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## TEST REPORT

Test report no.: 1-2842/16-01-10



Deutsche  
Akkreditierungsstelle  
D-PL-12076-01-01

### Testing laboratory

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#### Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

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### Manufacturer

#### Philips Medizin Systeme Böblingen GmbH

Hewlett-Packard-Strasse 2

71034 Böblingen / GERMANY

### Test standard/s

47 CFR Part 15

Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

RSS-210 Issue 9

Licence-Exempt Radio Apparatus: Category I Equipment

For further applied test standards please refer to section 3 of this test report.

### Test Item

**Kind of test item:** 2.4 GHz transceiver  
**Model name:** IntelliVue CL NBP Pod 865216  
**FCC ID:** PQC-CLNBPBV2  
**IC:** 3549C-CLNBPBV2  
**Frequency:** 13.56 MHz  
**Technology tested:** RFID  
**Antenna:** Integrated loop antenna  
**Power supply:** 3.7 V DC by Li-ion battery  
**Temperature range:** -20°C to +55°C



This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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### 2.2 Application details

|                                    |            |
|------------------------------------|------------|
| Date of receipt of order:          | 2016-11-17 |
| Date of receipt of test item:      | 2017-01-30 |
| Start of test:                     | 2017-02-01 |
| End of test:                       | 2017-02-03 |
| Person(s) present during the test: | -/-        |

### 2.3 Test laboratories sub-contracted

None

### 3 Test standard/s and references

| Test standard     | Date          | Description                                                                                                                                               |
|-------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 47 CFR Part 15    | -/-           | Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices                                                                 |
| RSS-210 Issue 9   | August 2016   | Licence-Exempt Radio Apparatus: Category I Equipment                                                                                                      |
| RSS - Gen Issue 4 | November 2014 | Spectrum Management and Telecommunications Radio Standards Specifications - General Requirements and Information for the Certification of Radio Apparatus |

| Guidance         | Version | Description                                                                                                                                                         |
|------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 |
| ANSI C63.10-2013 | -/-     | American national standard of procedures for compliance testing of unlicensed wireless devices                                                                      |

## 4 Test environment

|                           |   |                                                          |                                                                                                                     |
|---------------------------|---|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Temperature               | : | T <sub>nom</sub><br>T <sub>max</sub><br>T <sub>min</sub> | +22 °C during room temperature tests<br>+50 °C during high temperature tests<br>-20 °C during low temperature tests |
| Relative humidity content | : |                                                          | 35 %                                                                                                                |
| Barometric pressure       | : |                                                          | 1021 hpa                                                                                                            |
| Power supply              | : | V <sub>nom</sub><br>V <sub>max</sub><br>V <sub>min</sub> | 3.7 V DC by Li-ion battery<br>4.3 V<br>3.1 V                                                                        |

## 5 Test item

### 5.1 General description

|                            |   |                                                |
|----------------------------|---|------------------------------------------------|
| Kind of test item          | : | 2.4 GHz transceiver                            |
| Type identification        | : | IntelliVue CL NBP Pod 865216                   |
| HMN                        | : | -/-                                            |
| PMN                        | : | 865216                                         |
| HVIN                       | : | 865216                                         |
| FVIN                       | : | -/-                                            |
| S/N serial number          | : | Radiated unit: DE03801770                      |
| HW hardware status         | : | 1                                              |
| SW software status         | : | D.00.70                                        |
| Frequency band             | : | 13.553 MHz to 13.567 MHz<br>Carrier: 13.56 MHz |
| Type of radio transmission | : | modulated carrier                              |
| Use of frequency spectrum  | : |                                                |
| Type of modulation         | : | OOK                                            |
| Number of channels         | : | 1                                              |
| Antenna                    | : | Integrated loop antenna                        |
| Power supply               | : | 3.7 V DC by Li-ion battery                     |
| Temperature range          | : | -20°C to +55°C                                 |

### 5.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup- and EUT-photos are included in test report:

1-2842/16-01-07\_AnnexA  
 1-2842/16-01-07\_AnnexB  
 1-2842/16-01-07\_AnnexD

## 6 Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

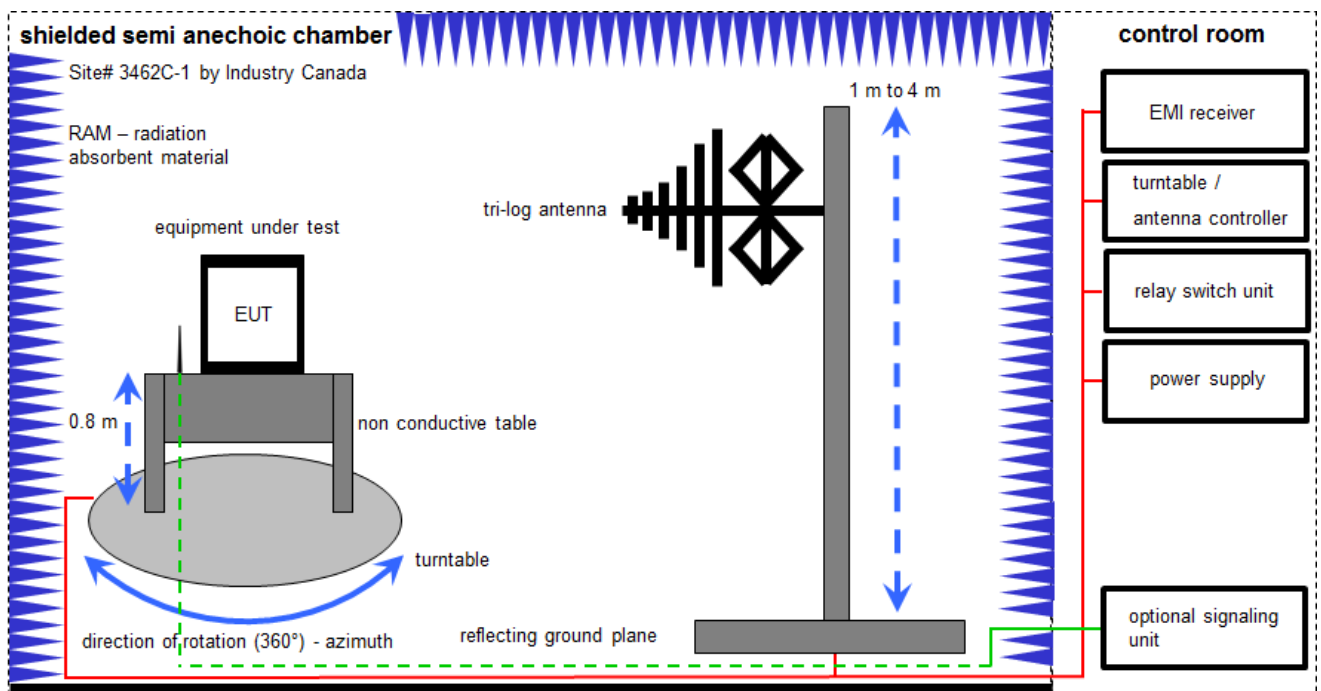
In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

