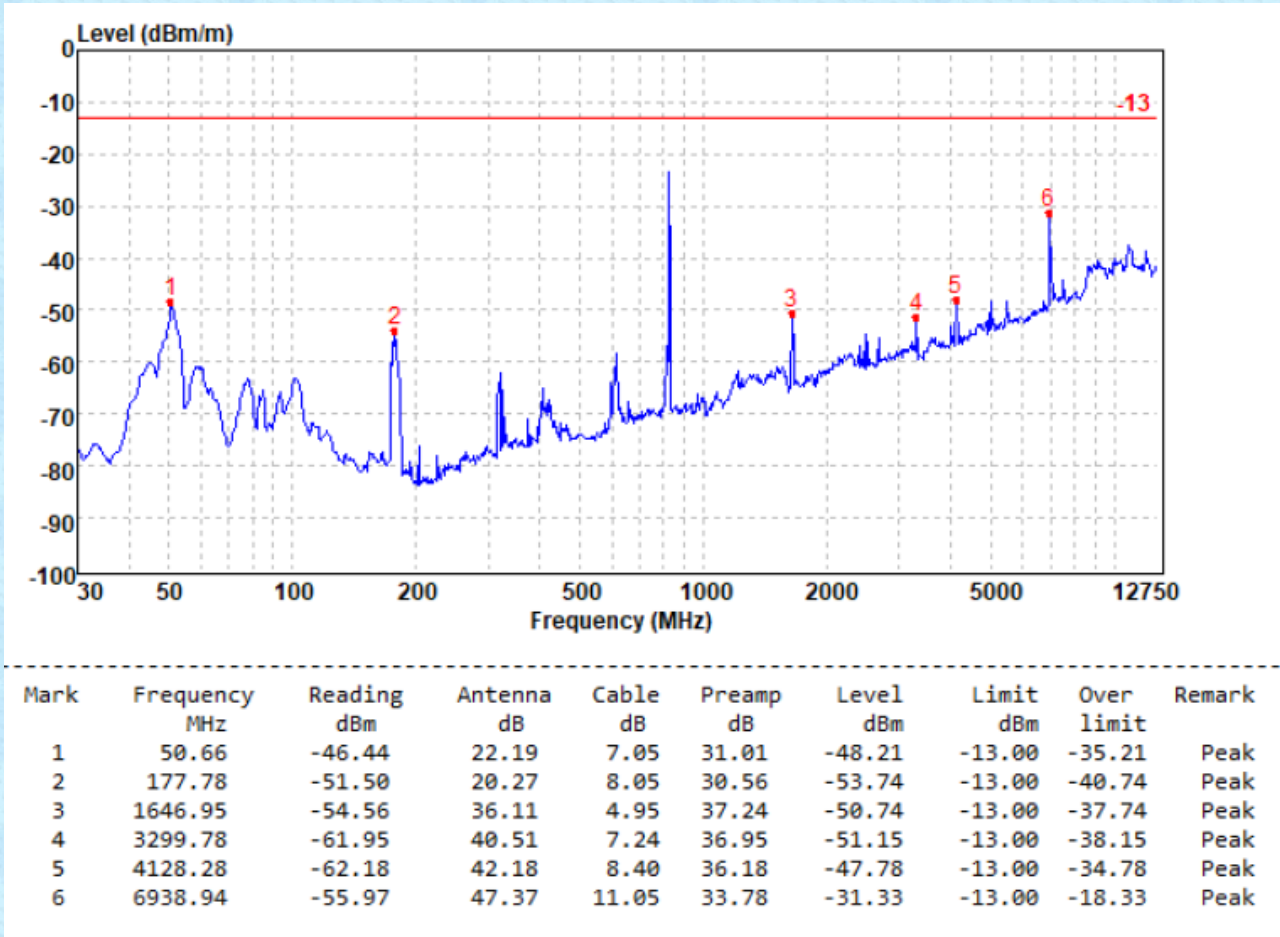


| | | | |
|------------|--------|---------------|--------|
| Test mode: | Band 5 | Test channel: | Lowest |
|------------|--------|---------------|--------|

Horizontal:

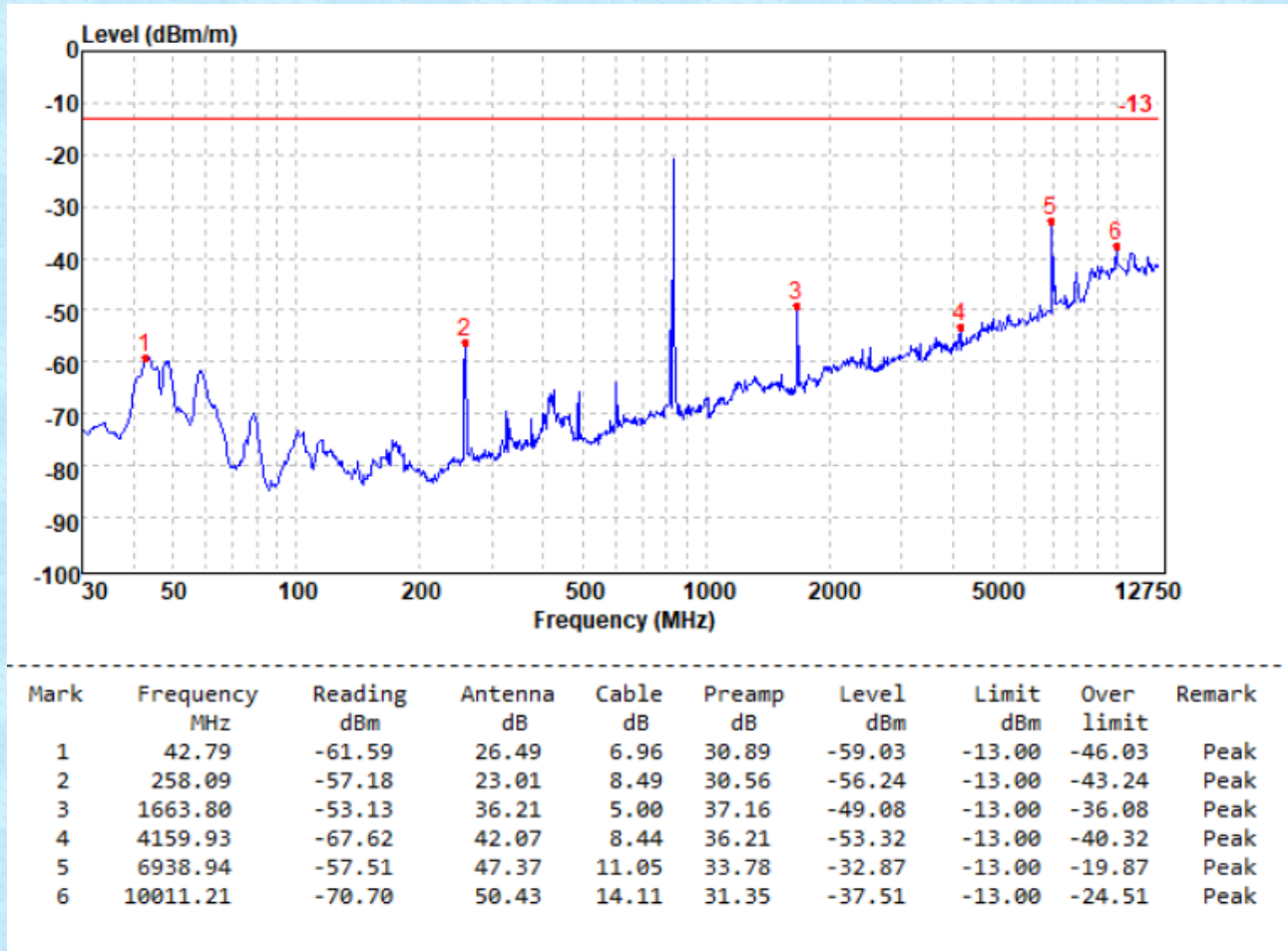


Vertical:

