HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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# TEST REPORT

**ACCORDING TO: FCC CFR 47 Part 15 subpart C, section 15.231 and subpart B; RSS-210 issue 9 Annex A, ICES-003 Issue 6:2016**

**FOR:**

## Paradox Security Systems Ltd.
## Wireless Door Contact
## Model: DCT6
## FCC ID:KDYDCT6
## IC: 2438A-DCT6

# Table of contents

# 1 Applicant information

| | |
|---|---|
| **Client name:** | Paradox Security Systems Ltd. |
| **Address:** | 780 Industrial Boulevard St.Eustache, Quebec J7R 5V3 Canada |
| **Telephone:** | 450-491-7444 |
| **Fax:** | 450-497-1095 |
| **E-mail:** | alexc@paradox.com |
| **Contact name:** | Mr. Alex Chaplik |

# 2 Equipment under test attributes

| | |
|---|---|
| **Product name:** | Wireless Door Contact |
| **Product type:** | Transmitter |
| **Model(s):** | DCT6 |
| **Serial number:** | 2E0000451 |
| **Hardware version:** | 320-0000-992 |
| **Software release:** | V1.00 |
| **Receipt date** | 28-Dec-17 |

# 3 Manufacturer information

| | |
|---|---|
| **Manufacturer name:** | Paradox Security Systems Ltd. |
| **Address:** | 780 Industrial Boulevard St.Eustache, Quebec J7R 5V3 Canada |
| **Telephone:** | 450-491-7444 |
| **Fax:** | 450-497-1095 |
| **E-Mail:** | rhamitouche@paradox.com |
| **Contact name:** | Mr. Rabah Hamitouche |

# 4 Test details

| | |
|---|---|
| **Project ID:** | 30220 |
| **Location:** | Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel |
| **Test started:** | 28-Dec-17 |
| **Test completed:** | 02-Jan-18 |
| **Test specification(s):** | FCC 47CFR part 15, subpart C, §15.231 and subpart B;<br>RSS-210 issue 9 Annex A, ICES-003 issue 6:2016 |

# 5 Tests summary

| Test | Status |
|---|---|
| **Transmitter characteristics** | |
| FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements | Pass |
| FCC Part 15, Section 231(a) / RSS-210, Section A1.2, Field strength of emissions | Pass |
| FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth | Pass |
| FCC Part 15, Section 207 / RSS-Gen, Section 8.8, Conducted emission | Not required |
| FCC Part 15, Section 203 / RSS-Gen, Section 8.3, Antenna requirements | Pass |
| **Unintentional emissions** | |
| FCC Part 15, Section 107 / ICES-003, Section 6.1 class B, Conducted emission at AC power port | Not required |
| FCC Part 15, Section 109 / ICES-003, Section 6.2 class B, Radiated emission | Pass |

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.

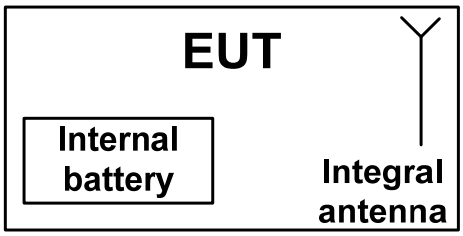
| | Name and Title | Date | Signature |
|---|---|---|---|
| **Tested by:** | Mrs. E.Pitt, test engineer | January 2, 2018 |  |
| **Reviewed by:** | Mrs. M. Cherniavsky, certification engineer | January 15, 2018 |  |
| **Approved by:** | Mr. K. Zushchyk, Projects & Customer Manager, EMC & Radio | January 22, 2018 |  |

# 6 EUT description

## 6.1 General information

The EUT is DCT6 Wireless Door Contact operating at 433.92 MHz and powered by 1.5V internal battery (AAA).

## 6.2 Test configuration




## 6.3 Changes made in EUT

No changes were implemented in the EUT during testing.

## 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) | | | | | | |

| **Operating frequency** | 433.92 MHz | |
|---|---|---|
| **Maximum rated output power** | At transmitter 50 Ω RF output connector | |
| | Field strength at 3 m distance | 74.4 dB(µV/m) – peak<br>63.0 dB(µV/m) -average |

| **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 | FORESIGHT ENT. Ltd. | 125-0868-200 | 0 dBi |

| **Transmitter aggregate data rate/s** | 1.67 kbps |
|---|---|
| **Type of modulation** | OOK |
| **Modulating test signal (baseband)** | ID code |

| **Transmitter power source** | | | | | |
|---|---|---|---|---|---|
| X | Battery | **Nominal rated voltage** | 1.5 VDC | Battery type | Alkaline type AAA |
| | DC | **Nominal rated voltage** | VDC | | |
| | AC mains | **Nominal rated voltage** | VAC | Frequency | |

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

| Test specification: | FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements | | |
|---|---|---|---|
| Test procedure: | Supplier declaration | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

# 7 Transmitter tests according to 47CFR part 15 subpart C and RSS-210 requirements

## 7.1 Periodic operation requirements

### 7.1.1 General

The EUT was verified for compliance with periodic operation requirements listed below:

- Continuous transmissions such as voice, video and the radio control of toys are not permitted;
- A manually operated transmitter shall employ switch that will automatically deactivate the transmitter within not more than 5 seconds of being released;
- A transmitter activated automatically shall cease transmission within 5 seconds after activation;
- Periodic transmissions, excluding polling or supervision transmissions, at regular predetermined intervals are not permitted;
- Total duration of polling or supervision transmissions, including data, to determine system integrity in security or safety applications shall not exceed 2 seconds per hour;
- Transmission of set-up information for security systems may exceed the transmission duration limits of 5 seconds, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

The rationale for compliance with the above requirements was either test results or supplier declaration. The summary of results is provided in Table 7.1.1.

### 7.1.2 Test procedure for transmitter shut down test

**7.1.2.1** The EUT was set up as shown in Figure 7.1.1.

**7.1.2.2** The spectrum analyzer center frequency was adjusted to the EUT carrier, span set to zero and video triggered for transmission.

**7.1.2.3** The transmitter was activated either manually or automatically. Once manually operated transmitter was activated, the switch was immediately released.

**7.1.2.4** The transmission time was captured and shown in Plot 7.1.1.

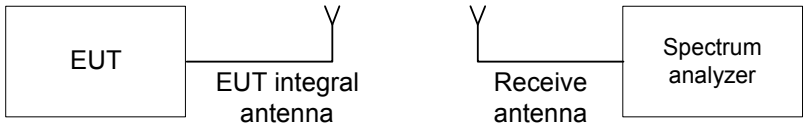
### 7.1.3 Test procedure for measurements of polling / supervision transmission duration

**7.1.3.1** The EUT was set up as shown in Figure 7.1.1.

**7.1.3.2** The spectrum analyzer center frequency was adjusted to the EUT carrier, span set to zero and video triggered for transmission.

**7.1.3.3** The transmission time was captured and shown in Plot 7.1.2, Plot 7.1.3.

**Figure 7.1.1 Setup for transmitter shut down test**



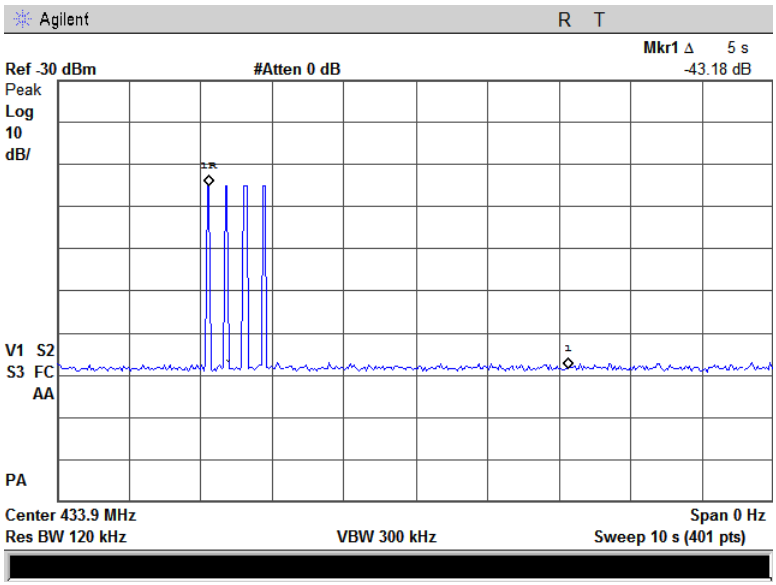
| Test specification: | FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements | | |
|---|---|---|---|
| Test procedure: | Supplier declaration | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Table 7.1.1 Periodic operation requirements**

| Requirement | Rationale | Verdict |
|---|---|---|
| Continuous transmissions are not permitted | Supplier declaration* | Comply |
| A manually operated transmitter shall be deactivated within not more than 5 seconds of switch being released | NA | NA |
| Transmitter activated automatically shall cease transmission within 5 seconds | Plot 7.1.1 | Comply |
| Periodic transmissions at regular predetermined intervals are not permitted | Supplier declaration* | Comply |
| Total duration of polling or supervision transmissions shall not exceed 2 seconds per hour | Plot 7.1.2, Plot 7.1.3 | Comply |
| Transmission of set-up information for security systems may exceed the transmission duration limits of 5 seconds, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data. | Supplier declaration | Comply |

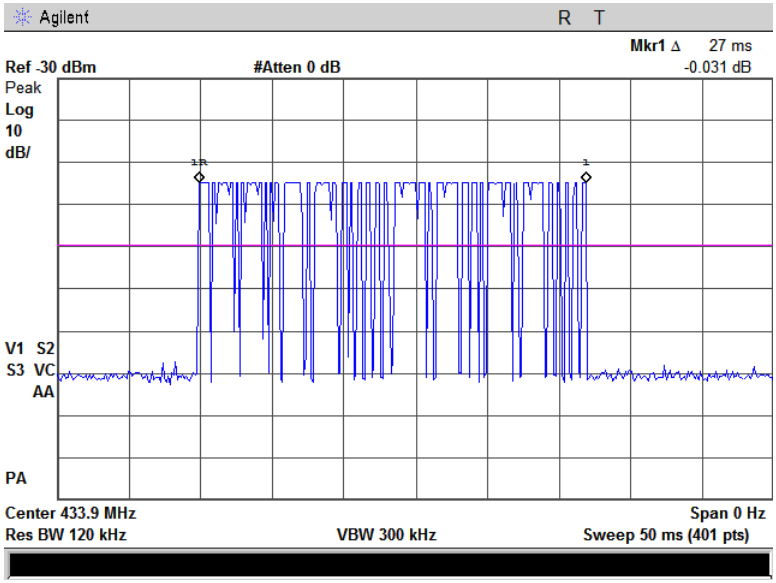
* Provided in Appendix G.

