

Test report

352148-TRFEMC

Date of issue: June 13, 2018

Applicant:

Somewear Labs

Product:

Portable Hotspot

Model:


Somewear Global Hotspot

Specifications:

- ◆ FCC 47 CFR Part 15, Subpart C – §15.207
- ◆ FCC 47 CFR Part 15, Subpart C – §15.209

Lab and test locations

| | |
|-----------------|---|
| Company name | Nemko USA Inc. |
| Address | 2210 Faraday Ave, Suite 150 |
| City | Carlsbad |
| State | California |
| Postal code | 92008 |
| Country | USA |
| Telephone | +1 760 444 3500 |
| Website | www.nemko.com |
| FCC Site Number | Test Firm Registration Number: 392943 Designation Number: US5058 |
| ISED Test Site | 2040B-3 |

| | |
|--------------------|--|
| Tested by | Andres Martinez, Wireless Engineer |
| Reviewed by | Chip Fleury, Wireless and Certification Supervisor |
| Review date | June 13, 2018 |
| Reviewer signature |  |

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

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Section 1 Report summary

1.1 Test specifications

| | |
|---|--|
| FCC 47 CFR Part 15, Subpart C – §15.207 | Conducted emission limits; general requirements. |
| FCC 47 CFR Part 15, Subpart C – §15.209 | Radiated emission limits; general requirements. |

1.2 Test methods

| | |
|------------------|--|
| ANSI C64.10-2013 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
|------------------|--|

1.3 Exclusions

None

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Test report revision history

Table 1.5-1: Test report revision history

| Revision # | Details of changes made to test report |
|------------|--|
| None | |

Notes:

Section 2 Summary of test results

2.1 Radiated Emissions in simultaneous transmission.

Table 2.1-1: FCC 47 CFR Part 15, Subpart C §15.207 & §15.209

| Test description | Verdict |
|---|----------------|
| FCC 15.209 - Radiated disturbance | Pass |
| FCC 15.109 - Conducted disturbance ¹ | Not applicable |

Notes: ¹ Conducted disturbance – As the EUT only charges through battery, this test isn't applicable.

Section 3 Equipment under test (EUT) details

3.1 Applicant

| | |
|-----------------|----------------------|
| Company name | Somewear Labs |
| Address | 1040 Mariposa Street |
| City | San Francisco |
| State | CA |
| Postal/Zip code | 94107 |
| Country | U.S.A. |

3.2 Manufacturer

| | |
|-----------------|----------------------|
| Company name | Somewear Labs |
| Address | 1040 Mariposa Street |
| City | San Francisco |
| State | CA |
| Postal/Zip code | 94107 |
| Country | U.S.A. |

3.3 Sample information

| | |
|------------------------|----------------|
| Receipt date | April 17, 2018 |
| Nemko sample ID number | 352148 |

3.4 EUT information

| | |
|---------------------------------|---|
| Product name | Somewear Labs |
| Model | Somewear Global Hotspot |
| Model variant | N/A |
| Serial number | Engineering Sample |
| Power requirements | 1000mA Battery and Micro USB. |
| Description/theory of operation | The Somewear Hotspot is a Bluetooth and satellite transceiver that provides a Bluetooth enabled smartphone constant connectivity even outside cellular coverage. It supports the following functions: Two-way messaging, location sharing, weather updates, S.O.S. |
| Operational frequencies | Bluetooth: 2402GHz – 2480GHz, Satellite: 1616MHz – 1626.5MHz |
| Software details | V.1.3.0 |

3.5 EUT exercise and monitoring details

For FCC-Intentional emissions both modules, BT and SAT, were set to transmit mode while in battery mode. BT was set on Low Channel 2402MHz and Satellite was set to 1616MHz, Satellite - Model:9603N (FCC ID: Q639603, IC: 4629A-9603), BT - Model: BL652-SA (FCC ID: SQGBL652, IC: 3147A-BL652).

3.6 EUT setup details

Table 3.6-1: EUT sub assemblies

| Description | Brand name | Model/Part number | Serial number |
|-------------|------------|-------------------|---------------|
| None | | | |

Table 3.6-2: EUT interface ports

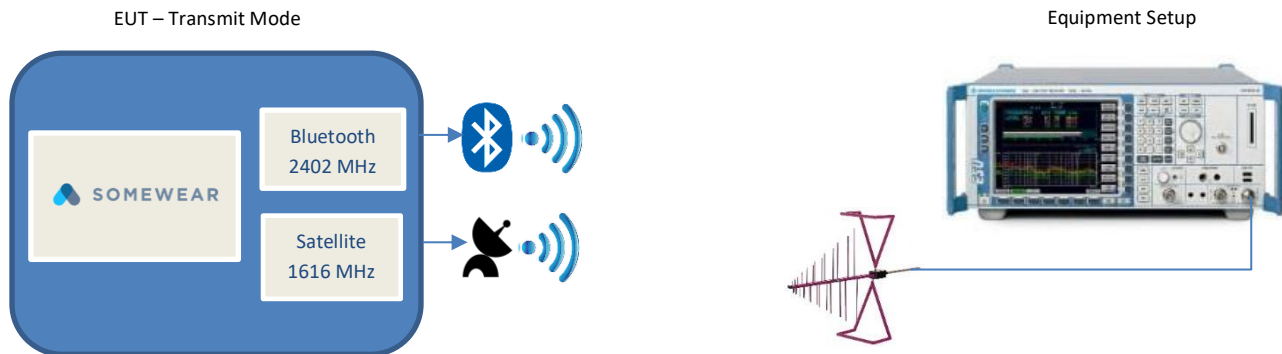
| Description | Qty. |
|-------------|------|
| None | |

