



## TEST REPORT

Test report no.: 1-3558/17-01-02-C



### 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-12076-01-03

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### Manufacturer

**Philips Medizin Systeme Böblingen GmbH**

Hewlett-Packard-Strasse 2  
71034 Böblingen / GERMANY

### Test standard/s

47 CFR Part 95      Personal radio services – medical device Radiocommunication service (MedRadio)

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

### Test Item

**Kind of test item:** CTG Base Station PQC-OBBSBV1  
including 2x 2.4GHz Transceiver PQC-SRRBV6  
**Model name:** 866074  
**FCC ID:** PQC-OBBSBV1  
**IC:** -/-  
**Frequency:** MBAN bands:  
2360 MHz to 2390 MHz & 2390 MHz to 2400 MHz  
**Technology tested:** MBAN  
**Antenna:** Chip antenna  
**Power supply:** 7.5 V DC by power supply  
**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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This test report replaces the test report with the number 1-3558/17-01-02-B and dated 2018-02-28

### 2.2 Application details

|                                    |            |
|------------------------------------|------------|
| Date of receipt of order:          | 2017-04-10 |
| Date of receipt of test item:      | 2017-04-18 |
| Start of test:                     | 2017-04-20 |
| End of test:                       | 2017-04-28 |
| 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 95 | May-14-2009 | Personal radio services – medical device Radiocommunication service (MedRadio) |

| 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 |
| KDB 550599 D01 v01r01 | December-08-2017 | Medical body area network (MBAN) measurement procedures                                                                                                             |

## 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>No tests under extreme conditions performed.<br>No tests under extreme conditions performed. |
| Relative humidity content | : |                                                          | 55 %                                                                                                                                 |
| Barometric pressure       | : |                                                          | 1021 hpa                                                                                                                             |
| Power supply              | : | V <sub>nom</sub><br>V <sub>max</sub><br>V <sub>min</sub> | 7.5 V DC by power supply<br>No tests under extreme conditions performed.<br>No tests under extreme conditions performed.             |

## 5 Test item

### 5.1 General description

|                            |   |                                                                                                                   |            |
|----------------------------|---|-------------------------------------------------------------------------------------------------------------------|------------|
| Kind of test item          | : | CTG Base Station PQC-OBBSBV1<br>including 2x 2.4GHz Transceiver PQC-SRRBV6                                        |            |
| Type identification        | : | 866074                                                                                                            |            |
| HMN                        | : | -/-                                                                                                               |            |
| PMN                        | : | -/-                                                                                                               |            |
| HVIN                       | : | -/-                                                                                                               |            |
| FVIN                       | : | -/-                                                                                                               |            |
| S/N serial number          | : | Rad.                                                                                                              | DE32000515 |
| HW hardware status         | : | 1                                                                                                                 |            |
| SW software status         | : | B.00.39 / B.02.60                                                                                                 |            |
| Frequency band             | : | MBAN bands:<br>2360 MHz to 2390 MHz & 2390 MHz to 2400 MHz<br>(lowest channel 2363 MHz, highest channel 2397 MHz) |            |
| Type of radio transmission | : | modulated carrier, DSSS                                                                                           |            |
| Use of frequency spectrum  | : |                                                                                                                   |            |
| Type of modulation         | : | QPSK                                                                                                              |            |
| Number of channels         | : | 15                                                                                                                |            |
| Antenna                    | : | Chip antenna                                                                                                      |            |
| Power supply               | : | 7.5 V DC by power supply                                                                                          |            |
| 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:

1-3558/17-01-01\_AnnexA  
 1-3558/13-01-03  
 1-3558/17-01-01\_AnnexD

## 6 Measurement uncertainty

| Measurement uncertainty                                  |                                                  |
|----------------------------------------------------------|--------------------------------------------------|
| Test case                                                | Uncertainty                                      |
| Frequency stability                                      | $\pm 100$ Hz                                     |
| Emission bandwidth                                       | $\pm 21.5$ kHz absolute; $\pm 15.0$ kHz relative |
| Maximum output power                                     | $\pm 1$ dB                                       |
| Band edge                                                | $\pm 3$ dB                                       |
| Spurious emissions radiated 30 MHz to 1 GHz              | $\pm 3$ dB                                       |
| Spurious emissions radiated 1 GHz to 12.75 GHz           | $\pm 3.7$ dB                                     |
| Spurious emissions radiated above 12.75 GHz              | $\pm 4.5$ dB                                     |
| Spurious emissions conducted below 30 MHz (AC conducted) | $\pm 2.6$ dB                                     |

