HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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# PARTIAL TEST REPORT

**ACCORDING TO:**

**FCC 47CFR part 15 subpart C §15.247 (FHSS),**
**RSS-247 Issue 2:2017**

**FOR:**

## Visonic Ltd.

## Magnetic Contact

## Model: MC-302E P9M0

## FCC ID: WP3MC309PG2

# Table of contents

# 1 Applicant information

| | |
|---|---|
| **Client name:** | Visonic Ltd. |
| **Address:** | 24 Habarzel street, Tel Aviv 69710, Israel |
| **Telephone:** | +972 3645 6832 |
| **Fax:** | +972 3645 6788 |
| **E-mail:** | zuri.rubin@jci.com |
| **Contact name:** | Mr. Zuri Rubin |

# 2 Equipment under test attributes

| | |
|---|---|
| **Product name:** | Magnetic Contact |
| **Product type:** | Transceiver |
| **Model(s):** | MC-302E P9M0 |
| **Serial number:** | NA |
| **Hardware version:** | 90-210047 |
| **Software release:** | JS-703905 |
| **Receipt date** | 02-Feb-22 |

# 3 Manufacturer information

| | |
|---|---|
| **Manufacturer name:** | Visonic Ltd. |
| **Address:** | 24 Habarzel street, Tel Aviv 69710, Israel |
| **Telephone:** | +972 3645 6832 |
| **Fax:** | +972 3645 6788 |
| **E-Mail:** | zuri.rubin@jci.com |
| **Contact name:** | Mr. Zuri Rubin |

# 4 Test details

| | |
|---|---|
| **Project ID:** | 46081 |
| **Location:** | Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel |
| **Test started:** | 01-Apr-22 |
| **Test completed:** | 08-Apr-22 |
| **Test specification(s):** | FCC 47CFR part 15 subpart C §15.247 (FHSS),<br>RSS-247 Issue 2:2017 |

# 5 Tests summary

| Test | Status |
|---|---|
| **Transmitter characteristics** | |
| FCC section 15.247(a)1/ RSS-247 section 5.1(c), 20 dB bandwidth | Not required |
| FCC section 15.247(a)1/ RSS-247 section 5.1(b), Frequency separation | Not required |
| FCC section 15.247(a)1/ RSS-247 section 5.1(c), Number of hopping frequencies | Not required |
| FCC section 15.247(a)1/ RSS-247 section 5.1(c), Average time of occupancy | Not required |
| FCC section 15.247(b) / RSS-247 section 5.4(a), 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 | Not required |
| FCC section 15.247(i)5/ RSS-102 section 2.5, RF exposure | Pass, the exhibit to the application of certification is provided* |
| FCC section 15.203/ RSS-Gen section 6.8, Antenna requirements | Not required |
| FCC section 15.207(a) / RSS-Gen section 8.8, Conducted emission | Not required |
| **Unintentional emissions** | |
| FCC section 15.107/ICES-003, Section 6.1, Class B, Conducted emission at AC power port | Not required |
| FCC section 15.109/ RSS-Gen section 7.3 /ICES-003, Section 6.2, Class B, Radiated emission | Not required |

The EUT were certified by FCC under FCC ID: WP3MC309PG2. The EUT was revised with the following changes:

1. Moved the LED place in the PCB.
2. Using of 2 outputs instead of 3.
3. New plastic.
4. New SW for support an enhanced encrypted key, over-the-air firmware upgrade, device lock down and lockable sensors.
5. Adding Flash Memory.

*The relevant tests were performed to support Application for Class II permissive changes certification.

This test report supersedes the previously issued test report identified by Doc ID: VISRAD_FCC.46081_31270

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. E. Pitt, test engineer, EMC & Radio | 01-Apr-22 – 08-Apr-22 |  |
| **Reviewed by:** | Mrs. S. Peysahov Sheynin, test engineer, EMC & Radio | 05-May-22 |  |
| **Approved by:** | Mr. M. Nikishin, group leader, EMC & Radio | 25-May-22 |  |

# 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 fully supervised PowerG magnetic contact device. It includes a built-in reed switch that opens upon removal of a magnet placed near it, The EUT is equipped with an integral antenna and is powered by 3V internal battery.

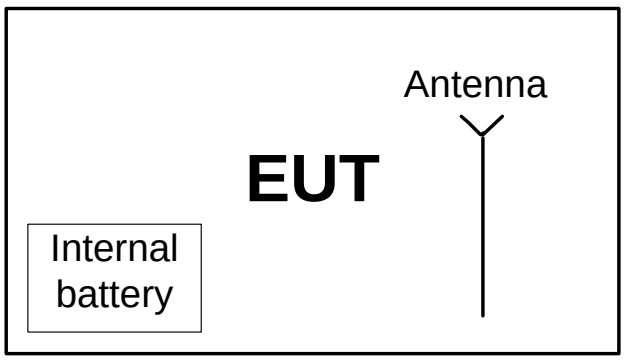
The purpose for this test report is the compliance with minor modification that was made relatively to original test report VISRAD_FCC.31270, issued by Hermon Laboratories.

The new model MC-302E P9M0, that was tested in the present test report have identical RF part configuration and differenced only with HW redesign of PCB, new plastic and SW that will support a new future as stated in manufacturer's declarations (refer to Appendix F of the test report).

## 6.2 Changes made in EUT

No changes were implemented in the EUT during the testing.

## 6.3 Test configuration



## 6.4 Transmitter characteristics

| **Type of equipment** | |
|---|---|
| X | Stand-alone (Equipment with or without its own control provisions) |
| | Combined equipment (Equipment where the radio part is fully integrated within another type of equipment) |
| | Plug-in card (Equipment intended for a variety of host systems) |

| **Intended use** | | **Condition of use** |
|---|---|---|
| | fixed | Always at a distance more than 2 m from all people |
| X | mobile | Always at a distance more than 20 cm from all people |
| | portable | May operate at a distance closer than 20 cm to human body |

| **Assigned frequency ranges** | 902 – 928 MHz |
|---|---|
| **Operating frequencies** | 912.750 – 919.106 MHz |

| **Maximum rated output power** | At transmitter 50 Ω RF output connector | dBm |
|---|---|---|
| | Peak output power | 14.6 dBm |

| **Is transmitter output power variable?** | X | No | | | |
|---|---|---|---|---|---|
| | | Yes | | continuous variable | |
| | | | | stepped variable with stepsize | dB |
| | | | minimum RF power | | dBm |
| | | | maximum RF power | | dBm |

| **Antenna connection** | | | | |
|---|---|---|---|---|
| unique coupling | standard connector | X | integral | with temporary RF connector |
| | | | | X without temporary RF connector |

| **Antenna/s technical characteristics** | | | |
|---|---|---|---|
| Type | Manufacturer | Model number | Gain |
| Integral | Visonic | Built-In Helical Antenna | 2 dBi |

| **Transmitter aggregate data rate/s** | 50 kbps |
|---|---|
| **Type of modulation** | GFSK |
| **Modulating test signal (baseband)** | PRBS |

| **Transmitter power source** | | | | | |
|---|---|---|---|---|---|
| X | Battery | **Nominal rated voltage** | 3.0 V | Battery type | CR123A |
| | DC | **Nominal rated voltage** | | | |
| | AC mains | **Nominal rated voltage** | | Frequency | |

| **Common power source for transmitter and receiver** | X yes | no |
|---|---|---|

| **Spread spectrum technique used** | X | Frequency hopping (FHSS) |
|---|---|---|
| | | Digital transmission system (DTS) |
| | | Hybrid |

| **Spread spectrum parameters for transmitters tested per FCC 15.247 only** | | |
|---|---|---|
| **FHSS** | Total number of hops | 50 |
| | Bandwidth per hop | 109.97 kHz |
| | Max. separation of hops | 131.2 kHz |

| Test specification: | Section 15.247(b), RSS-247 section 5.4(1), Peak output power | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, section 7.8.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 06-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 43 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