Table 3.6-3: Support equipment

| Description | Brand name | Model/Part number | Serial number | Rev. |
|-------------|------------|-----------------------------|---------------|------|
| MacBook Pro | Apple | Retina, 13-inch, Early 2015 | N/A | N/A |

Table 3.6-4: Inter-connection cables

| Cable description | From | To | Length (m) |
|-------------------|------|----|------------|
| None | | | |



Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

None

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

| | |
|-------------------|------------|
| Temperature | 19.9 °C |
| Relative humidity | 58.7 % |
| Air pressure | 86–106 kPa |

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5\%$, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko USA Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 "Uncertainty in EMC measurements." Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

| Test name | Measurement uncertainty |
|------------------------------|-------------------------|
| Conducted spurious emissions | 1.13 dB |
| Radiated spurious emissions | 3.78 dB |
| Temperature | 1 °C |
| Humidity | 5 % |

Section 7 Terms and definitions

7.1.1 Equipment type

| | |
|--|---|
| Multimedia Equipment (MME) | Equipment that is information technology equipment, audio equipment, video equipment, broadcast receiver equipment, entertainment lighting control equipment or combinations of these. |
| Information technology equipment [ITE] | Equipment having a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control of data and/or telecommunication messages and which may be equipped with one or more ports typically for information transfer. - Examples include data processing equipment, office machines, electronic business equipment and telecommunication equipment. |
| Audio equipment | Equipment which has a primary function of either (or a combination of) generation, input, storage, play, retrieval, transmission, reception, amplification, processing, switching or control of audio signals |
| Video equipment | Equipment which has a primary function of either (or a combination of) generation, input, storage, display, play, retrieval, transmission, reception, amplification, processing, switching, or control of video signals. |
| Broadcast receiver equipment | Equipment containing a tuner that is intended for the reception of broadcast services - These broadcast services are typically television and radio services, including terrestrial broadcast, satellite broadcast and/or cable transmission. |
| Entertainment lighting control equipment | Equipment generating or processing electrical signals for controlling the intensity, color, nature or direction of the light from a luminaire, where the intention is to create artistic effects in theatrical, televisual or musical productions and visual presentations. |

7.2 General definitions, continued

7.1.2 Port type

| | |
|-------------------------------|---|
| AC mains power port | Port used to connect to the mains supply network |
| Antenna port | <ul style="list-style-type: none"> - Equipment with a DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment |
| Broadcast receiver tuner port | <p>Port, other than a broadcast receiver tuner port (3.1.8), for connection of an antenna used for intentional transmission and/or reception of radiated RF energy.</p> <p>Port intended for the reception of a modulated RF signal carrying terrestrial, satellite and/or cable transmissions of audio and/or video broadcast and similar services</p> <ul style="list-style-type: none"> - This port may be connected to an antenna, a cable distribution system, a VCR or similar device. |
| DC network power port | <p>Port, not powered by a dedicated AC/DC power converter and not supporting communication, that connects to a DC supply network.</p> <ul style="list-style-type: none"> - Equipment with a DC power port which is powered by a dedicated AC/DC power converter is considered to be AC mains powered equipment. - DC power ports supporting communications are considered to be wired networks ports, for example Ethernet ports which include Power Over Ethernet (POE). |
| Enclosure port | Physical boundary of the EUT through which electromagnetic fields may radiate. |
| Optical fiber port | Port at which an optical fiber is connected to an equipment. |
| RF modulator output port | Port intended to be connected to a broadcast receiver tuner port to transmit a signal to the broadcast receiver. |
| Signal/control port | <p>Port intended for the interconnection of components of an equipment under test, or between an equipment under test and local associated equipment and used in accordance with relevant functional specifications (for example for the maximum length of cable connected to it)</p> <ul style="list-style-type: none"> - Examples include RS-232, Universal Serial Bus (USB), High-Definition Multimedia Interface (HDMI), IEEE Standard 1394 ("Fire Wire") |
| Wired network port | <p>Point of connection for voice, data and signaling transfers intended to interconnect widely-dispersed systems by direct connection to a single-user or multi-user communication network (for example CATV, PSTN, ISDN, xDSL, LAN and similar networks)</p> <ul style="list-style-type: none"> - These ports may support screened or unscreened cables and may also carry AC or DC power where this is an integral part of the telecommunication specification. |

Section 8 Testing data

8.1 Radiated emission limits; Intentional Radiators.

8.1.1 References

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.209 / ANSI C63.4: 2014

- (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100** | 3 |
| 88-216 | 150** | 3 |
| 216-960 | 200** | 3 |
| Above 960 | 500 | 3 |

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz, however, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

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

(e) The provisions in §§15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

(f) In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device.