**Agenda:** Kind of Calibration

|      |                                            |     |                                                      |
|------|--------------------------------------------|-----|------------------------------------------------------|
| k    | calibration / calibrated                   | EK  | limited calibration                                  |
| ne   | not required (k, ev, izw, zw not required) | zw  | cyclical maintenance (external cyclical maintenance) |
| ev   | periodic self verification                 | izw | internal cyclical maintenance                        |
| Ve   | long-term stability recognized             | g   | blocked for accredited testing                       |
| vlk! | Attention: extended calibration interval   |     |                                                      |
| NK!  | Attention: not calibrated                  | *)  | next calibration ordered / currently in progress     |

## 6.1 Shielded semi anechoic chamber

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform to specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: tri-log antenna 10 meter

$$FS = UR + CL + AF$$

(FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

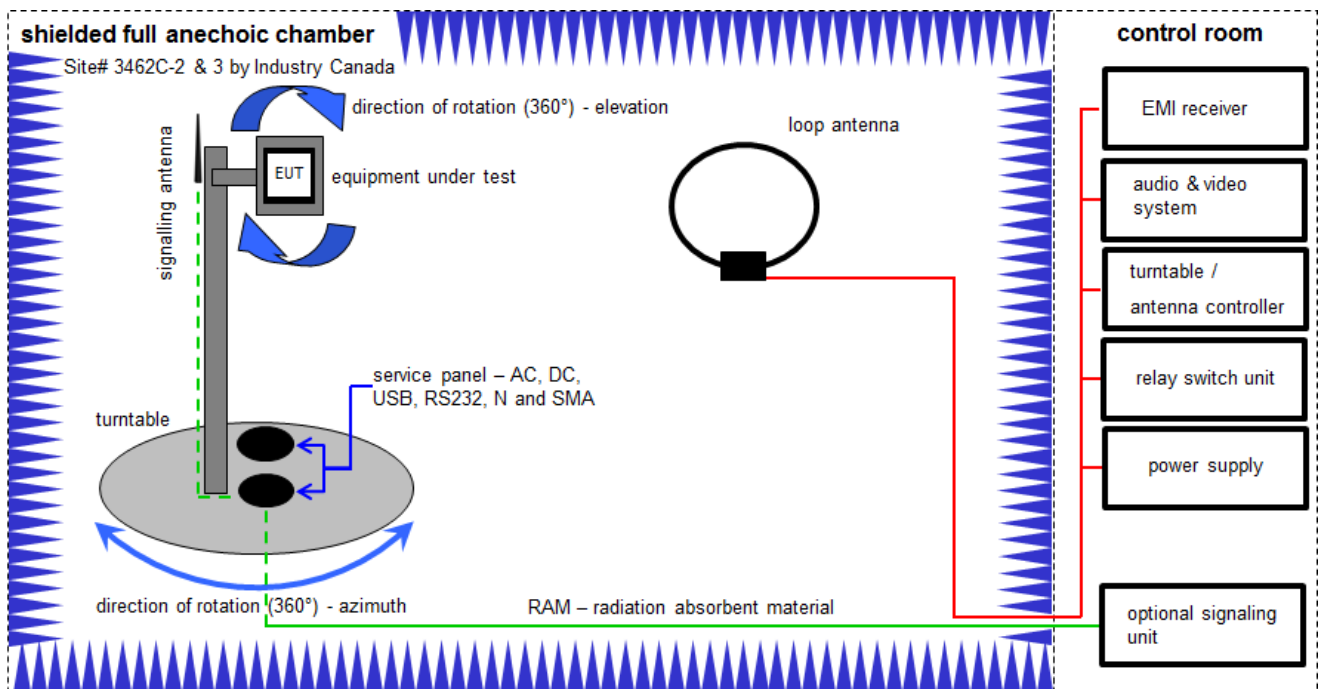
Example calculation:

$$FS [dB\mu V/m] = 12.35 [dB\mu V/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dB\mu V/m] (35.69 \mu V/m)$$