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

## 7.1 Peak output power

### 7.1.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.1.1.

**Table 7.1.1 Peak output power limits**

| Assigned frequency range, MHz | Peak output power* | | Equivalent field strength limit @ 3m, dB(µV/m)* | Maximum antenna gain, dBi |
|---|---|---|---|---|
| | W | dBm | | |
| **902.0 – 928.0** | **0.25 (<50 hopping channels)** | **24.0(<50 hopping channels)** | **125.2 (<50 hopping channels)** | 6.0* |
| | **1.0 (≥50 hopping channels)** | **30.0 (≥50 hopping channels)** | **131.2 (≥50 hopping channels)** | |
| 2400.0 – 2483.5 | 0.125 (<75 hopping channels) | 21.0(<75 hopping channels) | 122.2 (<75 hopping channels) | |
| | 1.0 (≥75 hopping channels) | 30.0 (≥75 hopping channels) | 131.2 (≥75 hopping channels) | |
| 5725.0 – 5850.0 | 1.0 | 30.0 | 131.2 | |

*- Equivalent field strength limit was calculated from the peak output power as follows: E=sqrt(30×P×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.
**- 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.

### 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 adjusted to produce maximum available to end user RF output power.

**7.1.2.3** The frequency span of spectrum analyzer was set approximately 5 times wider than 20 dB bandwidth of the EUT and the resolution bandwidth was set wider than 20 dB bandwidth of the EUT. To find maximum radiation the turntable was rotated $360^0$ and the measuring antenna height was swept in both vertical and horizontal polarizations.

**7.1.2.4** The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.1.2 and associated plots.

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

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

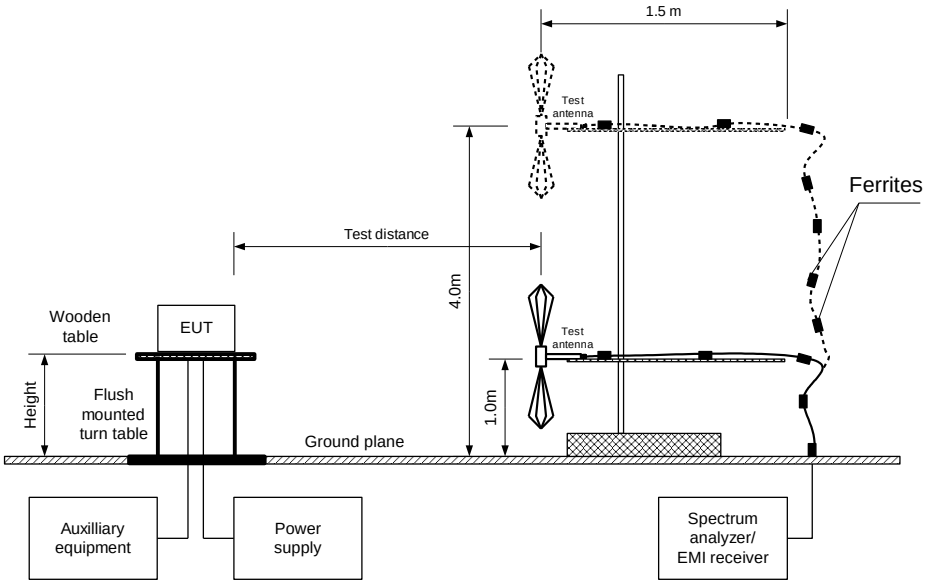
where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.
The above equation was converted in logarithmic units for 3 m test distance:

Peak output power in dBm = Field strength in dB(µV/m) - Transmitter antenna gain in dBi – 95.2 dB

**7.1.2.6** The worst test results (the lowest margins) were recorded in Table 7.1.2.

| Test specification: | Section 15.247(b), RSS-247 section 5.4(1), Peak output power | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, section 7.8.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 06-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 43 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Figure 7.1.1 Setup for carrier field strength measurements**



| **Test specification:** | **Section 15.247(b), RSS-247 section 5.4(1), Peak output power** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10, section 7.8.5 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 01-Apr-22 - 06-Apr-22 | | |
| **Temperature:** 21 ºC | **Relative Humidity:** 43 % | **Air Pressure:** 1012 hPa | **Power:** 3 VDC |
| **Remarks:** | | | |

**Table 7.1.2 Peak output power test results**

| | |
|---|---|
| ASSIGNED FREQUENCY: | 902-928 MHz |
| TEST DISTANCE: | 3 m |
| TEST SITE: | Semi anechoic chamber |
| EUT HEIGHT: | 0.8 m |
| DETECTOR USED: | Peak |
| MODULATION: | GFSK |
| BIT RATE: | 50 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| DETECTOR USED: | Peak |
| FREQUENCY HOPPING: | Disabled |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| 912.750 | 111.3 | Horizontal | 1.1 | 0 | 2 | 14.1 | 30 | -15.9 | Pass |
| 915.863 | 111.4 | Horizontal | 1.1 | 0 | 2 | 14.2 | 30 | -15.8 | Pass |
| 919.106 | 111.8 | Horizontal | 1.1 | 0 | 2 | 14.6 | 30 | -15.4 | 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.

**Reference numbers of test equipment used**

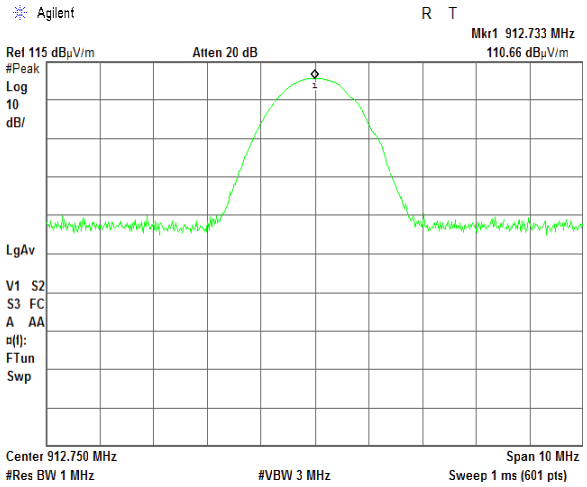
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 3818 | HL 3903 | HL 5902 | HL 604 | | | | |

Full description is given in Appendix A.