8.1.2 Test summary

| | | | |
|---------------|------------------------------------|-------------------|-----------|
| Verdict | Pass | | |
| Test date | June 12, 2018 | Temperature | 21°C |
| Test engineer | Andres Martinez, Wireless Engineer | Air pressure | 1001 mbar |
| Test location | 10m semi anechoic chamber | Relative humidity | 49 % |

8.1.3 Notes

8.1.4 Setup details

| | |
|--------------------------|--|
| EUT setup configuration | Table top |
| Test facility | 3 m Semi anechoic chamber |
| Measuring distance | 3 m |
| Antenna height variation | 1–4 m |
| Turn table position | 0–360° |
| Measurement details | A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement. |

Receiver/spectrum analyzer settings for frequencies below 1 GHz:

| | |
|----------------------|---|
| Resolution bandwidth | 120 kHz |
| Video bandwidth | 300 kHz |
| Detector mode | – Peak (Preview measurement) – Quasi-peak (Final measurement) |
| Trace mode | Max Hold |
| Measurement time | – 100 ms (Peak preview measurement) – 1000 ms (Quasi-peak final measurement) |

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

| | |
|----------------------|---|
| Resolution bandwidth | 1 MHz |
| Video bandwidth | 3 MHz |
| Detector mode | Peak (Preview measurement) Peak and CAverage (Final measurement) |
| Trace mode | Max Hold |
| Measurement time | – 100 ms (Peak preview measurement) – 100 ms (Peak and CAverage final measurement) |

8.1.4 Setup details, continued

Table 8.1-1: Radiated disturbance equipment list

| Equipment | Manufacturer | Model no. | Asset no. | Cal cycle | Next cal. |
|-------------------|-----------------|----------------|-----------|-----------|------------|
| EMC Test Receiver | Rohde & Schwarz | ESU 40 | E1121 | 1 yr. | 4/28/2019 |
| Antenna, Bilog | Schaffner-Chase | CBL6111C | 1763 | 2 yr. | 11/28/2018 |
| Antenna, Horn | ETS | 3117-PA | E1139 | 2 yr. | 1/25/2020 |
| Antenna, Horn | Sage | SAR-2309-42-S2 | E1143 | 2 yr. | 03/05/2020 |

Notes: None

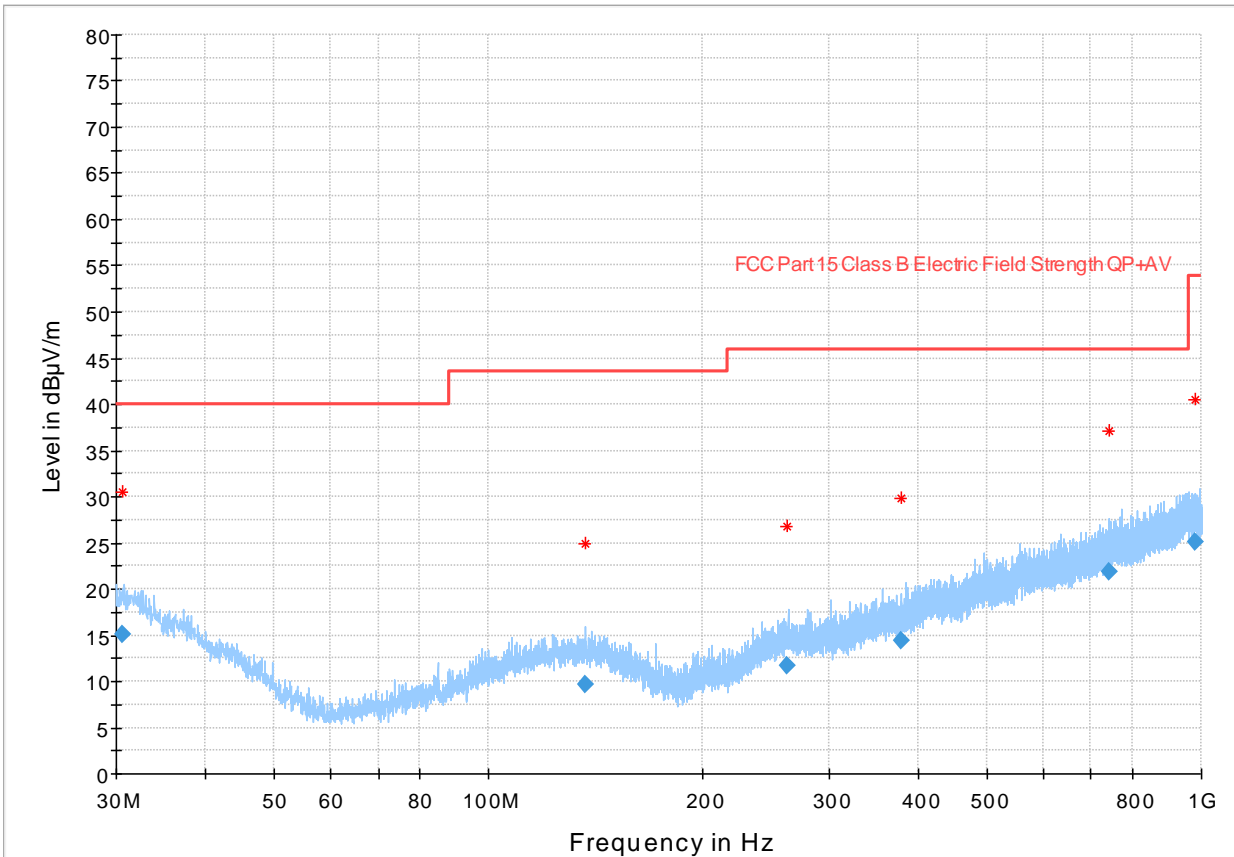
Table 8.1-2: Radiated disturbance test software details

| Manufacturer of Software | Details |
|--------------------------|-----------------|
| R&S | EMC32 V10.00.00 |

Notes: None

8.1.5 Test data Radiated Emissions 30MHz-1000MHz (FCC 15.209)

Full Spectrum



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

Note: A 2.4GHz Notch Filter was used.