**Plot 7.1.1 Transmitter shut down test result**

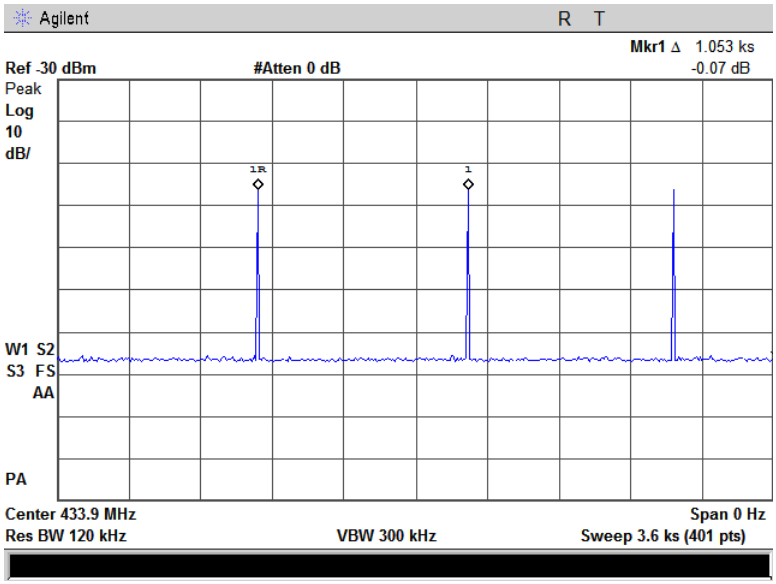


| Test specification: | FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements | | |
|---|---|---|---|
| Test procedure: | Supplier declaration | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 | | |
| Temperature: 23 °C | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Plot 7.1.2 Supervision transmission duration**




**Plot 7.1.3 Supervision transmission period**



| Test specification: | FCC Part 15, Section 231(a) / RSS-210, Section A1.1, Periodic operation requirements | | |
|---|---|---|---|
| Test procedure: | Supplier declaration | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Table 7.1.2 Total duration of polling / supervision transmissions**

| Duration, ms | Repetition period, ms | Maximum number of transmissions within 1 hour | Total duration within 1 hour, ms |
|---|---|---|---|
| 27 | NA | 16 | 432 |

**Reference numbers of test equipment used**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 3001 | | | | | | | |

Full description is given in Appendix A.

| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

## 7.2 Field strength of emissions

### 7.2.1 General

This test was performed to measure field strength of fundamental and spurious emissions from the EUT. Specification test limits are given in Table 7.2.1 and Table 7.2.2.

**Table 7.2.1 Radiated fundamental emission limits**

| Fundamental frequency, MHz | Field strength at 3 m, dB(μV/m) | |
|---|---|---|
| | Peak | Average |
| 433.92 | 100.8 | 80.8 |

**Table 7.2.2 Radiated spurious emissions limits**

| Frequency, MHz | Field strength at 3 m, dB(μV/m) | | | | |
|---|---|---|---|---|---|
| | Within restricted bands | | | Outside restricted bands | |
| | Peak | Quasi Peak | Average | Peak | Average |
| 0.009 – 0.090 | 148.5 – 128.5 | NA | 128.5 – 108.5** | 80.8 | 60.8 |
| 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 | | | |
| Above 1000 | 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.

*Note 1:* The fundamental emission limit in dB(μV/m) was calculated as follows:

$$Lim_{AVR} = 20 \times \log(56.81818 \times F - 6136.3636)$$ - within 130 – 174 MHz band;

$$Lim_{AVR} = 20 \times \log(41.6667 \times F - 7083.3333)$$ - within 260 – 470 MHz band,

where F is the carrier frequency in MHz.

The limit for spurious emissions was 20 dB lower than fundamental emission limit.

The above limits provided in terms of average values, peak limit was 20 dB above the average limit.

*Note 2:* The above 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.

| **Test specification:** | **FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10 sections 6.5, 6.6 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 28-Dec-17 - 31-Dec-17 | | |
| **Temperature:** 23 ºC | **Relative Humidity:** 55 % | **Air Pressure:** 1010 hPa | **Power:** 1.5 VDC |
| **Remarks:** | | | |

**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 in Table 7.2.3, Table 7.2.5 and shown in the associated plots.

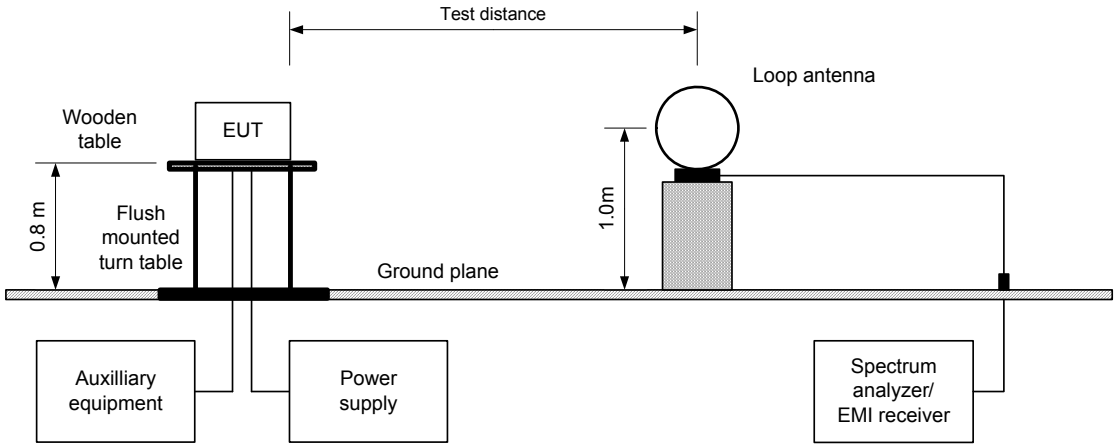
**7.2.3 Test procedure for spurious emission field strength measurements above 30 MHz**

**7.2.3.1** The EUT was set up as shown in Figure 7.2.2, Figure 7.2.3, 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 in Table 7.2.3, Table 7.2.5 and shown in the associated plots.

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



| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Figure 7.2.2 Setup for spurious emission field strength measurements above 30 MHz**

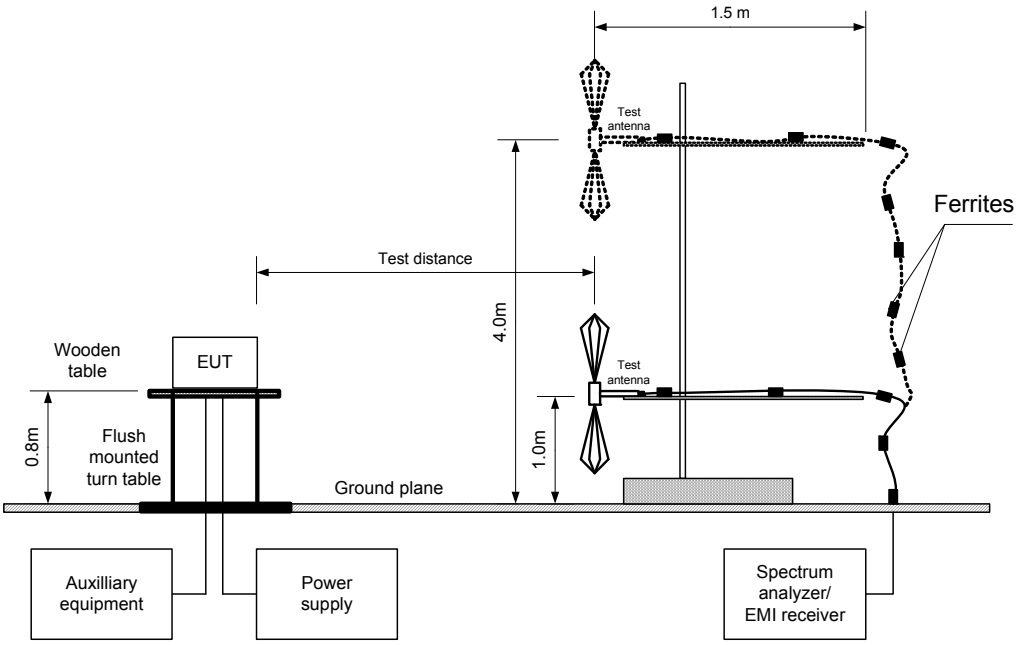
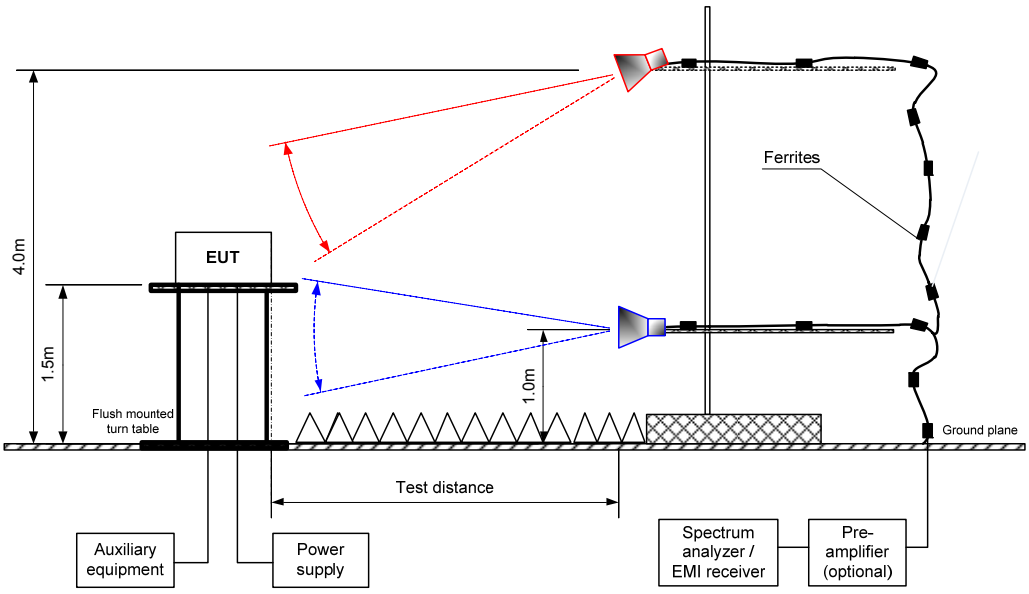