## 7 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).

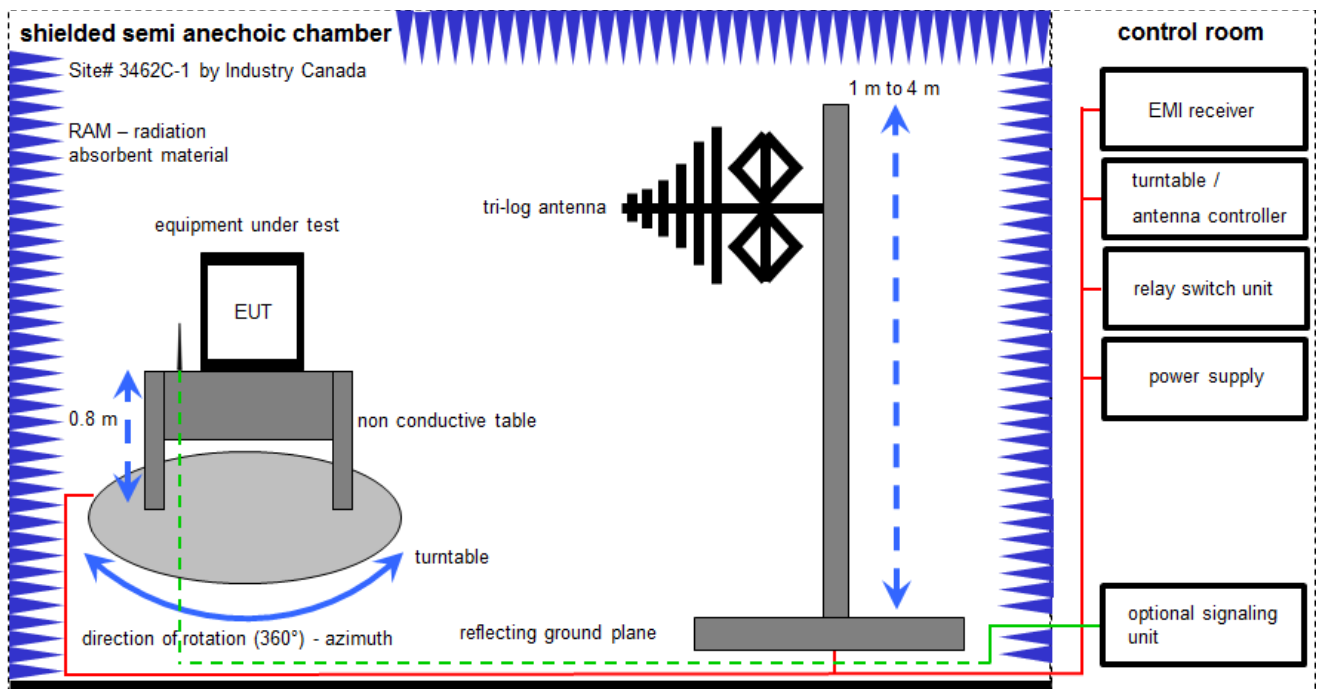
In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

**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                       |
| vk! | Attention: extended calibration interval   |     |                                                      |
| NK! | Attention: not calibrated                  | *)  | next calibration ordered / currently in progress     |