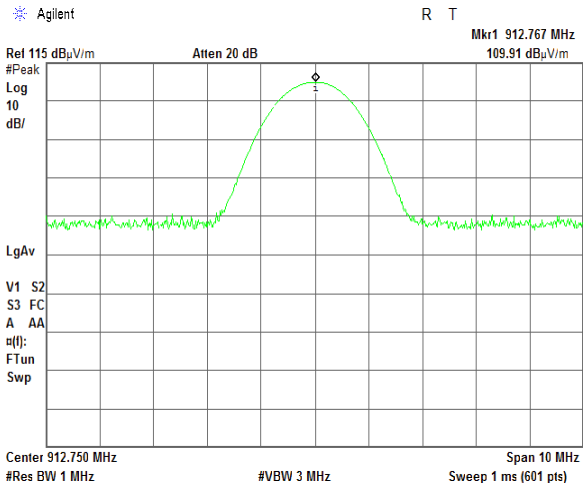
| Test specification: | Section 15.247(b), RSS-247 section 5.4(1), Peak output power | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, section 7.8.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 06-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 43 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Plot 7.1.1 Field strength of carrier at low frequency**

EUT POSITION: X
ANTENNA POLARIZATION: Vertical and Horizontal



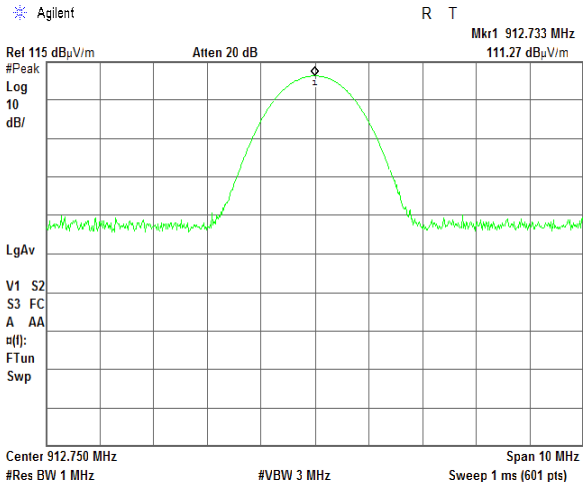

EUT POSITION: Y
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(b), RSS-247 section 5.4(1), Peak output power | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, section 7.8.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 06-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 43 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

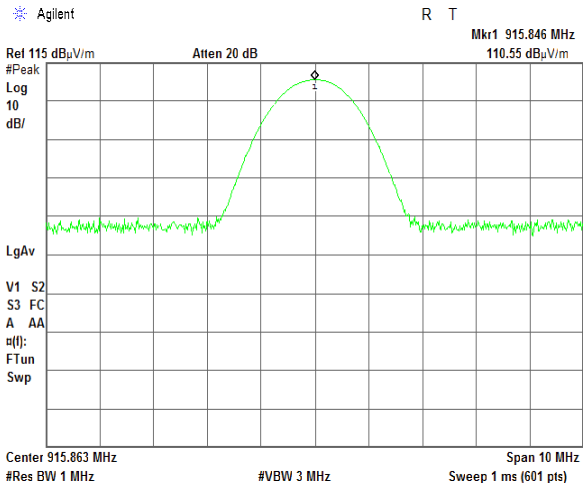
**Plot 7.1.2 Field strength of carrier at low frequency (continuation)**

EUT POSITION: Z
ANTENNA POLARIZATION: Vertical and Horizontal




**Plot 7.1.3 Field strength of carrier at mid frequency**

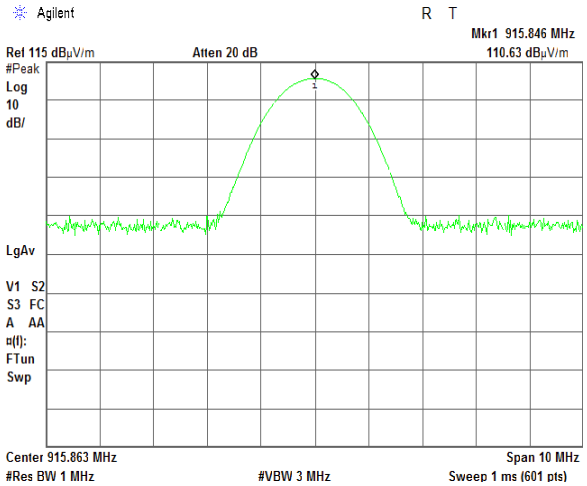
EUT POSITION: X
ANTENNA POLARIZATION: Vertical and Horizontal



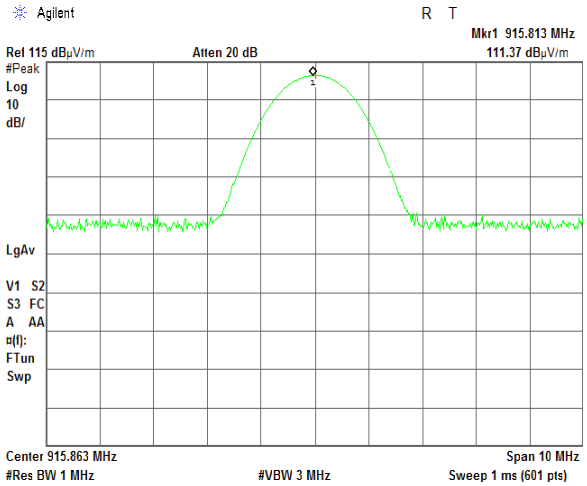
| Test specification: | Section 15.247(b), RSS-247 section 5.4(1), Peak output power | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, section 7.8.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 06-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 43 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Plot 7.1.4 Field strength of carrier at mid frequency (continuation)**

EUT POSITION: Y
ANTENNA POLARIZATION: Vertical and Horizontal



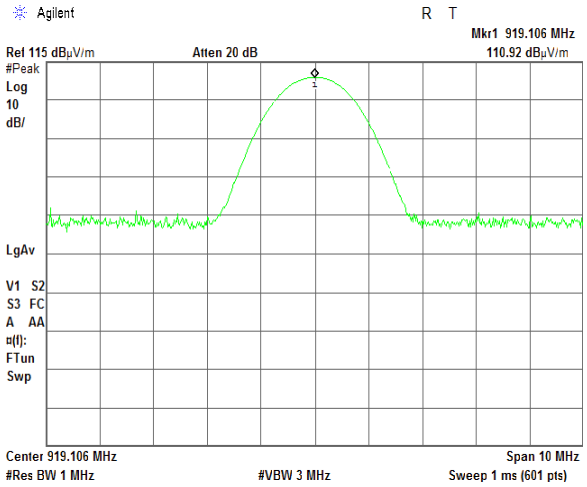

EUT POSITION: Z
ANTENNA POLARIZATION: Vertical and Horizontal



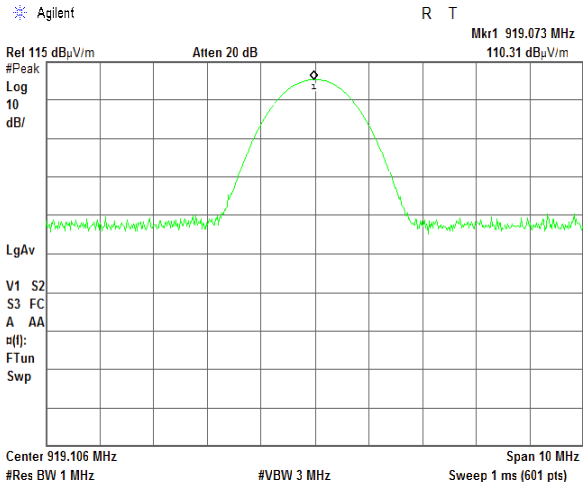
| Test specification: | Section 15.247(b), RSS-247 section 5.4(1), Peak output power | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, section 7.8.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 06-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 43 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Plot 7.1.3 Field strength of carrier at high frequency**