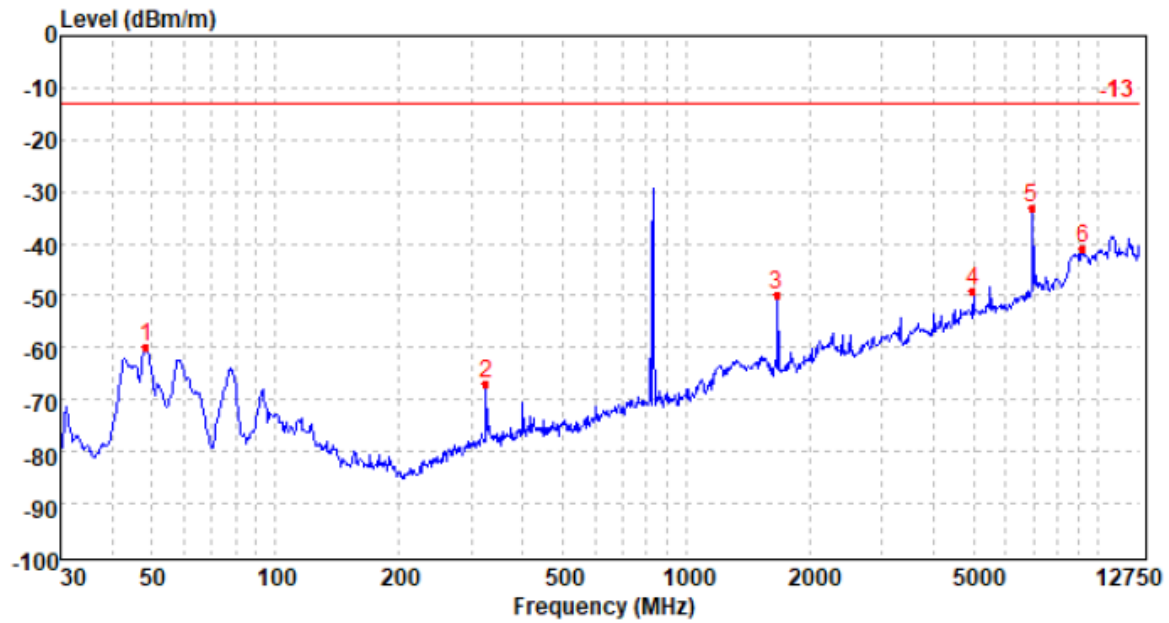


| | | | |
|------------|--------|---------------|--------|
| Test mode: | Band 5 | Test channel: | Middle |
|------------|--------|---------------|--------|

Horizontal:



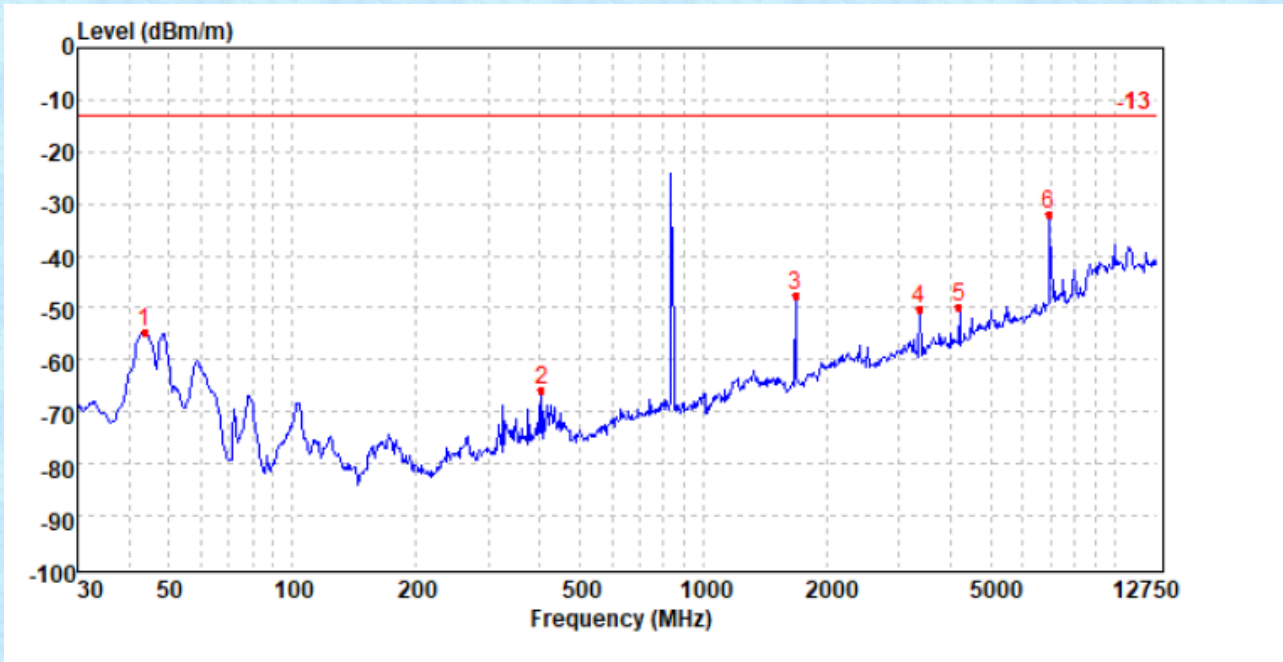
Vertical:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 48.57 | -57.74 | 21.94 | 7.03 | 30.98 | -59.75 | -13.00 | -46.75 | Peak |
| 2 | 325.51 | -68.78 | 23.58 | 8.83 | 30.44 | -66.81 | -13.00 | -53.81 | Peak |
| 3 | 1663.80 | -53.66 | 36.15 | 5.00 | 37.16 | -49.67 | -13.00 | -36.67 | Peak |
| 4 | 4996.69 | -67.98 | 44.50 | 9.32 | 34.81 | -48.97 | -13.00 | -35.97 | Peak |
| 5 | 6938.94 | -57.82 | 47.37 | 11.05 | 33.78 | -33.18 | -13.00 | -20.18 | Peak |
| 6 | 9228.06 | -73.48 | 49.74 | 14.00 | 31.10 | -40.84 | -13.00 | -27.84 | Peak |

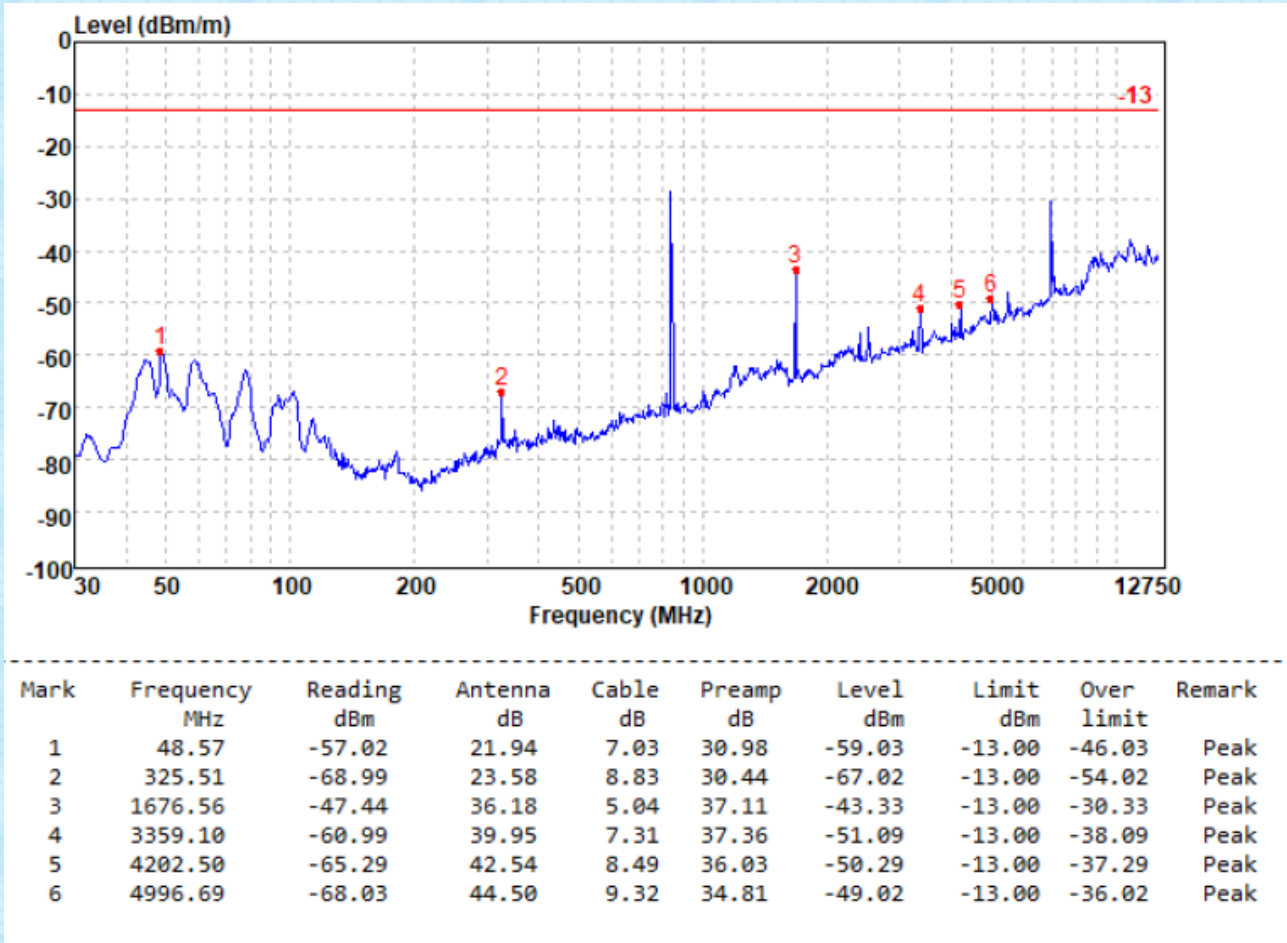
| | | | |
|------------|--------|---------------|---------|
| Test mode: | Band 5 | Test channel: | Highest |
|------------|--------|---------------|---------|