### Equipment table:

| No. | Lab / Item | Equipment                                    | Type         | Manufacturer | Serial No. | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|----------------------------------------------|--------------|--------------|------------|-----------|---------------------|------------------|------------------|
| 1   | A          | Switch-Unit                                  | 3488A        | HP           | 2719A14505 | 300000368 | ev                  | -/-              | -/-              |
| 2   | A          | EMI Test Receiver                            | ESCI 3       | R&S          | 100083     | 300003312 | k                   | 08.03.2016       | 08.03.2017       |
| 3   | A          | Antenna Tower                                | Model 2175   | ETS-Lindgren | 64762      | 300003745 | izw                 | -/-              | -/-              |
| 4   | A          | Positioning Controller                       | Model 2090   | ETS-Lindgren | 64672      | 300003746 | izw                 | -/-              | -/-              |
| 5   | A          | Turntable Interface-Box                      | Model 105637 | ETS-Lindgren | 44583      | 300003747 | izw                 | -/-              | -/-              |
| 6   | A          | TRILOG Broadband Test-Antenna 30 MHz - 3 GHz | VULB9163     | Schwarzbeck  | 295        | 300003787 | k                   | 25.04.2016       | 25.04.2018       |

## 6.2 Shielded fully anechoic chamber



Measurement distance: loop antenna 3 meter

FS = UR + CA + AF

(FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

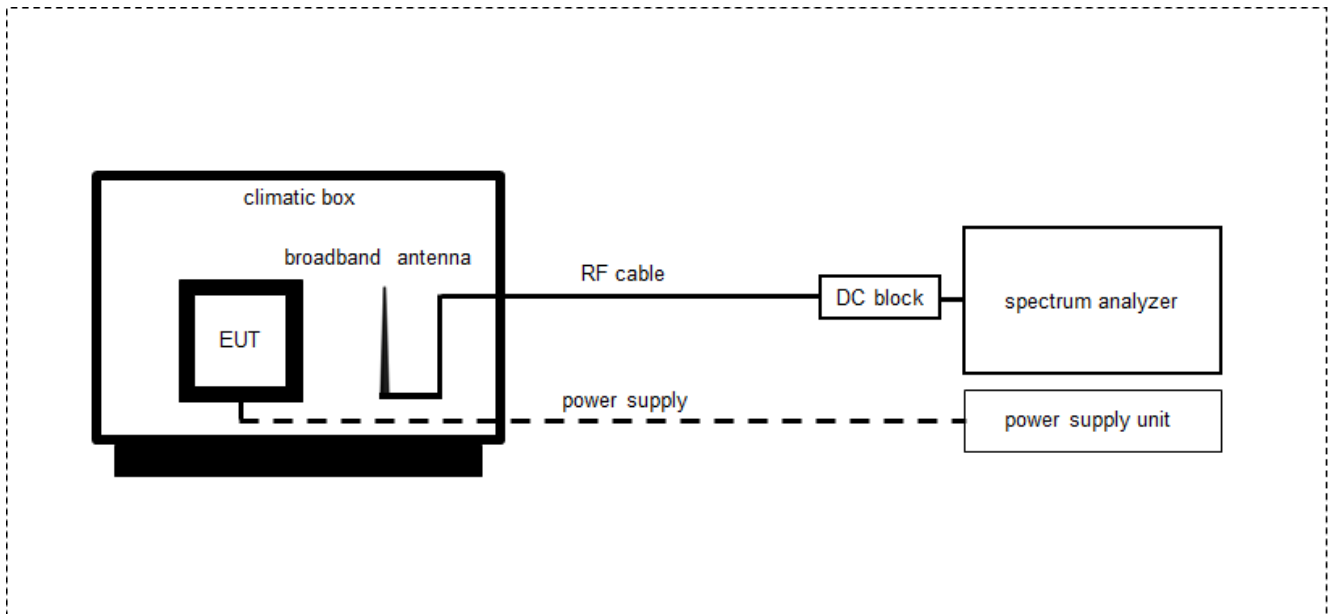
Example calculation:

FS [dBμV/m] = 40.0 [dBμV/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dBμV/m] (71.61 μV/m)

### Equipment table:

| No. | Lab / Item | Equipment                               | Type     | Manufacturer         | Serial No. | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|-----------------------------------------|----------|----------------------|------------|-----------|---------------------|------------------|------------------|
| 1   | A          | Anechoic chamber                        | FAC 3/5m | MWB / TDK            | 87400/02   | 300000996 | ev                  | -/-              | -/-              |
| 2   | A          | Switch / Control Unit                   | 3488A    | HP                   | *          | 300000199 | ne                  | -/-              | -/-              |
| 3   | A          | Active Loop Antenna<br>10 kHz to 30 MHz | 6502     | EMCO/2               | 8905-2342  | 300000256 | k                   | 24.06.2015       | 24.06.2017       |
| 4   | A          | EMI Test Receiver<br>20Hz- 26,5GHz      | ESU26    | R&S                  | 100037     | 300003555 | k                   | 31.01.2017       | 30.01.2018       |
| 5   | A          | 4U RF Switch Platform                   | L4491A   | Agilent Technologies | MY50000037 | 300004509 | ne                  | -/-              | -/-              |