EUT POSITION: X
ANTENNA POLARIZATION: Vertical and Horizontal



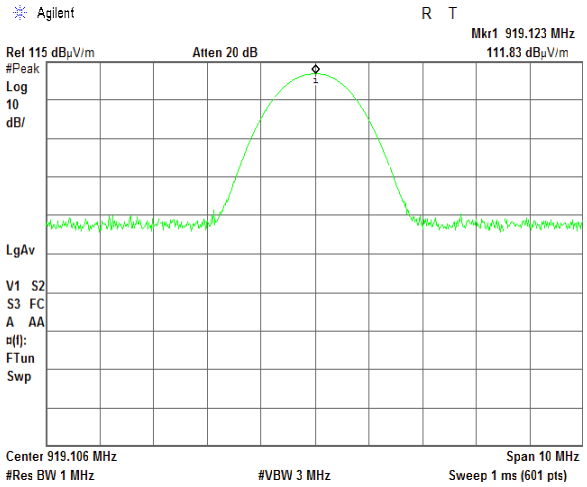

EUT POSITION: Y
ANTENNA POLARIZATION: Vertical and Horizontal



| **Test specification:** | **Section 15.247(b), RSS-247 section 5.4(1), Peak output power** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10, section 7.8.5 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 01-Apr-22 - 06-Apr-22 | | |
| **Temperature:** 21 ºC | **Relative Humidity:** 43 % | **Air Pressure:** 1012 hPa | **Power:** 3 VDC |
| **Remarks:** | | | |

**Plot 7.1.5 Field strength of carrier at high frequency (continuation)**

EUT POSITION: Z
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

## 7.2 Field strength of spurious emissions

### 7.2.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.2.1.

**Table 7.2.1 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 | NA | 54.0 | |

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

$$Lim_{S2} = Lim_{S1} + 40 \log (S_1/S_2),$$

where $S_1$ and $S_2$ – 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.

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

**7.2.2.1** The EUT was set up as shown in Figure 7.2.1, energized and the performance check was conducted.

**7.2.2.2** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated $360^0$ and the measuring antenna was rotated around its vertical axis.

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

### 7.2.3 Test procedure for spurious emission field strength measurements above 30 MHz

**7.2.3.1** The EUT was set up as shown in Figure 7.2.2, Figure 1.1.3, energized and the performance check was conducted.

**7.2.3.2** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated $360^0$, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

**7.2.3.3** 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, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Figure 7.2.1 Setup for spurious emission field strength measurements below 30 MHz**

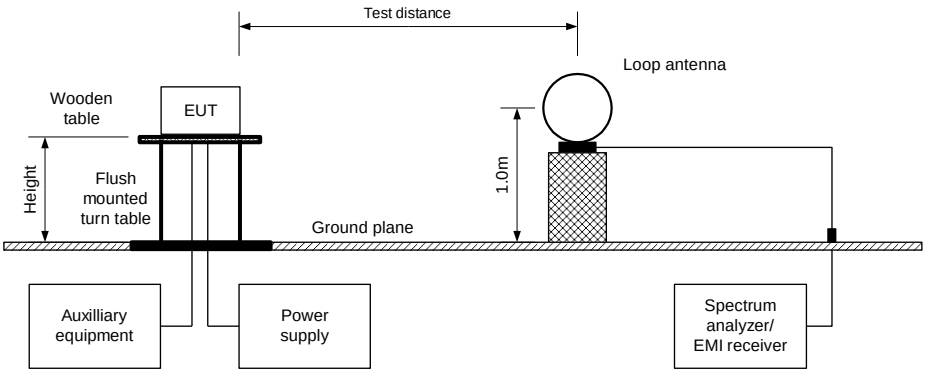
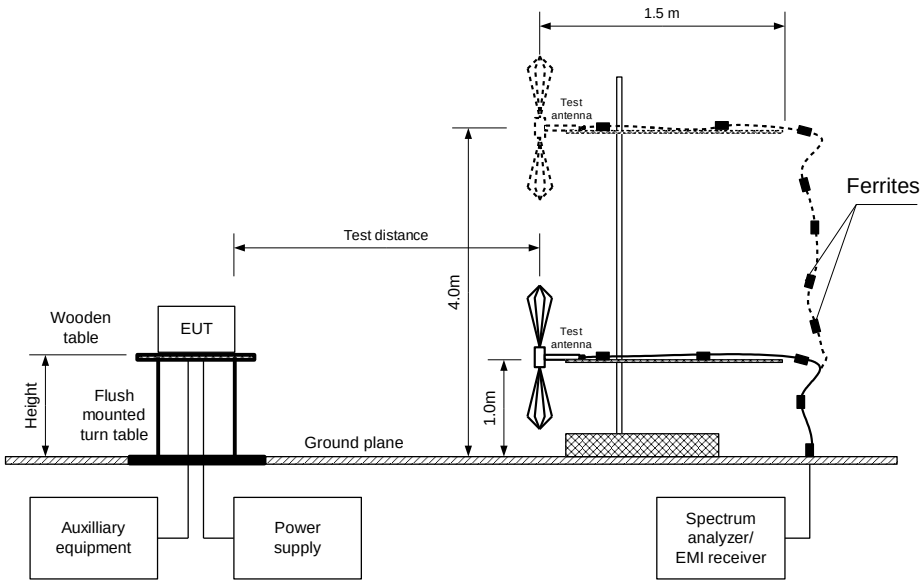
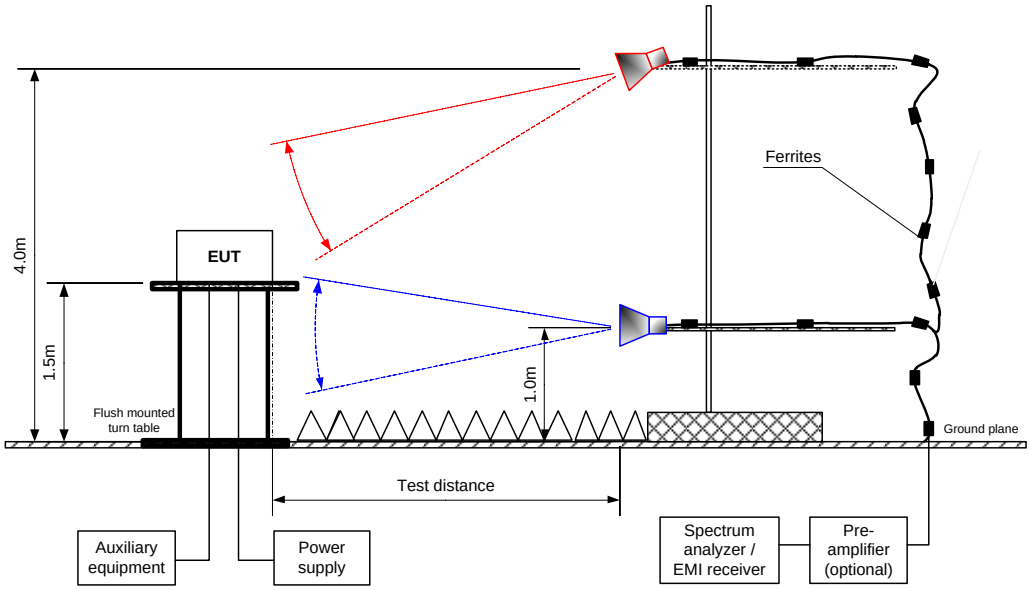