Horizontal:



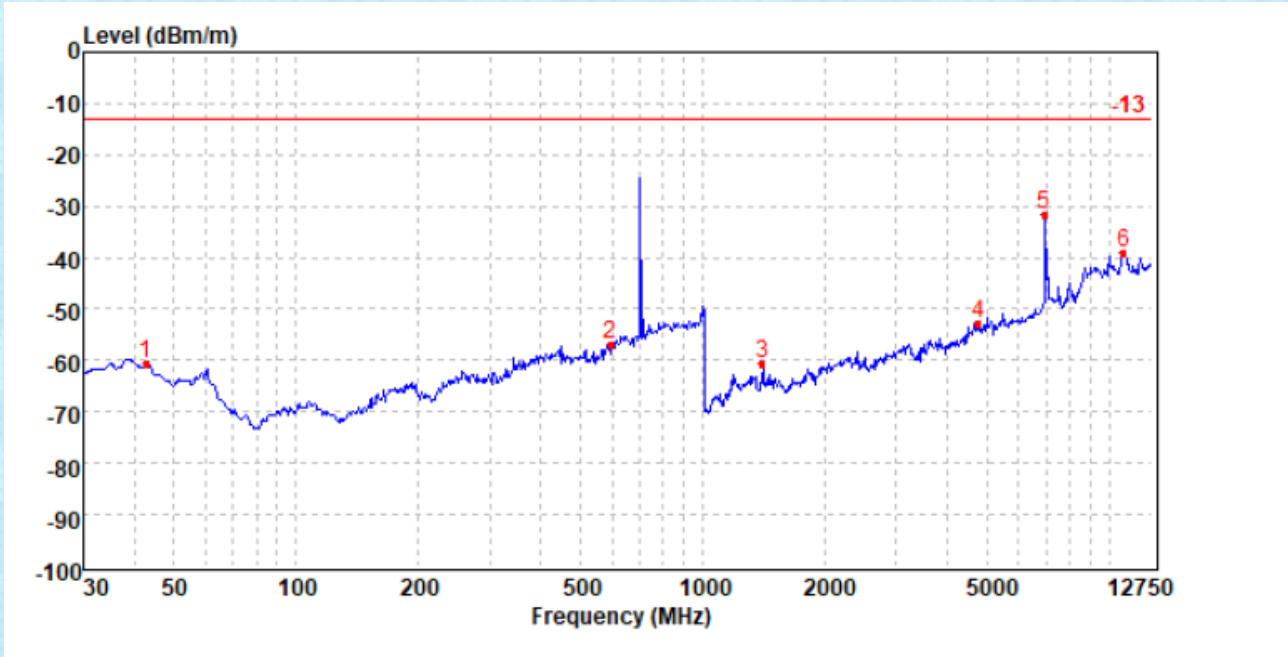
| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 43.71 | -56.84 | 26.09 | 6.97 | 30.90 | -54.68 | -13.00 | -41.68 | Peak |
| 2 | 403.39 | -70.16 | 25.51 | 9.20 | 30.45 | -65.90 | -13.00 | -52.90 | Peak |
| 3 | 1676.56 | -51.62 | 36.26 | 5.04 | 37.11 | -47.43 | -13.00 | -34.43 | Peak |
| 4 | 3359.10 | -59.89 | 39.94 | 7.31 | 37.36 | -50.00 | -13.00 | -37.00 | Peak |
| 5 | 4202.50 | -64.71 | 42.29 | 8.49 | 36.03 | -49.96 | -13.00 | -36.96 | Peak |
| 6 | 6938.94 | -56.51 | 47.37 | 11.05 | 33.78 | -31.87 | -13.00 | -18.87 | Peak |

Vertical:



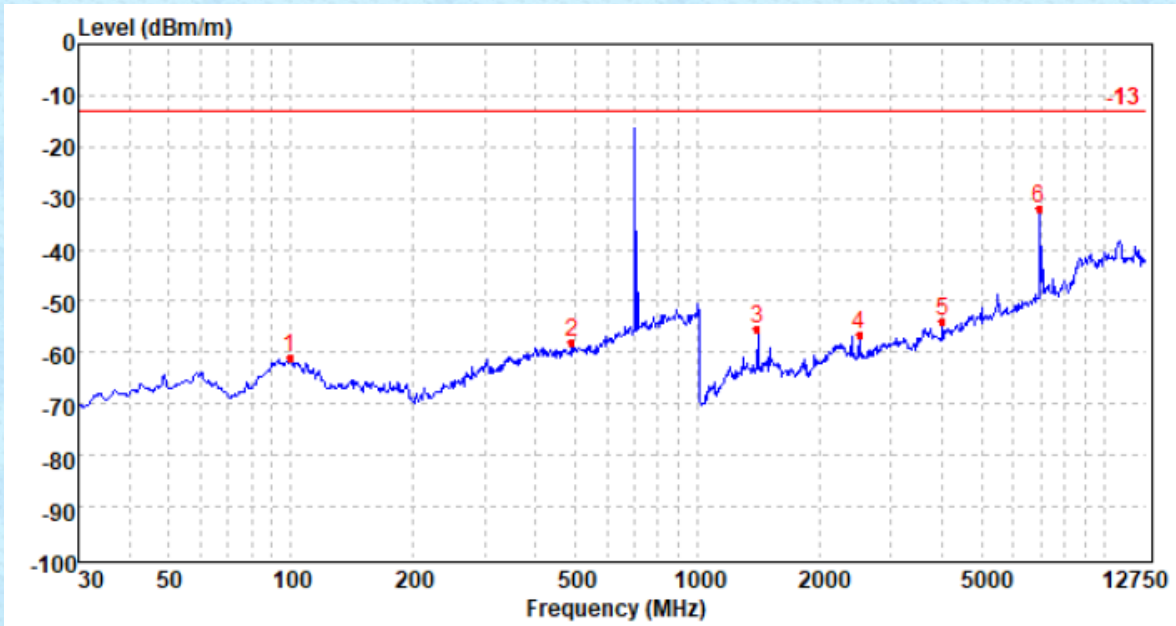
| | | | |
|------------|---------|---------------|--------|
| Test mode: | Band 12 | Test channel: | Lowest |
|------------|---------|---------------|--------|