Figure 8.1-1: Radiated disturbance spectral plot 3m (30MHz to 1000MHz)

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.560000 | 15.02 | 40.00 | 24.98 | 5000.0 | 120.000 | 237.9 | V | 72.0 | 20.4 |
| 136.491500 | 9.69 | 43.50 | 33.81 | 5000.0 | 120.000 | 402.7 | V | 42.0 | 13.8 |
| 262.521500 | 11.68 | 46.00 | 34.32 | 5000.0 | 120.000 | 146.3 | H | 0.0 | 15.9 |
| 378.286000 | 14.44 | 46.00 | 31.56 | 5000.0 | 120.000 | 267.1 | H | 175.0 | 18.4 |
| 740.877000 | 21.93 | 46.00 | 24.07 | 5000.0 | 120.000 | 283.9 | V | 84.0 | 25.4 |
| 981.184500 | 25.04 | 53.90 | 28.86 | 5000.0 | 120.000 | 341.7 | V | 206.0 | 28.4 |

Table 8.1-1: Radiated disturbance (Quasi-Peak) 3m results

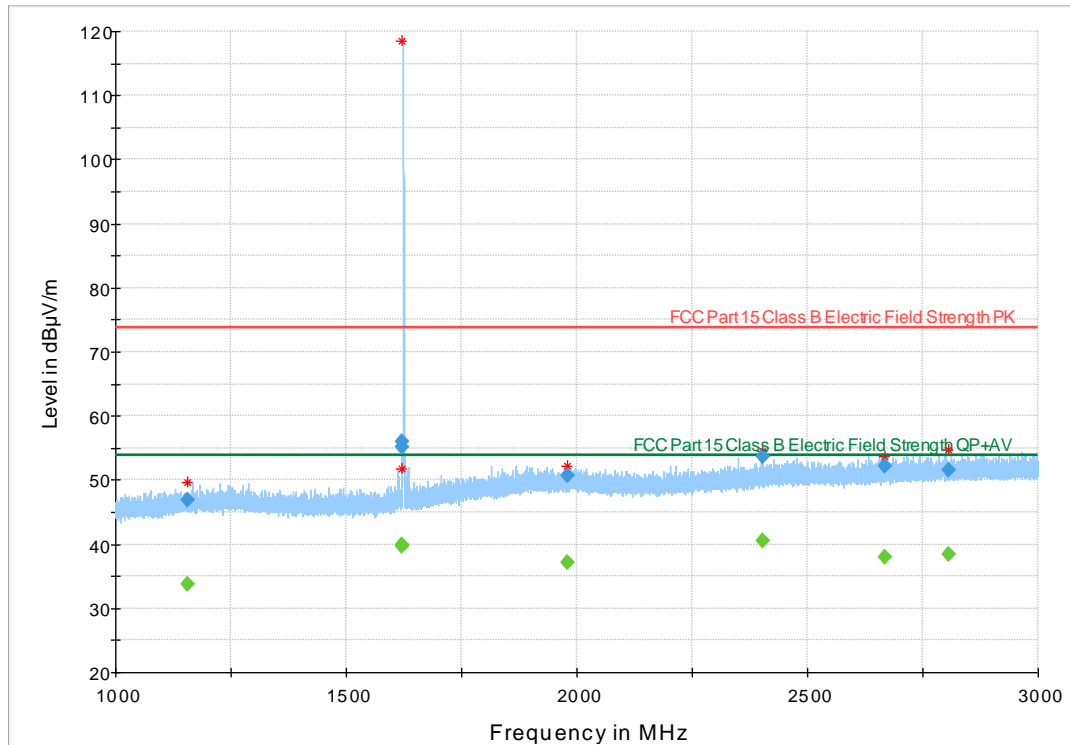
Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ The maximum measured value observed over a period of 15 seconds was recorded.

8.1.6 Test data, Radiated Emissions 1GHz - 3GHz (FCC15.209)

Full Spectrum



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

Note: A 2.4GHz Notch Filter was used.

Note: Emissions at 1621.66MHz and 1622MHz are fundamental from the satellite transmitter.

Radiated disturbance spectral plot 3m (1GHz – 3GHz)

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|-------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 1156.933333 | --- | 33.72 | 53.90 | 20.18 | 5000.0 | 1000.000 | 251.5 | H | 82.0 | 16.2 |
| 1156.933333 | 46.85 | --- | 73.90 | 27.05 | 5000.0 | 1000.000 | 251.5 | H | 82.0 | 16.2 |
| 1621.666667 | 55.96 | --- | 73.90 | 17.94 | 5000.0 | 1000.000 | 113.9 | V | 162.0 | 16.3 |
| 1621.666667 | --- | 39.86 | 53.90 | 14.04 | 5000.0 | 1000.000 | 113.9 | V | 162.0 | 16.3 |
| 1622.000000 | --- | 39.81 | 53.90 | 14.09 | 5000.0 | 1000.000 | 269.9 | V | 270.0 | 16.3 |
| 1622.000000 | 55.21 | --- | 73.90 | 18.69 | 5000.0 | 1000.000 | 269.9 | V | 270.0 | 16.3 |
| 1980.200000 | 50.74 | --- | 73.90 | 23.16 | 5000.0 | 1000.000 | 345.9 | V | 234.0 | 19.4 |
| 1980.200000 | --- | 37.09 | 53.90 | 16.81 | 5000.0 | 1000.000 | 345.9 | V | 234.0 | 19.4 |
| 2402.200000 | --- | 40.48 | 53.90 | 13.42 | 5000.0 | 1000.000 | 109.3 | V | 192.0 | 20.2 |
| 2402.200000 | 53.59 | --- | 73.90 | 20.31 | 5000.0 | 1000.000 | 109.3 | V | 192.0 | 20.2 |
| 2667.666667 | 52.13 | --- | 73.90 | 21.77 | 5000.0 | 1000.000 | 236.9 | V | 162.0 | 21.1 |
| 2667.666667 | --- | 38.03 | 53.90 | 15.87 | 5000.0 | 1000.000 | 236.9 | V | 162.0 | 21.1 |

