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TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C §15.247 (DTS),
RSS-247 Issue 2:2017, RSS-Gen Issue 5

FOR:

Maytronics Ltd.

Wireless Robotic Pool Cleaner with Inductive Charger

Model: Liberty

FCC ID: WCHLIBERTY

IC: 29982-LIBERTY

This report is in conformity with ISO/IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested.
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1 Applicant information

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Fax: +972 4-6522485
E-mail: Eugene.Plotnichenko@Maytronics.com
Contact name: Mr. Eugene Plotnichenko

2 Equipment under test attributes

Product name: Wireless Robotic Pool Cleaner with Inductive Charger
Product type: Transceiver
Model(s): Liberty
Serial number: prototype
Hardware version: 02
Software release: 8_819
Receipt date 20-Dec-22

3 Manufacturer information

Manufacturer name: Maytronics Ltd.
Address: Kibbutz Yizre'el, 1935000, Israel
Telephone: +972 4-6598113
Fax: +972 4-6522485
E-Mail: Eugene.Plotnichenko@Maytronics.com
Contact name: Mr. Eugene Plotnichenko

4 Test details

Project ID: 49441
Location: Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel
Test started: 26-Dec-22
Test completed: 29-Dec-22
Test specification(s): FCC 47CFR part 15 subpart C §15.247 (DTS),
RSS-247 Issue 2:2017, RSS-Gen Issue 5



5 Tests summary

| Test | Status |
|--|--------|
| Transmitter characteristics | |
| FCC Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth | Pass |
| FCC Section 15.247(b)3/ RSS-247 section 5.4(4), Peak output power | Pass |
| FCC Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | Pass |
| FCC Section 15.247(d)/ RSS-247 section 5.5, Emissions at band edges | Pass |
| FCC Section 15.247(e) / RSS-247 section 5.2(2), Peak power density | Pass |
| FCC section 15.203 / RSS-Gen section 6.8, Antenna requirement | Pass |

This test report supersedes the previously issued test report identified by Doc ID: MAYRAD_FCC.49441_Rev1

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested.

The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

| | Name and Title | Date | Signature |
|---------------------|---|-----------|-----------|
| Tested by: | Mrs. M. Evsuk, test engineer, EMC & Radio | 11-Jan-23 | |
| Reviewed by: | Mrs. S. Peysahov Sheynin, test engineer, EMC & Radio | 28-Mar-23 | |
| Approved by: | Mr. M. Nikishin, group leader, EMC & Radio | 28-Mar-23 | |



6 EUT description

Note: The following data in this clause is provided by the customer and represents his sole responsibility

6.1 General information

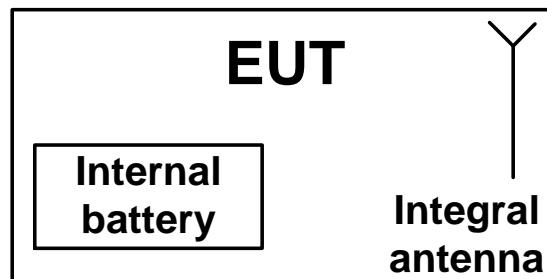
The EUT is a robot that is powered by an internal Li-Ion battery. The robot has a dedicated battery charger (inductive), that charges the battery when the robot is out of water. The charger can work in 100-240VAC range with 50/60Hz.

The robot has an embedded BLE transceiver (2.4GHz) with integral antenna, which operates during the robot's charging or idle state.

6.2 Changes made in EUT

No changes were performed in the EUT during testing.

6.3 Test configuration





6.4 Transmitter characteristics

| | | | | | |
|--|--|-------------------------------------|--------------------------------|-------------------------------------|--------------------------------|
| Type of equipment | | | | | |
| <input checked="" type="checkbox"/> | Stand-alone (Equipment with or without its own control provisions) | | | | |
| <input type="checkbox"/> | Combined equipment (Equipment where the radio part is fully integrated within another type of equipment) | | | | |
| <input type="checkbox"/> | Plug-in card (Equipment intended for a variety of host systems) | | | | |
| Assigned frequency range | | 2400 -2483.5 MHz | | | |
| Operating frequencies | | 2402-2480 MHz | | | |
| Maximum rated output power | | Peak output power 3.51 dBm | | | |
| Is transmitter output power variable? | | <input checked="" type="checkbox"/> | No | | |
| | | <input type="checkbox"/> | Yes | | |
| | | <input type="checkbox"/> | continuous variable | | |
| | | <input type="checkbox"/> | stepped variable with stepsize | | dB |
| <input type="checkbox"/> | | minimum RF power | | dBm | |
| <input type="checkbox"/> | | maximum RF power | | dBm | |
| Antenna connection | | | | | |
| <input type="checkbox"/> | unique coupling | <input type="checkbox"/> | standard connector | <input checked="" type="checkbox"/> | Integral |
| <input type="checkbox"/> | | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | with temporary RF connector |
| <input type="checkbox"/> | | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | without temporary RF connector |
| Antenna/s technical characteristics | | | | | |
| Type | Manufacturer | Model number | | Gain | |
| Internal | Maytronics | N/A | | 1.95 dBi | |
| Transmitter aggregate data rate/s | | | 1 Mbps | | |
| Type of modulation | | | GFSK | | |
| Modulating test signal (baseband) | | | | | |
| Transmitter power source | | | | | |
| <input checked="" type="checkbox"/> | Battery | Nominal rated voltage | 25 VDC | Battery type | Lithium Ion |
| <input type="checkbox"/> | DC | Nominal rated voltage | | | |
| <input type="checkbox"/> | AC mains | Nominal rated voltage | | Frequency | Hz |



| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth | | | |
| Test procedure: ANSI C63.10 section 11.8.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 22 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

7 Transmitter tests according to 47CFR part 15 subpart C and RSS-247 requirements

7.1 Minimum 6 dB and 99% bandwidth

7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 6 dB bandwidth limits

| Assigned frequency, MHz | Modulation envelope reference points*, dBc | Minimum bandwidth, kHz |
|-------------------------|--|------------------------|
| 2400.0 – 2483.5 | 6.0 | 500.0 |

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

Table 7.1.2 The 99% bandwidth limits

| Assigned frequency, MHz | Modulation envelope reference points | Limit, MHz |
|-------------------------|--------------------------------------|------------|
| 2400.0 – 2483.5 | 99% | NA |

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

7.1.2.2 The EUT was set to transmit modulated carrier.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.3 and associated plot.

Figure 7.1.1 6 dB bandwidth test setup





| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth | | | |
| Test procedure: ANSI C63.10 section 11.8.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 22 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.1.3 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 2400-2483.5 MHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc
MODULATION: GFSK
MODULATING SIGNAL: PRBS
BIT RATE: 1 Mbps

| Carrier frequency, MHz | 99% bandwidth, kHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz | Verdict |
|------------------------|--------------------|---------------------|------------|-------------|---------|
| 2402 | 1008.79 | 639.4 | 500 | 139.4 | Pass |
| 2440 | 1013.57 | 634.4 | 500 | 134.4 | Pass |
| 2480 | 1032.92 | 644.4 | 500 | 144.4 | Pass |

Reference numbers of test equipment used

| | | | | | | | | |
|---------|---------|---------|---------|--|--|--|--|--|
| HL 4933 | HL 5902 | HL 3903 | HL 7585 | | | | | |
|---------|---------|---------|---------|--|--|--|--|--|

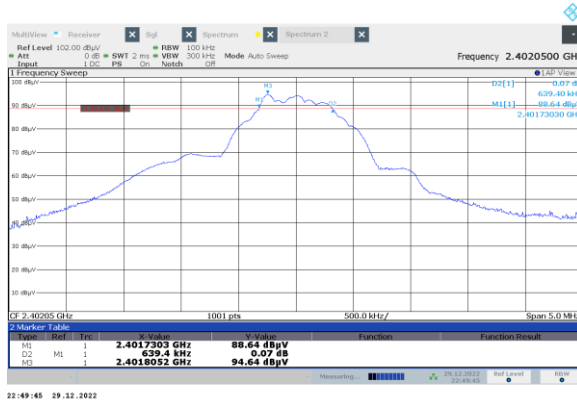
Full description is given in Appendix A.



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| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth | | | |
| Test procedure: ANSI C63.10 section 11.8.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 22 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.1.1 6 dB bandwidth test result at low frequency



Plot 7.1.2 99% bandwidth test result at low frequency

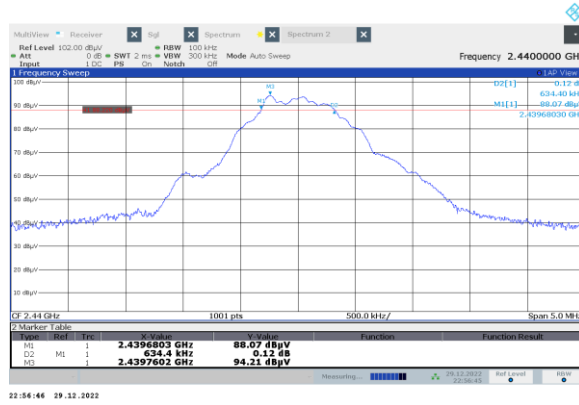




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| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth | | | |
| Test procedure: ANSI C63.10 section 11.8.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 22 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.1.2 6 dB bandwidth test result at mid frequency



Plot 7.1.4 99% bandwidth test result at mid frequency

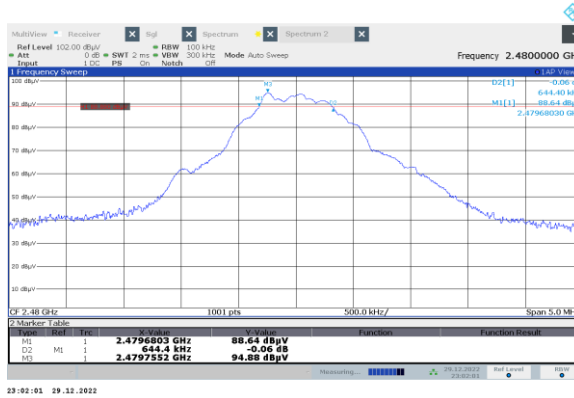




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| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth | | | |
| Test procedure: ANSI C63.10 section 11.8.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 22 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.1.3 6 dB bandwidth test result at high frequency



Plot 7.1.6 99% bandwidth test result at high frequency





| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(b)3 / RSS-247 section 5.4(4), Maximum output power | | | |
| Test procedure: ANSI C63.10 sections 11.9.2.2.4 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

7.2 Peak output power

7.2.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak output power limits

| Assigned frequency range, MHz | Maximum antenna gain, dBi | Peak output power* | | Equivalent field strength limit @ 3m, dB(µV/m)** |
|-------------------------------|---------------------------|--------------------|------|--|
| | | W | dBm | |
| 2400.0 – 2483.5 | 6.0 | 1.0 | 30.0 | 131.2 |

*- The limit is provided in terms of conducted RF power at the antenna connector. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

- by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;
- without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;
- by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

** - Equivalent field strength limit was calculated from the peak output power as follows: $E = \sqrt{30 \times P \times G} / r$, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

7.2.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.2.2.3 The resolution bandwidth of spectrum analyzer was set wider than 6 dB bandwidth of the EUT and the field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 3600 and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.2.2.4 The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.2.2 and associated plots.

7.2.2.5 The maximum peak output power was calculated from the field strength of carrier as follows:

$$P = (E \times d)^2 / (30 \times G),$$

where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.