Horizontal:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 42.79 | -94.08 | 26.49 | 6.96 | 0.00 | -60.63 | -13.00 | -47.63 | Peak |
| 2 | 593.90 | -94.39 | 27.59 | 9.91 | 0.00 | -56.89 | -13.00 | -43.89 | Peak |
| 3 | 1406.50 | -65.69 | 37.12 | 4.48 | 36.61 | -60.70 | -13.00 | -47.70 | Peak |
| 4 | 4772.91 | -71.35 | 43.62 | 9.10 | 34.15 | -52.78 | -13.00 | -39.78 | Peak |
| 5 | 6938.94 | -56.40 | 47.37 | 11.05 | 33.78 | -31.76 | -13.00 | -18.76 | Peak |
| 6 | 10860.83 | -73.64 | 52.57 | 14.52 | 32.46 | -39.01 | -13.00 | -26.01 | Peak |

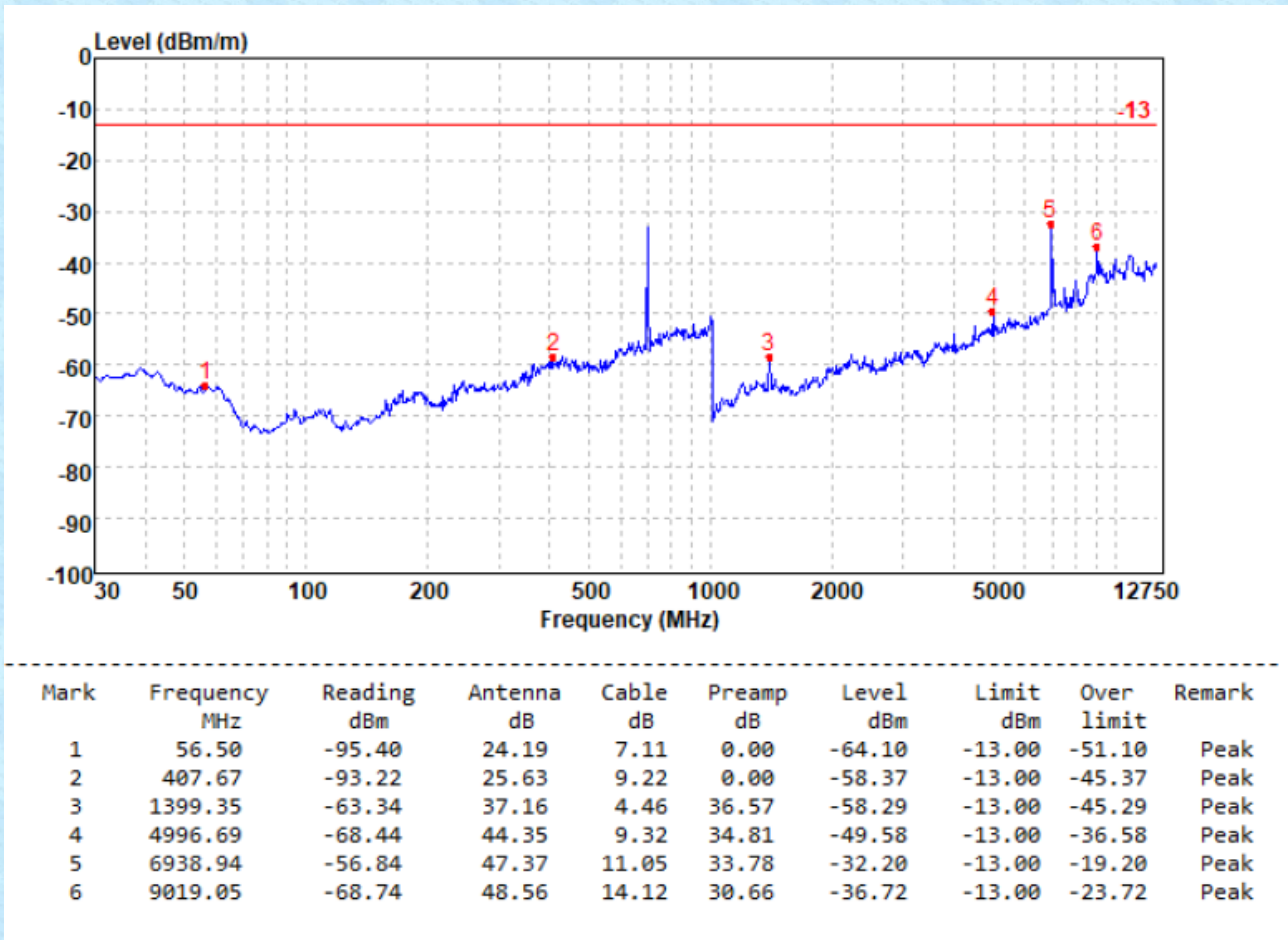
Vertical:



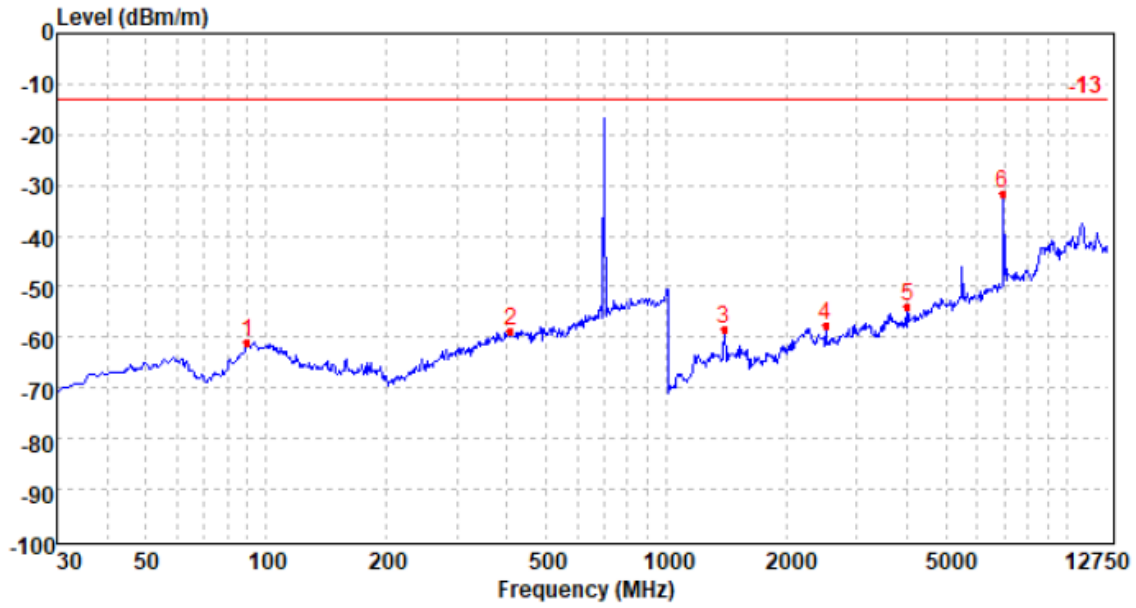
| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 99.52 | -94.33 | 25.76 | 7.51 | 0.00 | -61.06 | -13.00 | -48.06 | Peak |
| 2 | 491.19 | -93.57 | 26.03 | 9.53 | 0.00 | -58.01 | -13.00 | -45.01 | Peak |
| 3 | 1406.50 | -61.09 | 37.76 | 4.48 | 36.61 | -55.46 | -13.00 | -42.46 | Peak |
| 4 | 2500.25 | -64.69 | 39.23 | 6.15 | 37.28 | -56.59 | -13.00 | -43.59 | Peak |
| 5 | 4004.08 | -67.19 | 41.55 | 8.26 | 36.48 | -53.86 | -13.00 | -40.86 | Peak |
| 6 | 6938.94 | -56.73 | 47.37 | 11.05 | 33.78 | -32.09 | -13.00 | -19.09 | Peak |

| | | | |
|------------|---------|---------------|--------|
| Test mode: | Band 12 | Test channel: | Middle |
|------------|---------|---------------|--------|

Horizontal:



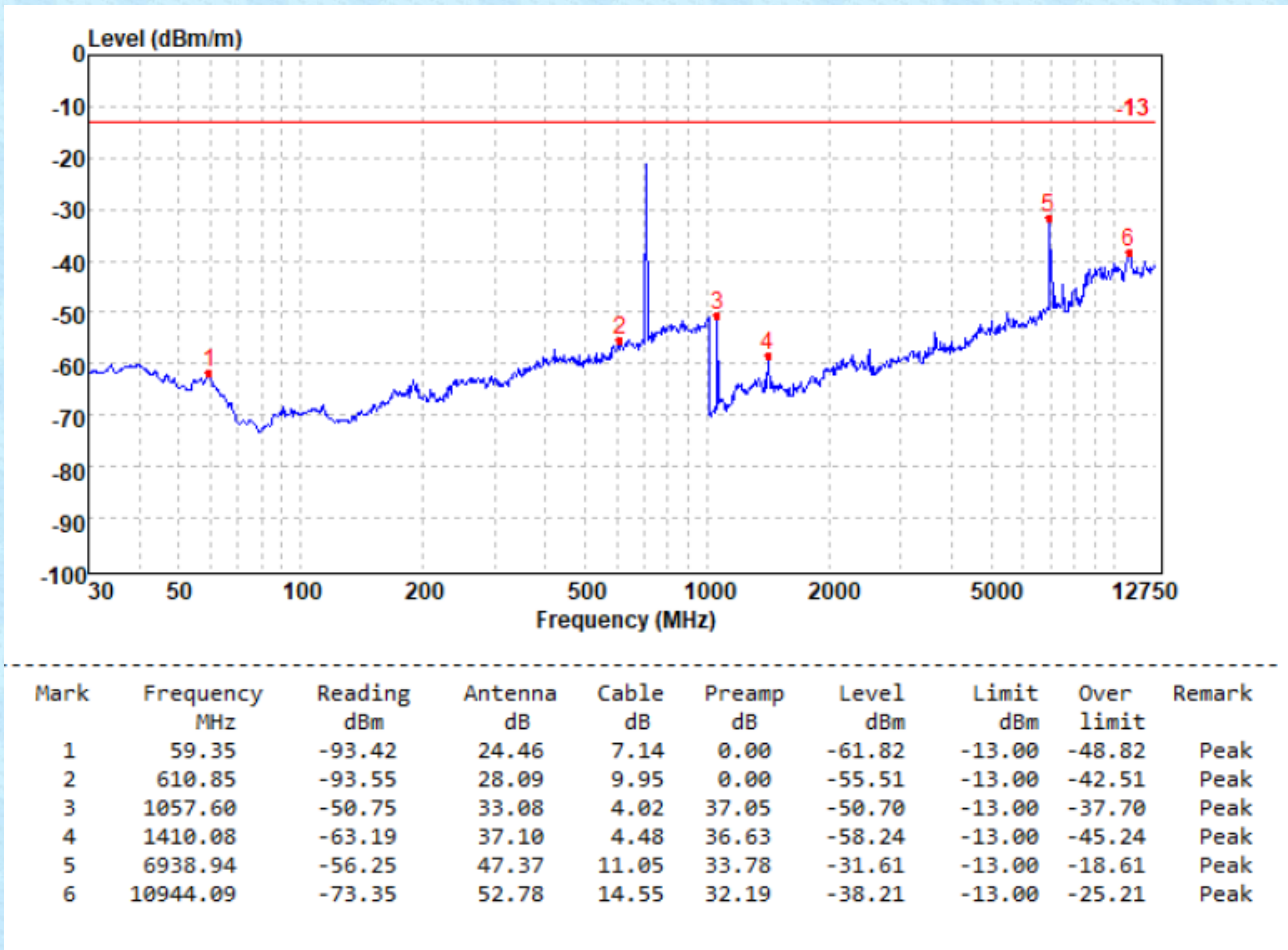
Vertical:



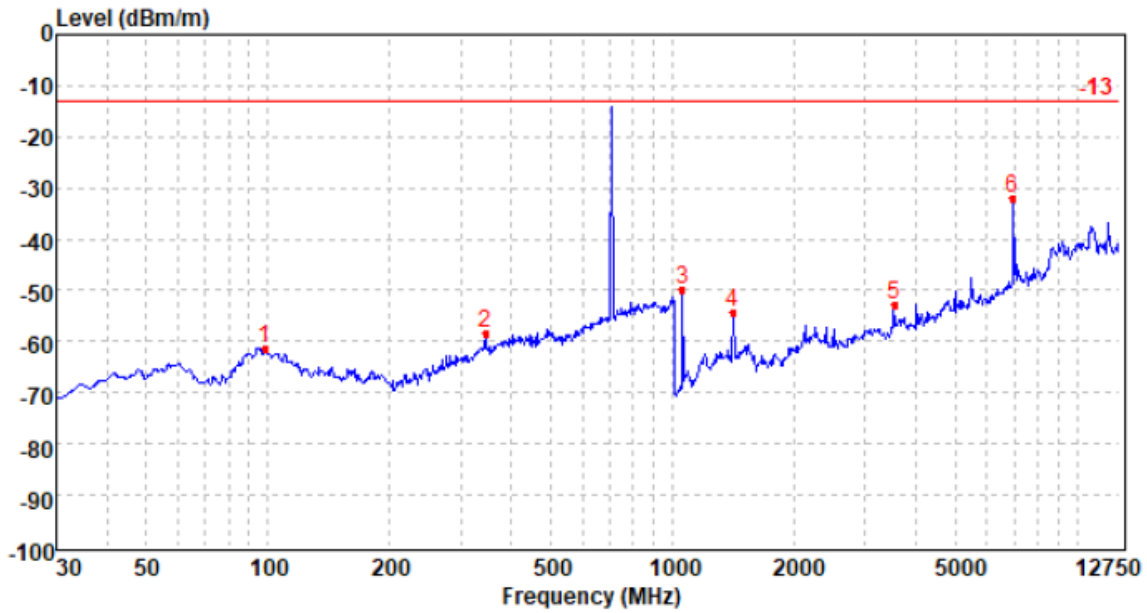
| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 89.87 | -94.04 | 25.83 | 7.42 | 0.00 | -60.79 | -13.00 | -47.79 | Peak |
| 2 | 407.67 | -93.14 | 25.30 | 9.22 | 0.00 | -58.62 | -13.00 | -45.62 | Peak |
| 3 | 1399.35 | -64.15 | 37.76 | 4.46 | 36.57 | -58.50 | -13.00 | -45.50 | Peak |
| 4 | 2500.25 | -65.87 | 39.23 | 6.15 | 37.28 | -57.77 | -13.00 | -44.77 | Peak |
| 5 | 4004.08 | -67.09 | 41.55 | 8.26 | 36.48 | -53.76 | -13.00 | -40.76 | Peak |
| 6 | 6938.94 | -56.23 | 47.37 | 11.05 | 33.78 | -31.59 | -13.00 | -18.59 | Peak |

| | | | |
|------------|---------|---------------|---------|
| Test mode: | Band 12 | Test channel: | Highest |
|------------|---------|---------------|---------|

Horizontal:



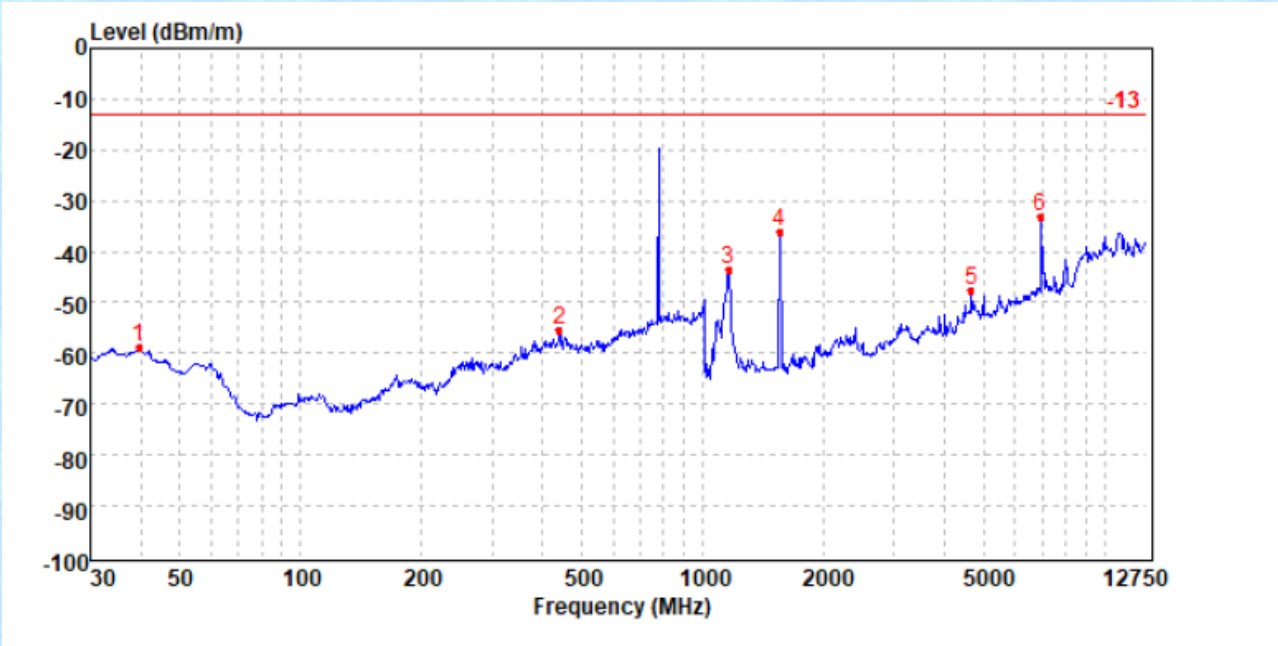
Vertical:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 98.47 | -94.64 | 25.77 | 7.50 | 0.00 | -61.37 | -13.00 | -48.37 | Peak |
| 2 | 345.56 | -91.80 | 24.65 | 8.93 | 0.00 | -58.22 | -13.00 | -45.22 | Peak |
| 3 | 1057.60 | -49.75 | 32.85 | 4.02 | 37.05 | -49.93 | -13.00 | -36.93 | Peak |
| 4 | 1410.08 | -59.94 | 37.76 | 4.48 | 36.63 | -54.33 | -13.00 | -41.33 | Peak |
| 5 | 3534.54 | -64.90 | 41.64 | 7.50 | 37.04 | -52.80 | -13.00 | -39.80 | Peak |
| 6 | 6938.94 | -56.56 | 47.37 | 11.05 | 33.78 | -31.92 | -13.00 | -18.92 | Peak |

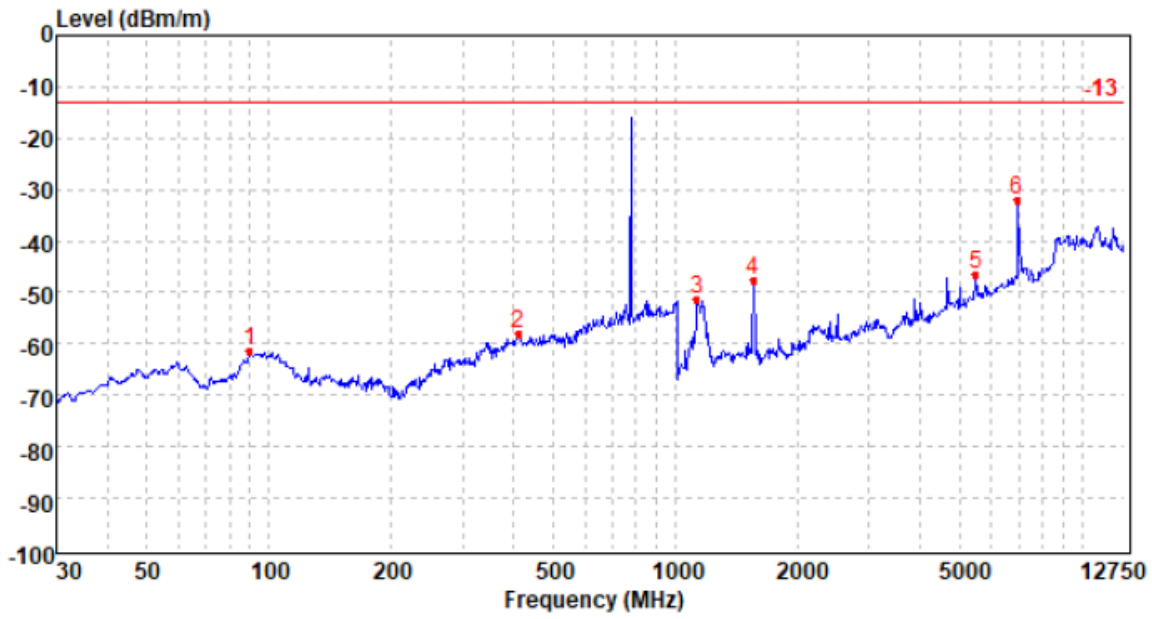
| | | | |
|------------|---------|---------------|--------|
| Test mode: | Band 13 | Test channel: | Lowest |
|------------|---------|---------------|--------|

Horizontal:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|---------------|-------------|------------|----------|-----------|-----------|-----------|------------|--------|
| 1 | 39.75 | -93.55 | 27.74 | 6.93 | 0.00 | -58.88 | -13.00 | -45.88 | Peak |
| 2 | 440.46 | -90.75 | 26.04 | 9.33 | 0.00 | -55.38 | -13.00 | -42.38 | Peak |
| 3 | 1159.10 | -46.61 | 35.73 | 4.08 | 36.73 | -43.53 | -13.00 | -30.53 | Peak |
| 4 | 1557.25 | -39.90 | 36.20 | 4.76 | 36.94 | -35.88 | -13.00 | -22.88 | Peak |
| 5 | 4664.81 | -65.47 | 43.52 | 9.22 | 34.77 | -47.50 | -13.00 | -34.50 | Peak |
| 6 | 6938.94 | -57.59 | 47.37 | 11.05 | 33.78 | -32.95 | -13.00 | -19.95 | Peak |

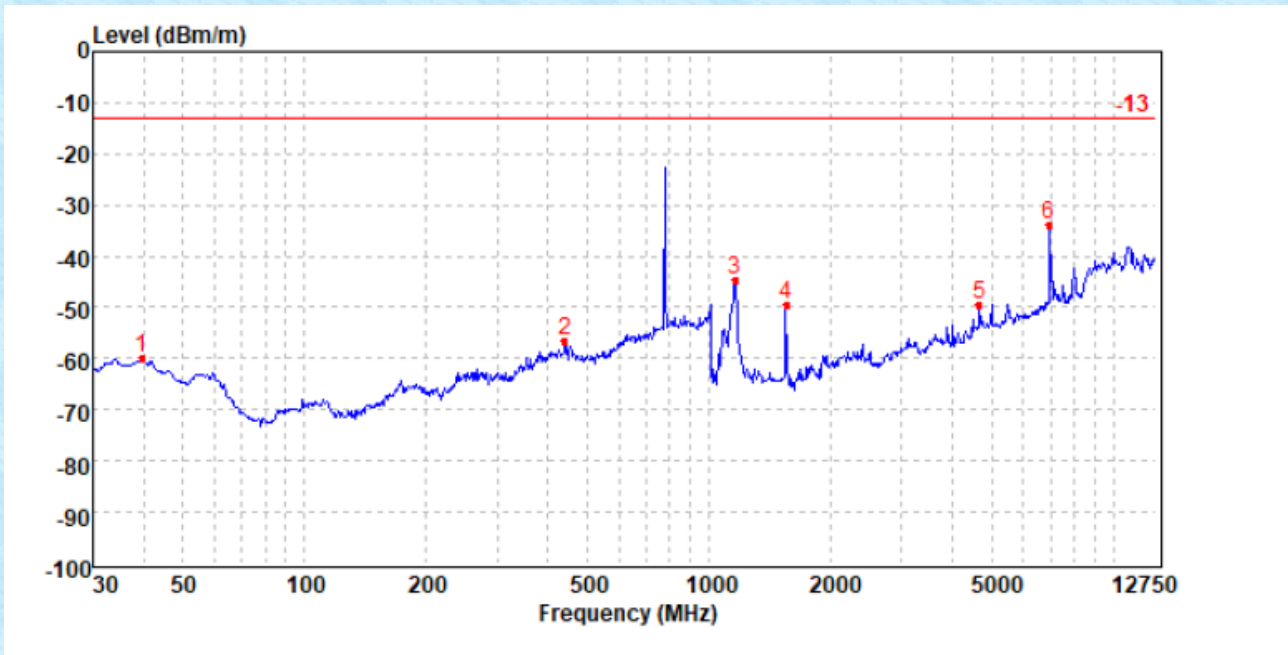
Vertical:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamplifier dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------------|--------------|--------------|---------------|--------|
| 1 | 89.87 | -94.64 | 25.83 | 7.42 | 0.00 | -61.39 | -13.00 | -48.39 | Peak |
| 2 | 410.54 | -92.51 | 25.31 | 9.22 | 0.00 | -57.98 | -13.00 | -44.98 | Peak |
| 3 | 1132.84 | -53.31 | 35.02 | 4.06 | 36.90 | -51.13 | -13.00 | -38.13 | Peak |
| 4 | 1557.25 | -53.21 | 37.76 | 4.76 | 36.94 | -47.63 | -13.00 | -34.63 | Peak |
| 5 | 5504.17 | -67.76 | 44.00 | 9.65 | 32.40 | -46.51 | -13.00 | -33.51 | Peak |
| 6 | 6938.94 | -56.48 | 47.37 | 11.05 | 33.78 | -31.84 | -13.00 | -18.84 | Peak |