**Figure 7.2.3 Setup for spurious emission field strength measurements above1000 MHz**



| **Test specification:** | **FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10 sections 6.5, 6.6 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 28-Dec-17 - 31-Dec-17 | | |
| **Temperature:** 23 ºC | **Relative Humidity:** 55 % | **Air Pressure:** 1010 hPa | **Power:** 1.5 VDC |
| **Remarks:** | | | |

**Table 7.2.3 Field strength of fundamental emission, spurious emissions outside restricted bands and within restricted bands at frequencies above 1 GHz**

| | |
|---|---|
| TEST DISTANCE: | 3 m |
| EUT POSITION: | Typical (Horizontal) |
| MODULATION: | OOK |
| BIT RATE: | 1.67 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| INVESTIGATED FREQUENCY RANGE: | 0.009 -4500.0 MHz |
| DETECTOR USED: | Peak |
| RESOLUTION BANDWIDTH: | 1.0 kHz (9 kHz – 150 kHz)<br>9.0 kHz (150 kHz – 30 MHz)<br>120 kHz (30 MHz – 1000 MHz)<br>1.0 MHz (above 1000 MHz) |
| VIDEO BANDWIDTH: | ≥ Resolution bandwidth |
| TEST ANTENNA TYPE: | Active loop (9 kHz – 30 MHz)<br>Biconilog (30 MHz – 1000 MHz)<br>Double ridged guide (above 1000 MHz) |

| F, MHz | Antenna | | Azimuth, degrees* | Peak field strength | | | Average field strength | | | | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pol. | 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** | |
| **Fundamental emission** | | | | | | | | | | | |
| 433.920 | Hor. | 1.0 | 90 | 74.41 | 100.8 | -26.39 | 74.41 | 63.04 | 80.8 | -17.76 | Pass |
| **Spurious emissions** | | | | | | | | | | | |
| 867.84 | Hor | 1.0 | 90 | 51.81 | 80.8 | -28.99 | 51.81 | 40.44 | 60.8 | -20.36 | Pass |
| 1301.72 | Hor | 1.7 | 87 | 46.13 | 74.0 | -27.87 | 46.13 | 34.76 | 54.0 | -19.24 | |
| 1735.68 | Hor | 1.1 | 90 | 53.16 | 80.8 | -27.64 | 53.16 | 41.79 | 60.8 | -19.01 | |
| 2169.59 | Hor | 1.55 | 76 | 61.26 | 80.8 | -19.54 | 61.26 | 49.89 | 60.8 | -10.91 | |
| 2603.52 | Hor | 1.1 | 90 | 44.04 | 80.8 | -36.76 | 44.04 | 32.67 | 60.8 | -28.13 | |
| 3037.41 | Hor | 1.3 | 87 | 43.91 | 80.8 | -36.89 | 43.91 | 32.54 | 60.8 | -28.26 | |

*****- EUT front panel refers to 0 degrees position of turntable.
******- Margin, dB =Measured (calculated) value, dB(μV/m)-Limit, dB(μV/m)

**Table 7.2.4 Average factor calculation**

| Transmission pulse | | Transmission burst | | Transmission train duration, ms | Average factor, dB |
|---|---|---|---|---|---|
| TxON Duration, ms | During 100 ms | Duration, ms | Period, ms | | |
| 27 | 1 | N/A | N/A | NA | -11.37 |

*- 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: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

**Reference numbers of test equipment used**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 0446 | HL 0604 | HL 4276 | HL 4339 | HL 4353 | HL 4543 | HL 4933 | |

Full description is given in Appendix A.

| **Test specification:** | **FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10 sections 6.5, 6.6 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 28-Dec-17 - 31-Dec-17 | | |
| **Temperature:** 23 ºC | **Relative Humidity:** 55 % | **Air Pressure:** 1010 hPa | **Power:** 1.5 VDC |
| **Remarks:** | | | |

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

| | |
|---|---|
| TEST DISTANCE: | 3 m |
| EUT POSITION: | Typical (Horizontal) |
| MODULATION: | OOK |
| BIT RATE: | 1.67 kbps |
| INVESTIGATED FREQUENCY RANGE: | 0.009 – 1000 MHz |
| DETECTOR USED: | Peak |
| RESOLUTION BANDWIDTH: | 1.0 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, 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*** | | | | |
| No 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 0446 | HL 0604 | HL 4276 | HL 4339 | HL 4353 | HL 4543 | | |

Full description is given in Appendix A.

| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Table 7.2.6 Restricted bands according to FCC 15, Section 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 | 12.290 - 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 | 16.420 - 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 | |

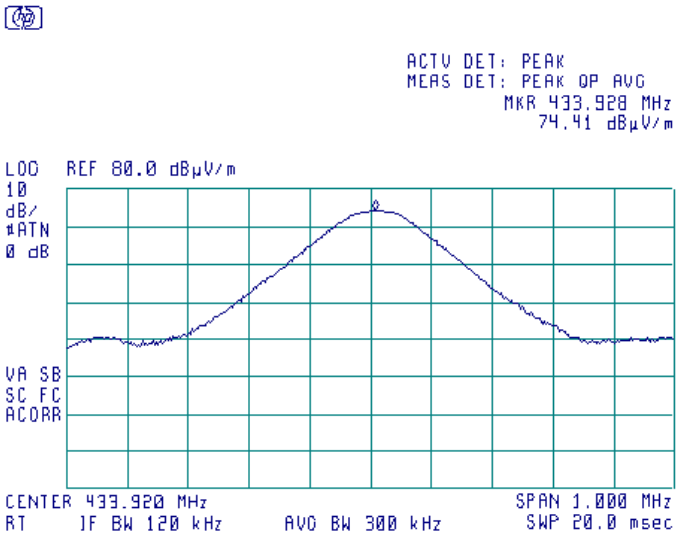
**Table 7.2.7 Restricted bands according to RSS-Gen, Table 3**

| 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 - 2.190 | 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 | 12.290 - 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 – 24.0 |
| 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: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10 sections 6.5, 6.6 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 28-Dec-17 - 31-Dec-17 | | |
| **Temperature:** 23 ºC | **Relative Humidity:** 55 % | **Air Pressure:** 1010 hPa | **Power:** 1.5 VDC |
| **Remarks:** | | | |

**Plot 7.2.1 Radiated emission measurements at the fundamental frequency**

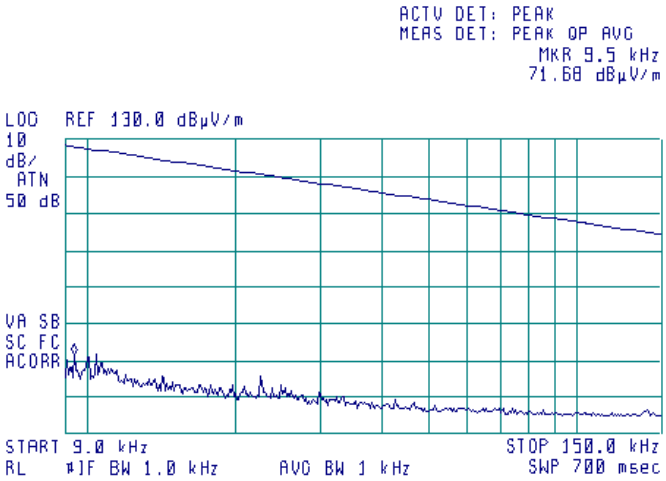
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal
EUT POSITION: Typical (Horizontal)



| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

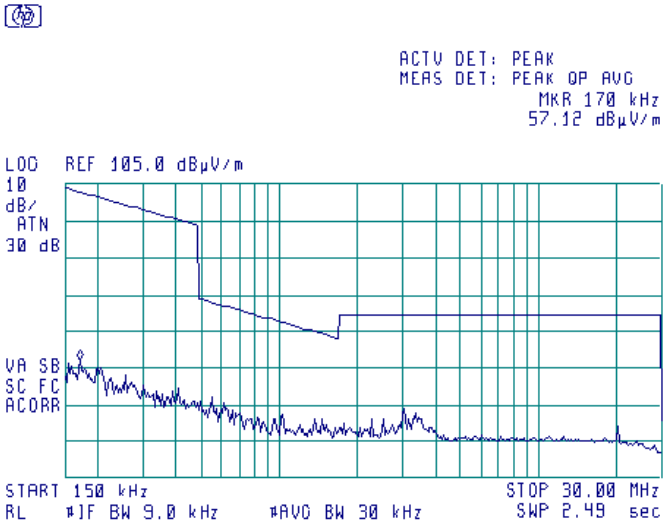
**Plot 7.2.2 Radiated emission measurements from 9 to 150 kHz**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: Typical (Horizontal)




**Plot 7.2.3 Radiated emission measurements from 0.15 to 30 MHz**

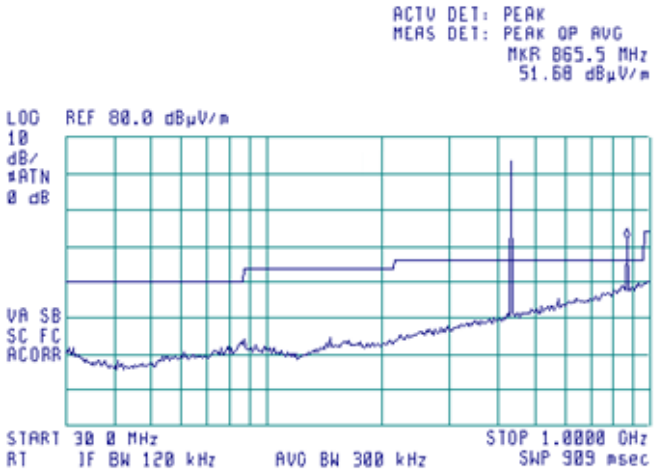
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: Typical (Horizontal)



| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

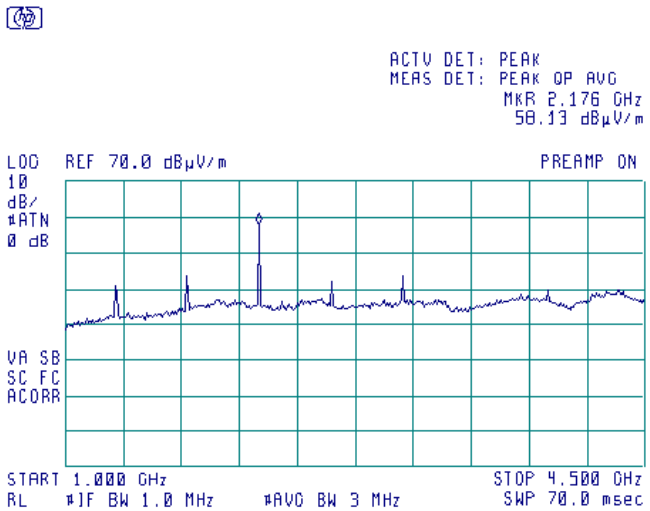
**Plot 7.2.4 Radiated emission measurements from 30 to 1000 MHz**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical (Horizontal)