### 6.3 Test setup for normalized measurement configurations & frequency error



#### Equipment table:

| No. | Lab / Item | Equipment                     | Type              | Manufacturer    | Serial No.      | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|-------------------------------|-------------------|-----------------|-----------------|-----------|---------------------|------------------|------------------|
| 1   | A, B       | Power Supply 0-20V; 0-5A      | 6632B             | HP              | US37478366      | 400000117 | ne                  | -/-              | -/-              |
| 2   | B          | Temperature Test Chamber      | VT 4002           | Heraeus Voetsch | 521/84193       | 300003889 | ev                  | 03.09.2015       | 03.09.2017       |
| 3   | A, B       | Signal Analyzer 40 GHz        | FSV40             | R&S             | 101353          | 300004819 | k                   | 19.09.2016       | 19.09.2017       |
| 4   | A, B       | RF-Cable WLAN-Tester Analyzer | ST18/SMAM/SMAM/36 | Huber & Suhner  | Batch no. 54876 | 400001220 | ev                  | -/-              | -/-              |

## 7 Sequence of testing

### 7.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

#### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1.5 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

#### Final measurement

- Identified emissions during the premeasurement are maximized by the software by rotating the turntable from 0° to 360°. In case of the 2-axis positioner is used the elevation axis is also rotated from 0° to 360°.
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

## 7.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position  $\pm 45^\circ$  and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

## 8 Measurement uncertainty

| Measurement uncertainty                            |             |
|----------------------------------------------------|-------------|
| Test case                                          | Uncertainty |
| Occupied bandwidth                                 | ± used RBW  |
| Field strength of the fundamental                  | ± 3 dB      |
| Field strength of the harmonics and spurious       | ± 3 dB      |
| Receiver spurious emissions and cabinet radiations | ± 3 dB      |
| Conducted limits                                   | ± 2.6 dB    |

## 9 Summary of measurement results

|                                     |                                                                                                                       |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | No deviations from the technical specifications were ascertained                                                      |
| <input type="checkbox"/>            | There were deviations from the technical specifications ascertained                                                   |
| <input type="checkbox"/>            | This test report is only a partial test report. The content and verdict of the performed test cases are listed below. |

| TC Identifier | Description                                       | Verdict    | Date       | Remark |
|---------------|---------------------------------------------------|------------|------------|--------|
| RF-Testing    | CFR Part 15<br>RSS-210 Issue 9<br>RSS Gen Issue 4 | See table! | 2017-02-23 | -/-    |

| Test specification clause                     | Test case                                          | Temperature conditions      | Power source conditions     | C                                   | NC                       | NA                                  | NP                       | Remark                        |
|-----------------------------------------------|----------------------------------------------------|-----------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------|
| RSS Gen Issue 4                               | Occupied bandwidth                                 | Nominal                     | Nominal                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | -/-                           |
| § 15.225 (a) RSS-210 Issue 9 B.6              | Field strength of the fundamental                  | Nominal                     | Nominal                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | -/-                           |
| § 15.209 & § 15.225 (b-d) RSS-210 Issue 9 B.6 | Field strength of the harmonics and spurious       | Nominal                     | Nominal                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | -/-                           |
| § 15.109 RSS Gen Issue 4                      | Receiver spurious emissions and cabinet radiations | Nominal                     | Nominal                     | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | No stand-alone receiver mode! |
| §15.107 §15.207                               | Conducted limits                                   | Nominal                     | Nominal                     | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Battery powered only!         |
| § 15.225 (a) RSS-210 Issue 9 B.6              | Frequency tolerance                                | Normal & extreme conditions | Normal & extreme conditions | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | -/-                           |

### Note:

C Compliant  
 NC Not compliant  
 NA Not applicable  
 NP Not performed

## 10 Additional comments

Reference documents: Questionnaire\_IntelliVue CL NBP Pod

Special test descriptions: None

Configuration descriptions: None

## 11 Measurement results

### 11.1 Occupied bandwidth

#### Measurement:

The emission bandwidth (x dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated x dB below the maximum in-band spectral density of the modulated signal.

| Measurement parameters   |                                                              |
|--------------------------|--------------------------------------------------------------|
| Detector:                | Peak                                                         |
| Resolution bandwidth:    | 1 % (9.41 kHz) – 5 % (47.1 kHz)<br>of the occupied bandwidth |
| Video bandwidth:         | ≥ 3x RBW                                                     |
| Trace mode:              | Max hold                                                     |
| Analyzer function:       | 99 % power function                                          |
| Used equipment:          | See chapter 6.3 – A                                          |
| Measurement uncertainty: | See chapter 8                                                |

#### Limit:

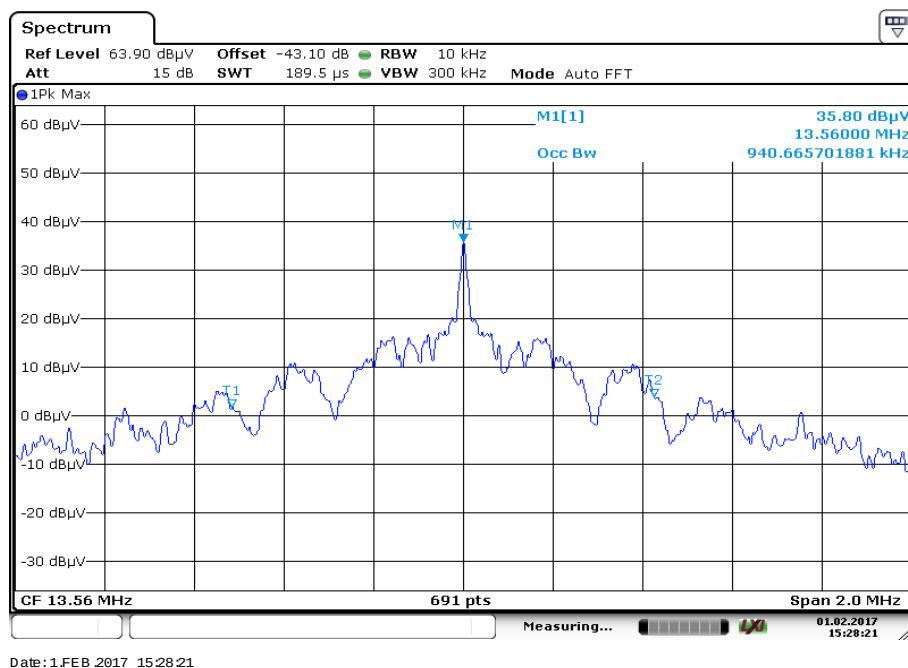
| IC                                      |
|-----------------------------------------|
| for RSP-100 test report coversheet only |