## 7.1 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)

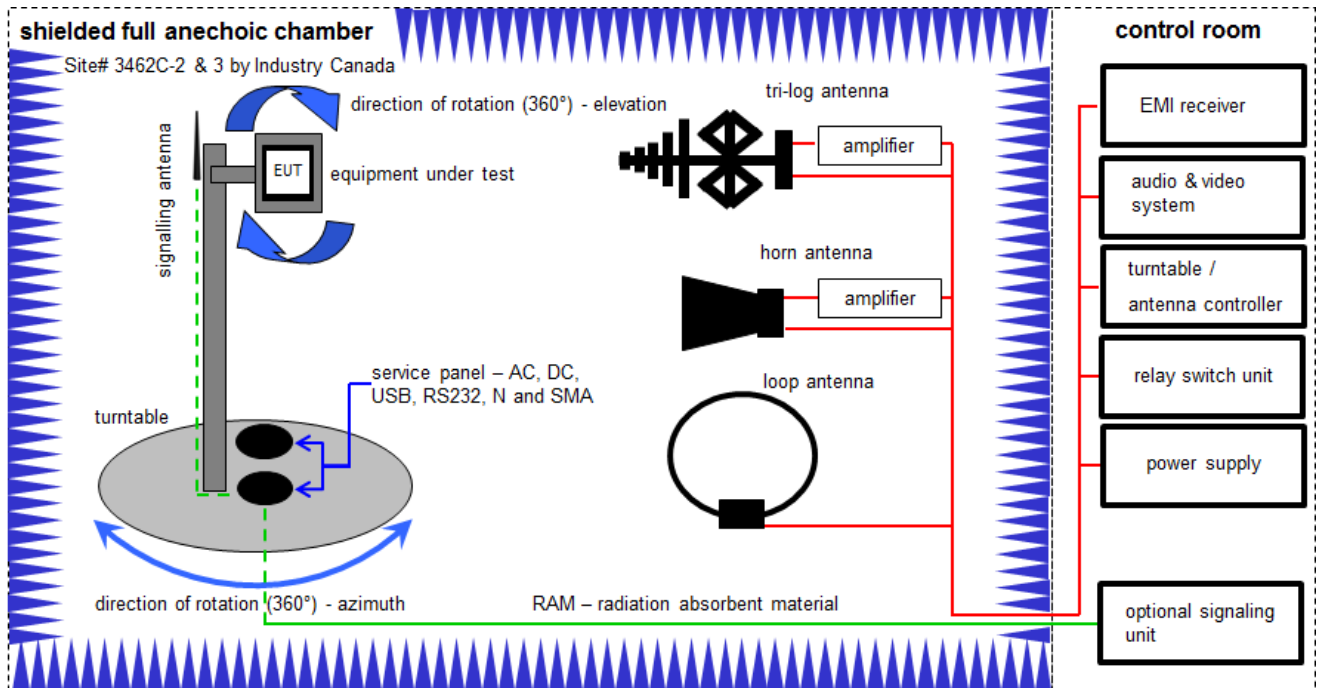
Example calculation:

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

### 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          | Meßkabine 1                                       | HF-Absorberhalle | MWB AG 300023 | 101042          | 300000551 | ne                  | -/-              | -/-              |
| 3   | A          | EMI Test Receiver                                 | ESCI 3           | R&S           | 100083          | 300003312 | k                   | 01.02.2017       | 31.01.2018       |
| 4   | A          | Analyzer-Reference-System (Harmonics and Flicker) | ARS 16/1         | SPS           | A3509 07/0 0205 | 300003314 | Ve                  | 02.02.2016       | 02.02.2018       |
| 5   | A          | Antenna Tower                                     | Model 2175       | ETS-Lindgren  | 64762           | 300003745 | izw                 | -/-              | -/-              |
| 6   | A          | Positioning Controller                            | Model 2090       | ETS-Lindgren  | 64672           | 300003746 | izw                 | -/-              | -/-              |
| 7   | A          | Turntable Interface-Box                           | Model 105637     | ETS-Lindgren  | 44583           | 300003747 | izw                 | -/-              | -/-              |
| 8   | A          | TRILOG Broadband Test-Antenna 30 MHz - 3 GHz      | VULB9163         | Schwarzbeck   | 295             | 300003787 | k                   | 25.04.2016       | 25.04.2018       |

## 7.2 Shielded fully anechoic chamber



Measurement distance: tri-log antenna and horn antenna 3 meter; 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:

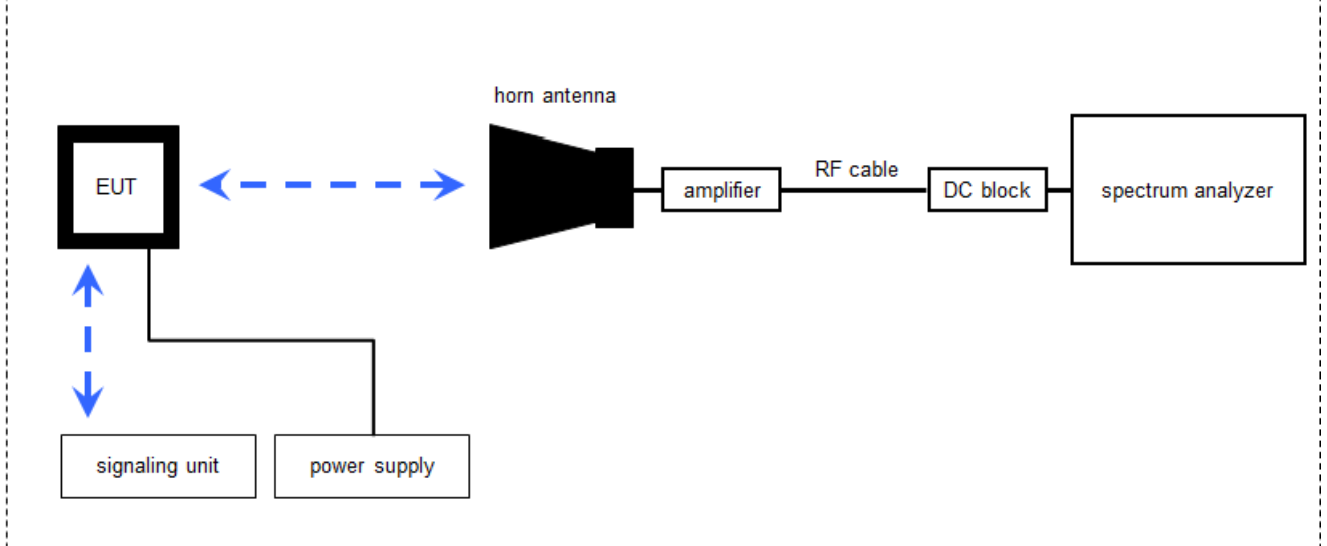
FS [dBμV/m] = 40.0 [dBμV/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dBμV/m] (71.61 μV/m)

### Equipment table:

| No. | Lab / Item | Equipment                                      | Type                                  | Manufacturer         | Serial No.      | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|------------------------------------------------|---------------------------------------|----------------------|-----------------|-----------|---------------------|------------------|------------------|
| 1   | C          | Active Loop Antenna 10 kHz to 30 MHz           | 6502                                  | EMCO                 | 2210            | 300001015 | k                   | 20.05.2015       | 20.05.2017       |
| 2   | A          | Double-Ridged Waveguide Horn Antenna 1-18.0GHz | 3115                                  | EMCO                 | 9709-5290       | 300000212 | k                   | 13.08.2015       | 13.08.2017       |
| 3   | A          | Highpass Filter                                | WHK1.1/15G-10SS                       | Wainwright           | 37              | 400000148 | ne                  | -/-              | -/-              |
| 4   | A          | Highpass Filter                                | WHKX7.0/18G-8SS                       | Wainwright           | 18              | 300003789 | ne                  | -/-              | -/-              |
| 5   | B          | TRILOG Broadband Test-Antenna 30 MHz - 3 GHz   | VULB9163                              | Schwarzbeck          | 371             | 300003854 | vIKI!               | 29.10.2014       | 29.10.2017       |
| 6   | A, B       | Broadband Amplifier 0.5-18 GHz                 | CBLU5184540                           | CERNEX               | 22051           | 300004483 | ev                  | -/-              | -/-              |
| 7   | A, B, C    | 4U RF Switch Platform                          | L4491A                                | Agilent Technologies | MY50000032      | 300004510 | ne                  | -/-              | -/-              |
| 8   | A, B, C    | Messrechner und Monitor                        | Intel Core i3 3220/3.3 GHz, Prozessor | Huber & Suhner       | 2V2403033A54 21 | 300004591 | ne                  | -/-              | -/-              |
| 9   | A, B, C    | NEXIO EMV-Software                             | BAT EMC V3.16.0.49                    | EMCO                 | Batch no. 14844 | 300004682 | ne                  | -/-              | -/-              |
| 10  | A, B, C    | Anechoic chamber                               | ESH3-Z5                               | TDK                  | 893045/004      | 300003726 | ne                  | -/-              | -/-              |
| 11  | A, B, C    | EMI Test Receiver 9kHz-26,5GHz                 | ESR26                                 | R&S                  | 101376          | 300005063 | vIKI!               | 13.09.2016       | 13.03.2018       |

### 7.3 Radiated measurements > 18 GHz

#### Radiated measurements > 18 GHz



Measurement distance: horn antenna 50 cm

$$FS = U_R + CA + AF$$

(FS-field strength;  $U_R$ -voltage at the receiver; CA-loss signal path & distance correction; AF-antenna factor)