**Plot 7.2.5 Radiated emission measurements from 1000 to 4500 MHz**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Typical (Horizontal)

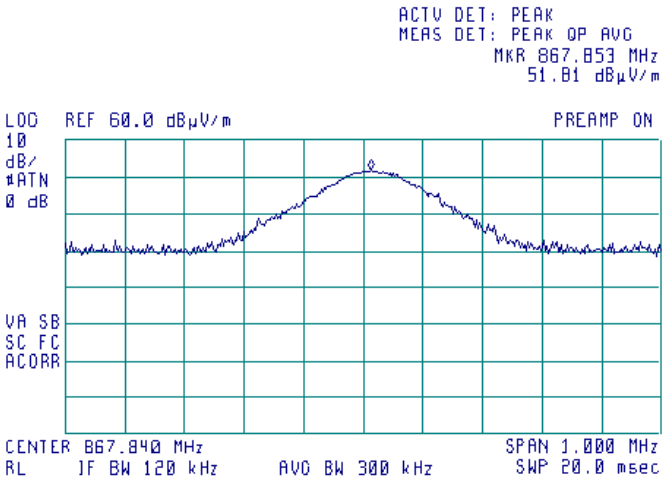



Note: Limit of 74 dBµV/m was used

| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

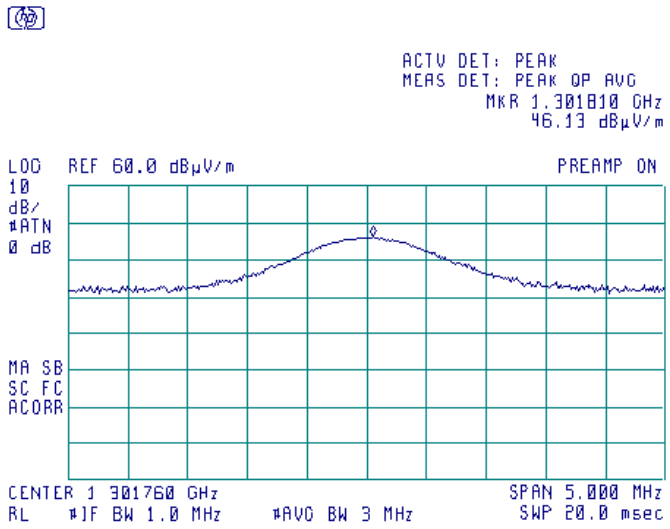
**Plot 7.2.6 Radiated emission measurements at the second harmonic frequency**

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




**Plot 7.2.7 Radiated emission measurements at the third harmonic frequency**

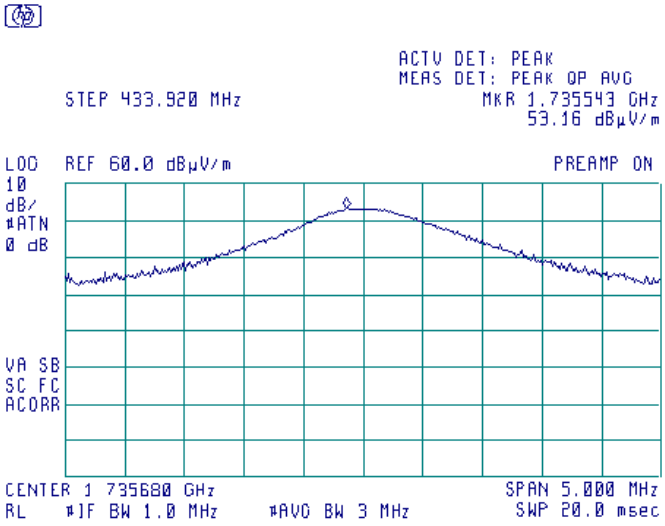
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical& Horizontal
EUT POSITION: Typical (Horizontal)



| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

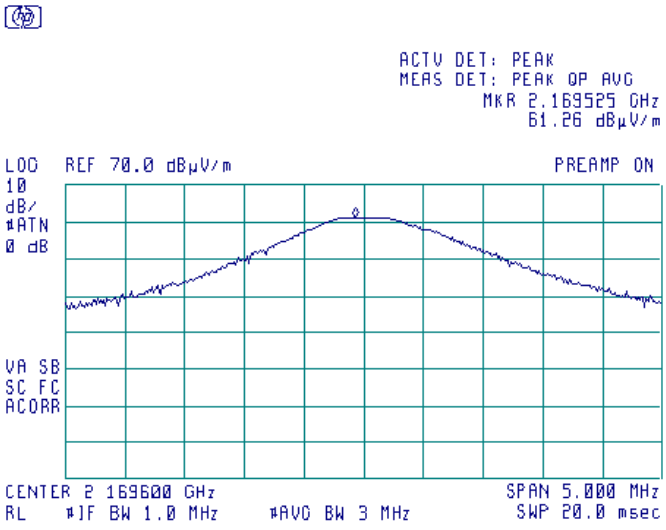
**Plot 7.2.8 Radiated emission measurements at the fourth harmonic frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical& Horizontal
EUT POSITION: Typical (Horizontal)




**Plot 7.2.9 Radiated emission measurements at the fifth harmonic frequency**

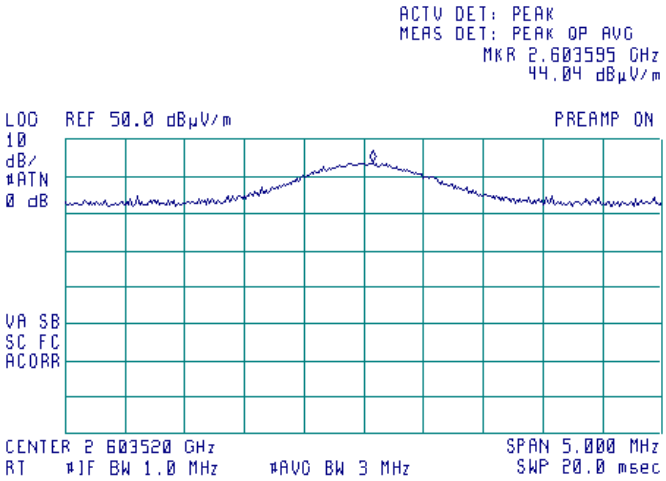
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical& Horizontal
EUT POSITION: Typical (Horizontal)



| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

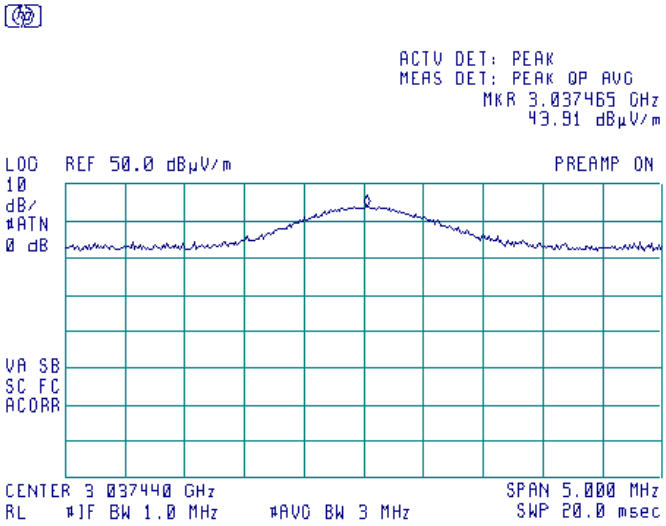
**Plot 7.2.10 Radiated emission measurements at the sixth harmonic frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical& Horizontal
EUT POSITION: Typical (Horizontal)



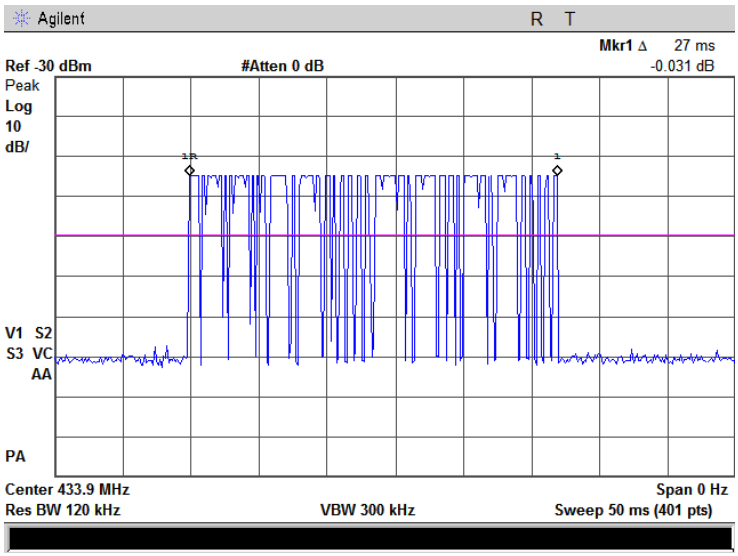

**Plot 7.2.11 Radiated emission measurements at the seventh harmonic frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical& Horizontal
EUT POSITION: Typical (Horizontal)