The above equation was converted in logarithmic units for 3 m test distance:

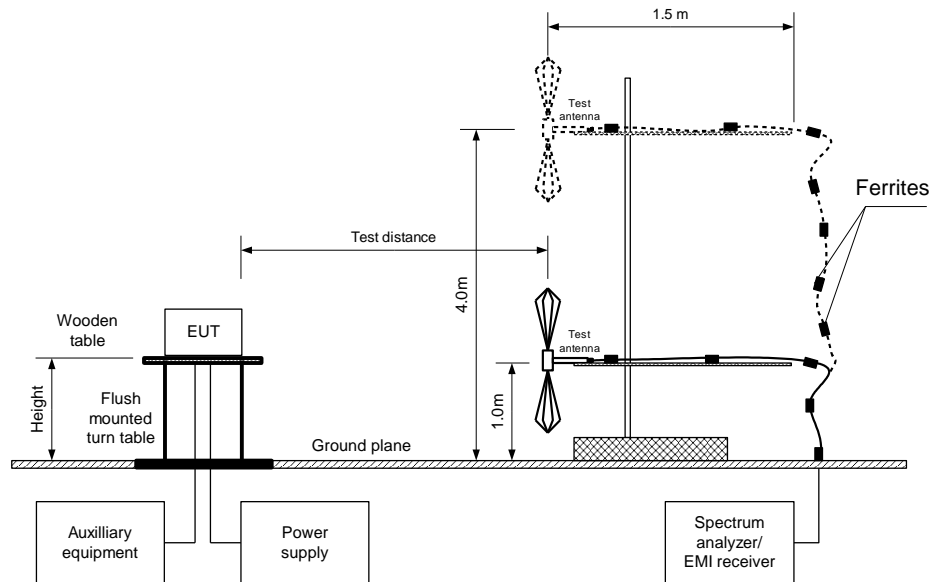
$$\text{Peak output power in dBm} = \text{Field strength in dB}(\mu\text{V/m}) - \text{Transmitter antenna gain in dBi} - 95.2 \text{ dB}$$

7.2.2.6 The worst test results (the lowest margins) were recorded in Table 7.2.2.



| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(b)3 / RSS-247 section 5.4(4), Maximum output power | | | |
| Test procedure: ANSI C63.10 sections 11.9.2.2.4 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Figure 7.2.1 Setup for carrier field strength measurements





| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(b)3 / RSS-247 section 5.4(4), Maximum output power | | | |
| Test procedure: ANSI C63.10 sections 11.9.2.2.4 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 1.5 m
DETECTOR USED: Peak
TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 3 MHz
VIDEO BANDWIDTH: 10 MHz

MODULATION: GFSK
BITRATE: 1 Mbps

| Frequency, MHz | Field strength, dB(µV/m) | Antenna polarization | Antenna height, m | Azimuth, degrees* | EUT antenna gain, dBi | Peak output power, dBm** | Limit, dBm | Margin, dB*** | Verdict |
|----------------|--------------------------|----------------------|-------------------|-------------------|-----------------------|--------------------------|------------|---------------|---------|
| 2402.0 | 100.66 | Horizontal | 1.70 | -115 | 1.95 | 3.51 | 30 | -26.49 | Pass |
| 2440.0 | 99.86 | Vertical | 1.52 | -45 | 1.95 | 2.68 | 30 | -27.32 | Pass |
| 2480.0 | 97.38 | Horizontal | 1.70 | -165 | 1.95 | 0.20 | 30 | -29.80 | Pass |

*- EUT front panel refer to 0 degrees position of turntable.

** - Peak output power was calculated from the field strength of carrier as follows: $P = (E \times d)^2 / (30 \times G)$, where P is the peak output power in W, E is the field strength in V/m, d is the test distance in meters and G is the transmitter numeric antenna gain over an isotropic radiator. The above equation was converted in logarithmic units for 3 m test distance: *Peak output power in dBm = Field strength in dB(µV/m) - Transmitter antenna gain in dBi - 95.2 dB*

*** - Margin = Peak output power – specification limit.

Note: Maximum peak output power was obtained at Unom (115%Unom, 85%Unom) input power voltage.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|--|--|--|--|
| HL 3903 | HL 4933 | HL 5902 | HL 7585 | | | | |
|---------|---------|---------|---------|--|--|--|--|

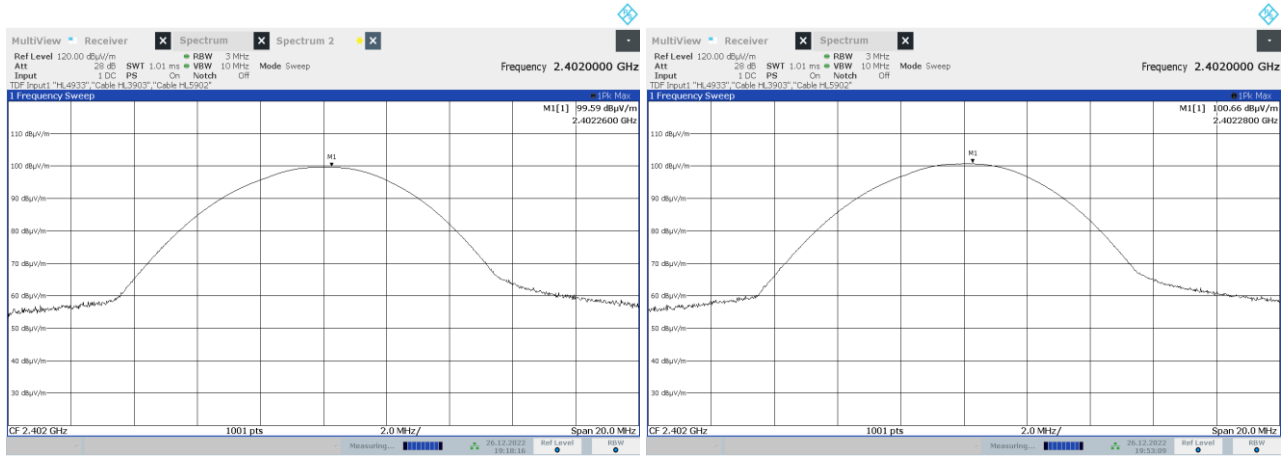
Full description is given in Appendix A.



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| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(b)3 / RSS-247 section 5.4(4), Maximum output power | | | |
| Test procedure: ANSI C63.10 sections 11.9.2.2.4 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

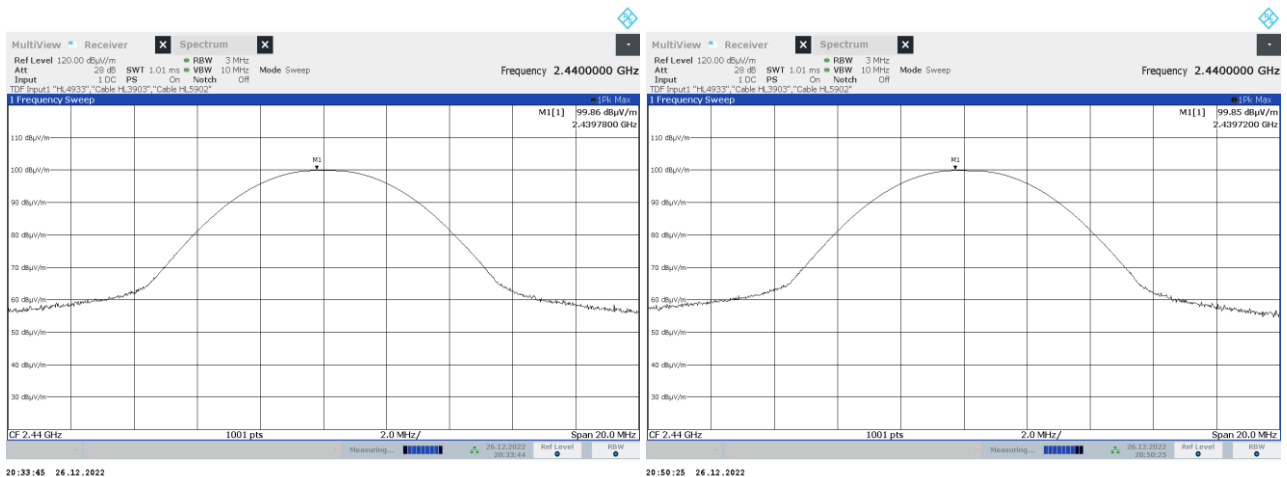
Plot 7.2.1 Field strength of carrier at low frequency



Vertical antenna polarization

Horizontal antenna polarization

Plot 7.2.2 Field strength of carrier at mid frequency



Vertical antenna polarization

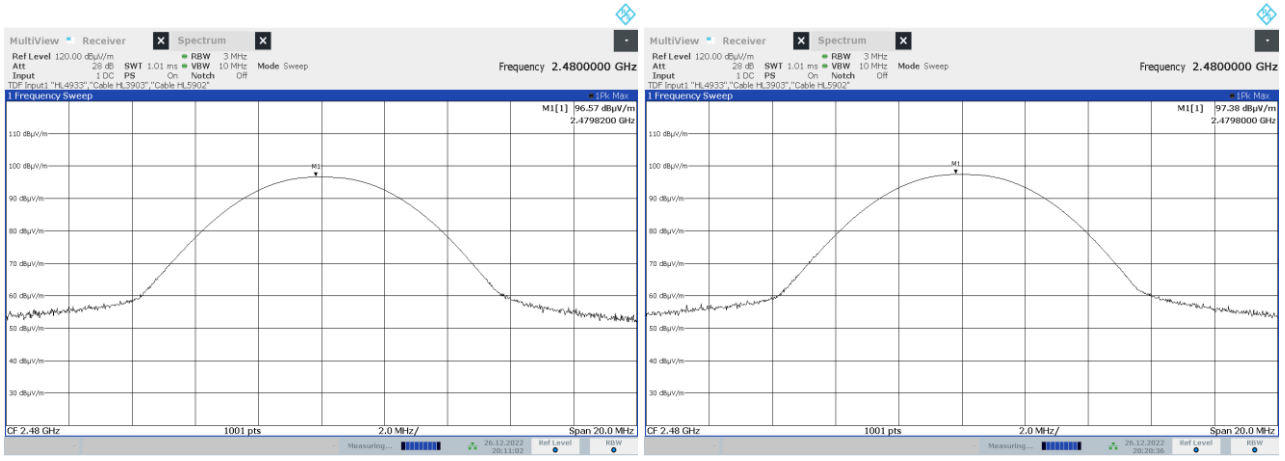
Horizontal antenna polarization



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| | | | |
|--|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(b)3 / RSS-247 section 5.4(4), Maximum output power | | | |
| Test procedure: ANSI C63.10 sections 11.9.2.2.4 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.2.3 Field strength of carrier at high frequency



Vertical antenna polarization

Horizontal antenna polarization



| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

7.3 Field strength of spurious emissions

7.3.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Radiated spurious emissions limits

| Frequency, MHz | Field strength at 3 m within restricted bands, dB(μV/m) ^{***} | | | Attenuation of field strength of spurious versus carrier outside restricted bands, dBc ^{***} |
|----------------------------------|--|-----------------------------|-----------------------------|---|
| | Peak | Quasi Peak | Average | |
| 0.009 – 0.090 | 148.5 – 128.5 | NA | 128.5 – 108.5 ^{**} | 20.0 |
| 0.090 – 0.110 | NA | 108.5 – 106.8 ^{**} | NA | |
| 0.110 – 0.490 | 126.8 – 113.8 | NA | 106.8 – 93.8 ^{**} | |
| 0.490 – 1.705 | NA | 73.8 – 63.0 ^{**} | NA | |
| 1.705 – 30.0* | | 69.5 | | |
| 30 – 88 | | 40.0 | | |
| 88 – 216 | | 43.5 | | |
| 216 – 960 | | 46.0 | | |
| 960 - 1000 | | 54.0 | | |
| 1000 – 10 th harmonic | | 74.0 | | |

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$\text{Lim}_{S_2} = \text{Lim}_{S_1} + 40 \log (S_1/S_2),$$

where S₁ and S₂ – standard defined and test distance respectively in meters.

** - The limit decreases linearly with the logarithm of frequency.

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

7.3.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.

7.3.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.

7.3.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

7.3.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, Figure 7.3.3, energized and the performance check was conducted.