**Figure 7.2.2 Setup for spurious emission field strength measurements from 30 to 1000 MHz**



| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Figure 7.2.3 Setup for spurious emission field strength measurements above1000 MHz**



| **Test specification:** | **Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10, sections 6.5, 6.6 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 01-Apr-22 - 08-Apr-22 | | |
| **Temperature:** 21 ºC | **Relative Humidity:** 53 % | **Air Pressure:** 1012 hPa | **Power:** 3 VDC |
| **Remarks:** | | | |

**Table 7.2.2 Field strength of emissions outside restricted bands**

ASSIGNED FREQUENCY: 902-928 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 -9200MHz
TEST DISTANCE: 3 m
MODULATION: GFSK
BIT RATE: 50 Kbps
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 HOPPING: Disabled

| 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** | | | | | | | | | |
| 1825.500 | 49.4 | Horizontal | 1.6 | 5 | 111.3 | 61.9 | 20.0 | -41.9 | Pass |
| 6389.250 | 50.7 | Vertical | 1.0 | 120 | | 60.6 | | -40.6 | |
| **Mid carrier frequency** | | | | | | | | | |
| 1831.726 | 47.8 | Horizontal | 1.9 | 20 | 111.4 | 63.6 | 20.0 | -43.6 | Pass |
| 6411.041 | 50.4 | Vertical | 1.0 | 113 | | 61.0 | | -41.0 | |
| **High carrier frequency** | | | | | | | | | |
| 1838.212 | 46.8 | Horizontal | 1.6 | 180 | 111.8 | 65.0 | 20.0 | -45.0 | Pass |
| 6433.742 | 47.3 | Vertical | 1.3 | -80 | | 64.5 | | -44.5 | |

*****- EUT front panel refers to 0 degrees position of turntable.
******- Margin = Specification limit- attenuation below carrier.

| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Table 7.2.3 Field strength of spurious emissions above 1 GHz within restricted bands**

ASSIGNED FREQUENCY: 902-928 MHz
INVESTIGATED FREQUENCY RANGE: 1000 – 9200 MHz
TEST DISTANCE: 3 m
MODULATION: GFSK
BIT RATE: 50 Kbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1 MHz
TEST ANTENNA TYPE: Double ridged guide
FREQUENCY HOPPING: Disabled

| 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** | | | | | | | | | | | |
| 2738.25 | Vertical | 1.0 | 83 | 55.4 | 74.0 | -18.6 | 55.4 | 27.4 | 54.0 | -26.6 | Pass |
| 3651.00 | Vertical | 1.6 | -170 | 43.7 | 74.0 | -30.3 | 43.7 | 15.7 | 54.0 | -38.3 | |
| 4563.75 | Horizontal | 1.9 | 71 | 51.3 | 74.0 | -22.7 | 51.3 | 23.3 | 54.0 | -30.7 | |
| 8214.75 | Horizontal | 1.9 | 84 | 48.6 | 74.0 | -25.4 | 48.6 | 20.6 | 54.0 | -33.4 | |
| 9127.50 | Horizontal | 1.6 | 90 | 48.0 | 74.0 | -26.0 | 48.0 | 20.0 | 54.0 | -34.0 | |
| **Mid carrier frequency** | | | | | | | | | | | |
| 2747.589 | Vertical | 1.4 | 75 | 56.4 | 74.0 | -17.6 | 56.4 | 28.4 | 54.0 | -25.6 | Pass |
| 3663.452 | Vertical | 1.3 | -142 | 42.7 | 74.0 | -31.3 | 42.7 | 14.7 | 54.0 | -39.3 | |
| 4579.315 | Horizontal | 1.9 | 60 | 50.9 | 74.0 | -23.1 | 50.9 | 22.9 | 54.0 | -31.1 | |
| 7326.904 | Horizontal | 1.2 | -100 | 46.4 | 74.0 | -27.6 | 46.4 | 18.4 | 54.0 | -35.6 | |
| 8242.767 | Horizontal | 1.0 | 92 | 50.8 | 74.0 | -23.2 | 50.8 | 22.8 | 54.0 | -31.2 | |
| **High carrier frequency** | | | | | | | | | | | |
| 2757.318 | Vertical | 1.3 | -111 | 56.8 | 74.0 | -17.2 | 56.8 | 28.8 | 54.0 | -25.2 | Pass |
| 3676.424 | Vertical | 1.0 | 23 | 44.2 | 74.0 | -29.8 | 44.2 | 16.2 | 54.0 | -37.8 | |
| 4595.530 | Horizontal | 1.6 | -126 | 49.8 | 74.0 | -24.2 | 49.8 | 21.8 | 54.0 | -32.2 | |
| 7352.848 | Horizontal | 1.0 | -101 | 47.5 | 74.0 | -26.5 | 47.5 | 19.5 | 54.0 | -34.5 | |
| 8271.954 | Horizontal | 2.2 | 145 | 44.2 | 74.0 | -29.8 | 44.2 | 16.2 | 54.0 | -37.8 | |

*****- 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 7.2.4 Average factor calculation**

| Transmission pulse | | Transmission burst | | Transmission train duration, ms | Average factor, dB |
|---|---|---|---|---|---|
| Duration, ms | Period, s | Duration, ms | Period, ms | | |
| 4 | 256 | NA | NA | NA | -28 |

*- 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, sections 6.5, 6.6 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 01-Apr-22 - 08-Apr-22 | | |
| **Temperature:** 21 ºC | **Relative Humidity:** 53 % | **Air Pressure:** 1012 hPa | **Power:** 3 VDC |
| **Remarks:** | | | |

**Table 7.2.5 Field strength of spurious emissions below 1 GHz within restricted bands**

| | |
|---|---|
| ASSIGNED FREQUENCY: | 902-928 MHz |
| INVESTIGATED FREQUENCY RANGE: | 0.009 – 1000 MHz |
| TEST DISTANCE: | 3 m |
| MODULATION: | GFSK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 50 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| RESOLUTION BANDWIDTH: | 0.2 kHz (9 kHz – 150 kHz)<br>9.0 kHz (150 kHz – 30 MHz)<br>120 kHz (30 MHz – 1000 MHz) |
| VIDEO BANDWIDTH: | > Resolution bandwidth |
| TEST ANTENNA TYPE: | Active loop (9 kHz – 30 MHz)<br>Biconilog (30 MHz – 1000 MHz) |
| FREQUENCY HOPPING: | Disabled |

| **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 carrier frequency** | | | | | | | | |
| No spurious emissions were found | | | | | | | | Pass |
| **Mid carrier frequency** | | | | | | | | |
| No spurious emissions were found | | | | | | | | Pass |
| **High carrier frequency** | | | | | | | | |
| No spurious emissions were found | | | | | | | | Pass |

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

**Reference numbers of test equipment used**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 3903 | HL 604 | HL 4933 | HL 4339 | HL 4360 | HL 5902 | | |

Full description is given in Appendix A.

| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Table 7.2.6 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 | |