#### Result:

| 99% emission bandwidth |
|------------------------|
| 941 kHz                |

**Plot:**

**Plot 1: 99 % emission bandwidth**



## 11.2 Field strength of the fundamental

### Measurement:

The maximum detected field strength for the carrier signal.

| Measurement parameters   |                                |
|--------------------------|--------------------------------|
| Detector:                | Quasi peak / peak (worst case) |
| Resolution bandwidth:    | 120 kHz                        |
| Video bandwidth:         | ≥ 3x RBW                       |
| Trace mode:              | Max hold                       |
| Used equipment:          | See chapter 6.2 – A            |
| Measurement uncertainty: | See chapter 8                  |

### Limit:

| FCC & IC           |                          |                             |
|--------------------|--------------------------|-----------------------------|
| Frequency<br>(MHz) | Field strength<br>(μV/m) | Measurement distance<br>(m) |
| 13.553 to 13.567   | 15,848 (84 dBμV/m)       | 30                          |

### Recalculation:

| According to ANSI C63.10 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Frequency                | Formula                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Correction value<br>from 3m to 30m |
| 13.56 MHz                | $FS_{\text{limit}} = FS_{\text{max}} - 40 \log\left(\frac{d_{\text{nearfield}}}{d_{\text{measure}}}\right) - 20 \log\left(\frac{d_{\text{limit}}}{d_{\text{nearfield}}}\right)$ <p> <math>FS_{\text{limit}}</math> is the calculation of field strength at the limit distance, expressed in dBμV/m<br/> <math>FS_{\text{max}}</math> is the measured field strength, expressed in dBμV/m<br/> <math>d_{\text{nearfield}}</math> is the λ/2π distance<br/> <math>d_{\text{measure}}</math> is the distance of the measurement point from EUT<br/> <math>d_{\text{limit}}</math> is the reference limit distance         </p> | -21.4 dB                           |

### According to ANSI C63.10

### Result:

| Field strength of the fundamental |                                        |                                        |
|-----------------------------------|----------------------------------------|----------------------------------------|
| Frequency                         | 13.56 MHz                              |                                        |
| Distance                          | @ 3 m                                  | @ 30 m                                 |
| Measured / calculated value       | 57.0 dBμV/m (peak)<br>56.0 dBμV/m (QP) | 35.6 dBμV/m (peak)<br>34.6 dBμV/m (QP) |

### 11.3 Field strength of the harmonics and spurious

#### Measurement:

The maximum detected field strength for the harmonics and spurious.

| Measurement parameters   |                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------|
| Detector:                | Quasi peak / average or peak (worst case – pre-scan)                                     |
| Resolution bandwidth:    | F < 150 kHz: 200 Hz<br>150 kHz < F < 30 MHz: 9 kHz<br>30 MHz < F < 1 GHz: 120 kHz        |
| Video bandwidth:         | F < 150 kHz: ≥ 1 kHz<br>150 kHz < F < 30 MHz: ≥ 100 kHz<br>30 MHz < F < 1 GHz: ≥ 300 kHz |
| Trace mode:              | Max hold                                                                                 |
| Used equipment:          | See chapter 6.1 – A<br>See chapter 6.2 – A                                               |
| Measurement uncertainty: | See chapter 8                                                                            |

#### Limit:

| FCC & IC        |                         |                          |
|-----------------|-------------------------|--------------------------|
| Frequency (MHz) | Field strength (dBµV/m) | Measurement distance (m) |
| 0.009 – 0.490   | 2400/F(kHz)             | 300                      |
| 0.490 – 1.705   | 24000/F(kHz)            | 30                       |
| 1.705 – 30      | 30 (29.5 dBµV/m)        | 30                       |
| 30 – 88         | 100 (40 dBµV/m)         | 3                        |
| 88 – 216        | 150 (43.5 dBµV/m)       | 3                        |
| 216 – 960       | 200 (46 dBµV/m)         | 3                        |