7.3.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.3.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.



| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Figure 7.3.1 Setup for spurious emission field strength measurements below 30 MHz

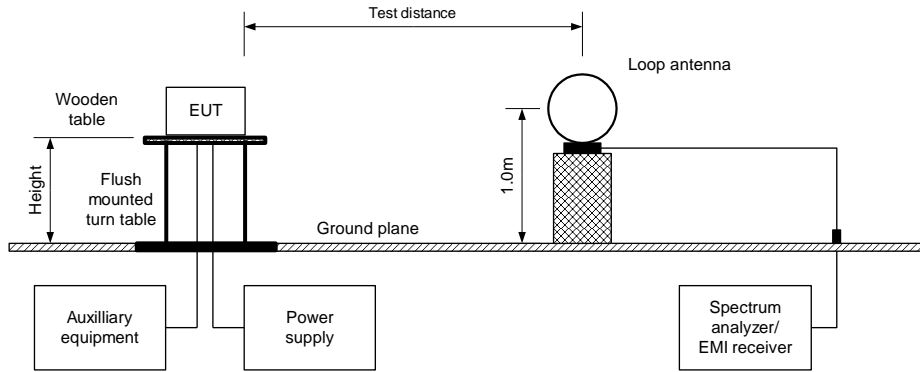
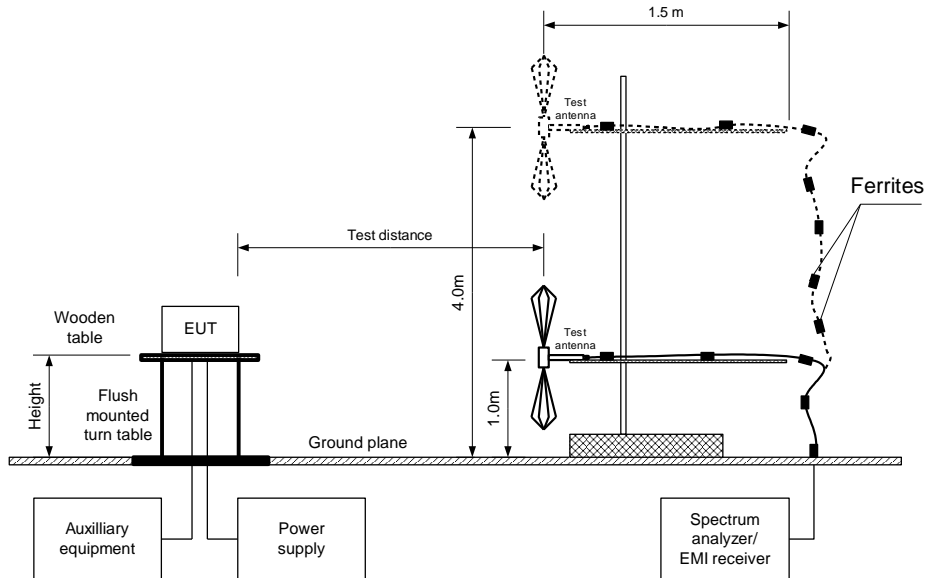


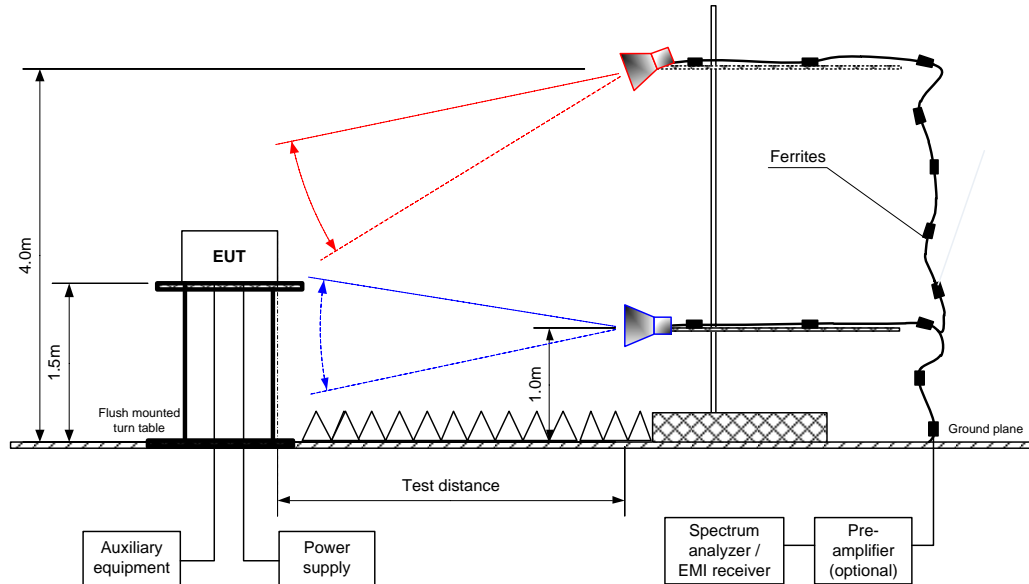
Figure 7.3.2 Setup for spurious emission field strength measurements from 30 to 1000 MHz





| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Figure 7.3.3 Setup for spurious emission field strength measurements above 1000 MHz





| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.3.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 - 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 BIT RATE: 1 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

| Frequency, MHz | Field strength of spurious, dB(µV/m) | Antenna polarization | Antenna height, m | Azimuth, degrees* | Field strength of carrier, dB(µV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB** | Verdict |
|--|--------------------------------------|----------------------|-------------------|-------------------|-------------------------------------|--------------------------------|------------|--------------|---------|
| Low carrier frequency 2402 MHz | | | | | | | | | |
| 7206 | 62.2 | Vertical | 1.40 | 20 | 100.56 | 38.36 | 20.0 | 1.41 | Pass |
| Mid carrier frequency 2442 MHz | | | | | | | | | |
| No emissions were found | | | | | | | | | Pass |
| High carrier frequency 2480 MHz | | | | | | | | | |
| No emissions were found | | | | | | | | | Pass |

*- EUT front panel refers to 0 degrees position of turntable.
 **- Margin = Attenuation below carrier – specification limit.



| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.3.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 - 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 BIT RATE: 1 Mbps
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1 MHz
 VIDEO BANDWIDTH: 3 MHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

| Frequency, MHz | Antenna | | Azimuth, degrees* | Peak field strength | | | Average field strength | | | | Verdict |
|--|--------------|-----------|-------------------|---------------------|-----------------|--------------|------------------------|----------------------|-----------------|---------------|---------|
| | Polarization | Height, m | | Measured, dB(µV/m) | Limit, dB(µV/m) | Margin, dB** | Measured, dB(µV/m) | Calculated, dB(µV/m) | Limit, dB(µV/m) | Margin, dB*** | |
| Low carrier frequency 2402 MHz | | | | | | | | | | | |
| 4804 | Vertical | 1.4 | 20 | 50.6 | 74 | -23.4 | 50.6 | 33.4 | 54 | -20.6 | Pass |
| Mid carrier frequency 2442 MHz | | | | | | | | | | | |
| 4880 | Vertical | 2.7 | 20 | 48.7 | 74 | -25.3 | 48.7 | 31.5 | 54 | -22.5 | Pass |
| 7320 | Vertical | 1.5 | 22 | 65.1 | 74 | -8.9 | 65.1 | 47.9 | 54 | -6.1 | |
| High carrier frequency 2480 MHz | | | | | | | | | | | |
| 4960 | Vertical | 1.4 | 18 | 45.4 | 74 | -28.6 | 45.4 | 28.2 | 54 | -25.8 | Pass |
| 7440 | Vertical | 1.3 | 18 | 65.6 | 74 | -8.4 | 65.6 | 48.4 | 54 | -5.6 | |

*- EUT front panel refers to 0 degrees position of turntable.
 **- Margin = Measured field strength - specification limit.
 ***- Margin = Calculated field strength - specification limit,
 where Calculated field strength = Measured field strength + average factor.

Table 7.3.4 Average factor calculation

| Transmission pulse | | Transmission burst | | Transmission train duration, ms | Average factor, dB |
|--------------------|------------|--------------------|------------|---------------------------------|--------------------|
| Duration, ms | Period, ms | Duration, ms | Period, ms | | |
| 0.086 | 0.628 | NA | NA | NA | -17.2 |

*- Average factor was calculated as follows
 for pulse train shorter than 100 ms: $Average\ factor = 20 \times \log_{10} \left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train \right)$
 for pulse train longer than 100 ms: $Average\ factor = 20 \times \log_{10} \left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\ ms} \times Number\ of\ bursts\ within\ 100\ ms \right)$



| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.3.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 - 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: GFSK
 BIT RATE: 1 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

| Frequency, MHz | Peak emission, dB(µV/m) | Quasi-peak | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|----------------------------------|-------------------------|-----------------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|---------|
| | | Measured emission, dB(µV/m) | Limit, dB(µV/m) | Margin, dB* | | | | |
| Low, mid, high carrier frequency | | | | | | | | |
| No emissions were found | | | | | | | | Pass |

*- Margin = Measured emission - specification limit.
 **- EUT front panel refer to 0 degrees position of turntable.



| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.3.6 Restricted bands according to FCC section 15.205

| MHz | MHz | MHz | MHz | MHz | GHz |
|-------------------|---------------------|-----------------------|-----------------|---------------|---------------|
| 0.09 - 0.11 | 8.37625 - 8.38675 | 73 - 74.6 | 399.9 - 410 | 2690 - 2900 | 10.6 - 12.7 |
| 0.495 - 0.505 | 8.41425 - 8.41475 | 74.8 - 75.2 | 608 - 614 | 3260 - 3267 | 13.25 - 13.4 |
| 2.1735 - 2.1905 | 12.29 - 12.293 | 108 - 121.94 | 960 - 1240 | 3332 - 3339 | 14.47 - 14.5 |
| 4.125 - 4.128 | 12.51975 - 12.52025 | 123 - 138 | 1300 - 1427 | 3345.8 - 3358 | 15.35 - 16.2 |
| 4.17725 - 4.17775 | 12.57675 - 12.57725 | 149.9 - 150.05 | 1435 - 1626.5 | 3600 - 4400 | 17.7 - 21.4 |
| 4.20725 - 4.20775 | 13.36 - 13.41 | 156.52475 - 156.52525 | 1645.5 - 1646.5 | 4500 - 5150 | 22.01 - 23.12 |
| 6.215 - 6.218 | 16.42 - 16.423 | 156.7 - 156.9 | 1660 - 1710 | 5350 - 5460 | 23.6 - 24 |
| 6.26775 - 6.26825 | 16.69475 - 16.69525 | 162.0125 - 167.17 | 1718.8 - 1722.2 | 7250 - 7750 | 31.2 - 31.8 |
| 6.31175 - 6.31225 | 16.80425 - 16.80475 | 167.72 - 173.2 | 2200 - 2300 | 8025 - 8500 | 36.43 - 36.5 |
| 8.291 - 8.294 | 25.5 - 25.67 | 240 - 285 | 2310 - 2390 | 9000 - 9200 | Above 38.6 |
| 8.362 - 8.366 | 37.5 - 38.25 | 322 - 335.4 | 2483.5 - 2500 | 9300 - 9500 | |

Table 7.3.7 Restricted bands according to RSS-Gen

| MHz | MHz | MHz | MHz | MHz | GHz |
|-------------------|---------------------|-----------------------|-----------------|---------------|---------------|
| 0.09 - 0.11 | 8.291 - 8.294 | 16.80425 - 16.80475 | 399.9 - 410 | 3260 - 3267 | 10.6 - 12.7 |
| 2.1735 - 2.1905 | 8.362 - 8.366 | 25.5 - 25.67 | 608 - 614 | 3332 - 3339 | 13.25 - 13.4 |
| 3.020 - 3.026 | 8.37625 - 8.38675 | 37.5 - 38.25 | 960 - 1427 | 3345.8 - 3358 | 14.47 - 14.5 |
| 4.125 - 4.128 | 8.41425 - 8.41475 | 73 - 74.6 | 1435 - 1626.5 | 3500 - 4400 | 15.35 - 16.2 |
| 4.17725 - 4.17775 | 12.29 - 12.293 | 74.8 - 75.2 | 1645.5 - 1646.5 | 4500 - 5150 | 17.7 - 21.4 |
| 4.20725 - 4.20775 | 12.51975 - 12.52025 | 108 - 138 | 1660 - 1710 | 5350 - 5460 | 22.01 - 23.12 |
| 5.677 - 5.683 | 12.57675 - 12.57725 | 156.52475 - 156.52525 | 1718.8 - 1722.2 | 7250 - 7750 | 23.6 - 24 |
| 6.215 - 6.218 | 13.36 - 13.41 | 156.7 - 156.9 | 2200 - 2300 | 8025 - 8500 | 31.2 - 31.8 |
| 6.26775 - 6.26825 | 16.42 - 16.423 | 240 - 285 | 2310 - 2390 | 9000 - 9200 | 36.43 - 36.5 |
| 6.31175 - 6.31225 | 16.69475 - 16.69525 | 322 - 335.4 | 2655 - 2900 | 9300 - 9500 | Above 38.6 |

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|--|
| HL 0446 | HL 3903 | HL 4360 | HL 4933 | HL 4956 | HL 5288 | HL 4919 | |
|---------|---------|---------|---------|---------|---------|---------|--|

Full description is given in Appendix A.