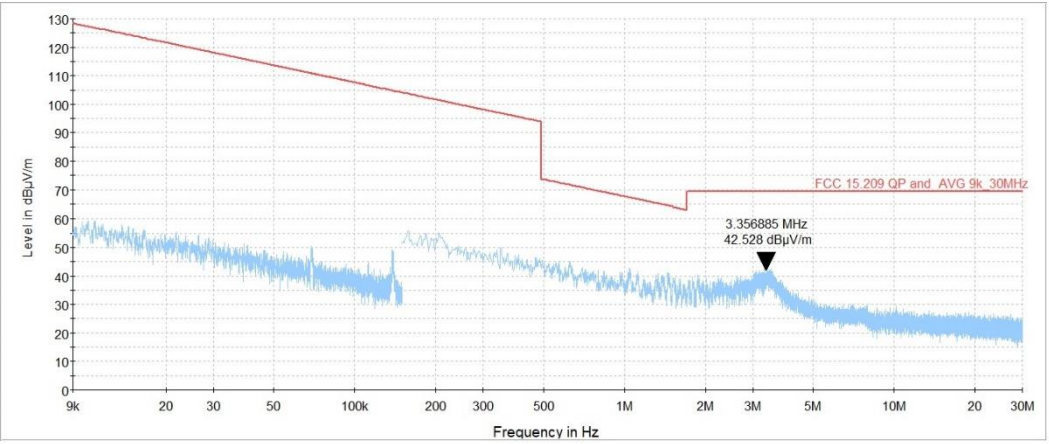
**Table 7.2.7 Restricted bands according to RSS-Gen**

| 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 |

| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

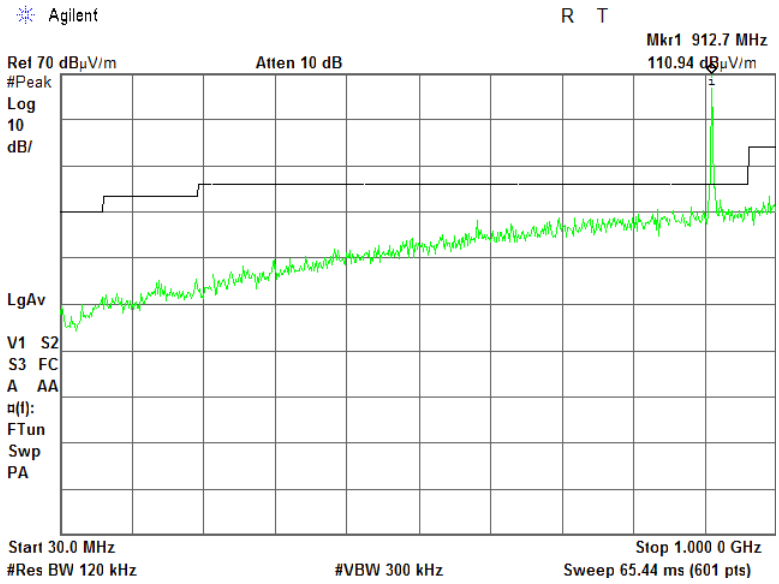
**Plot 7.2.1 Radiated emission measurements from 9 kHz to 30 MHz at the low, mid, high carrier frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m




**Plot 7.2.2 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency**

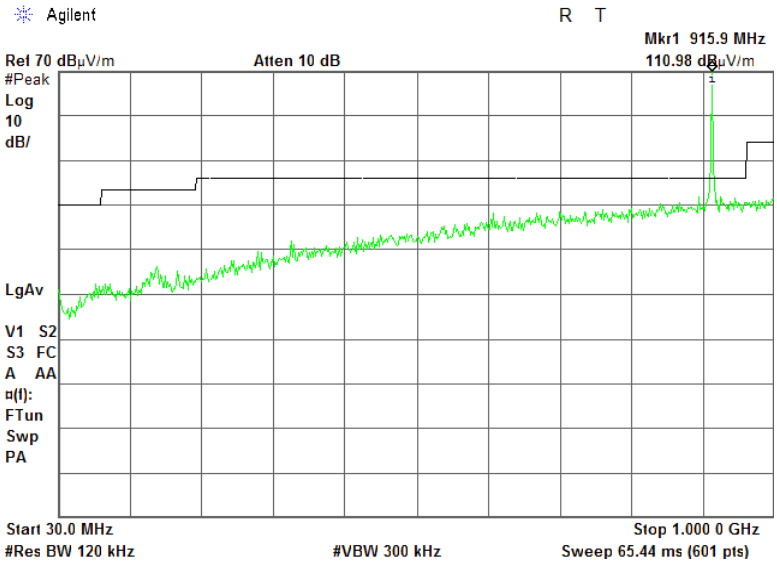
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| **Test specification:** | **Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10, sections 6.5, 6.6 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 01-Apr-22 - 08-Apr-22 | | |
| **Temperature:** 21 ºC | **Relative Humidity:** 53 % | **Air Pressure:** 1012 hPa | **Power:** 3 VDC |
| **Remarks:** | | | |

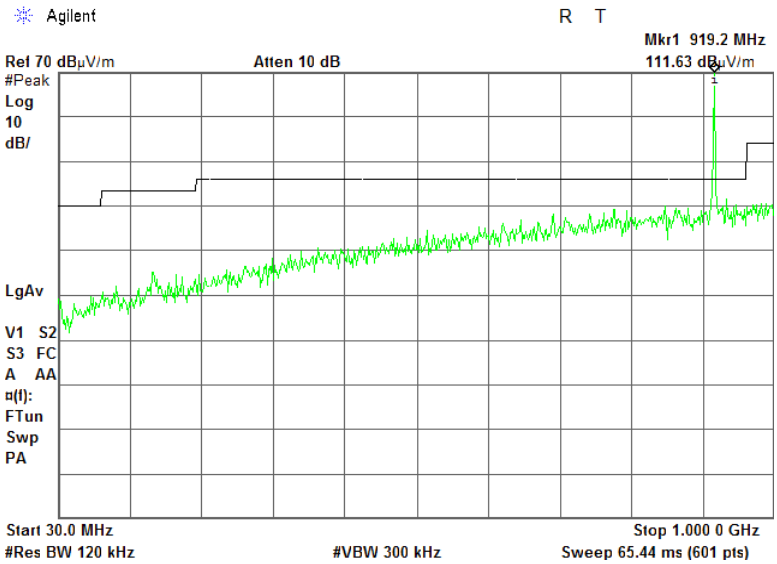
**Plot 7.2.3 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency**

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




**Plot 7.2.4 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency**

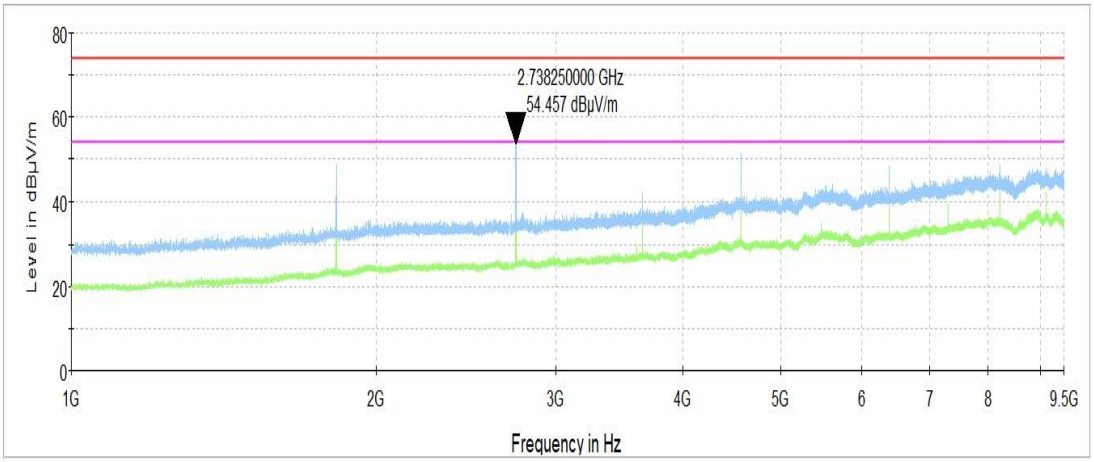
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