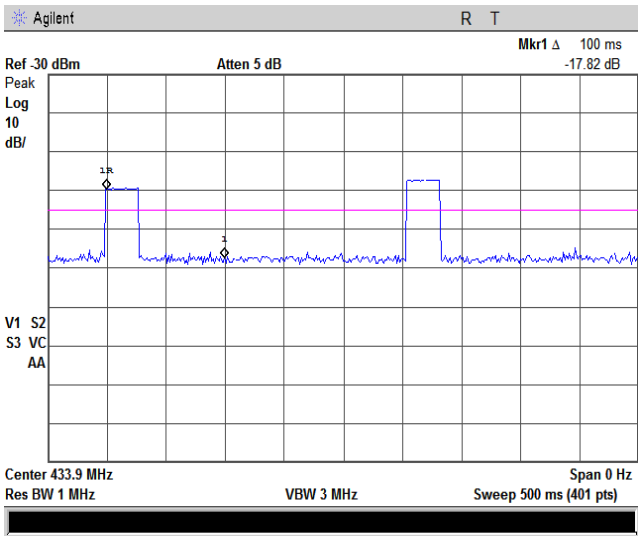


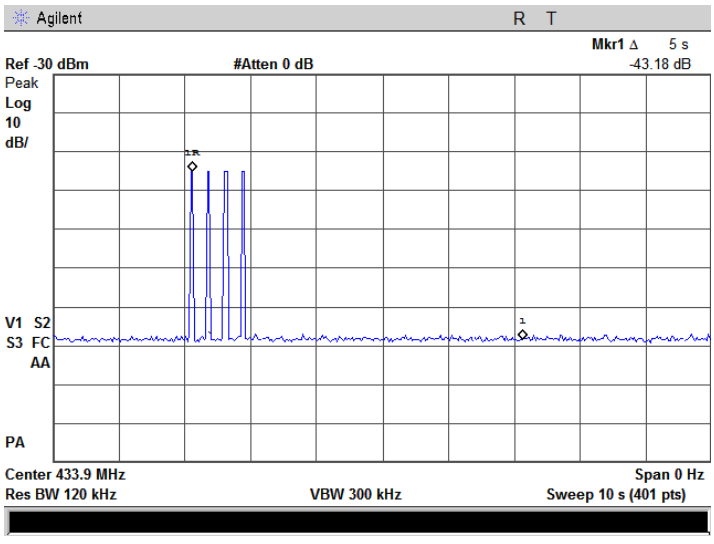
| Test specification: | FCC Part 15, Section 231(b) / RSS-210, Section A1. 2, Field strength of emissions | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 sections 6.5, 6.6 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 °C | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Plot 7.2.12 Transmission pulse duration**




**Plot 7.2.13 Transmission pulse period**



| Test specification: | FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 section 6.9.2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 02-Jan-18 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1020 hPa | Power: 1.5 VDC |
| Remarks: | | | |

## 7.3 Occupied bandwidth test

### 7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1.

**Table 7.3.1 Occupied bandwidth limits**

| Assigned frequency, MHz | Modulation envelope reference points*, dBc | Maximum allowed bandwidth, % of the carrier frequency |
|---|---|---|
| 70 - 900 | 20.0 | 0.25 |
| Above 900 | | 0.50 |

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

### 7.3.2 Test procedure

**7.3.2.1** The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

**7.3.2.2** The EUT was set to transmit modulated carrier.

**7.3.2.3** The transmitter occupied bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.3.2 and the associated plot.

**Figure 7.3.1 Occupied bandwidth test setup**

| **Test specification:** | **FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.10 section 6.9.2 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 02-Jan-18 | | |
| **Temperature:** 23 ºC | **Relative Humidity:** 55 % | **Air Pressure:** 1020 hPa | **Power:** 1.5 VDC |
| **Remarks:** | | | |

**Table 7.3.2 Occupied bandwidth test results**

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 3 kHz
VIDEO BANDWIDTH: 10 kHz
MODULATION ENVELOPE REFERENCE POINTS: 20 dBc
MODULATION: OOK
BIT RATE: 1.67 kbps

| Carrier frequency, MHz | Occupied bandwidth, kHz | Limit | | Margin, kHz | Verdict |
|---|---|---|---|---|---|
| | | % of the carrier frequency | kHz | | |
| 433.92 | 43.18 | 0.25 | 1084.8 | -1041.62 | Pass |

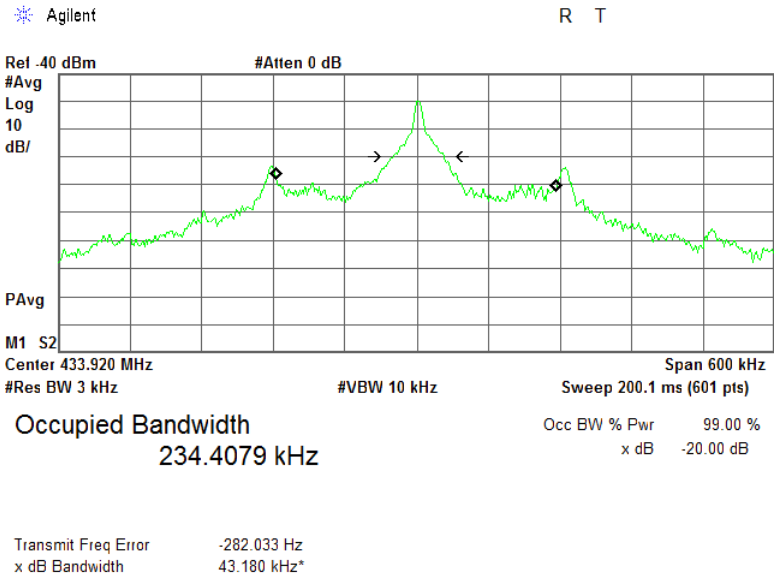
**Reference numbers of test equipment used**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HL 3818 | | | | | | | | |

Full description is given in Appendix A.

| Test specification: | FCC Part 15, Section 231(c) / RSS-210, Section A1.3, Occupied bandwidth | | |
|---|---|---|---|
| Test procedure: | ANSI C63.10 section 6.9.2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 02-Jan-18 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1020 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Plot 7.3.1 Occupied bandwidth test result**



| Test specification: | FCC Part 15, Section 203 / RSS-Gen, Section 8.3, Antenna requirements | | |
|---|---|---|---|
| Test procedure: | Visual inspection / supplier declaration | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 02-Jan-18 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1020 hPa | Power: 1.5 VDC |
| Remarks: | | | |

## 7.4 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.
The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.4.1.

**Table 7.4.1 Antenna requirements**

| Requirement | Rationale | Verdict |
|---|---|---|
| The transmitter antenna is permanently attached | Visual inspection | Comply |
| The transmitter employs a unique antenna connector | NA | |
| The transmitter requires professional installation | NA | |

| Test specification: | FCC Part 15, Section 109 / ICES-003, Radiated emission | | |
|---|---|---|---|
| Test procedure: | ANSI C63.4, Sections 8.3 and 12.2.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

# 8 Unintentional emissions

## 8.1 Radiated emission measurements

### 8.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.1.1.

**Table 8.1.1 Radiated emission limits**

| Frequency, MHz | Class B limit, dB(μV/m) | | Class A limit, dB(μV/m) | |
|---|---|---|---|---|
| | 10 m distance | 3 m distance | 10 m distance | 3 m distance |
| 30 - 88 | 29.5* | 40.0 | 39.0 | 49.5* |
| 88 - 216 | 33.0* | 43.5 | 43.5 | 54.0* |
| 216 - 960 | 35.5* | 46.0 | 46.4 | 56.9* |
| 960 - 5$^{th}$ harmonic** | 43.5* | 54.0 | 49.5 | 60.0* |

* - The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where $S_1$ and $S_2$ – standard defined and test distance respectively in meters.

### 8.1.2 Test procedure

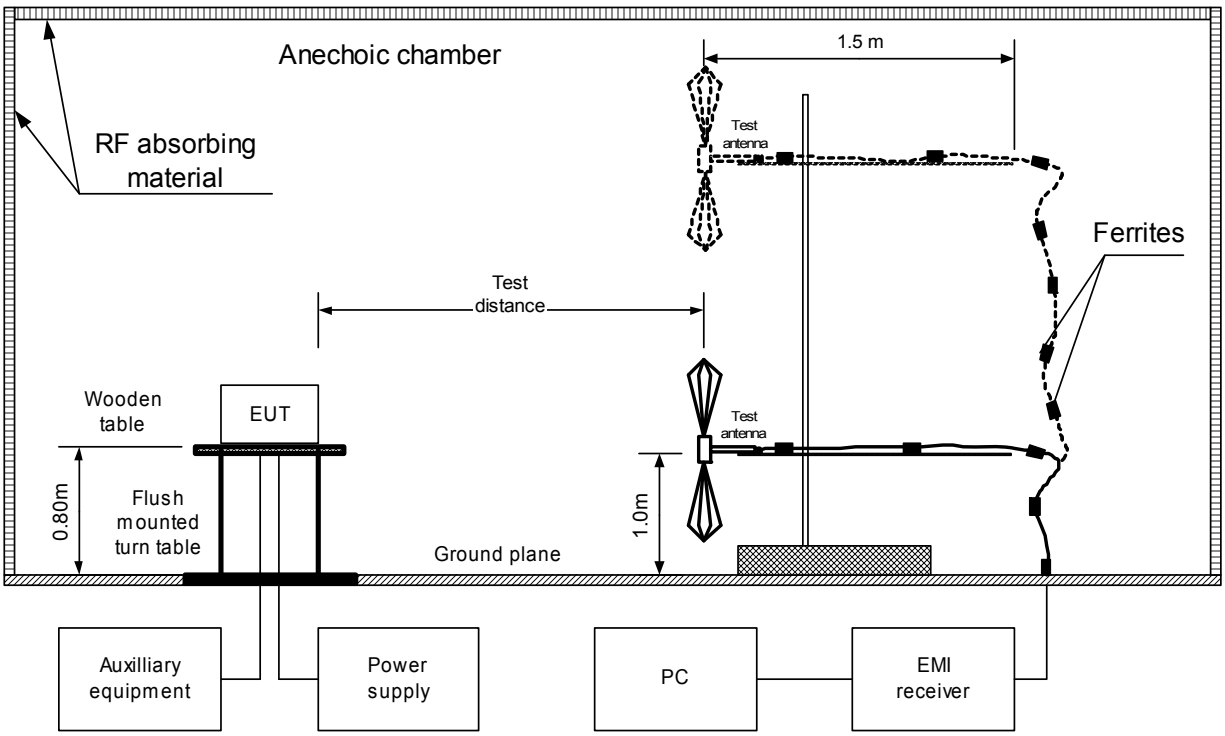
**8.1.2.1** The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.

**8.1.2.2** The specified frequency range was investigated with biconilog antenna connected to 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 and the EUT cables position was varied.