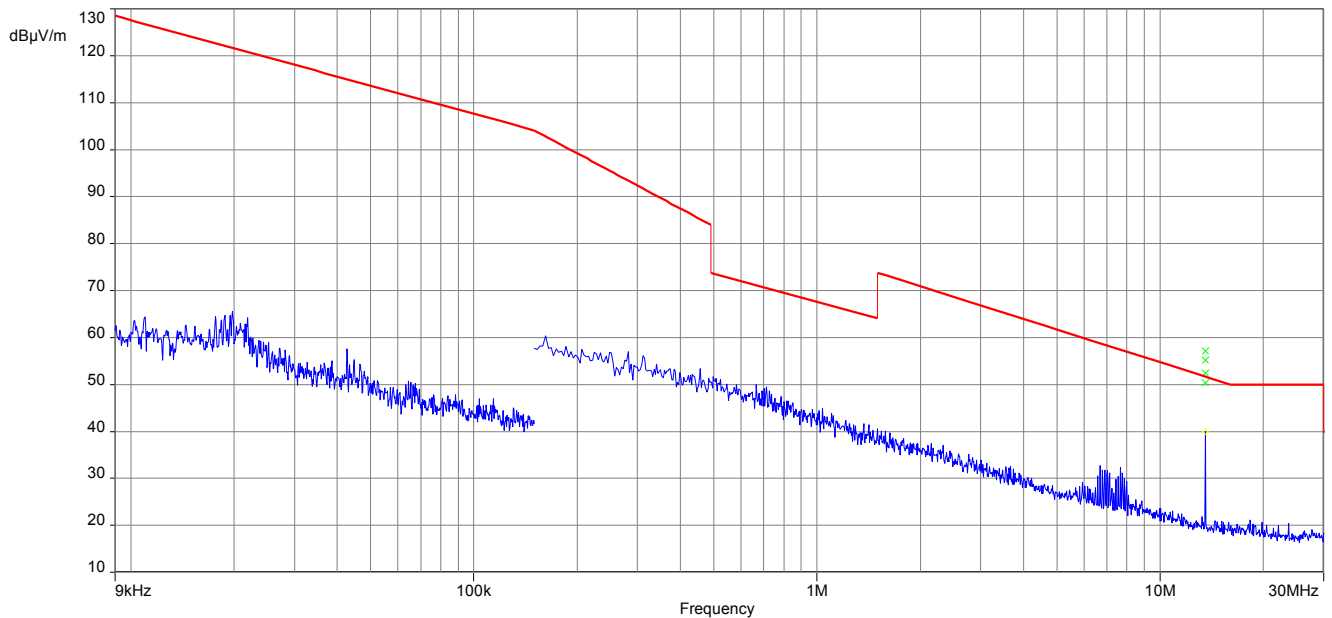
**Note:** For a reduced measurement distance, please take a look at the limit line and the ANSI C63.10-2013 sub clause 6.4 radiated emissions from unlicensed wireless devices below 30 MHz.

#### Result:

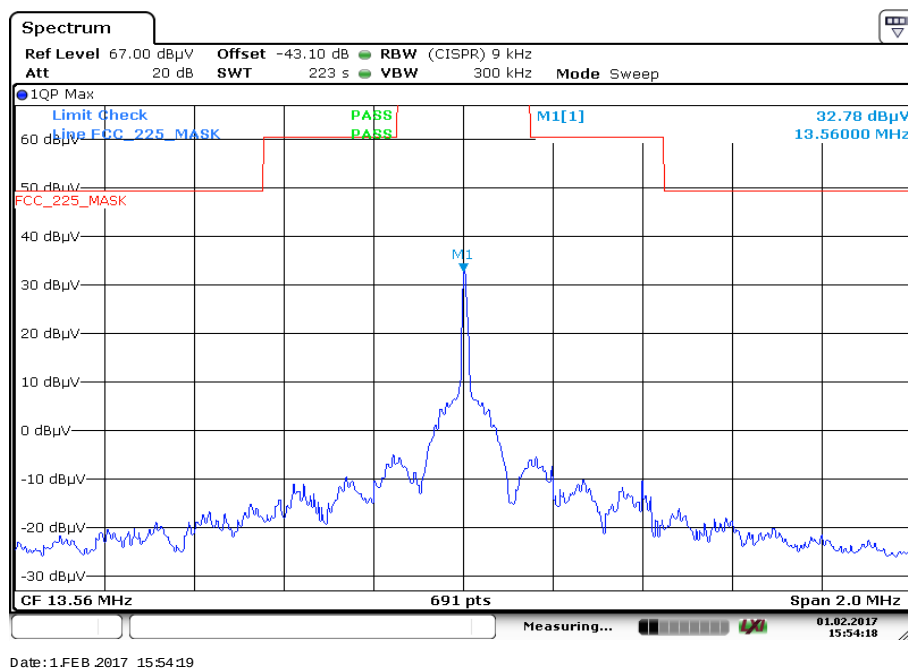
| Detected emissions                                          |          |                            |                              |
|-------------------------------------------------------------|----------|----------------------------|------------------------------|
| Frequency (MHz)                                             | Detector | Resolution bandwidth (kHz) | Detected value (dBµV/m @ 3m) |
| All detected emissions are more than 20 dB below the limit. |          |                            |                              |
|                                                             |          |                            |                              |
|                                                             |          |                            |                              |