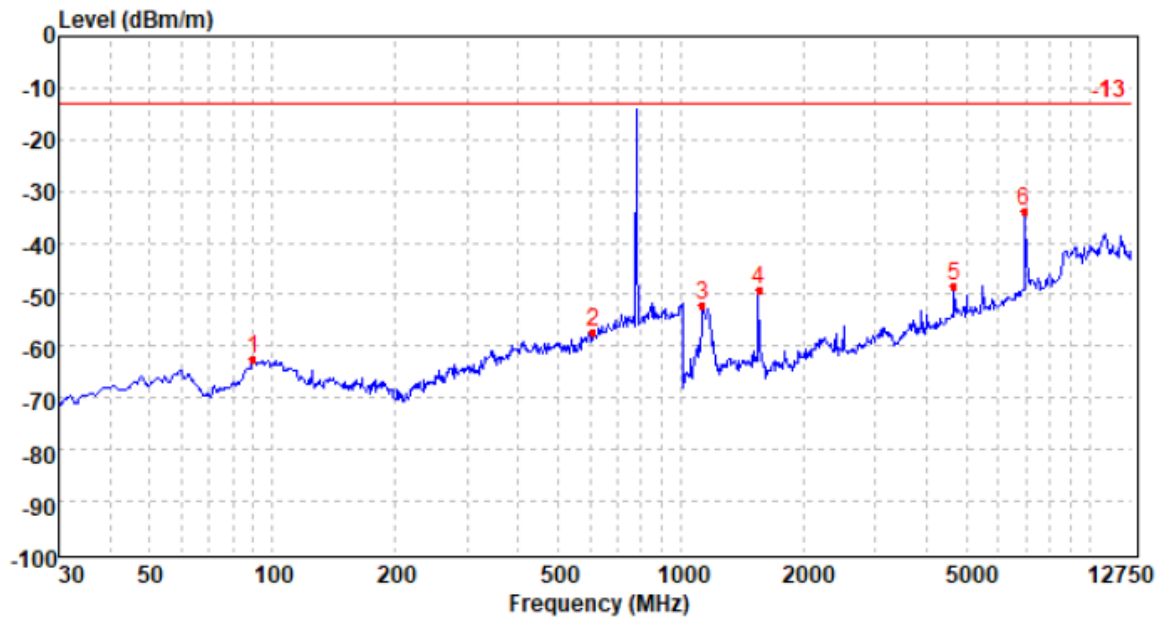
| | | | |
|------------|---------|---------------|--------|
| Test mode: | Band 13 | Test channel: | Middle |
|------------|---------|---------------|--------|

Horizontal:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|------------------|----------------|---------------|-------------|--------------|--------------|--------------|---------------|--------|
| 1 | 39.75 | -94.55 | 27.74 | 6.93 | 0.00 | -59.88 | -13.00 | -46.88 | Peak |
| 2 | 440.46 | -91.75 | 26.04 | 9.33 | 0.00 | -56.38 | -13.00 | -43.38 | Peak |
| 3 | 1159.10 | -47.61 | 35.73 | 4.08 | 36.73 | -44.53 | -13.00 | -31.53 | Peak |
| 4 | 1553.29 | -53.33 | 36.23 | 4.75 | 36.94 | -49.29 | -13.00 | -36.29 | Peak |
| 5 | 4664.81 | -67.47 | 43.52 | 9.22 | 34.77 | -49.50 | -13.00 | -36.50 | Peak |
| 6 | 6938.94 | -58.59 | 47.37 | 11.05 | 33.78 | -33.95 | -13.00 | -20.95 | Peak |

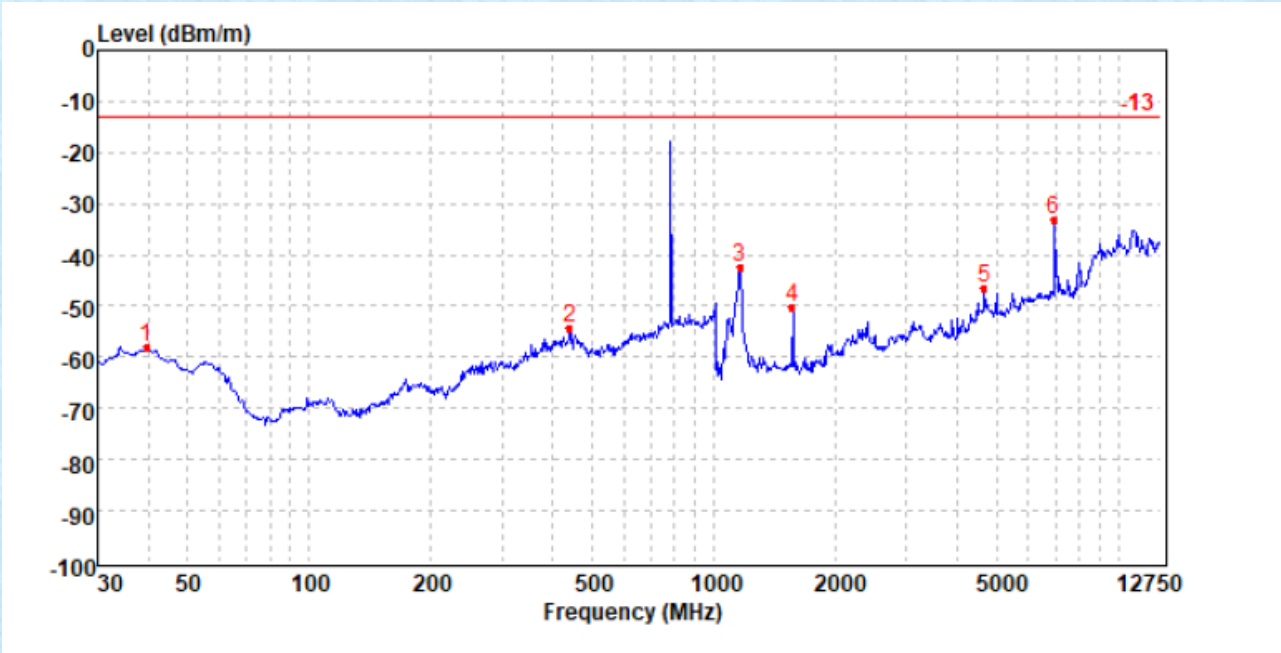
Vertical:



| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|---------------|-------------|------------|----------|-----------|-----------|-----------|------------|--------|
| 1 | 89.87 | -95.64 | 25.83 | 7.42 | 0.00 | -62.39 | -13.00 | -49.39 | Peak |
| 2 | 608.70 | -94.89 | 27.59 | 9.95 | 0.00 | -57.35 | -13.00 | -44.35 | Peak |
| 3 | 1132.84 | -54.31 | 35.02 | 4.06 | 36.90 | -52.13 | -13.00 | -39.13 | Peak |
| 4 | 1553.29 | -54.83 | 37.76 | 4.75 | 36.94 | -49.26 | -13.00 | -36.26 | Peak |
| 5 | 4664.81 | -66.31 | 43.54 | 9.22 | 34.77 | -48.32 | -13.00 | -35.32 | Peak |
| 6 | 6938.94 | -58.48 | 47.37 | 11.05 | 33.78 | -33.84 | -13.00 | -20.84 | Peak |