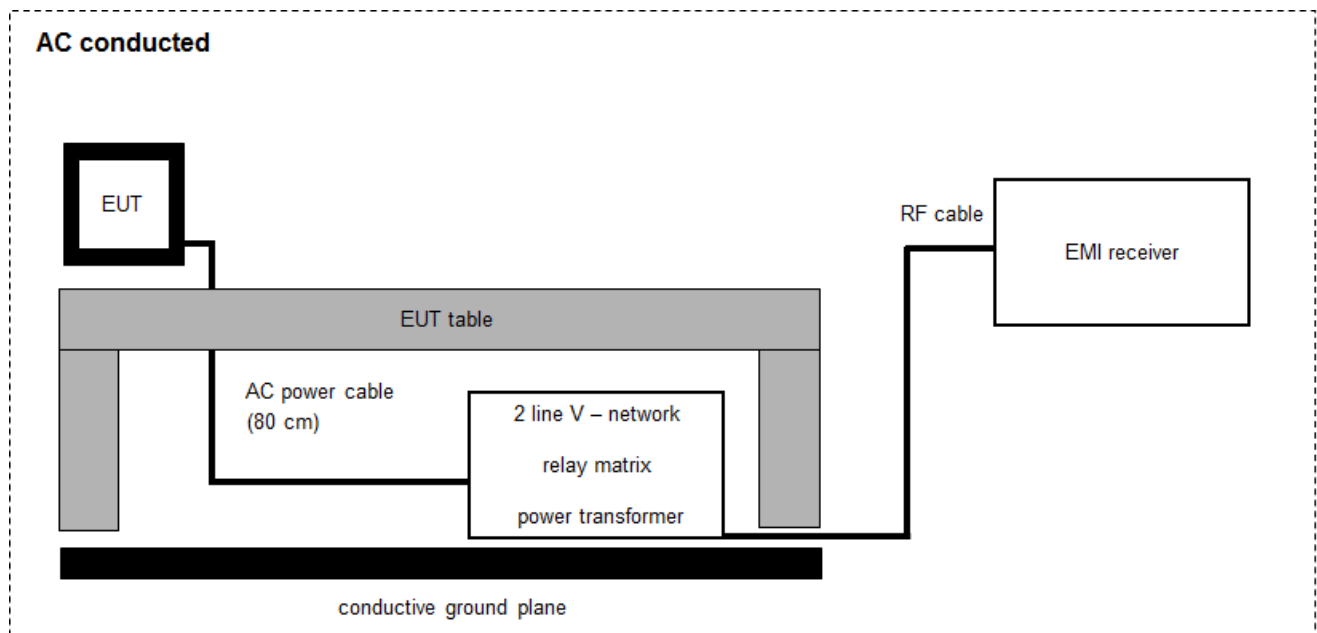
#### Example calculation:

$$FS \text{ [dB}\mu\text{V/m]} = 40.0 \text{ [dB}\mu\text{V/m]} + (-60.1) \text{ [dB]} + 36.74 \text{ [dB/m]} = 16.64 \text{ [dB}\mu\text{V/m]} \text{ (6.79 } \mu\text{V/m)}$$

#### Equipment table:

| No. | Lab / Item | Equipment                               | Type                | Manufacturer   | Serial No.       | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|-----------------------------------------|---------------------|----------------|------------------|-----------|---------------------|------------------|------------------|
| 1   | A          | Std. Gain Horn Antenna 18.0 to 26.5 GHz | 638                 | Narda          | -/-              | 300000486 | k                   | 10.09.2015       | 10.09.2017       |
| 2   | A          | Signal Analyzer 40 GHz                  | FSV40               | R&S            | 101042           | 300004517 | k                   | 27.01.2017       | 26.01.2018       |
| 3   | A          | Amplifier 2-40 GHz                      | JS32-02004000-57-5P | MITEQ          | 1777200          | 300004541 | ev                  | -/-              | -/-              |
| 4   | A          | RF-Cable                                | ST18/SMAm/SMAm/48   | Huber & Suhner | Batch no. 600918 | 400001182 | ev                  | -/-              | -/-              |
| 5   | A          | RF-Cable                                | ST18/SMAm/SMAm/48   | Huber & Suhner | Batch no. 127377 | 400001183 | ev                  | -/-              | -/-              |
| 6   | A          | DC-Blocker 0.1-40 GHz                   | 8141A               | Inmet          | -/-              | 400001185 | ev                  | -/-              | -/-              |