Radiated disturbance results 3m (Quasi-Peak)

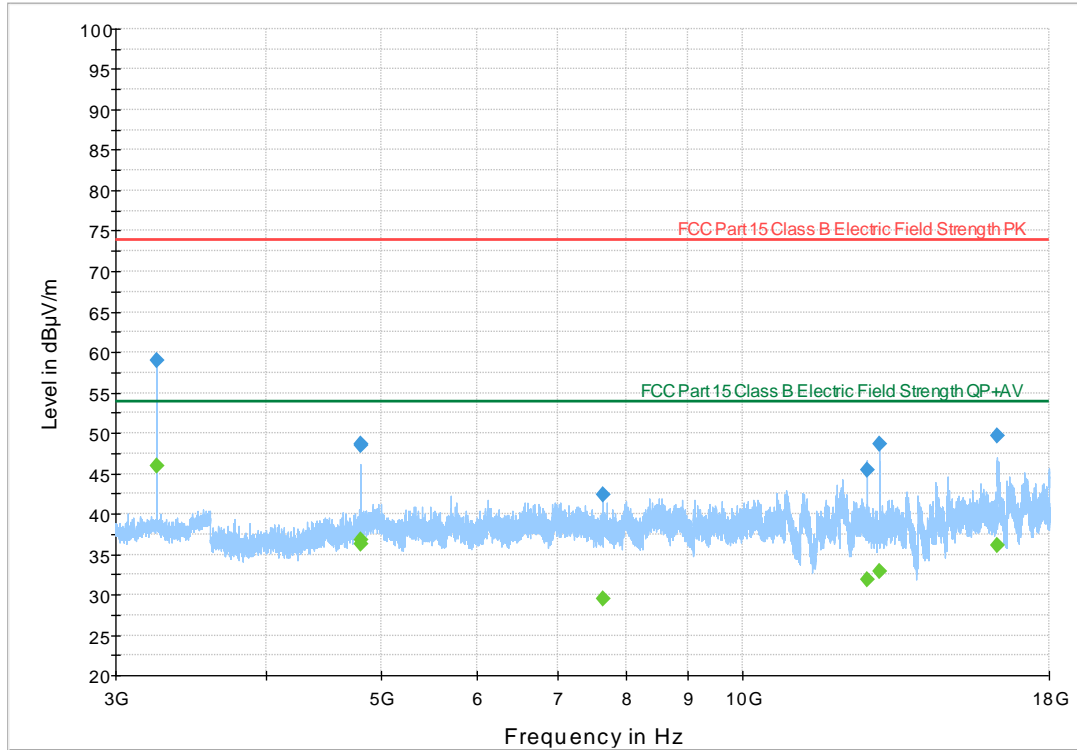
Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)

³ The maximum measured value observed over a period of 15 seconds was recorded.

8.1.7 Test data, Radiated Emissions 3GHz - 18GHz (FCC15.209)

Full Spectrum



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

Note: A 2.4GHz Notch Filter was used and a 2.5GHz high pass filter.

Radiated disturbance spectral plot 3m (3GHz – 18GHz)

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|-------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 3248.000000 | 58.90 | --- | 73.90 | 33.58 | 5000.0 | 1000.000 | 236.7 | V | 26.0 | -7.1 |
| 3248.000000 | --- | 45.90 | 53.90 | 26.68 | 5000.0 | 1000.000 | 236.7 | V | 26.0 | -7.1 |
| 4803.700000 | --- | 36.72 | 53.90 | 17.18 | 5000.0 | 1000.000 | 112.7 | V | 245.0 | -2.0 |
| 4803.700000 | 48.71 | --- | 73.90 | 25.19 | 5000.0 | 1000.000 | 112.7 | V | 245.0 | -2.0 |
| 4804.400000 | --- | 36.21 | 53.90 | 17.69 | 5000.0 | 1000.000 | 150.4 | H | 218.0 | -2.0 |
| 4804.400000 | 48.54 | --- | 73.90 | 25.36 | 5000.0 | 1000.000 | 150.4 | H | 218.0 | -2.0 |
| 7645.100000 | 42.43 | --- | 73.90 | 31.47 | 5000.0 | 1000.000 | 121.9 | V | 123.0 | 0.3 |
| 7645.100000 | --- | 29.55 | 53.90 | 24.35 | 5000.0 | 1000.000 | 121.9 | V | 123.0 | 0.3 |
| 12683.300000 | 45.36 | --- | 73.90 | 28.54 | 5000.0 | 1000.000 | 389.7 | V | 304.0 | 5.9 |
| 12683.300000 | --- | 31.87 | 53.90 | 22.03 | 5000.0 | 1000.000 | 389.7 | V | 304.0 | 5.9 |
| 12992.700000 | 48.68 | --- | 73.90 | 25.22 | 5000.0 | 1000.000 | 202.9 | V | 224.0 | 6.3 |
| 12992.700000 | --- | 32.89 | 53.90 | 21.01 | 5000.0 | 1000.000 | 202.9 | V | 224.0 | 6.3 |
| 16298.100000 | 49.65 | --- | 73.90 | 24.25 | 5000.0 | 1000.000 | 256.3 | H | 253.0 | 10.5 |
| 16298.100000 | --- | 36.13 | 53.90 | 17.77 | 5000.0 | 1000.000 | 256.3 | H | 253.0 | 10.5 |