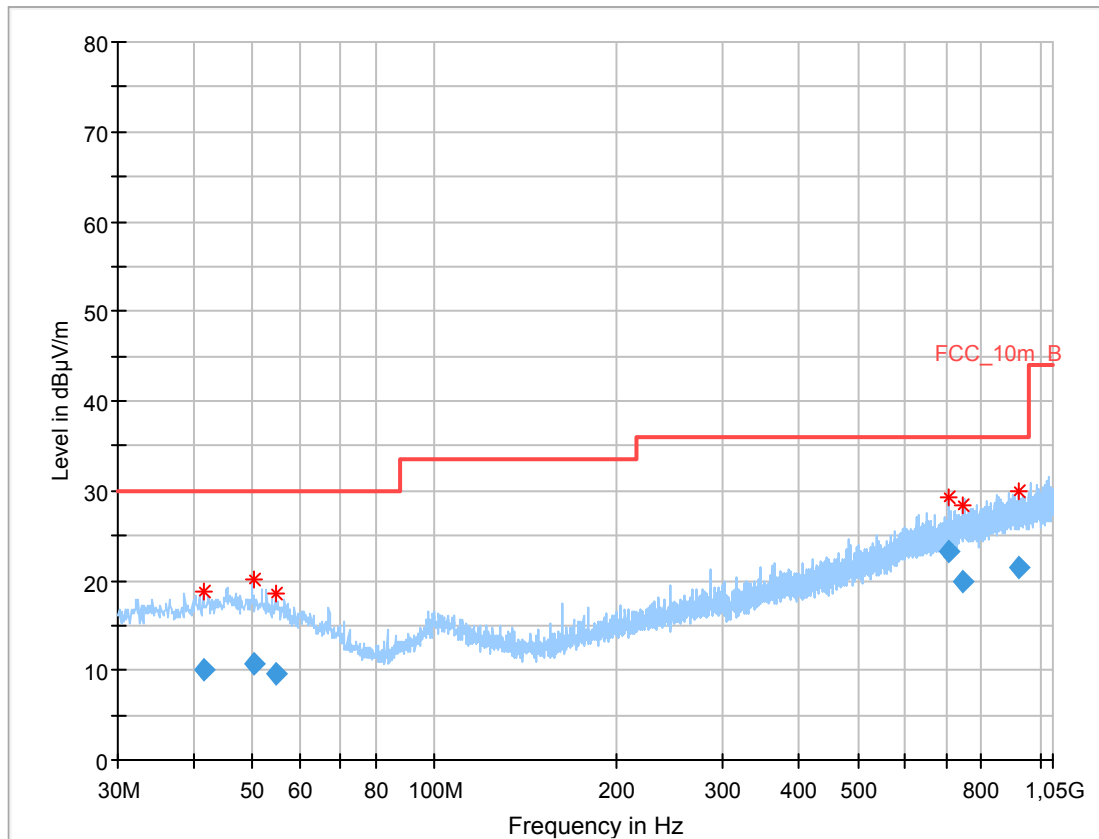
**Plots:**

**Plot 1: 9 kHz – 30 MHz, magnetic emissions**



**Plot 2: Spectrum mask (the limits are recalculated according to the ANSI C63.10-2013 sub clause 6.4)**



**Plot 3:** 30 MHz – 1 GHz, vertical and horizontal polarization**Final\_Result:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 41.590650       | 10.13              | 30.00          | 19.87       | 1000.0          | 120.000         | 101.0       | V   | 76.0          | 13.3       |
| 50.464800       | 10.63              | 30.00          | 19.37       | 1000.0          | 120.000         | 101.0       | V   | 83.0          | 13.7       |
| 54.586650       | 9.58               | 30.00          | 20.42       | 1000.0          | 120.000         | 179.0       | H   | 350.0         | 13.1       |
| 705.120000      | 23.25              | 36.00          | 12.75       | 1000.0          | 120.000         | 101.0       | H   | 105.0         | 21.7       |
| 747.258900      | 19.97              | 36.00          | 16.03       | 1000.0          | 120.000         | 101.0       | H   | 3.0           | 22.7       |
| 923.349000      | 21.43              | 36.00          | 14.57       | 1000.0          | 120.000         | 179.0       | H   | 350.0         | 24.3       |

## 11.4 Frequency error

### Measurement:

The maximum detected field strength for the spurious.

| Measurement parameters   |                           |
|--------------------------|---------------------------|
| Detector:                | Peak detector             |
| Resolution bandwidth:    | 10 Hz                     |
| Video bandwidth:         | ≥ RBW                     |
| Trace mode:              | Single sweep or max. hold |
| Used equipment:          | See chapter 6.3 – A       |
| Measurement uncertainty: | See chapter 8             |

### Limit:

| FCC & IC                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>FCC: The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. (±1.356 kHz)</p> <p>IC: ± 100 ppm</p> |

### Result: Temperature variation

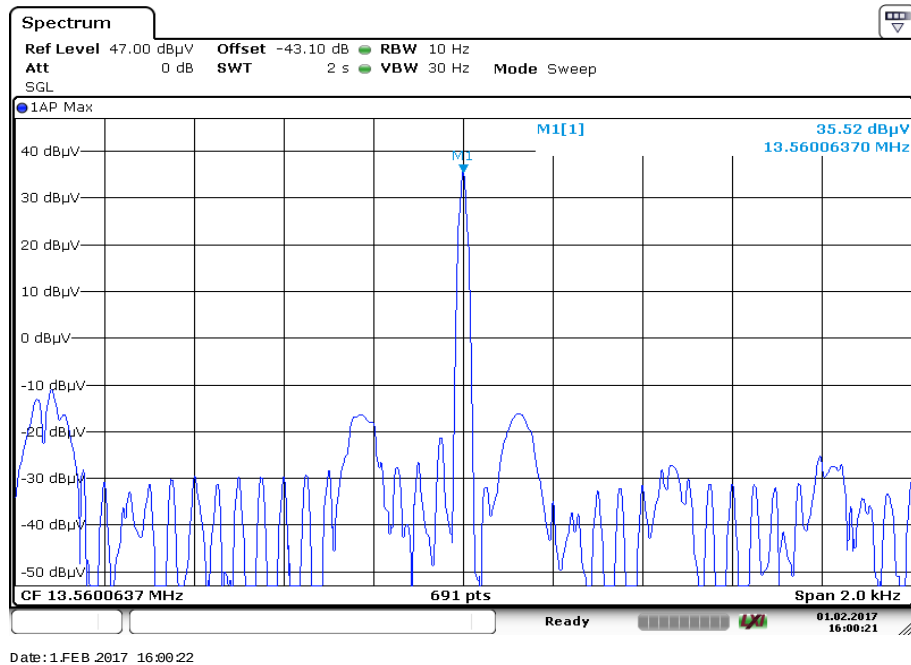
| Frequency tolerance      |                       |                       |           |
|--------------------------|-----------------------|-----------------------|-----------|
| Measured frequency (MHz) | Frequency error (kHz) | Conditions            | Result    |
| 13.560162                | 0.16                  | -20 °C & 100% voltage | compliant |
| 13.560146                | 0.15                  | -10 °C & 100% voltage | compliant |
| 13.560112                | 0.11                  | 0 °C & 100% voltage   | compliant |
| 13.560058                | 0.06                  | +10 °C & 100% voltage | compliant |
| 13.560064                | 0.06                  | +20 °C & 100% voltage | compliant |
| 13.560059                | 0.06                  | +30 °C & 100% voltage | compliant |
| 13.560022                | 0.02                  | +40 °C & 100% voltage | compliant |
| 13.560000                | 0.00                  | +50 °C & 100% voltage | compliant |