**8.1.2.3** The worst test results (the lowest margins) were provided in the associated tables and plots.

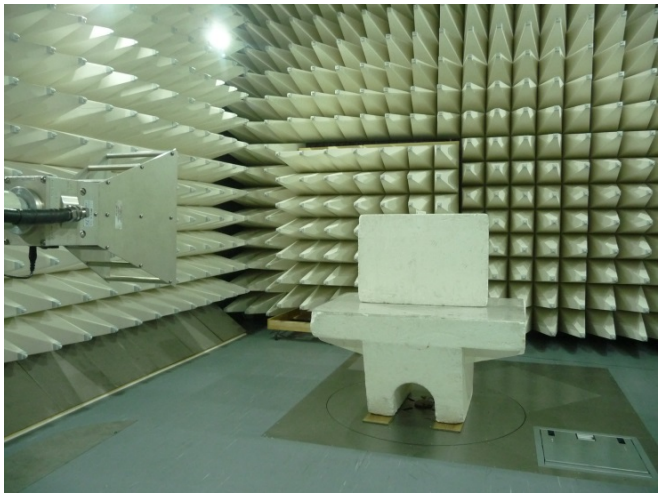
| Test specification: | FCC Part 15, Section 109 / ICES-003, Radiated emission | | |
|---|---|---|---|
| Test procedure: | ANSI C63.4, Sections 8.3 and 12.2.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Figure 8.1.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment**

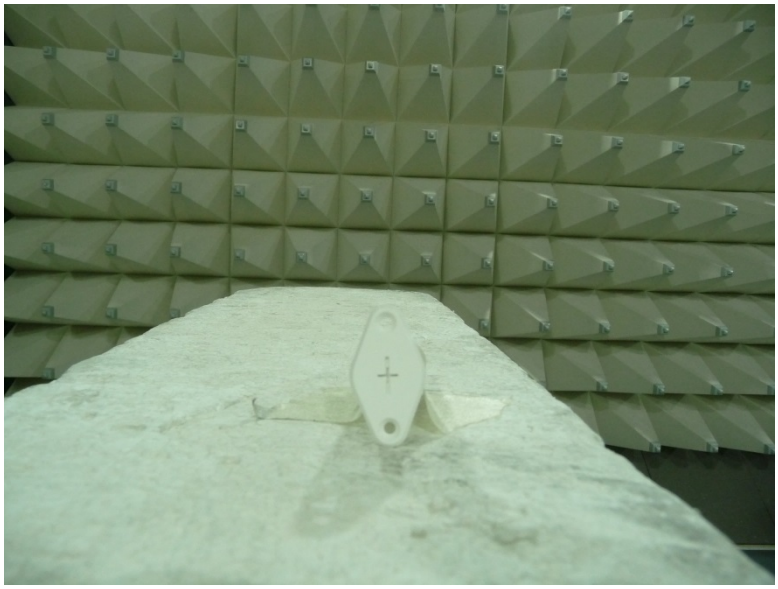


| Test specification: | FCC Part 15, Section 109 / ICES-003, Radiated emission | | |
|---|---|---|---|
| Test procedure: | ANSI C63.4, Sections 8.3 and 12.2.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

**Photograph 8.1.1 Setup for radiated emission measurements, general view**



**Photograph 8.1.2 Setup for radiated emission measurements, EUT close view**



| **Test specification:** | **FCC Part 15, Section 109 / ICES-003, Radiated emission** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.4, Sections 8.3 and 12.2.5 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date(s):** | 28-Dec-17 - 31-Dec-17 | | |
| **Temperature:** 23 ºC | **Relative Humidity:** 55 % | **Air Pressure:** 1010 hPa | **Power:** 1.5 VDC |
| **Remarks:** | | | |

**Table 8.1.2 Radiated emission test results**

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Stand-by
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

| **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*** | | | | |
| No signals were found | | | | | | | | Pass |

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 4500 MHz
RESOLUTION BANDWIDTH: 1000 kHz

| **Frequency, MHz** | **Peak** | | | **Average** | | | **Antenna polarization** | **Antenna height, m** | **Turn-table position**, degrees** | **Verdict** |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Measured emission, dB(μV/m)** | **Limit, dB(μV/m)** | **Margin, dB*** | **Measured emission, dB(μV/m)** | **Limit, dB(μV/m)** | **Margin, dB*** | | | | |
| No signals were found | | | | | | | | | | Pass |

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

**Reference numbers of test equipment used**

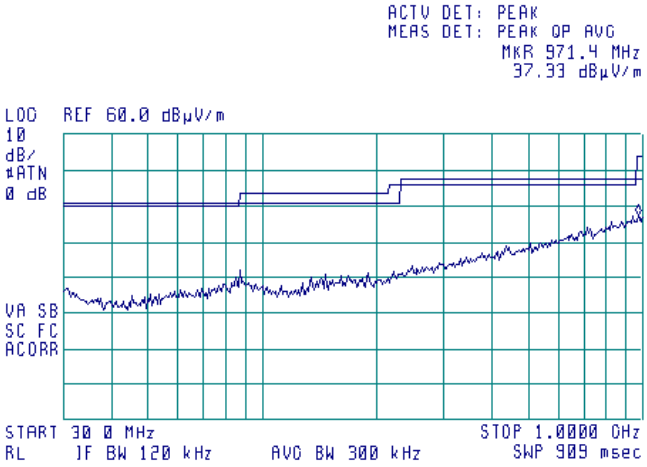
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 0521 | HL 0604 | HL 4278 | HL 4353 | HL 4933 | | | |

Full description is given in Appendix A.

| Test specification: | FCC Part 15, Section 109 / ICES-003, Radiated emission | | |
|---|---|---|---|
| Test procedure: | ANSI C63.4, Sections 8.3 and 12.2.5 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date(s): | 28-Dec-17 - 31-Dec-17 | | |
| Temperature: 23 ºC | Relative Humidity: 55 % | Air Pressure: 1010 hPa | Power: 1.5 VDC |
| Remarks: | | | |

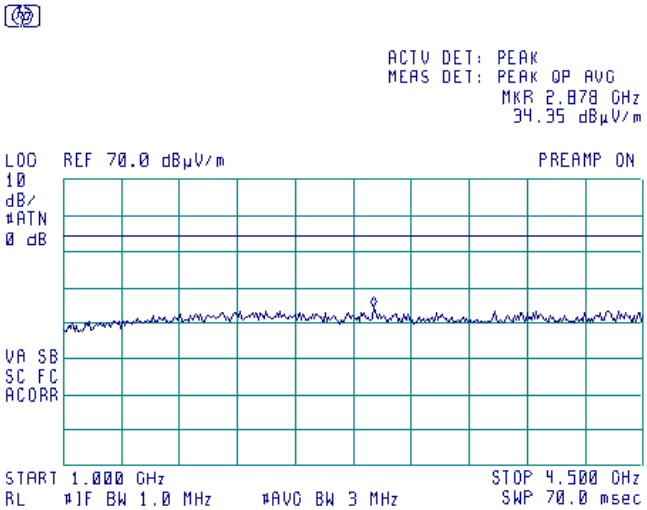
**Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range**

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal
EUT OPERATING MODE: Stand-by




**Plot 8.1.2 Radiated emission measurements above 1000 MHz**

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal
EUT OPERATING MODE: Stand-by



# 9 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 kHz - 30 MHz | EMCO | 6502 | 2857 | 19-Jan-17 | 19-Jan-18 |
| 0521 | EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz | Hewlett Packard | 8546A | 3617A 00319, 3448A002 53 | 31-Oct-17 | 31-Oct-18 |
| 0604 | Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz | EMCO | 3141 | 9611-1011 | 12-May-17 | 12-May-18 |
| 3001 | EMC Analyzer, 9 kHz to 3 GHz | Agilent Technologies | E7402A | US394401 80 | 09-Oct-17 | 09-Oct-18 |
| 3818 | PSA Series Spectrum Analyzer, 3 Hz- 44 GHz | Agilent Technologies | E4446A | MY482502 88 | 07-May-17 | 07-May-18 |
| 4276 | Test Cable , DC-18 GHz, 3.05 m, N/M - N/M | Mini-Circuits | APC-10FT-NMNM+ | 0747A | 24-Aug-17 | 24-Aug-18 |
| 4278 | Test Cable , DC-18 GHz, 4.6 m, N/M - N/M | Mini-Circuits | APC-15FT-NMNM+ | 0755A | 24-Aug-17 | 24-Aug-18 |
| 4339 | High pass Filter, 50 Ohm, 1000 to 18000 MHz, SMA-FM / SMA-M | Micro-Tronics | HPM5011 5-02 | 001 | 14-May-17 | 14-May-18 |
| 4353 | Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M | MegaPhase | NC29-N1N1-244 | 12025101 003 | 15-Mar-17 | 15-Mar-18 |
| 4543 | Broadband preamplifier, 0.5 to 18 GHz, 35 dB gain | Schwarzbeck mess-elektronik | BBV 9718 | 9718-134 | 15-Mar-17 | 15-Mar-18 |
| 4933 | Active Horn Antenna, 1 GHz to 18 GHz | Com-Power Corporation | AHA-118 | 701046 | 04-Jan-18 | 04-Jan-19 |

# 10 APPENDIX B Measurement uncertainties

**Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements**

| Test description | Expanded uncertainty |
|---|---|
| Conducted emissions with LISN | 9 kHz to 150 kHz: ± 3.9 dB<br>150 kHz to 30 MHz: ± 3.8 dB |
| Radiated emissions at 10 m measuring distance<br>Horizontal polarization<br><br><br>Vertical polarization | <br>Biconilog antenna: ± 5.0 dB<br>Biconical antenna: ± 5.0 dB<br>Log periodic antenna: ± 5.1 dB<br>Double ridged horn antenna: ± 5.3 dB<br>Biconilog antenna: ± 5.5 dB<br>Biconical antenna: ± 5.5 dB<br>Log periodic antenna: ± 5.6 dB<br>Double ridged horn antenna: ± 5.8 dB |
| Radiated emissions at 3 m measuring distance<br>Horizontal polarization<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 |
| 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 |
| Duty cycle, timing (Tx ON / OFF) and average factor measurements | ± 1.0 % |
| Occupied bandwidth | ± 8.0 % |

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 C 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 1, 2, 15, 18 parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; registered by Industry Canada for electromagnetic emissions, file number IC 2186A-1 for OATS, certified by VCCI, Japan (the registration numbers are R-10808 for OATS, R-1082 for anechoic chamber, G-869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-1606 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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Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

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

# 12 APPENDIX D Specification references

| | |
|---|---|
| FCC 47CFR part 15: 2016 | Radio Frequency Devices. |
| ANSI C63.10: 2013 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| ANSI C63.2: 1996 | American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications. |
| ANSI C63.4: 2014 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. |
| 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 4: 2014 | General Requirements and Information for the Certification of Radiocommunication Equipment |
| ICES-003 Issue 6: 2016 | Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement |

# 13 APPENDIX E Test equipment correction factors

**Antenna factor**
**Active loop antenna**
**Model 6502, S/N 2857, HL 0446**

| Frequency, MHz | Magnetic antenna factor, dB | Electric antenna factor, dB |
|---|---|---|
| 0.009 | -32.8 | 18.7 |
| 0.010 | -33.8 | 17.7 |
| 0.020 | -38.3 | 13.2 |
| 0.050 | -41.1 | 10.4 |
| 0.075 | -41.3 | 10.2 |
| 0.100 | -41.6 | 9.9 |
| 0.150 | -41.7 | 9.8 |
| 0.250 | -41.6 | 9.9 |
| 0.500 | -41.8 | 9.8 |
| 0.750 | -41.9 | 9.7 |
| 1.000 | -41.4 | 10.1 |
| 2.000 | -41.5 | 10.0 |
| 3.000 | -41.4 | 10.2 |
| 4.000 | -41.4 | 10.1 |
| 5.000 | -41.5 | 10.1 |
| 10.000 | -41.9 | 9.6 |
| 15.000 | -41.9 | 9.6 |
| 20.000 | -42.2 | 9.3 |
| 25.000 | -42.8 | 8.7 |
| 30.000 | -44.0 | 7.5 |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).