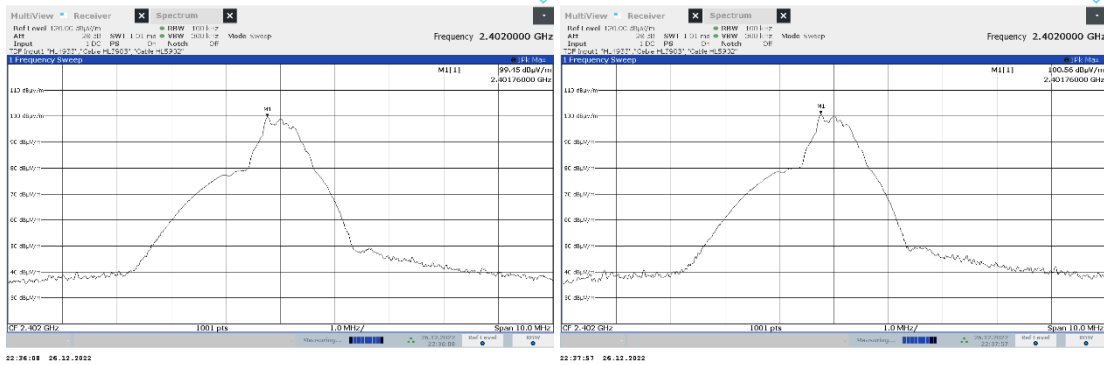


HERMON LABORATORIES

| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

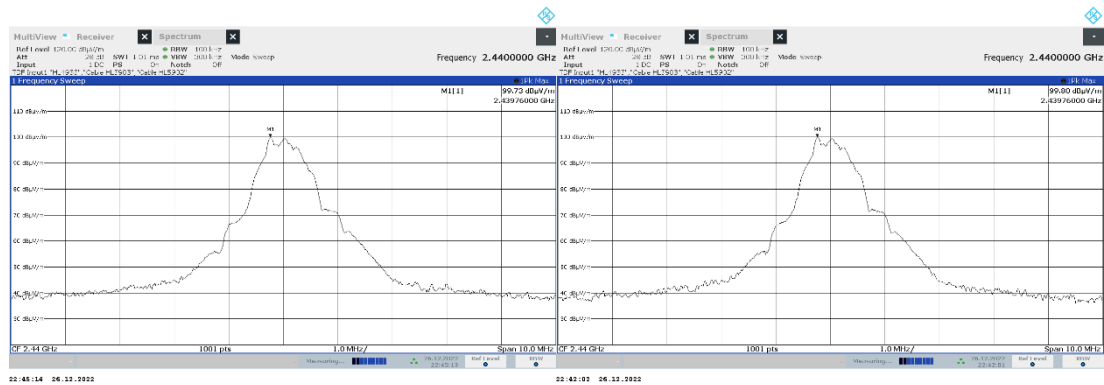
Plot 7.3.1 Radiated emission measurements at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.2 Radiated emission measurements at the mid carrier frequency

TEST SITE: anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



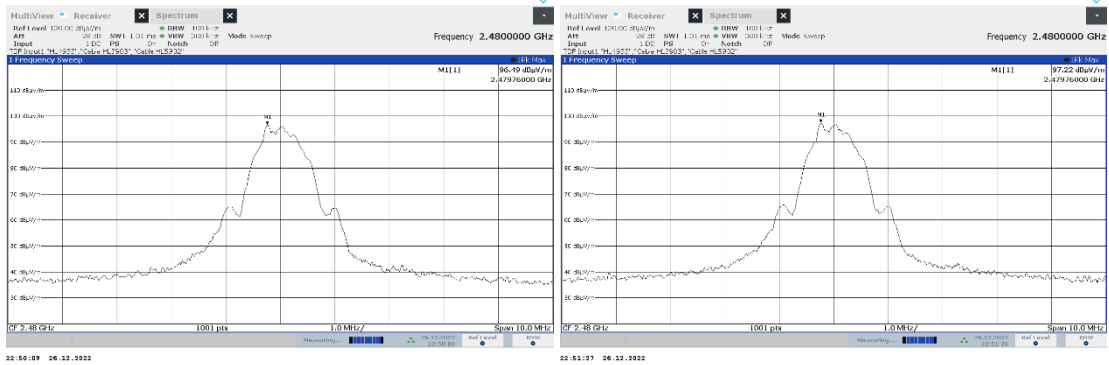


HERMON LABORATORIES

| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.3.3 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

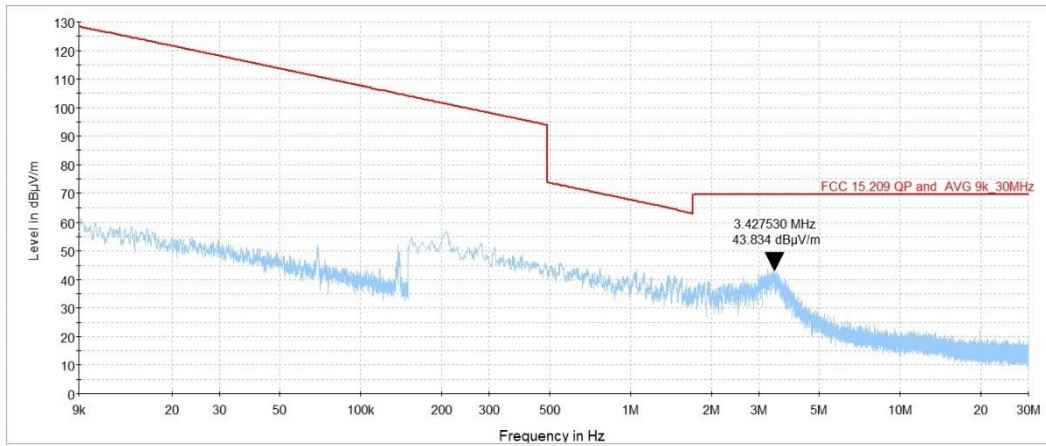




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

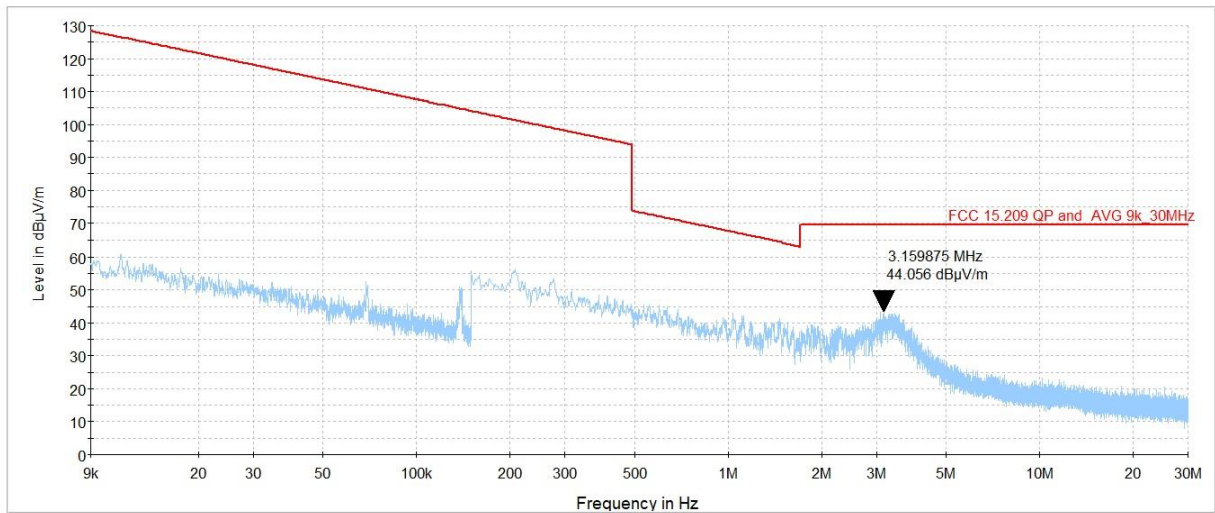
Plot 7.3.4 Radiated emission measurements from 9 kHz to 30 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical



Plot 7.3.5 Radiated emission measurements from 9 kHz to 30 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical

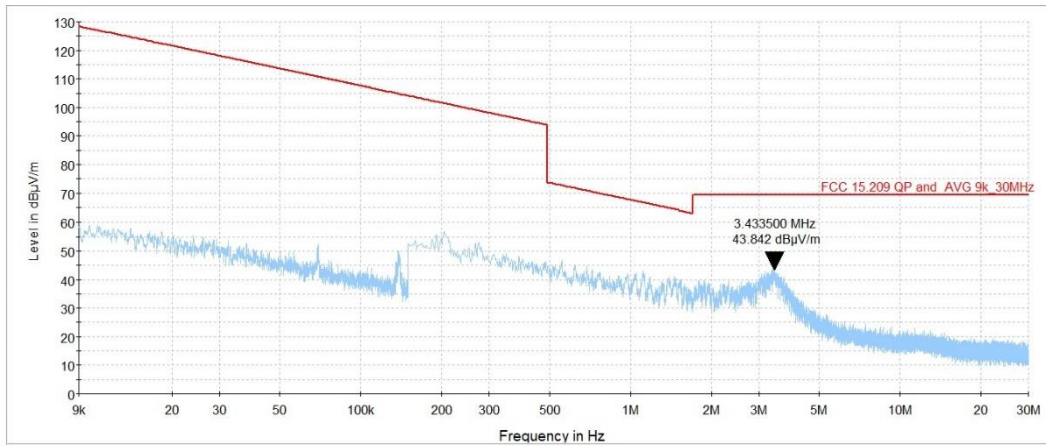




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.3.6 Radiated emission measurements from 9 kHz to 30 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

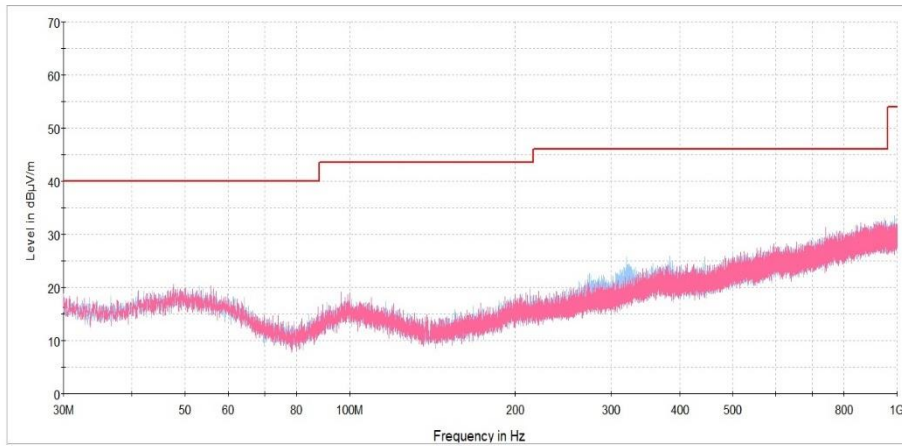




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

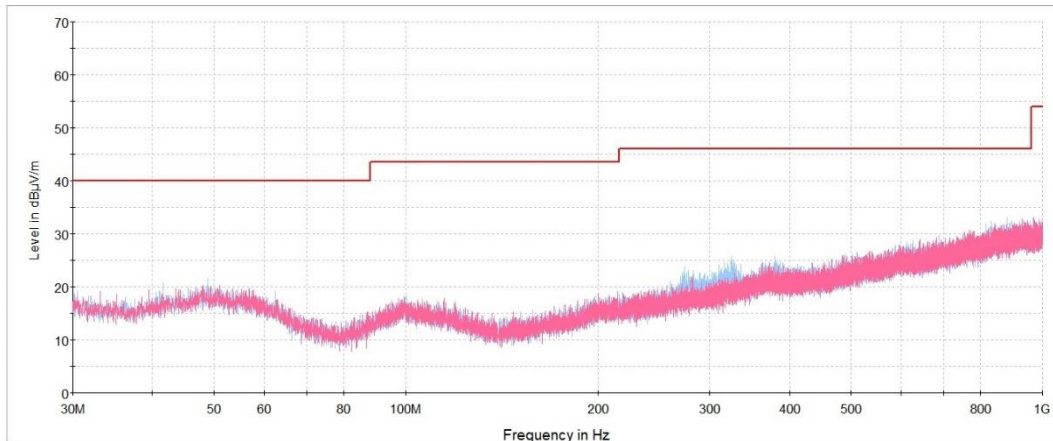
Plot 7.3.7 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.8 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

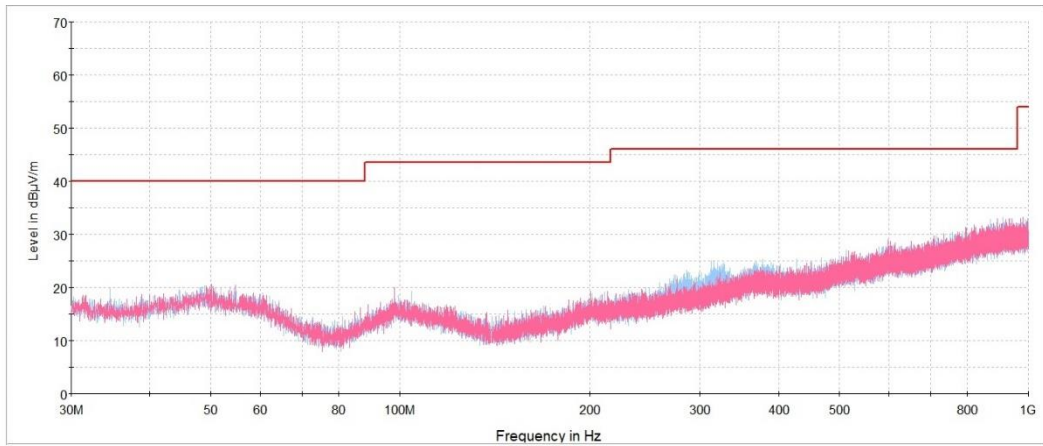




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.3.9 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