### Result: Voltage variation

| Frequency tolerance      |                       |                       |           |
|--------------------------|-----------------------|-----------------------|-----------|
| Measured frequency (MHz) | Frequency error (kHz) | Conditions            | Result    |
| 13.560064                | 0.06                  | +20 °C & 85% voltage  | compliant |
| 13.560064                | 0.06                  | +20 °C & 100% voltage | compliant |
| 13.560064                | 0.06                  | +20 °C & 115% voltage | compliant |

**Plots:**

**Plot 1:**



## 12 Observations

No observations except those reported with the single test cases have been made.

## Annex A Document history

| Version | Applied changes | Date of release |
|---------|-----------------|-----------------|
|         | Initial release | 2017-02-23      |

## Annex B Further information

### Glossary

|          |   |                                                |
|----------|---|------------------------------------------------|
| AVG      | - | Average                                        |
| DUT      | - | Device under test                              |
| EMC      | - | Electromagnetic Compatibility                  |
| EN       | - | European Standard                              |
| EUT      | - | Equipment under test                           |
| ETSI     | - | European Telecommunications Standard Institute |
| FCC      | - | Federal Communication Commission               |
| FCC ID   | - | Company Identifier at FCC                      |
| HW       | - | Hardware                                       |
| IC       | - | Industry Canada                                |
| Inv. No. | - | Inventory number                               |
| N/A      | - | Not applicable                                 |
| PP       | - | Positive peak                                  |
| QP       | - | Quasi peak                                     |
| S/N      | - | Serial number                                  |
| SW       | - | Software                                       |
| PMN      | - | Product marketing name                         |
| HMN      | - | Host marketing name                            |
| HVIN     | - | Hardware version identification number         |
| FVIN     | - | Firmware version identification number         |
| OBW      |   | Occupied Bandwidth                             |
| OC       |   | Operating Channel                              |
| OCW      |   | Operating Channel Bandwidth                    |
| OOB      |   | Out Of Band                                    |

## Annex C Accreditation Certificate

first page

last page



Deutsche Akkreditierungsstelle GmbH

Befähigung gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV  
 Unterzeichnerin der Multilateralen Abkommen  
 von EA, ILAC und IAF zur gegenseitigen Anerkennung

**Akkreditierung**



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

**CTC advanced GmbH**  
 Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

**Funk**  
 Mobilfunk (GSM / DCS) + OTA  
 Elektromagnetische Verträglichkeit (EMV)  
 Produktsicherheit  
 SAR / EMF  
 Umwelt  
 Smart Card Technology  
 Bluetooth®  
 Automotive  
 Wi-Fi-Services  
 Kanadische Anforderungen  
 US-Anforderungen  
 Akustik  
 Near Field Communication (NFC)

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 25.11.2016 mit der  
 Akkreditierungsnummer D-PL-12076-01 und ist gültig bis 17.01.2018. Sie besteht aus diesem Deckblatt,  
 der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 63 Seiten.

Registrierungsnummer der Urkunde: D-PL-12076-01-01

Frankfurt, 25.11.2016

Bitte kleben Sie auf die Rückseite

Im Auftrag Dipl.-Ing. Gert Kall Eigner  
 Abteilungsleiter

Deutsche Akkreditierungsstelle GmbH

Standort Berlin  
 Spittelmarkt 10  
 10117 Berlin

Standort Frankfurt am Main  
 Europa-Allee 52  
 60327 Frankfurt am Main

Standort Braunschweig  
 Bundesallee 100  
 38116 Braunschweig

Die auszugsweise Veröffentlichung der Akkreditierungsurkunde bedarf der vorherigen schriftlichen  
 Zustimmung der Deutsche Akkreditierungsstelle GmbH (DAKKS). Ausgenommen davon ist die separate  
 Weiterverbreitung des Deckblattes durch die umseitig genannte Konformitätsbewertungsstelle in  
 unveränderter Form.

Es darf nicht der Anschein erweckt werden, dass sich die Akkreditierung auch auf Bereiche erstreckt,  
 die über den durch die DAKKS bestätigten Akkreditierungsbereich hinausgehen.

Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom  
 31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments  
 und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung  
 im Zusammenhang mit der Vermarktung von Produkten (Abl. L 218 vom 9. Juli 2008, S. 30).  
 Die DAKKS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der  
 European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und  
 der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen  
 erkennen ihre Akkreditierungen gegenseitig an.

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:  
 EA: [www.european-accreditation.org](http://www.european-accreditation.org)  
 ILAC: [www.ilac.org](http://www.ilac.org)  
 IAF: [www.iaf.eu](http://www.iaf.eu)

### Note:

The current certificate including annex can be received on request.