Radiated disturbance results 3m (Quasi-Peak)

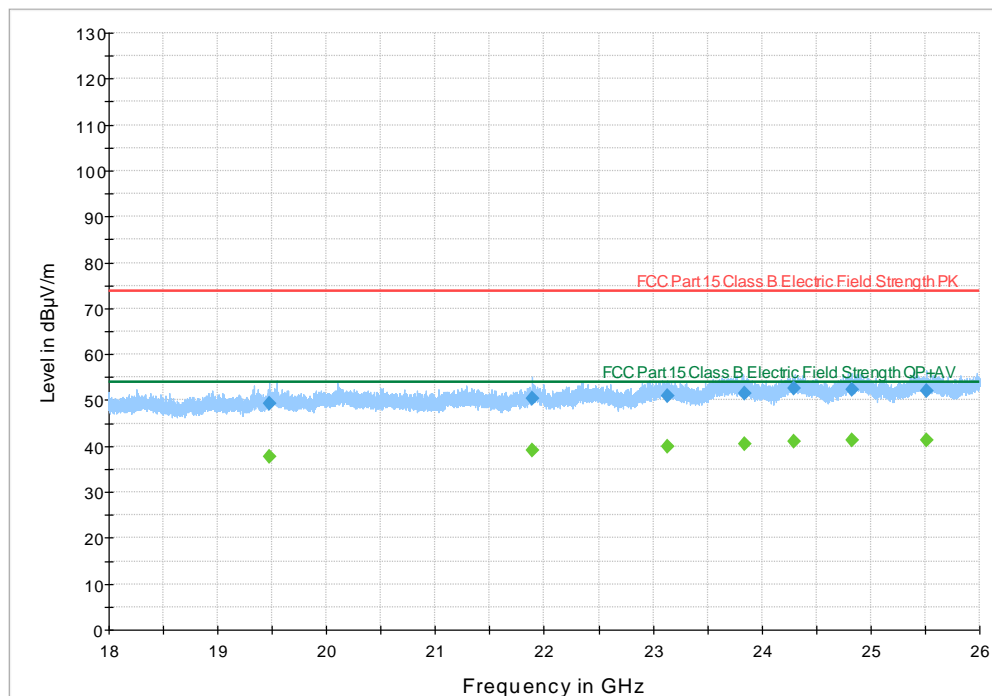
Notes: ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)

³ The maximum measured value observed over a period of 15 seconds was recorded.

8.1.8 Test data, Radiated Emissions 18GHz - 26GHz (FCC15.209)

Full Spectrum



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

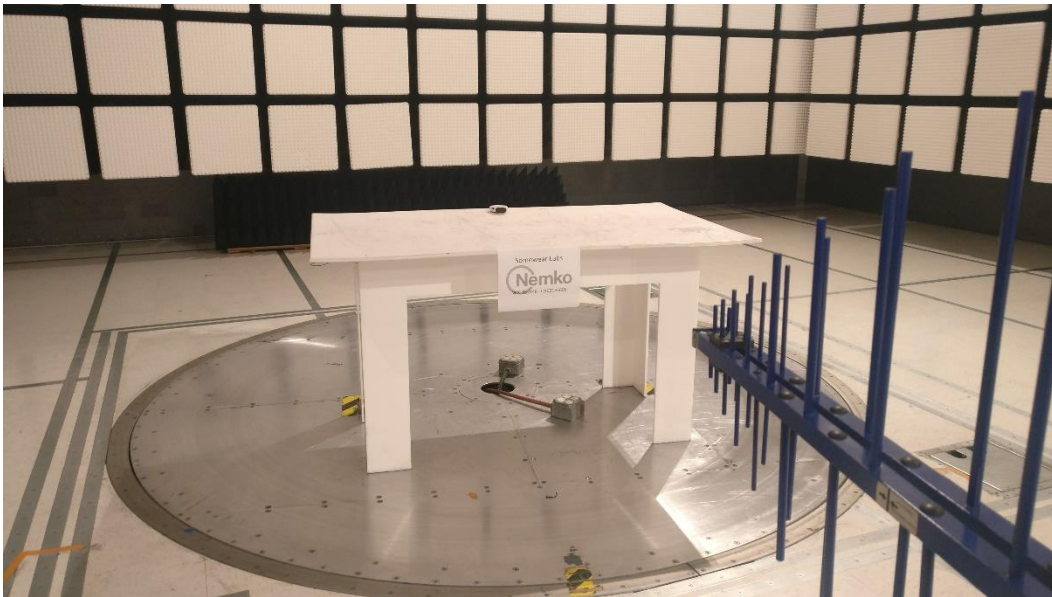
Radiated disturbance spectral plot 3m (18GHz – 26GHz)