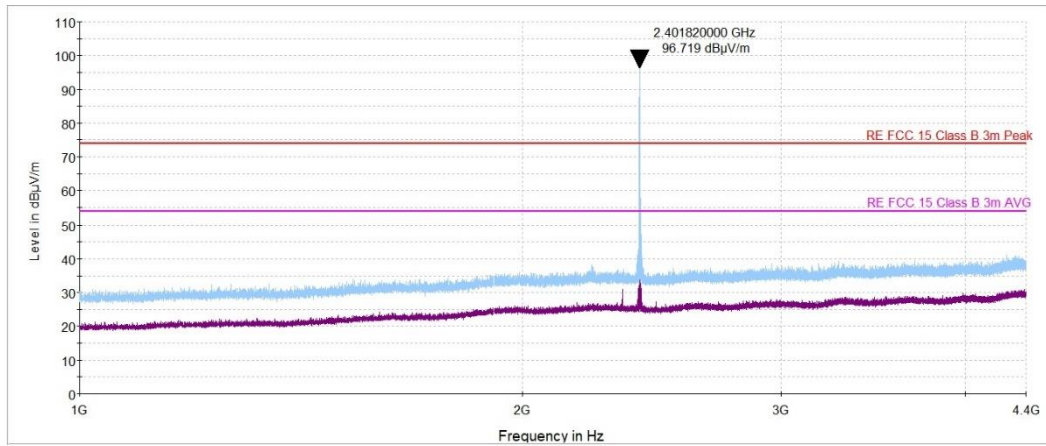




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

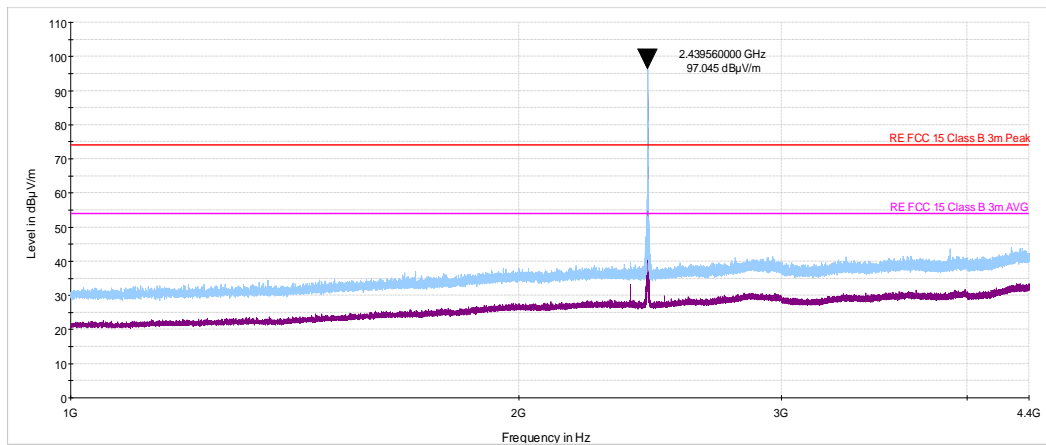
Plot 7.3.10 Radiated emission measurements from 1000 to 4400 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.11 Radiated emission measurements from 1000 to 4400 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



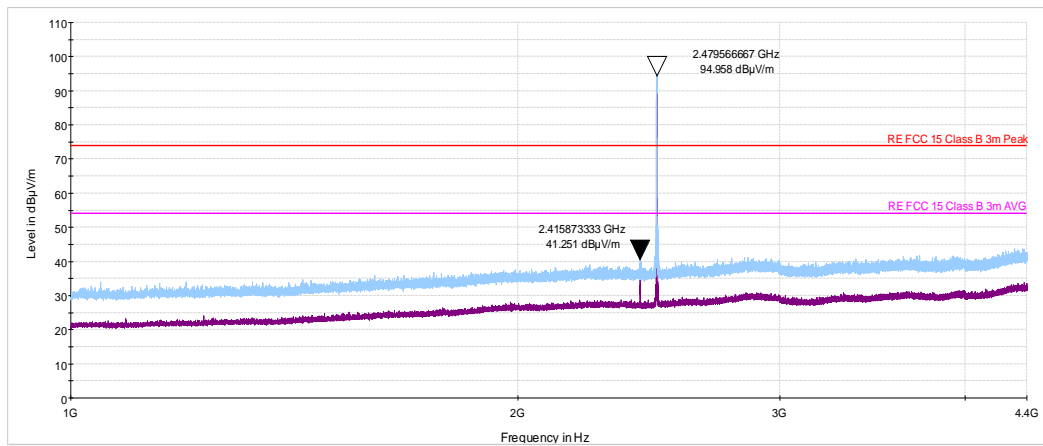


HERMON LABORATORIES

| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.3.12 Radiated emission measurements from 1000 to 4400 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

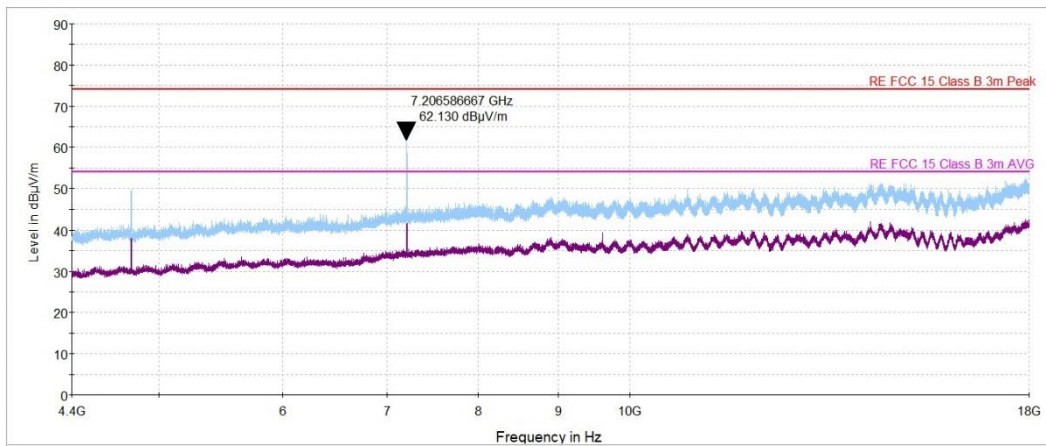




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

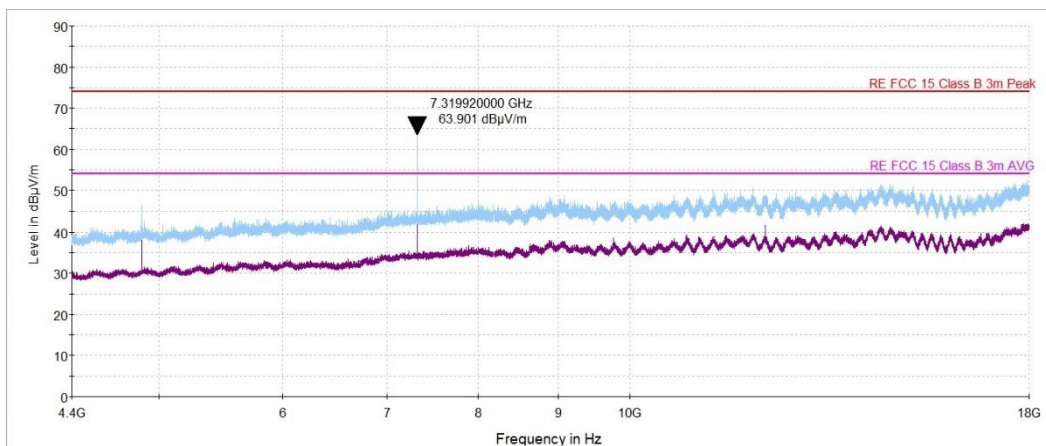
Plot 7.3.13 Radiated emission measurements from 4400 to 18000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.14 Radiated emission measurements from 4400 to 18000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

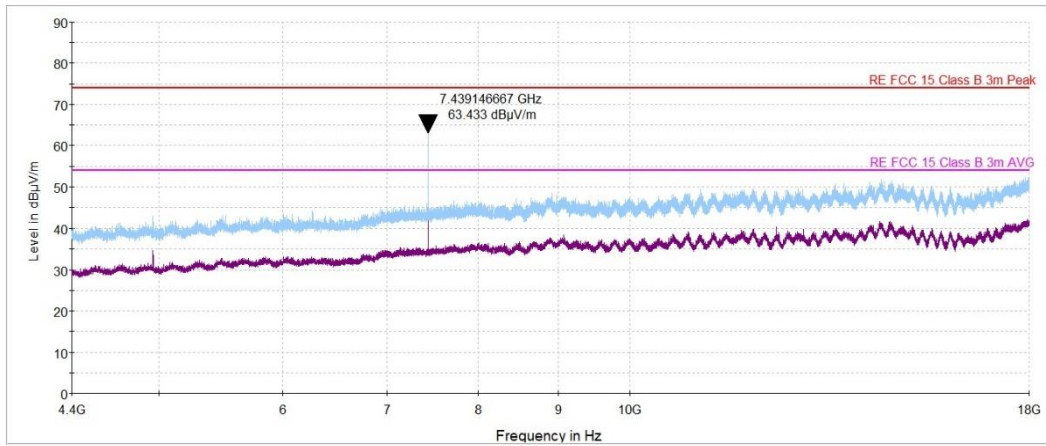




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.3.15 Radiated emission measurements from 4400 to 18000MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

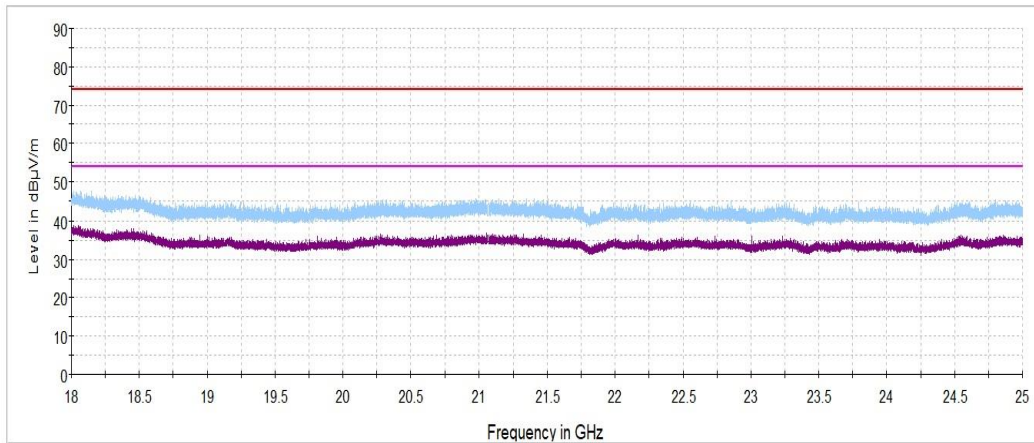




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

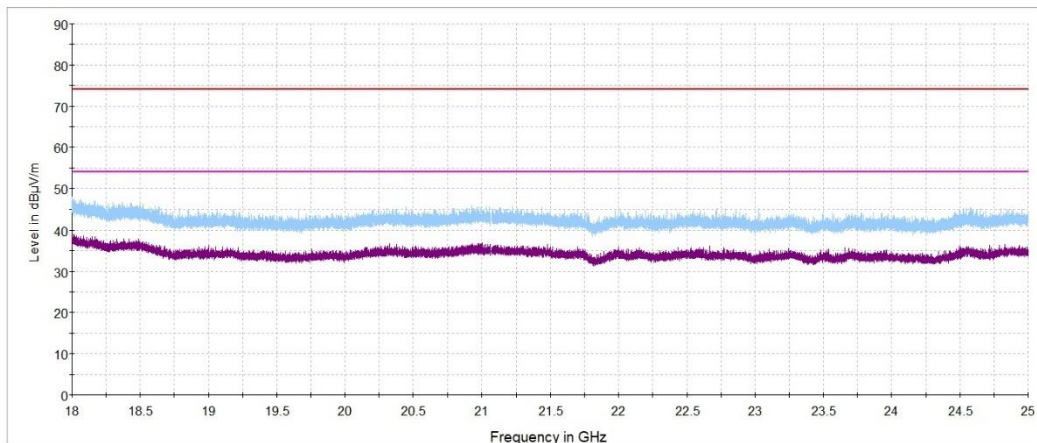
Plot 7.3.16 Radiated emission measurements from 18 to 25 GHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.17 Radiated emission measurements from 18 to 25 GHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