**Antenna factor**
**Biconilog antenna EMCO Model 3141**
**Ser.No.1011, HL 0604**

| Frequency, MHz | Antenna factor, dB(1/m) | Frequency, MHz | Antenna factor, dB(1/m) | Frequency, MHz | Antenna factor, dB(1/m) |
|---|---|---|---|---|---|
| 26 | 7.8 | 580 | 20.6 | 1320 | 27.8 |
| 28 | 7.8 | 600 | 21.3 | 1340 | 28.3 |
| 30 | 7.8 | 620 | 21.5 | 1360 | 28.2 |
| 40 | 7.2 | 640 | 21.2 | 1380 | 27.9 |
| 60 | 7.1 | 660 | 21.4 | 1400 | 27.9 |
| 70 | 8.5 | 680 | 21.9 | 1420 | 27.9 |
| 80 | 9.4 | 700 | 22.2 | 1440 | 27.8 |
| 90 | 9.8 | 720 | 22.2 | 1460 | 27.8 |
| 100 | 9.7 | 740 | 22.1 | 1480 | 28.0 |
| 110 | 9.3 | 760 | 22.3 | 1500 | 28.5 |
| 120 | 8.8 | 780 | 22.6 | 1520 | 28.9 |
| 130 | 8.7 | 800 | 22.7 | 1540 | 29.6 |
| 140 | 9.2 | 820 | 22.9 | 1560 | 29.8 |
| 150 | 9.8 | 840 | 23.1 | 1580 | 29.6 |
| 160 | 10.2 | 860 | 23.4 | 1600 | 29.5 |
| 170 | 10.4 | 880 | 23.8 | 1620 | 29.3 |
| 180 | 10.4 | 900 | 24.1 | 1640 | 29.2 |
| 190 | 10.3 | 920 | 24.1 | 1660 | 29.4 |
| 200 | 10.6 | 940 | 24.0 | 1680 | 29.6 |
| 220 | 11.6 | 960 | 24.1 | 1700 | 29.8 |
| 240 | 12.4 | 980 | 24.5 | 1720 | 30.3 |
| 260 | 12.8 | 1000 | 24.9 | 1740 | 30.8 |
| 280 | 13.7 | 1020 | 25.0 | 1760 | 31.1 |
| 300 | 14.7 | 1040 | 25.2 | 1780 | 31.0 |
| 320 | 15.2 | 1060 | 25.4 | 1800 | 30.9 |
| 340 | 15.4 | 1080 | 25.6 | 1820 | 30.7 |
| 360 | 16.1 | 1100 | 25.7 | 1840 | 30.6 |
| 380 | 16.4 | 1120 | 26.0 | 1860 | 30.6 |
| 400 | 16.6 | 1140 | 26.4 | 1880 | 30.6 |
| 420 | 16.7 | 1160 | 27.0 | 1900 | 30.6 |
| 440 | 17.0 | 1180 | 27.0 | 1920 | 30.7 |
| 460 | 17.7 | 1200 | 26.7 | 1940 | 30.9 |
| 480 | 18.1 | 1220 | 26.5 | 1960 | 31.2 |
| 500 | 18.5 | 1240 | 26.5 | 1980 | 31.6 |
| 520 | 19.1 | 1260 | 26.5 | 2000 | 32.0 |
| 540 | 19.5 | 1280 | 26.6 | | |
| 560 | 19.8 | 1300 | 27.0 | | |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).

**Antenna factor, HL 4933**

COM-POWER CORPORATION

# Active Horn Antenna Factor Calibration

*1 GHz to 18 GHz*

| | |
|---|---|
| ***Equipment:*** | **ACTIVE HORN ANTENNA** |
| ***Model:*** | **AHA-118** |
| ***Serial Number:*** | **701046** |
| ***Calibration Distance:*** | **3 Meter** |
| ***Polarization:*** | **Horizontal** |
| ***Calibration Date:*** | **11/12/2014** |

| *Frequency (GHz)* | *Preamplifier Gain (dB)* | *Antenna Factor with pre-amp (dB/m)* | *Frequency (GHz)* | *Preamplifier Gain (dB)* | *Antenna Factor with pre-amp (dB/m)* |
|---|---|---|---|---|---|
| 1 | 40.96 | -16.47 | 10 | 40.94 | -1.97 |
| 1.5 | 41.21 | -14.53 | 10.5 | 40.63 | -1.06 |
| 2 | 41.44 | -13.30 | 11 | 40.74 | -1.50 |
| 2.5 | 41.71 | -12.87 | 11.5 | 40.65 | -0.52 |
| 3 | 41.96 | -12.26 | 12 | 40.76 | -0.15 |
| 3.5 | 42.14 | -11.77 | 12.5 | 41.03 | -0.85 |
| 4 | 42.13 | -10.91 | 13 | 41.37 | -0.81 |
| 4.5 | 41.79 | -9.41 | 13.5 | 41.18 | 0.05 |
| 5 | 41.44 | -7.54 | 14 | 40.98 | 0.36 |
| 5.5 | 40.91 | -6.47 | 14.5 | 40.81 | 1.26 |
| 6 | 40.69 | -5.48 | 15 | 40.65 | 0.25 |
| 6.5 | 40.64 | -5.53 | 15.5 | 40.93 | -1.05 |
| 7 | 40.76 | -4.12 | 16 | 41.31 | -1.44 |
| 7.5 | 40.94 | -3.12 | 16.5 | 40.96 | -0.80 |
| 8 | 40.68 | -1.69 | 17 | 40.64 | -0.02 |
| 8.5 | 40.08 | -1.71 | 17.5 | 40.57 | 1.81 |
| 9 | 40.41 | -1.86 | 18 | 40.08 | 3.63 |
| 9.5 | 41.21 | -2.73 | | | |

*Calibration according to ARP 958*

***Antenna Factor to be added to receiver reading:***

Meter Reading (dBuV) + Antenna Factor (dB/m) = Corrected Reading (dBuV/m)

**Cable loss**
**Test cable, Mini-Circuits, S/N 0747A, 18 GHz, 3.05 m, N/M - N/M**
**APC-10FT-NMNM+, HL 4276**

| Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB |
|---|---|---|---|---|---|---|---|
| 10 | 0.11 | 4500 | 2.81 | 9300 | 4.30 | 14100 | 5.59 |
| 30 | 0.19 | 4600 | 2.85 | 9400 | 4.33 | 14200 | 5.61 |
| 50 | 0.25 | 4700 | 2.88 | 9500 | 4.36 | 14300 | 5.63 |
| 100 | 0.36 | 4800 | 2.92 | 9600 | 4.39 | 14400 | 5.66 |
| 150 | 0.44 | 4900 | 2.95 | 9700 | 4.42 | 14500 | 5.68 |
| 200 | 0.52 | 5000 | 3.00 | 9800 | 4.46 | 14600 | 5.70 |
| 300 | 0.64 | 5100 | 3.03 | 9900 | 4.49 | 14700 | 5.72 |
| 400 | 0.75 | 5200 | 3.08 | 10000 | 4.53 | 14800 | 5.75 |
| 500 | 0.84 | 5300 | 3.11 | 10100 | 4.56 | 14900 | 5.77 |
| 600 | 0.93 | 5400 | 3.13 | 10200 | 4.60 | 15000 | 5.80 |
| 700 | 1.01 | 5500 | 3.16 | 10300 | 4.64 | 15100 | 5.82 |
| 800 | 1.08 | 5600 | 3.20 | 10400 | 4.66 | 15200 | 5.85 |
| 900 | 1.15 | 5700 | 3.22 | 10500 | 4.68 | 15300 | 5.88 |
| 1000 | 1.22 | 5800 | 3.26 | 10600 | 4.70 | 15400 | 5.91 |
| 1100 | 1.28 | 5900 | 3.30 | 10700 | 4.73 | 15500 | 5.93 |
| 1200 | 1.34 | 6000 | 3.34 | 10800 | 4.75 | 15600 | 5.97 |
| 1300 | 1.40 | 6100 | 3.39 | 10900 | 4.77 | 15700 | 5.99 |
| 1400 | 1.46 | 6200 | 3.42 | 11000 | 4.80 | 15800 | 6.02 |
| 1500 | 1.51 | 6300 | 3.47 | 11100 | 4.83 | 15900 | 6.07 |
| 1600 | 1.57 | 6400 | 3.50 | 11200 | 4.86 | 16000 | 6.08 |
| 1700 | 1.62 | 6500 | 3.52 | 11300 | 4.88 | 16100 | 6.11 |
| 1800 | 1.68 | 6600 | 3.55 | 11400 | 4.90 | 16200 | 6.12 |
| 1900 | 1.72 | 6700 | 3.58 | 11500 | 4.92 | 16300 | 6.14 |
| 2000 | 1.77 | 6800 | 3.60 | 11600 | 4.94 | 16400 | 6.17 |
| 2100 | 1.82 | 6900 | 3.62 | 11700 | 4.96 | 16500 | 6.19 |
| 2200 | 1.87 | 7000 | 3.64 | 11800 | 4.98 | 16600 | 6.21 |
| 2300 | 1.92 | 7100 | 3.66 | 11900 | 5.01 | 16700 | 6.22 |
| 2400 | 1.96 | 7200 | 3.68 | 12000 | 5.03 | 16800 | 6.24 |
| 2500 | 2.01 | 7300 | 3.71 | 12100 | 5.06 | 16900 | 6.26 |
| 2600 | 2.05 | 7400 | 3.74 | 12200 | 5.09 | 17000 | 6.28 |
| 2700 | 2.10 | 7500 | 3.78 | 12300 | 5.12 | 17100 | 6.31 |
| 2800 | 2.14 | 7600 | 3.81 | 12400 | 5.15 | 17200 | 6.33 |
| 2900 | 2.18 | 7700 | 3.84 | 12500 | 5.17 | 17300 | 6.36 |
| 3000 | 2.23 | 7800 | 3.87 | 12600 | 5.20 | 17400 | 6.39 |
| 3100 | 2.27 | 7900 | 3.90 | 12700 | 5.22 | 17500 | 6.42 |
| 3200 | 2.31 | 8000 | 3.93 | 12800 | 5.25 | 17600 | 6.45 |
| 3300 | 2.35 | 8100 | 3.96 | 12900 | 5.28 | 17700 | 6.48 |
| 3400 | 2.39 | 8200 | 4.00 | 13000 | 5.32 | 17800 | 6.50 |
| 3500 | 2.42 | 8300 | 4.03 | 13100 | 5.35 | 17900 | 6.52 |
| 3600 | 2.46 | 8400 | 4.06 | 13200 | 5.38 | 18000 | 6.55 |
| 3700 | 2.50 | 8500 | 4.08 | 13300 | 5.40 | | |
| 3800 | 2.54 | 8600 | 4.11 | 13400 | 5.42 | | |
| 3900 | 2.58 | 8700 | 4.13 | 13500 | 5.44 | | |
| 4000 | 2.61 | 8800 | 4.16 | 13600 | 5.46 | | |
| 4100 | 2.65 | 8900 | 4.18 | 13700 | 5.48 | | |
| 4200 | 2.69 | 9000 | 4.21 | 13800 | 5.51 | | |
| 4300 | 2.73 | 9100 | 4.24 | 13900 | 5.53 | | |
| 4400 | 2.77 | 9200 | 4.27 | 14000 | 5.56 | | |