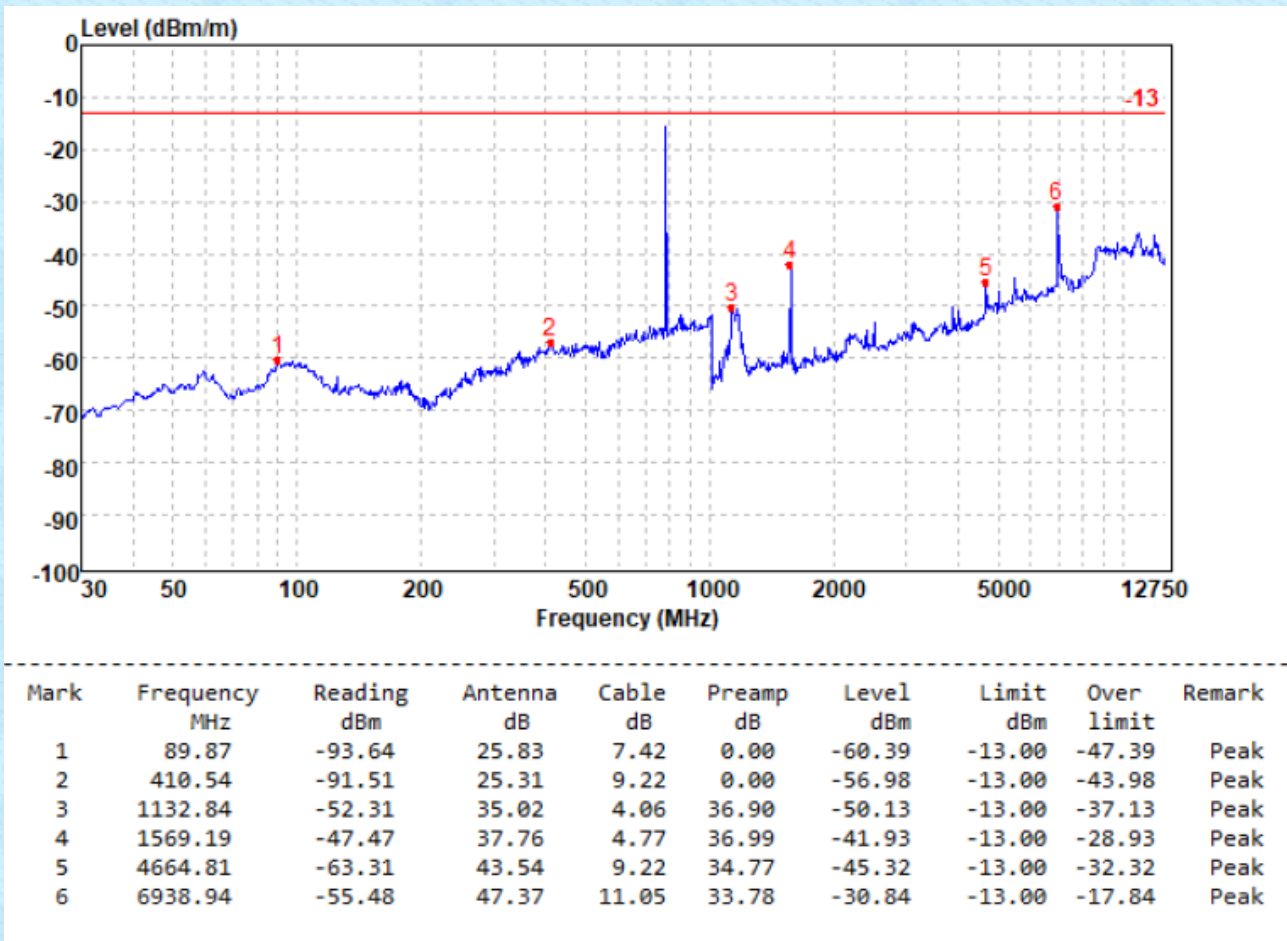
| | | | |
|------------|---------|---------------|---------|
| Test mode: | Band 13 | Test channel: | Highest |
|------------|---------|---------------|---------|

Horizontal:

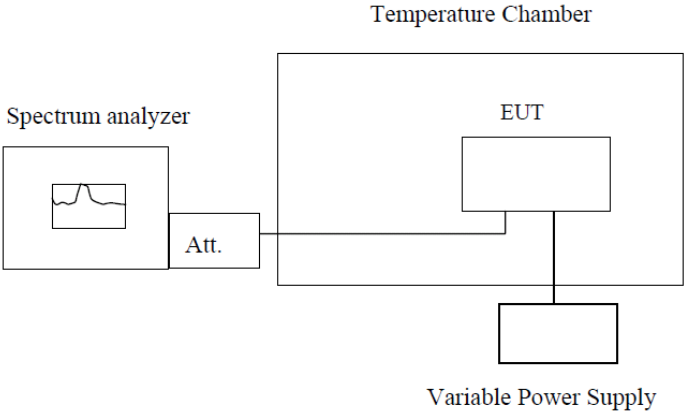


| Mark | Frequency MHz | Reading dBm | Antenna dB | Cable dB | Preamp dB | Level dBm | Limit dBm | Over limit | Remark |
|------|---------------|-------------|------------|----------|-----------|-----------|-----------|------------|--------|
| 1 | 39.75 | -92.55 | 27.74 | 6.93 | 0.00 | -57.88 | -13.00 | -44.88 | Peak |
| 2 | 440.46 | -89.75 | 26.04 | 9.33 | 0.00 | -54.38 | -13.00 | -41.38 | Peak |
| 3 | 1159.10 | -45.61 | 35.73 | 4.08 | 36.73 | -42.53 | -13.00 | -29.53 | Peak |
| 4 | 1569.19 | -54.25 | 36.13 | 4.77 | 36.99 | -50.34 | -13.00 | -37.34 | Peak |
| 5 | 4664.81 | -64.47 | 43.52 | 9.22 | 34.77 | -46.50 | -13.00 | -33.50 | Peak |
| 6 | 6938.94 | -57.59 | 47.37 | 11.05 | 33.78 | -32.95 | -13.00 | -19.95 | Peak |

Vertical:

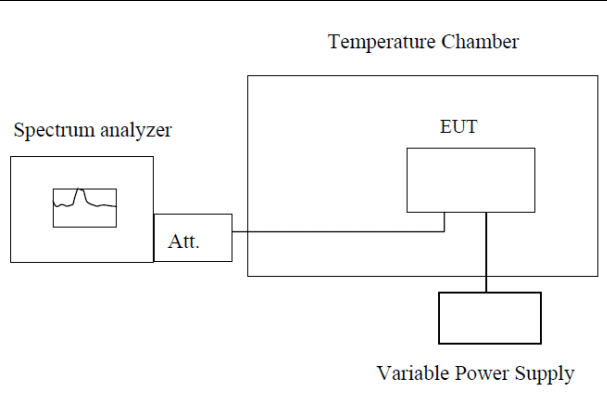


7.9 Frequency stability V.S. Temperature measurement

| | |
|-------------------|--|
| Test Requirement: | FCC Part2.1055 |
| Test Method: | FCC Part2.1055 |
| Limit: | 2.5ppm |
| Test setup: |  <p style="text-align: center;">Note : Measurement setup for testing on Antenna connector</p> |
| Test procedure: | <ol style="list-style-type: none"> 1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 7.1 for details |
| Test results: | Pass |

Measurement Data: The detailed test data see Appendix

7.10 Frequency stability V.S. Voltage measurement

| | |
|-------------------|--|
| Test Requirement: | FCC Part2.1055(d) |
| Test Method: | FCC Part2.1055(d) |
| Limit: | 2.5ppm |
| Test setup: |  <p style="text-align: center;">Temperature Chamber</p> <p style="text-align: center;">Spectrum analyzer</p> <p style="text-align: center;">Att.</p> <p style="text-align: center;">EUT</p> <p style="text-align: center;">Variable Power Supply</p> <p>Note : Measurement setup for testing on Antenna connector</p> |
| Test procedure: | <ol style="list-style-type: none"> 1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 7.1 for details |
| Test results: | Pass |

Measurement Data: The detailed test data see Appendix

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----