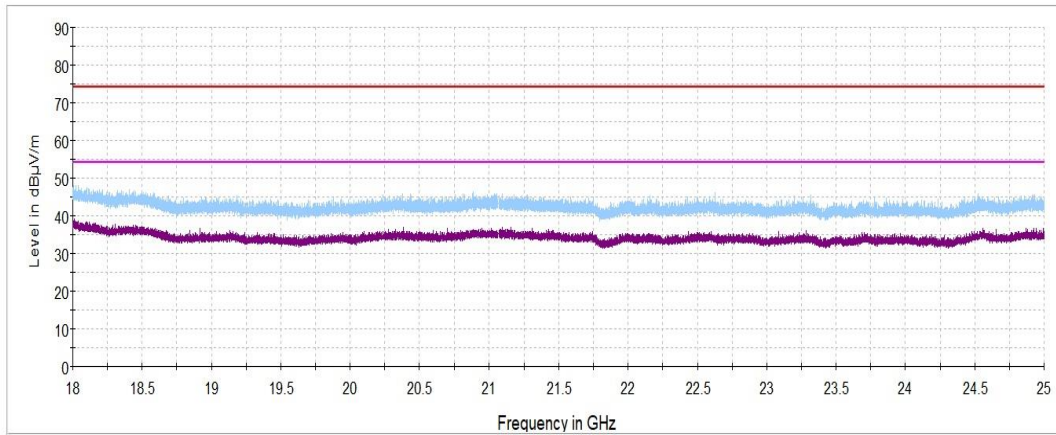




| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 29-Dec-22 | | | |
| Temperature: 24 °C | Relative Humidity: 48 % | Air Pressure: 1012 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.3.18 Radiated emission measurements from 18 to 25 GHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.19 Transmission pulse period and duration





| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

7.4 Band edge radiated emissions

7.4.1 General

This test was performed to measure emissions, radiated from the EUT at the assigned frequency band edges. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Band edge emission limits

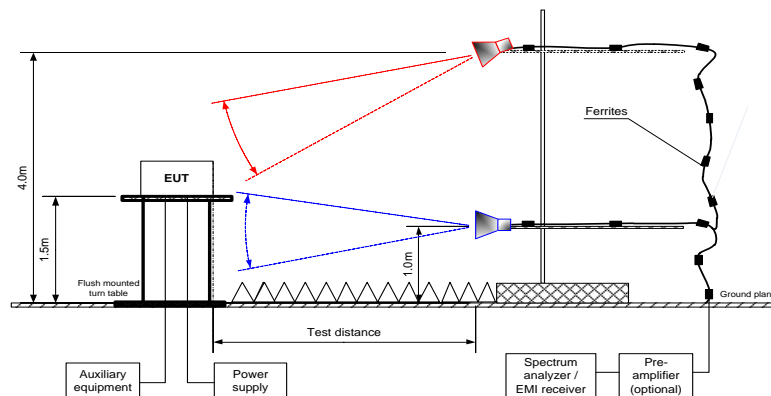
| Output power | Assigned frequency, MHz | Attenuation below carrier*, dBc | Field strength at 3 m within restricted bands, dB(μV/m) | |
|--------------|-------------------------|---------------------------------|---|---------|
| | | | Peak | Average |
| Peak | 2400.0 – 2483.5 | 20.0 | 74.0 | 54.0 |

* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

7.4.2 Test procedure

- 7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized normally modulated at the maximum data rate and its proper operation was checked.
- 7.4.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- 7.4.2.3 The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.4.2.4 The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- 7.4.2.5 The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.4.2 and associated plots and referenced to the highest emission level measured within the authorized band.
- 7.4.2.6 The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.

Figure 7.4.1 Band edge emission test setup





| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.4.2 Band edge emission outside restricted bands test results

ASSIGNED FREQUENCY RANGE: 2400.0 – 2483.5 MHz
 DETECTOR USED: Peak
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: ≥ RBW

MODULATION/BITRATE: GFSK / 1 Mbps

| Frequency, MHz | Band edge emission, dB(μV/m) | Emission at carrier, dB(μV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|----------------|------------------------------|-------------------------------|--------------------------------|------------|-------------|---------|
| 2400.000 | 61.92 | 100.59 | 38.67 | 20.0 | 18.67 | Pass |

*- Margin = Attenuation below carrier – specification limit.

Table 7.4.3 Band edge emission inside restricted bands test results

ASSIGNED FREQUENCY RANGE: 2400.0 – 2483.5 MHz
 DETECTOR USED: Peak
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 VIDEO BANDWIDTH: ≥ RBW

MODULATION/BITRATE: GFSK / 1 Mbps

| Frequency, MHz | Peak field strength(VBW=3 MHz) | | | Average field strength(VBW=1 kHz) | | | Verdict |
|----------------|--------------------------------|-----------------|--------------|-----------------------------------|-----------------|--------------|---------|
| | Measured, dB(μV/m) | Limit, dB(μV/m) | Margin, dB** | Measured, dB(μV/m) | Limit, dB(μV/m) | Margin, dB** | |
| 2388.41 | 43.65 | 74.0 | -30.35 | NA | 54.0 | -10.35 | Pass |
| 2482.70 | 52.14 | 74.0 | -21.86 | NA | 54.0 | -1.86 | Pass |

Reference numbers of test equipment used

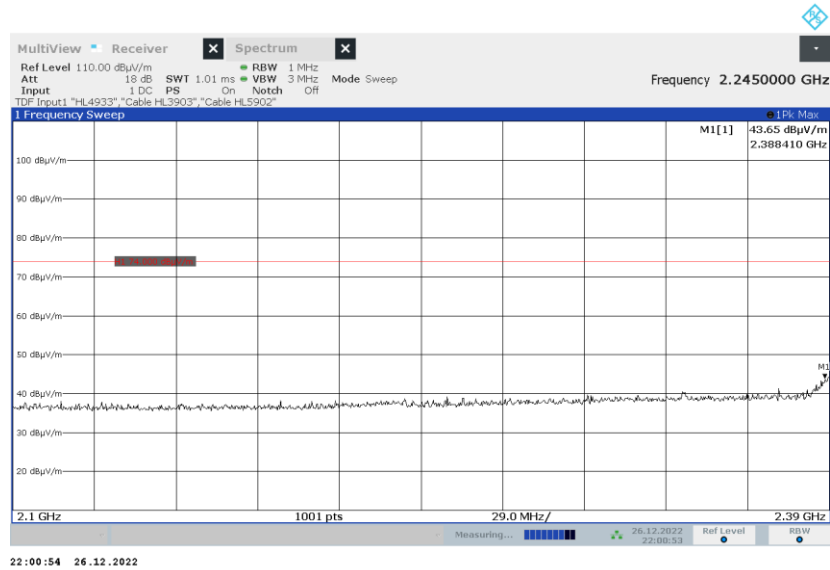
| | | | | | | | |
|---------|---------|---------|---------|--|--|--|--|
| HL 3903 | HL 4933 | HL 5902 | HL 7585 | | | | |
|---------|---------|---------|---------|--|--|--|--|

Full description is given in Appendix A.

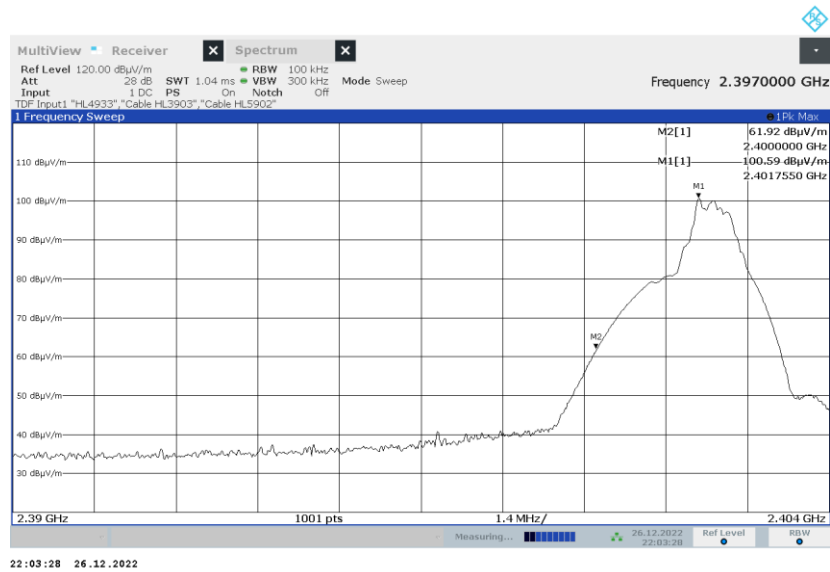


| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.4.1 The highest emission level within restricted band at low carrier frequency



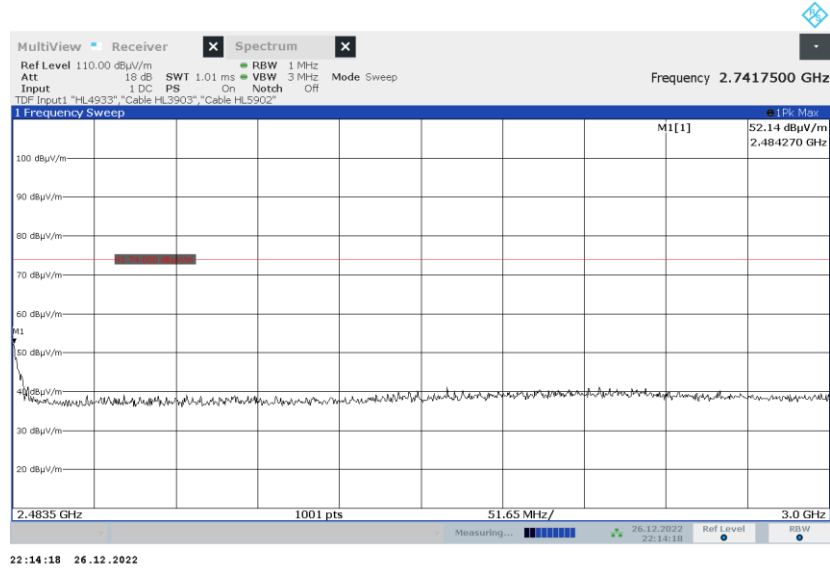
Plot 7.4.2 The highest emission level outside restricted band at low carrier frequency





| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(d) / RSS-247 section 5.5, Band edge emissions | | | |
| Test procedure: ANSI C63.10 section 11.12.1 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.4.3 The highest emission level within restricted band at high carrier frequency





| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(e) / RSS-247 section 5.2(2), Maximum power spectral density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

7.5 Peak spectral power density

7.5.1 General

This test was performed to measure the peak spectral power density radiated by the transmitter RF antenna. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Peak spectral power density limits

| Assigned frequency range, MHz | Measurement bandwidth, kHz | Peak spectral power density, dBm | Equivalent Peak spectral power density limit @ 3m, dB(μV/m)* |
|-------------------------------|----------------------------|----------------------------------|--|
| 902.0 – 928.0 | 3.0 | 8.0 | 103.2 |
| 2400.0 – 2483.5 | | | |
| 5725.0 – 5850.0 | | | |

* - Equivalent Peak spectral power density limit was calculated from the peak spectral power density as follows: $E = \sqrt{30 \times P} / r$, where P is peak spectral power density and r is antenna to EUT distance in meters.

7.5.2 Test procedure for field strength measurements

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.

7.5.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.5.2.3 The Peak spectral power density of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept in both vertical and horizontal polarizations.

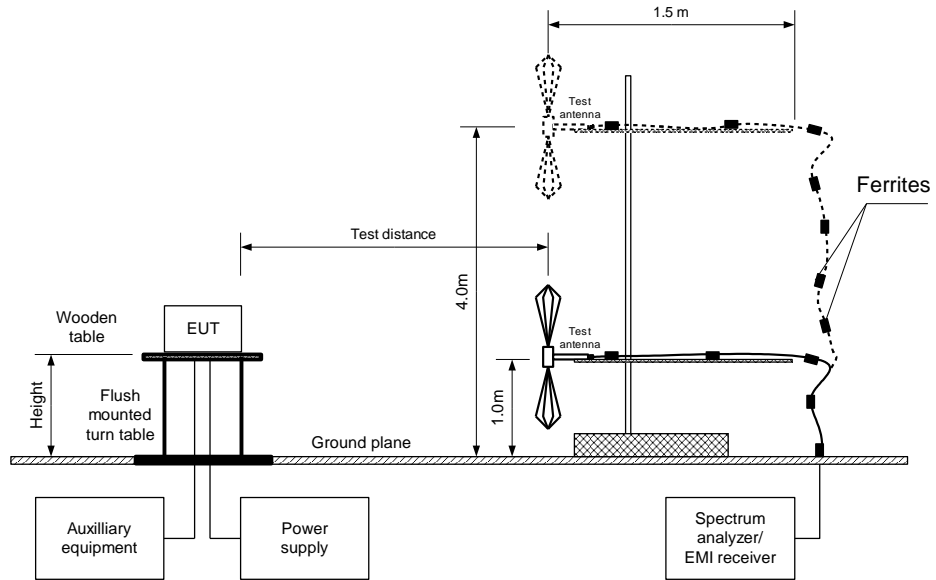
7.5.2.4 The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz. Otherwise the resolution bandwidth was reduced until individual spectrum lines were resolved and the power of individual spectrum lines was integrated over 3 kHz band.