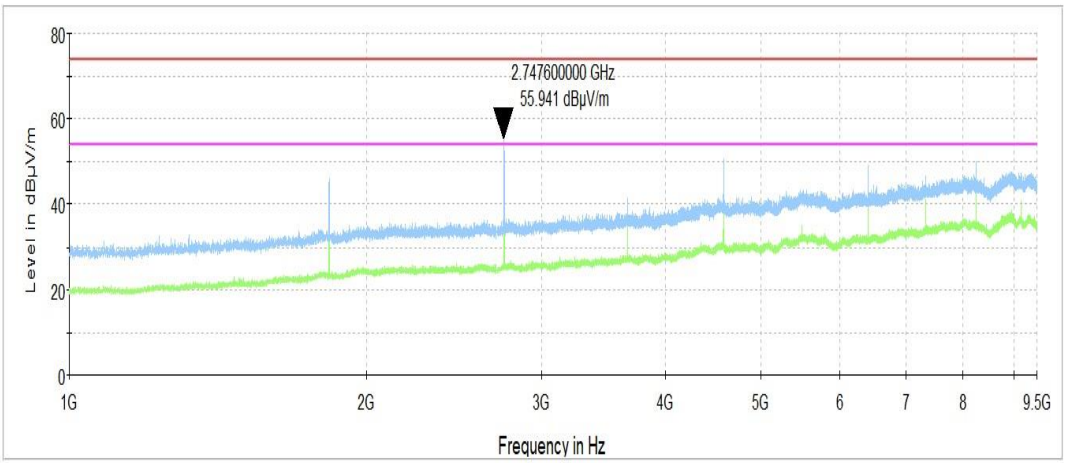
**Plot 7.2.5 Radiated emission measurements from 1000 to 9500 MHz at the low carrier frequency**

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




**Plot 7.2.6 Radiated emission measurements from 1000 to 9500 MHz at the mid carrier frequency**

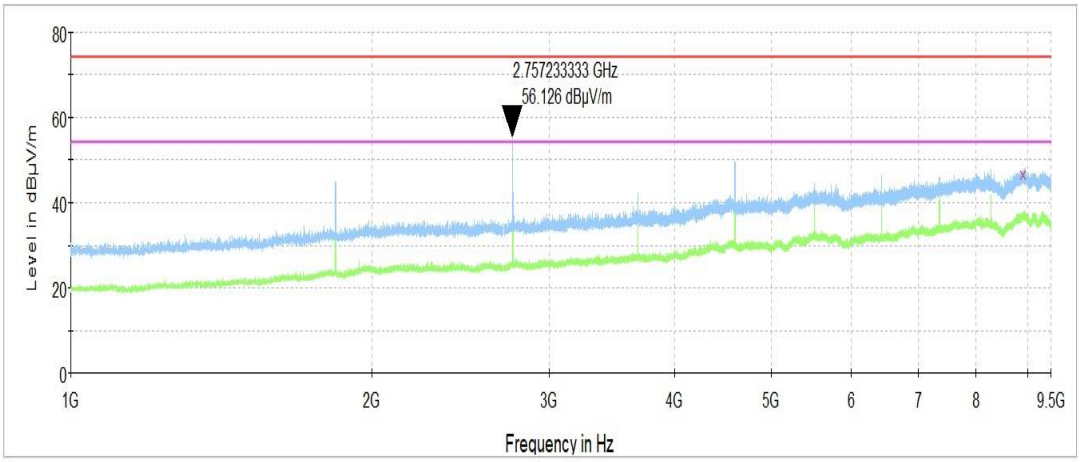
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

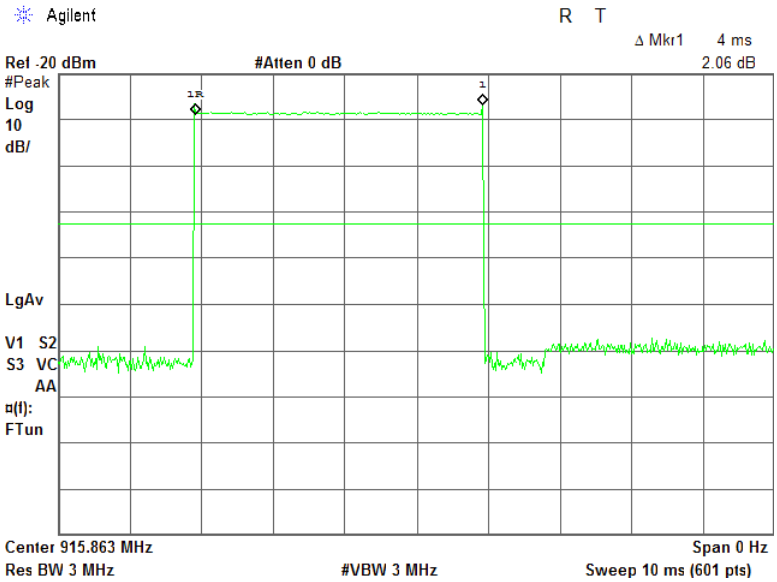
**Plot 7.2.7 Radiated emission measurements from 1000 to 9500 MHz at the high carrier frequency**

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

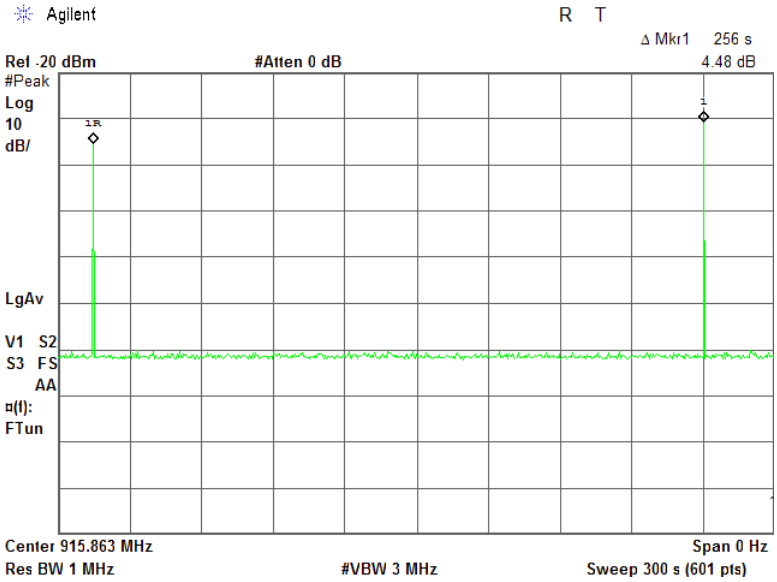


| Test specification: | Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10, sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 01-Apr-22 - 08-Apr-22 | | |
| Temperature: 21 ºC | Relative Humidity: 53 % | Air Pressure: 1012 hPa | Power: 3 VDC |
| Remarks: | | | |