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|-------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 19476.816667 | 49.28 | --- | 73.90 | 24.62 | 10.0 | 1000.000 | 144.6 | V | 2.0 | 38.6 |
| 19476.816667 | --- | 37.72 | 53.90 | 16.18 | 10.0 | 1000.000 | 144.6 | V | 2.0 | 38.6 |
| 21885.283333 | 50.41 | --- | 73.90 | 23.49 | 10.0 | 1000.000 | 115.4 | H | 23.0 | 39.4 |
| 21885.283333 | --- | 39.19 | 53.90 | 14.71 | 10.0 | 1000.000 | 115.4 | H | 23.0 | 39.4 |
| 23130.000000 | 51.07 | --- | 73.90 | 22.83 | 10.0 | 1000.000 | 155.5 | H | 73.0 | 40.0 |
| 23130.000000 | --- | 39.86 | 53.90 | 14.04 | 10.0 | 1000.000 | 155.5 | H | 73.0 | 40.0 |
| 23837.800000 | 51.39 | --- | 73.90 | 22.51 | 10.0 | 1000.000 | 159.1 | V | 6.0 | 40.2 |
| 23837.800000 | --- | 40.55 | 53.90 | 13.35 | 10.0 | 1000.000 | 159.1 | V | 6.0 | 40.2 |
| 24292.950000 | --- | 40.94 | 53.90 | 12.96 | 10.0 | 1000.000 | 153.3 | H | 207.0 | 40.3 |
| 24292.950000 | 52.70 | --- | 73.90 | 21.20 | 10.0 | 1000.000 | 153.3 | H | 207.0 | 40.3 |
| 24833.016667 | --- | 41.29 | 53.90 | 12.61 | 10.0 | 1000.000 | 171.9 | H | 142.0 | 40.7 |
| 24833.016667 | 52.24 | --- | 73.90 | 21.66 | 10.0 | 1000.000 | 171.9 | H | 142.0 | 40.7 |
| 25507.500000 | --- | 41.36 | 53.90 | 12.54 | 10.0 | 1000.000 | 162.4 | H | 207.0 | 40.7 |
| 25507.500000 | 52.02 | --- | 73.90 | 21.88 | 10.0 | 1000.000 | 162.4 | H | 207.0 | 40.7 |

Radiated disturbance results 3m (Quasi-Peak)

- Notes:
- ¹ Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB) – amplifier gain (dB)
 - ³ The maximum measured value observed over a period of 15 seconds was recorded.

8.1.9 Radiated Emissions Setup photos



Front Picture - Radiated disturbance 30MHz-1000MHz



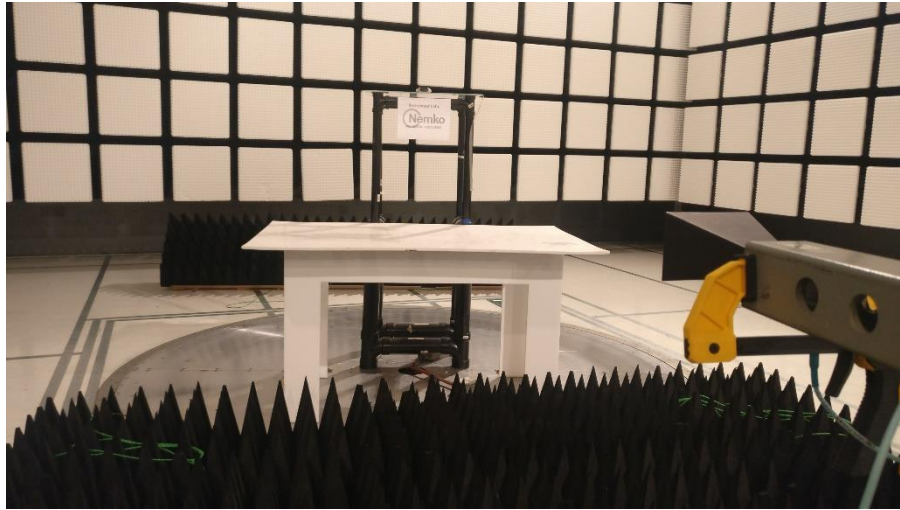
Back Picture - Radiated disturbance 30MHz-1000MHz



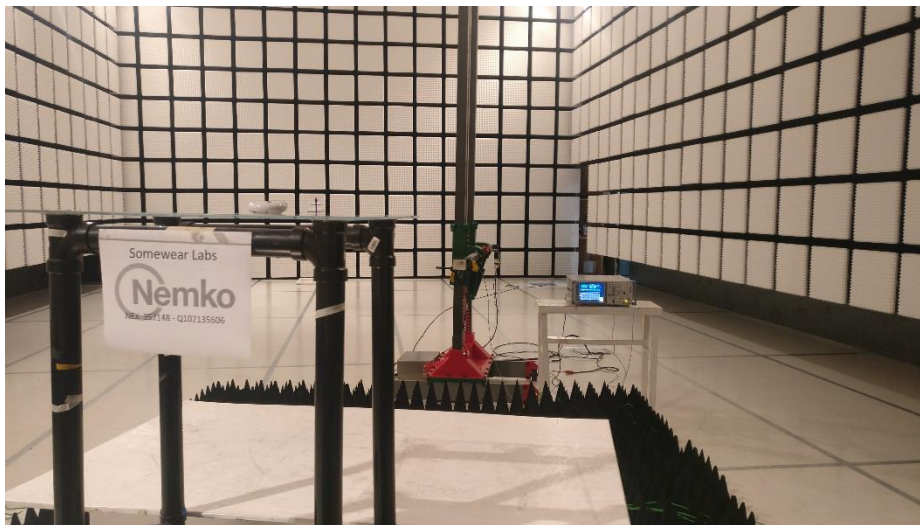
Front Picture - Radiated disturbance 1GHz - 18GHz