7.5.2.5 The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 7.5.2 and associated plots.



| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(e) / RSS-247 section 5.2(2), Maximum power spectral density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Figure 7.5.1 Setup for carrier field strength measurements





| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(e) / RSS-247 section 5.2(2), Maximum power spectral density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Table 7.5.2 Field strength measurement of peak spectral power density

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 1.5 m
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 1 MHz
TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

MODULATION/BITRATE: GFSK / 1 Mbps

| Frequency, MHz | Peak spectral power density, dB(µV/m) | EUT antenna gain, dBi | Limit, dB(µV/m) | Margin, dB* | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|----------------|---------------------------------------|-----------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|---------|
| 2402.0 | 100.64 | 0 | 103.2 | -2.56 | Horizontal | 1.70 | -115 | Pass |
| 2442.0 | 99.81 | 0 | 103.2 | -3.39 | Vertical | 1.52 | 45 | Pass |
| 2480.0 | 97.22 | 0 | 103.2 | -5.98 | Horizontal | 1.70 | -165 | Pass |

*- Margin = Peak spectral power density - EUT antenna gain - 95.2 - calculated Peak spectral power density limit.

** - EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|--|--|--|--|
| HL 3903 | HL 4933 | HL 5902 | HL 7585 | | | | |
|---------|---------|---------|---------|--|--|--|--|

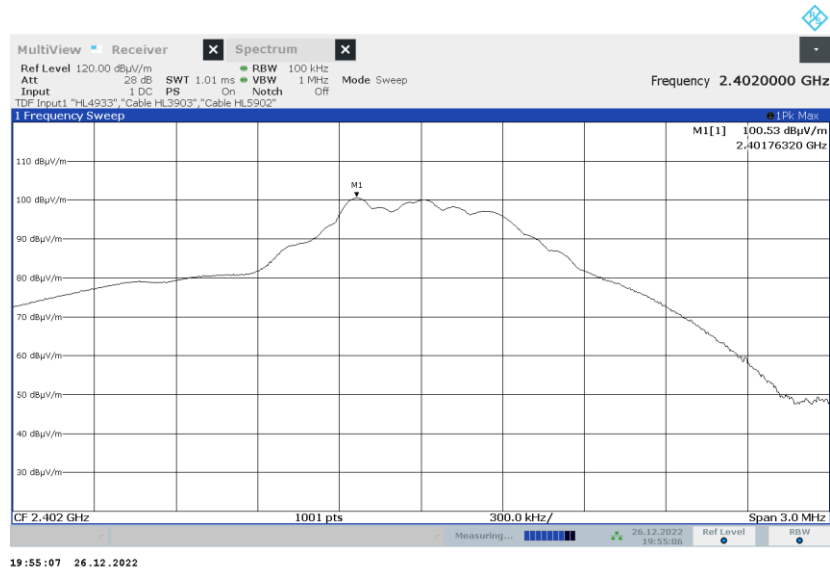
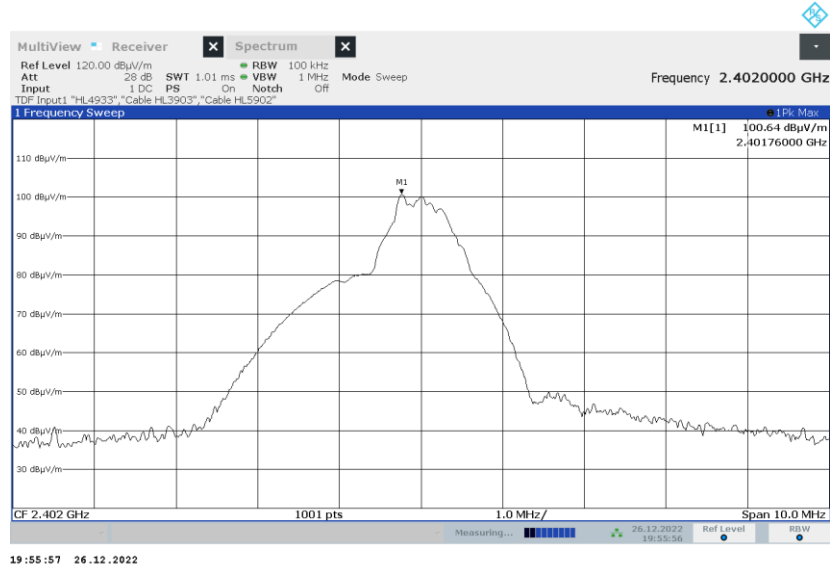
Full description is given in Appendix A.



HERMON LABORATORIES

| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(e) / RSS-247 section 5.2(2), Maximum power spectral density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.5.1 Peak spectral power density of carrier at low frequency

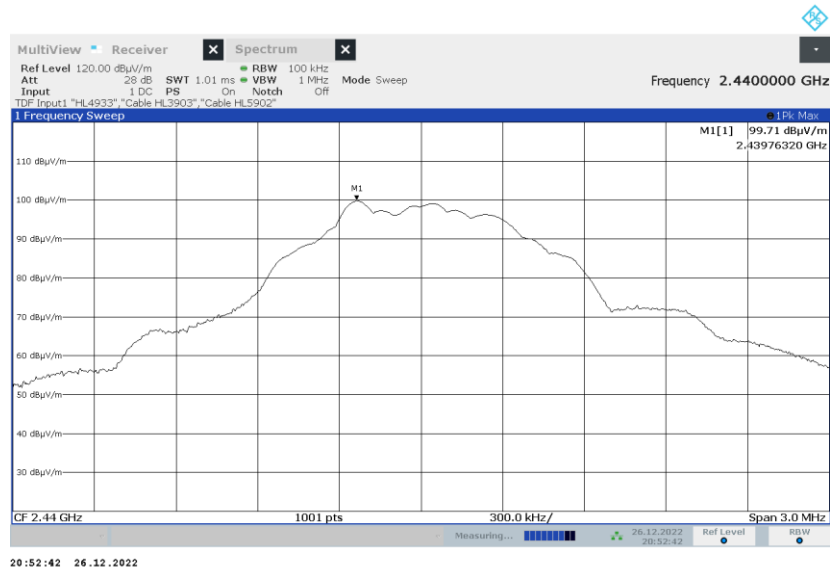
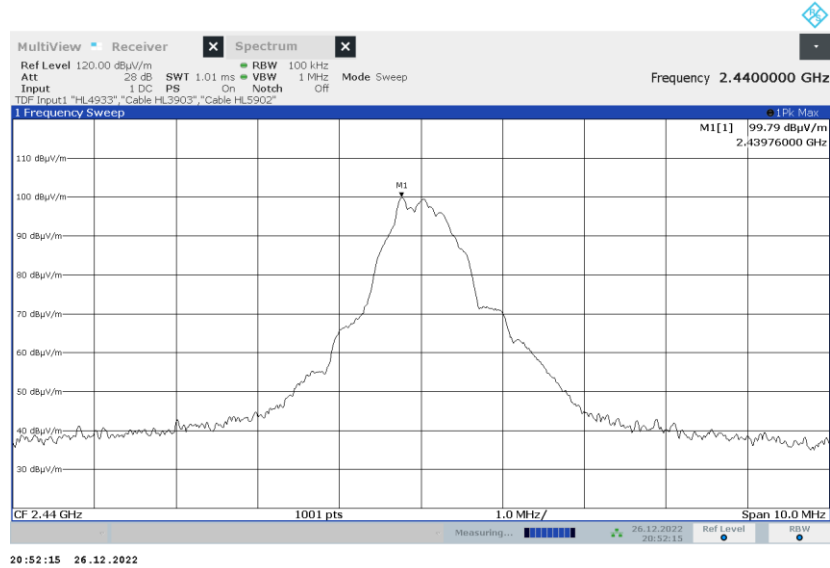




HERMON LABORATORIES

| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(e) / RSS-247 section 5.2(2), Maximum power spectral density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.5.2 Peak spectral power density of carrier at mid frequency

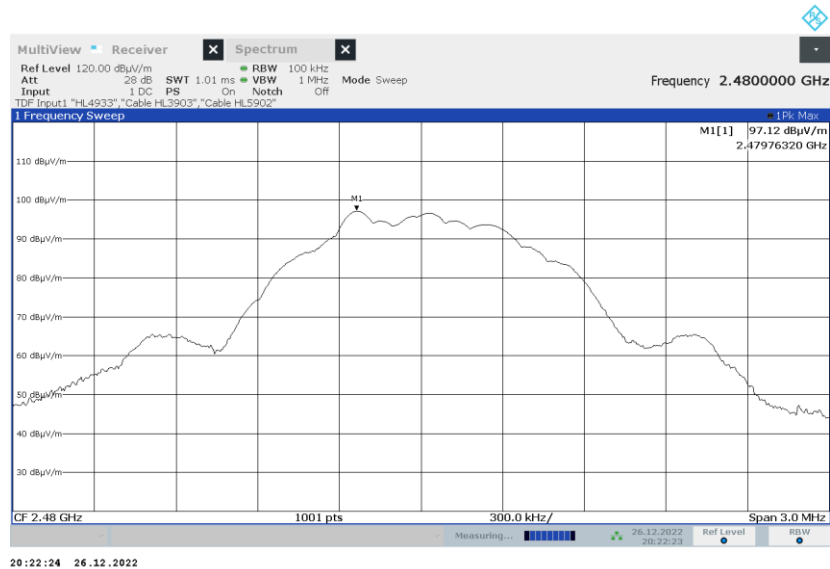
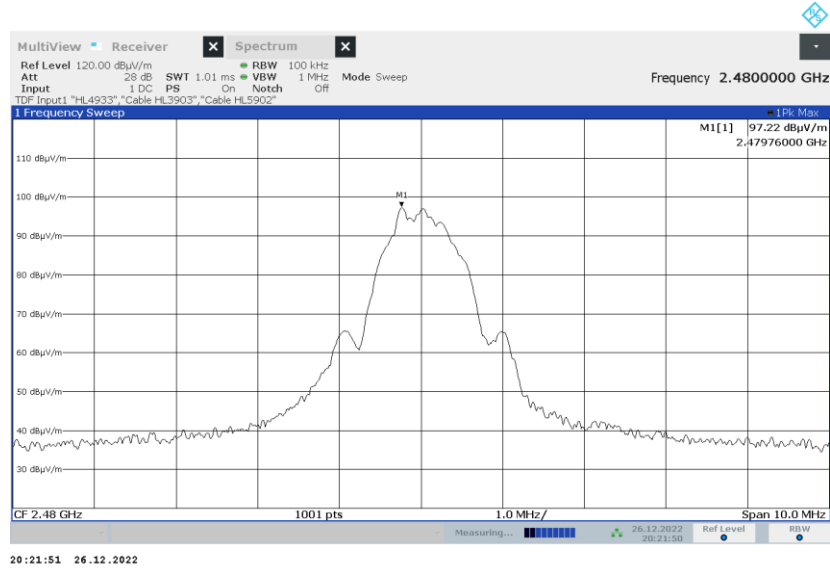




HERMON LABORATORIES

| | | | |
|---|--------------------------------|-------------------------------|----------------------|
| Test specification: Section 15.247(e) / RSS-247 section 5.2(2), Maximum power spectral density | | | |
| Test procedure: ANSI C63.10 section 11.10.2 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date(s): 26-Dec-22 | | | |
| Temperature: 25 °C | Relative Humidity: 45 % | Air Pressure: 1005 hPa | Power: 25 VDC |
| Remarks: | | | |