**Plot 7.2.8 Transmission pulse duration**




**Plot 7.2.9 Transmission pulse period**



# 8 APPENDIX A Test equipment and ancillaries used for tests

| HL No | Description | Manufacturer | Model | Ser. No. | Last Cal./ Check | Due Cal./ Check |
|---|---|---|---|---|---|---|
| 0604 | Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz | EMCO | 3141 | 9611-1011 | 11-May-21 | 11-May-22 |
| 3818 | PSA Series Spectrum Analyzer, 3 Hz- 44 GHz | Agilent Technologies | E4446A | MY48250288 | 02-Aug-21 | 02-Aug-22 |
| 3903 | Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA | Huber-Suhner | SUCOFLEX 102A | 1226/2A | 06-Apr-21 | 06-Apr-22 |
| 4339 | High pass Filter, 50 Ohm, 1000 to 18000 MHz, SMA-FM / SMA-M | Micro-Tronics | HPM50115-02 | 001 | 15-Jun-21 | 15-Jun-23 |
| 4360 | EMI Test Receiver, 20 Hz to 40 GHz. | Rohde & Schwarz | ESU40 | 100322 | 13-Jan-22 | 13-Jan-23 |
| 4933 | Active Horn Antenna, 1 GHz to 18 GHz | COM-POWER CORPORATION | AHA-118 | 701046 | 13-Jan-22 | 13-Jan-23 |
| 5902 | RF cable, 18 GHz, 6.0m, N-type | Huber-Suhner | SF126EA/11N/11N/6000 | NA | 16-Jan-22 | 16-Jan-23 |

# 9 APPENDIX B Test equipment correction factors

**HL 0604: Antenna BiconiLog Log-Periodic/T Bow-TIE**
**EMCO, model 3141, serial number 9611-1011**

| Frequency, MHz | Antenna factor, dB/m | | |
|---|---|---|---|
| | Measured | Last | Deviation |
| 30 | 12.1 | 12.6 | -0.5 |
| 35 | 9.1 | 9.5 | -0.4 |
| 40 | 8.0 | 8.3 | -0.3 |
| 45 | 8.3 | 8.6 | -0.3 |
| 50 | 9.0 | 9.1 | -0.1 |
| 60 | 10.5 | 10.7 | -0.2 |
| 70 | 11.4 | 11.3 | 0.1 |
| 80 | 12.3 | 12.2 | 0.1 |
| 90 | 13.4 | 13.2 | 0.2 |
| 100 | 13.0 | 13.0 | 0.0 |
| 120 | 11.4 | 11.4 | 0.0 |
| 140 | 12.5 | 12.4 | 0.1 |
| 160 | 14.9 | 14.8 | 0.1 |
| 180 | 14.4 | 14.0 | 0.4 |
| 200 | 13.7 | 13.9 | -0.2 |
| 250 | 16.3 | 16.4 | -0.1 |
| 300 | 17.2 | 17.5 | -0.3 |
| 400 | 19.8 | 20.2 | -0.4 |
| 500 | 22.0 | 22.4 | -0.4 |
| 600 | 24.3 | 24.5 | -0.2 |
| 700 | 25.8 | 25.6 | 0.2 |
| 800 | 26.9 | 26.6 | 0.3 |
| 900 | 27.3 | 28.0 | -0.7 |
| 1000 | 28.5 | 29.3 | -0.8 |

The antenna factor shall be added to receiver reading in dBµV to obtain field strength in dBµV/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 dBμV to obtain field strength in dBμV/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<br>12.4 GHz to 40 GHz: ± 2.3 dB |
| Conducted emissions at RF antenna connector | 9 kHz to 2.9 GHz: ± 2.6 dB<br>2.9 GHz to 6.46 GHz: ± 3.5 dB<br>6.46 GHz to 13.2 GHz: ± 4.3 dB<br>13.2 GHz to 22.0 GHz: ± 5.0 dB<br>22.0 GHz to 26.8 GHz: ± 5.5 dB<br>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<br>150 kHz to 30 MHz: ± 3.8 dB |
| Radiated emissions at 3 m measuring distance<br>Horizontal polarization<br><br><br><br>Vertical polarization | <br>Biconilog antenna: ± 5.3 dB<br>Biconical antenna: ± 5.0 dB<br>Log periodic antenna: ± 5.3 dB<br>Double ridged horn antenna: ± 5.3 dB<br>Biconilog antenna: ± 6.0 dB<br>Biconical antenna: ± 5.7 dB<br>Log periodic antenna: ± 6.0 dB<br>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.

# 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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e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

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

# 12 APPENDIX E Specification references

| | |
|---|---|
| FCC 47CFR part 15: 2020 | Radio Frequency Devices |
| ANSI C63.10: 2013 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| RSS-247 Issue 2: 2017 | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence- Exempt Local Area Network (LE-LAN) Devices |
| RSS-Gen Issue 5 with_amendment_1_2: 2021 | General Requirements and Information for the Certification of Radiocommunication Equipment |

# 13 APPENDIX F Manufacturer's declaration

Visonic
A Tyco International Company

*Visonic Ltd.*
*24 Habarzel Street*
*P.O.Box 22020*
*Tel-Aviv 69710, Israel*

*Tele: +972 3 645 6789*
*Fax: +972 3 645 6788*
*www.visonic.com*

## Declaration of Identity

We, the undersigned,

Company: Visonic Ltd
Address: 24 Habarzel Street
Country: Israel
Telephone number: +972 3 6456 789
Fax number: +972 3 6456 788

Declare under our sole responsibility that the following equipment:

| Brand/Item | Type/Model | Short Product description |
|---|---|---|
| Johnson Controls | MC-302E P9M0 | PG+ Wired Input Door/Window Magnetic Contact, 915MHz |

Is electronically/electrically identical to the following equipment:

| Brand/Item | Type/Model | Short Product description |
|---|---|---|
| TYCO | MC-309 PG2 | PowerG Wireless Magnetic Contact Device with Hardwired Inputs, 915MHz |

The differences are: moved LED place in the PCB, reduce to two hardwired inputs instead of three, Flash added, new plastic enclosure design, addition of some new supplementary SW features.

28/04/2022

Zuri Rubin

Certification Manager - Visonic

# 14 APPENDIX G Abbreviations and acronyms

| | |
|---|---|
| A | ampere |
| 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(μV) | decibel referred to one microvolt |
| dB(μV/m) | decibel referred to one microvolt per meter |
| dB(μA) | decibel referred to one microampere |
| DC | direct current |
| EIRP | equivalent isotropically radiated power |
| ERP | effective radiated power |
| 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 |
| μs | microsecond |
| NA | not applicable |
| NB | narrow band |
| OATS | open area test site |
| Ω | Ohm |
| PM | pulse modulation |
| PS | power supply |
| ppm | part per million ($10^{-6}$) |
| QP | quasi-peak |
| RE | radiated emission |
| RF | radio frequency |
| rms | root mean square |
| Rx | receive |
| s | second |
| T | temperature |
| Tx | transmit |
| V | volt |
| WB | wideband |

END OF DOCUMENT