**Cable loss**
**Test cable, Mini-Circuits, S/N 0755A, 18 GHz, 4.6 m, N/M - N/M**
**APC-15FT-NMNM+, HL 4278**

| Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB |
|---|---|---|---|---|---|---|---|
| 10 | 0.24 | 4900 | 4.19 | 10000 | 6.47 | 15100 | 8.33 |
| 30 | 0.26 | 5000 | 4.25 | 10100 | 6.50 | 15200 | 8.35 |
| 50 | 0.34 | 5100 | 4.29 | 10200 | 6.52 | 15300 | 8.37 |
| 100 | 0.50 | 5200 | 4.32 | 10300 | 6.57 | 15400 | 8.40 |
| 200 | 0.72 | 5300 | 4.38 | 10400 | 6.59 | 15500 | 8.42 |
| 300 | 0.90 | 5400 | 4.41 | 10500 | 6.61 | 15600 | 8.46 |
| 400 | 1.06 | 5500 | 4.46 | 10600 | 6.64 | 15700 | 8.50 |
| 500 | 1.20 | 5600 | 4.51 | 10700 | 6.64 | 15800 | 8.52 |
| 600 | 1.32 | 5700 | 4.56 | 10800 | 6.65 | 15900 | 8.56 |
| 700 | 1.44 | 5800 | 4.59 | 10900 | 6.68 | 16000 | 8.61 |
| 800 | 1.54 | 5900 | 4.64 | 11000 | 6.68 | 16100 | 8.64 |
| 900 | 1.64 | 6000 | 4.69 | 11100 | 6.69 | 16200 | 8.66 |
| 1000 | 1.74 | 6100 | 4.72 | 11200 | 6.70 | 16300 | 8.70 |
| 1100 | 1.83 | 6200 | 4.77 | 11300 | 6.74 | 16400 | 8.73 |
| 1200 | 1.92 | 6300 | 4.80 | 11400 | 6.78 | 16500 | 8.74 |
| 1300 | 2.01 | 6400 | 4.83 | 11500 | 6.81 | 16600 | 8.75 |
| 1400 | 2.09 | 6500 | 4.89 | 11600 | 6.84 | 16700 | 8.78 |
| 1500 | 2.18 | 6600 | 4.90 | 11700 | 6.87 | 16800 | 8.79 |
| 1600 | 2.25 | 6700 | 4.95 | 11800 | 6.92 | 16900 | 8.81 |
| 1700 | 2.33 | 6800 | 5.01 | 11900 | 6.98 | 17000 | 8.85 |
| 1800 | 2.39 | 6900 | 4.99 | 12000 | 7.02 | 17100 | 8.90 |
| 1900 | 2.47 | 7000 | 5.04 | 12100 | 7.08 | 17200 | 8.95 |
| 2000 | 2.53 | 7100 | 5.11 | 12200 | 7.15 | 17300 | 8.99 |
| 2100 | 2.60 | 7200 | 5.14 | 12300 | 7.20 | 17400 | 9.03 |
| 2200 | 2.67 | 7300 | 5.21 | 12400 | 7.26 | 17500 | 9.07 |
| 2300 | 2.73 | 7400 | 5.29 | 12500 | 7.31 | 17600 | 9.11 |
| 2400 | 2.80 | 7500 | 5.33 | 12600 | 7.36 | 17700 | 9.15 |
| 2500 | 2.87 | 7600 | 5.38 | 12700 | 7.41 | 17800 | 9.19 |
| 2600 | 2.93 | 7700 | 5.46 | 12800 | 7.46 | 17900 | 9.24 |
| 2700 | 3.00 | 7800 | 5.52 | 12900 | 7.51 | 18000 | 9.28 |
| 2800 | 3.06 | 7900 | 5.58 | 13000 | 7.55 | | |
| 2900 | 3.12 | 8000 | 5.64 | 13100 | 7.59 | | |
| 3000 | 3.18 | 8100 | 5.69 | 13200 | 7.65 | | |
| 3100 | 3.24 | 8200 | 5.75 | 13300 | 7.69 | | |
| 3200 | 3.30 | 8300 | 5.80 | 13400 | 7.72 | | |
| 3300 | 3.35 | 8400 | 5.84 | 13500 | 7.78 | | |
| 3400 | 3.42 | 8500 | 5.90 | 13600 | 7.82 | | |
| 3500 | 3.46 | 8600 | 5.97 | 13700 | 7.86 | | |
| 3600 | 3.52 | 8700 | 5.99 | 13800 | 7.91 | | |
| 3700 | 3.57 | 8800 | 6.04 | 13900 | 7.96 | | |
| 3800 | 3.61 | 8900 | 6.10 | 14000 | 8.01 | | |
| 3900 | 3.67 | 9000 | 6.13 | 14100 | 8.06 | | |
| 4000 | 3.71 | 9100 | 6.17 | 14200 | 8.10 | | |
| 4100 | 3.77 | 9200 | 6.23 | 14300 | 8.13 | | |
| 4200 | 3.83 | 9300 | 6.27 | 14400 | 8.16 | | |
| 4300 | 3.89 | 9400 | 6.30 | 14500 | 8.19 | | |
| 4400 | 3.94 | 9500 | 6.35 | 14600 | 8.21 | | |
| 4500 | 4.00 | 9600 | 6.37 | 14700 | 8.23 | | |
| 4600 | 4.05 | 9700 | 6.40 | 14800 | 8.26 | | |
| 4700 | 4.10 | 9800 | 6.44 | 14900 | 8.28 | | |
| 4800 | 4.16 | 9900 | 6.45 | 15000 | 8.30 | | |

**Cable loss**
**Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,**
**NC29-N1N1-244S/N 12025101 003,**
**HL 4353**

| Frequency, MHz | Cable loss, dB | Frequency, MHz | Cable loss, dB |
|---|---|---|---|
| 50 | 0.20 | 9000 | 2.71 |
| 100 | 0.27 | 9500 | 2.81 |
| 300 | 0.47 | 10000 | 2.90 |
| 500 | 0.61 | 10500 | 2.97 |
| 1000 | 0.87 | 11000 | 3.06 |
| 1500 | 1.07 | 11500 | 3.13 |
| 2000 | 1.24 | 12000 | 3.20 |
| 2500 | 1.39 | 12500 | 3.26 |
| 3000 | 1.53 | 13000 | 3.34 |
| 3500 | 1.65 | 13500 | 3.39 |
| 4000 | 1.77 | 14000 | 3.47 |
| 4500 | 1.89 | 14500 | 3.54 |
| 5000 | 1.99 | 15000 | 3.62 |
| 5500 | 2.07 | 15500 | 3.69 |
| 6000 | 2.20 | 16000 | 3.76 |
| 6500 | 2.30 | 16500 | 3.83 |
| 7000 | 2.39 | 17000 | 3.86 |
| 7500 | 2.51 | 17500 | 3.94 |
| 8000 | 2.58 | 18000 | 4.02 |
| 8500 | 2.65 | | |

# 14 APPENDIX F 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 TEST REPORT

# 15 APPENDIX G Manufacturer's declaration about periodic operation

PARADOX™

December 29th, 2017

To: Hermon Laboratories

Attention: Mr. Michael Nikishin and Ms. Ella Pitt

## Manufacturer's Declaration

We, Paradox Security Systems Ltd. located in 780 Industrial Boulevard St.Eustache, Quebec J7R 5V3, Canada declare under our sole responsibility that the product Indoor Wireless Door Contact DCT6 is operate on 433.92 MHz and designed to comply and satisfy periodic operational requirements.

DCT6 does not allow continuous transmitting (such as voice, video and radio control).

The Wireless Door Contact DCT6 is not manually operated device.

The transmissions of DCT6 are not periodical and occur upon intrusion only.

DCT6 is an intrusion alarm system device and will send automatically its supervision status to control panel in a certain interval. This interval will be randomly selected between 17 minutes and 20 minutes.

Since, there is no periodical behavior except supervision transmissions, there are no predetermined intervals of any kind included in device's algorithm.

Alex Chaplik
Certification Manager

Ref : FCC Declaration DCT6_rev0

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