Plot 7.5.3 Peak spectral power density of carrier at high frequency



**8 APPENDIX A Test equipment and ancillaries used for tests**

| HL No | Description | Manufacturer | Model | Ser. No. | Last Cal./ Check | Due Cal./ Check |
|-------|--|-----------------------|----------------------|----------|------------------|-----------------|
| 0446 | Antenna, Loop, Active, 10 (9) kHz - 30 MHz | EMCO | 6502 | 2857 | 28-Feb-22 | 28-Feb-23 |
| 3903 | Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA | Huber-Suhner | SUCOFL EX 102A | 1226/2A | 07-Apr-22 | 07-Apr-23 |
| 4360 | EMI Test Receiver, 20 Hz to 40 GHz. | Rohde & Schwarz | ESU40 | 100322 | 13-Jan-22 | 13-Jan-23 |
| 4919 | High Pass Filter, 50 Ohm, 3900 to 9800 MHz, SMA-FM / SMA-M | Mini-Circuits | VHF-3500+ | NA | 15-Jun-21 | 15-Jun-23 |
| 4933 | Active Horn Antenna, 1 GHz to 18 GHz | COM-POWER CORPORATION | AHA-118 | 701046 | 13-Jan-22 | 13-Jan-23 |
| 4956 | Active horn antenna, 18 to 40 GHz | COM-POWER CORPORATION | AHA-840 | 105004 | 07-Mar-22 | 07-Mar-23 |
| 5288 | Trilog Antenna, 25 MHz - 8 GHz, 100W | Frankonia | ALX-8000E | 00809 | 24-Mar-22 | 24-Apr-25 |
| 5902 | RF cable, 18 GHz, 6.0m, N-type | Huber-Suhner | SF126EA/11N/11N/6000 | NA | 08-Dec-22 | 08-Dec-23 |
| 7585 | EMI Test Receiver, 1 Hz to 44 GHz | Rohde & Schwarz | ESW44 | 103130 | 19-May-22 | 19-May-23 |



9 APPENDIX B Test equipment correction factors

HL 0446: Active Loop Antenna
EMCO, model: 6502, s/n 2857

| Frequency, | Measured antenna factor, dBS/m | Measurement uncertainty, dB |
|------------|--------------------------------|-----------------------------|
| 10 | -33.4 | ±1.0 |
| 20 | -37.8 | ±1.0 |
| 50 | -40.5 | ±1.0 |
| 75 | -41.0 | ±1.0 |
| 100 | -41.2 | ±1.0 |
| 150 | -41.2 | ±1.0 |
| 250 | -41.1 | ±1.0 |
| 500 | -41.2 | ±1.0 |
| 750 | -41.3 | ±1.0 |
| 1000 | -41.3 | ±1.0 |

| Frequency, | Measured antenna factor, dBS/m | Measurement uncertainty, dB |
|------------|--------------------------------|-----------------------------|
| 2000 | -41.4 | ±1.0 |
| 3000 | -41.4 | ±1.0 |
| 4000 | -41.5 | ±1.0 |
| 5000 | -41.5 | ±1.0 |
| 10000 | -41.7 | ±1.0 |
| 15000 | -42.1 | ±1.0 |
| 20000 | -42.7 | ±1.0 |
| 25000 | -44.2 | ±1.0 |
| 30000 | -45.8 | ±1.0 |

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ A/m.



HL 4933: Active Horn Antenna
COM-POWER CORPORATION, model: AHA-118, s/n 701046

| Frequency, MHz | Measured antenna factor (with preamplifier), dB/m |
|----------------|---|
| 1000 | -16.1 |
| 1500 | -15.1 |
| 2000 | -10.9 |
| 2500 | -11.9 |
| 3000 | -11.1 |
| 3500 | -10.6 |
| 4000 | -8.6 |
| 4500 | -8.3 |
| 5000 | -5.9 |
| 5500 | -5.7 |
| 6000 | -3.3 |
| 6500 | -4.0 |
| 7000 | -2.2 |
| 7500 | -1.7 |
| 8000 | 1.1 |
| 8500 | -0.8 |
| 9000 | -1.5 |
| 9500 | -0.2 |

| Frequency, MHz | Measured antenna factor (with preamplifier), dB/m |
|----------------|---|
| 10000 | 1.8 |
| 10500 | 1.0 |
| 11000 | 0.3 |
| 11500 | -0.5 |
| 12000 | 3.1 |
| 12500 | 1.4 |
| 13000 | -0.3 |
| 13500 | -0.4 |
| 14000 | 2.5 |
| 14500 | 2.2 |
| 15000 | 1.9 |
| 15500 | 0.5 |
| 16000 | 2.1 |
| 16500 | 1.2 |
| 17000 | 0.6 |
| 17500 | 3.1 |
| 18000 | 4.2 |

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ V/m.



Antenna factor, HL 4956



Active Horn Antenna Factor Calibration

18 GHz to 40 GHz

| Equipment: | | | ACTIVE HORN ANTENNA | | |
|--|------------------------------|--|----------------------------|------------------------------|--|
| Model: | | | AHA-840 | | |
| Serial Number: | | | 105004 | | |
| Calibration Distance: | | | 3 meter | | |
| Polarization: | | | Horizontal | | |
| Calibration Date: | | | 1/26/2015 | | |
| Frequency (GHz) | Preamplifier Gain (dB) | Antenna Factor with pre-amp (dB/m) | Frequency (GHz) | Preamplifier Gain (dB) | Antenna Factor with pre-amp (dB/m) |
| 18 | 38.83 | -1.06 | 29.5 | 42.47 | -5.33 |
| 18.5 | 39.34 | -2.65 | 30 | 41.91 | -4.86 |
| 19 | 39.71 | -3.88 | 30.5 | 41.60 | -4.64 |
| 19.5 | 39.87 | -4.35 | 31 | 41.52 | -4.60 |
| 20 | 39.98 | -3.97 | 31.5 | 41.56 | -4.79 |
| 20.5 | 40.42 | -3.68 | 32 | 41.80 | -5.21 |
| 21 | 41.12 | -4.06 | 32.5 | 42.29 | -5.54 |
| 21.5 | 41.74 | -5.46 | 33 | 42.79 | -5.63 |
| 22 | 42.14 | -6.22 | 33.5 | 42.88 | -5.38 |
| 22.5 | 42.35 | -6.42 | 34 | 42.62 | -4.76 |
| 23 | 42.50 | -6.59 | 34.5 | 42.63 | -4.84 |
| 23.5 | 42.65 | -6.82 | 35 | 43.15 | -5.13 |
| 24 | 42.81 | -7.01 | 35.5 | 43.91 | -5.83 |
| 24.5 | 42.86 | -7.37 | 36 | 44.59 | -6.39 |
| 25 | 42.73 | -7.53 | 36.5 | 45.04 | -6.64 |
| 25.5 | 42.77 | -7.45 | 37 | 45.08 | -6.40 |
| 26 | 42.85 | -7.21 | 37.5 | 44.82 | -5.75 |
| 26.5 | 42.98 | -7.17 | 38 | 44.16 | -4.58 |
| 27 | 43.14 | -7.22 | 38.5 | 42.90 | -2.66 |
| 27.5 | 43.18 | -7.32 | 39 | 42.39 | -1.71 |
| 28 | 43.04 | -7.10 | 39.5 | 43.76 | -2.49 |
| 28.5 | 43.01 | -6.73 | 40 | 45.98 | -5.21 |
| <p>Calibration per ANSI C63.5: 2006 Standard Site Method, Equations 1-6 (3-antenna)</p> <p>Corrected Reading (dBμV/m) = Meter Reading (dBμV) + AFE(dB/m)</p> | | | | | |



HL 5288: Trilog Antenna
Frankonia, model: ALX-8000E, s/n: 00809
30-1000 MHz

| Frequency, MHz | Antenna factor, dB/m |
|----------------|----------------------|
| 30 | 14.96 |
| 35 | 15.33 |
| 40 | 16.37 |
| 45 | 17.56 |
| 50 | 17.95 |
| 60 | 16.87 |
| 70 | 13.22 |
| 80 | 10.56 |
| 90 | 13.61 |
| 100 | 15.46 |
| 120 | 14.03 |
| 140 | 12.23 |

| Frequency, MHz | Antenna factor, dB/m |
|----------------|----------------------|
| 160 | 12.67 |
| 180 | 13.34 |
| 200 | 15.40 |
| 250 | 16.42 |
| 300 | 17.28 |
| 400 | 19.98 |
| 500 | 21.11 |
| 600 | 22.90 |
| 700 | 24.13 |
| 800 | 25.25 |
| 900 | 26.35 |
| 1000 | 27.18 |

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ V/m.

above 1000 MHz

| Frequency, MHz | Antenna factor, dB/m |
|----------------|----------------------|
| 1000 | 26.9 |
| 1100 | 28.1 |
| 1200 | 28.4 |
| 1300 | 29.6 |
| 1400 | 29.1 |
| 1500 | 30.4 |
| 1600 | 30.7 |
| 1700 | 31.5 |
| 1800 | 32.3 |
| 1900 | 32.6 |
| 2000 | 32.5 |
| 2100 | 32.9 |
| 2200 | 33.5 |
| 2300 | 33.2 |
| 2400 | 33.7 |
| 2500 | 34.6 |
| 2600 | 34.7 |
| 2700 | 34.6 |
| 2800 | 35.0 |
| 2900 | 35.5 |
| 3000 | 36.2 |
| 3100 | 36.8 |
| 3200 | 36.8 |
| 3300 | 37.0 |
| 3400 | 37.5 |
| 3500 | 38.2 |

| Frequency, MHz | Antenna factor, dB/m |
|----------------|----------------------|
| 3600 | 38.9 |
| 3700 | 39.4 |
| 3800 | 39.4 |
| 3900 | 39.6 |
| 4000 | 39.7 |
| 4100 | 39.8 |
| 4200 | 40.5 |
| 4300 | 40.9 |
| 4400 | 41.1 |
| 4500 | 41.4 |
| 4600 | 41.3 |
| 4700 | 41.6 |
| 4800 | 41.9 |
| 4900 | 42.3 |
| 5000 | 42.7 |
| 5100 | 43.0 |
| 5200 | 42.9 |
| 5300 | 43.5 |
| 5400 | 43.6 |
| 5500 | 44.3 |
| 5600 | 44.7 |
| 5700 | 45.0 |
| 5800 | 45.0 |
| 5900 | 45.3 |
| 6000 | 45.9 |

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ V/m.



10 APPENDIX C Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

| Test description | Expanded uncertainty |
|--|--|
| Conducted carrier power at RF antenna connector | Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 dB |
| Conducted emissions at RF antenna connector | 9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB |
| Occupied bandwidth | ± 8.0 % |
| Duty cycle, timing (Tx ON / OFF) and average factor measurements | ± 1.0 % |
| Conducted emissions with LISN | 9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB |
| Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization | Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB |

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.



HERMON LABORATORIES

11 APPENDIX D Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, Radio, Safety, Environmental and Telecommunication testing facility.

Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for relevant parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; Recognized by Innovation, Science and Economic Development Canada for wireless and terminal testing (ISED), ISED #2186A, CAB identifier is IL1001; Certified by VCCI, Japan (the registration numbers for OATS are R-10808 for RE measurements below 1 GHz, G-20112 for RE measurements above 1 GHz, R-11082 for anechoic chamber for RE measurements below 1 GHz, G-10869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-11606 for conducted emissions at telecommunication ports).

The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

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website: www.hermonlabs.com

Person for contact: Mr. Michael Nikishin, EMC&Radio group manager



HERMON LABORATORIES

12 APPENDIX E

Specification references

FCC 47CFR part 15: 2020

ANSI C63.10: 2013

RSS-247 Issue 2: 2017

RSS-Gen Issue 5: 2018

Radio Frequency Devices

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence- Exempt Local Area Network (LE-LAN) Devices

General Requirements and Information for the Certification of Radiocommunication Equipment



13 APPENDIX F Abbreviations and acronyms

| | |
|----------------|---|
| AC | alternating current |
| A/m | ampere per meter |
| AM | amplitude modulation |
| AVRG | average (detector) |
| cm | centimeter |
| dB | decibel |
| dBm | decibel referred to one milliwatt |
| dB(μ V) | decibel referred to one microvolt |
| dB(μ V/m) | decibel referred to one microvolt per meter |
| dB(μ A) | decibel referred to one microampere |
| DC | direct current |
| EUT | equipment under test |
| F | frequency |
| GHz | gigahertz |
| GND | ground |
| H | height |
| HL | Hermon laboratories |
| Hz | hertz |
| k | kilo |
| kHz | kilohertz |
| LO | local oscillator |
| m | meter |
| MHz | megahertz |
| min | minute |
| mm | millimeter |
| ms | millisecond |
| μ s | microsecond |
| NA | not applicable |
| OATS | open area test site |
| Ω | Ohm |
| PS | power supply |
| QP | quasi-peak |
| RE | radiated emission |
| RF | radio frequency |
| rms | root mean square |
| Rx | receive |
| s | second |
| T | temperature |
| Tx | transmit |
| V | volt |

END OF DOCUMENT