Back Picture - Radiated disturbance 1GHz - 18GHz



Front Picture - Radiated disturbance 18GHz - 26GHz



Back Picture - Radiated disturbance 18GHz - 26GHz

8.2 Conducted emission limits; Intentional Radiators.

8.2.1 References

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.207 / ANSI C63.4: 2014

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

| Frequency of emission (MHz) | Conducted limit (dB μ V) | |
|-----------------------------|------------------------------|-----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz in lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μ V within the frequency band 535-1705 kHz, as measured using a 50 μ H/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

8.2.2 8.2.2 Conducted Emissions Test summary

| | | | |
|---------------|------------------------------------|-------------------|-----------|
| Verdict | Not applicable | | |
| Test date | June 12, 2018 | Temperature | 23 °C |
| Test engineer | Andres Martinez, Wireless Engineer | Air pressure | 1000 mbar |
| Test location | Ground Plane | Relative humidity | 56 |

8.2.3 Notes

Not applicable. EUT can only be charge by a Li-Ion battery.

Section 9 EUT photos

9.1 External photos

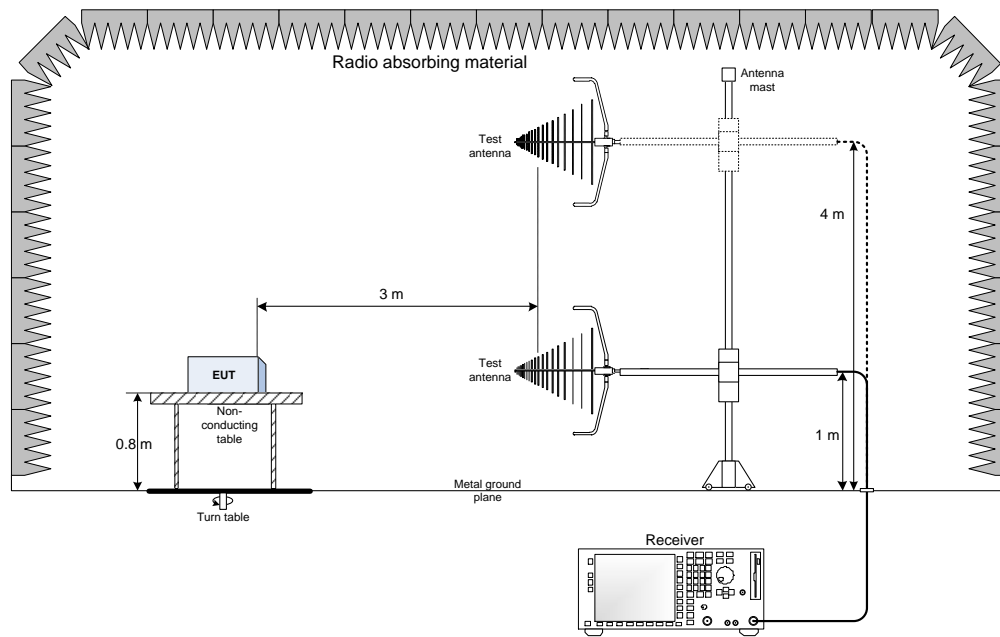


Front Image - EUT

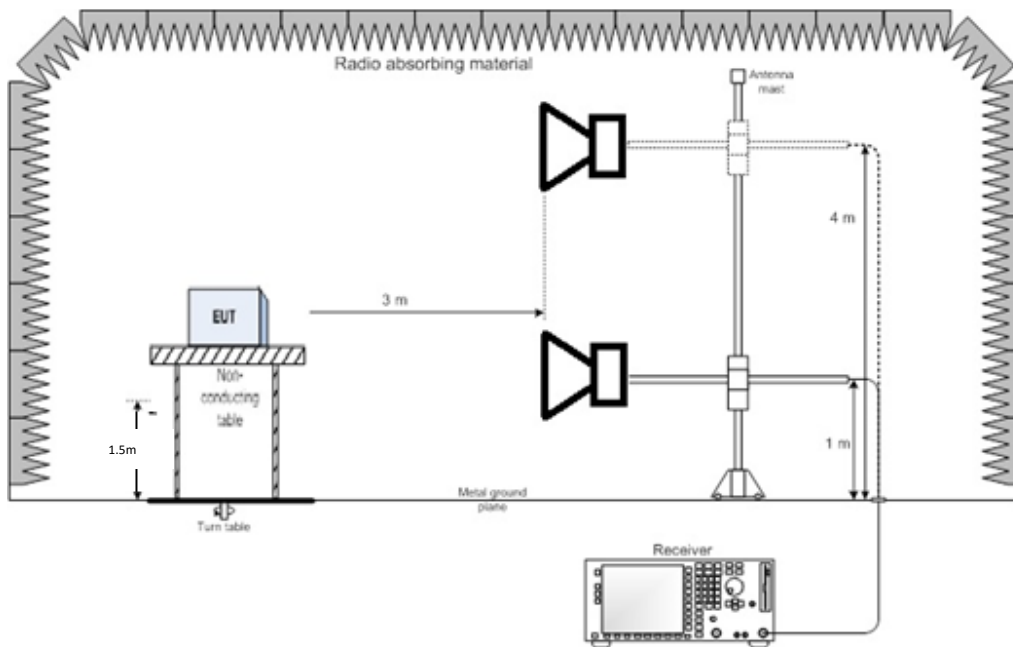


Back Image- EUT

Section 10 Block diagrams of test set-ups



30-1000MHz Setup



Above 1GHz Setup

Thank you for choosing