## 7.4 AC conducted



$$FS = UR + CF + VC$$

(FS-field strength; UR-voltage at the receiver; CR-loss of the cable and filter; VC-correction factor of the ISN)

*Example calculation:*

$$FS [dB\mu V/m] = 37.62 [dB\mu V/m] + 9.90 [dB] + 0.23 [dB] = 47.75 [dB\mu V/m] (244.06 \mu V/m)$$

### Equipment table:

| No. | Lab / Item | Equipment                                      | Type     | Manufacturer         | Serial No. | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|------------------------------------------------|----------|----------------------|------------|-----------|---------------------|------------------|------------------|
| 1   | A          | Two-line V-Network (LISN) 9 kHz to 30 MHz      | ESH3-Z5  | R&S                  | 893045/004 | 300000584 | k                   | 31.01.2017       | 30.01.2018       |
| 2   | A          | RF-Filter-section                              | 85420E   | HP                   | 3427A00162 | 300002214 | k                   | 27.11.2006       | -/-              |
| 3   | A          | EM-Injection Clamp AC-Spannungsquelle variabel | FCC-203i | emv                  | 232        | 300000626 | ev                  | 18.05.2001       | -/-              |
| 4   | A          | Spannungsquelle variabel                       | MV2616-V | EM-Test              | 0397-12    | 300003259 | k                   | 11.12.2015       | 11.12.2017       |
| 5   | A          | Hochpass 150 kHz                               | EZ-25    | R&S                  | 100010     | 300003798 | ev                  | 08.04.2008       | -/-              |
| 6   | A          | MXE EMI Receiver 20 Hz to 26,5 GHz             | N9038A   | Agilent Technologies | MY51210197 | 300004405 | k                   | 16.08.2016       | 16.08.2017       |

## 8 Sequence of testing

### 8.1 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.

## 8.2 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.

### 8.3 Sequence of testing radiated spurious 1 GHz to 18 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 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 is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector 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 maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, 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.

## 8.4 Sequence of testing radiated spurious above 18 GHz

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- 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.
- The measurement distance is as appropriate (e.g. 0.5 m).
- The EUT is set into operation.

### Premeasurement

- The test antenna is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.

### Final measurement

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.

## 9 Summary of measurement results

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

| TC Identifier | Description                       | Verdict   | Date       | Remark                               |
|---------------|-----------------------------------|-----------|------------|--------------------------------------|
| RF-Testing    | 47 CFR Part 2<br>47 CFR Part 95 H | See table | 2018-03-02 | Tests according to customer's demand |

| Test Specification Clause          | Test Case                                       | Temperature Conditions | Power Source Voltages | C                                   | NC                       | NA                       | NP                                  | Remark |
|------------------------------------|-------------------------------------------------|------------------------|-----------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------|
| FCC 47 CFR § 95.2565(b)            | Frequency stability                             | Nominal and extreme    | Nominal               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | *1     |
| FCC 47 CFR § 95.2573(e)            | Emission bandwidth                              | Nominal                | Nominal               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | *1     |
| FCC 47 CFR § 95.2567(e) and (f)    | Maximum transmit power                          | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | -/-    |
| FCC 47 CFR § 95.2579(a)(5) and (f) | Band edge measurements                          | Nominal                | Nominal               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | *1     |
| FCC 47 CFR § 95.2579(a)(5) and (f) | Transmitter unwanted radiation                  | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | -/-    |
| FCC 47 CFR § 95.2579(a)(5) and (f) | Receiver spurious emissions (radiated)          | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | -/-    |
| FCC 47 CFR § 15.107(a) § 15.207    | Conducted emissions below 30 MHz (AC conducted) | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | -/-    |

\*1: For conducted results please see main report 1-2773/16-01-02

**Note:** C = Compliant; NC = Not compliant; NA = Not Applicable; NP = Not Performed

**10 Additional comments**

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reference documents:                   | Customer_Questionnaire_1-3558_17-01_Base.docx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                        | Main test report 1-2773/16-01-02-A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Special test descriptions:             | The EUT contains two radio modules (left and right). The tests were performed on both modules.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Configuration descriptions:            | Used power settings: Lower band: -5 dBm for all channels<br>Upper band: 0 dBm for all channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Test mode:                             | <input checked="" type="checkbox"/> Special software is used.<br>EUT is transmitting pseudo random data by itself                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Antennas and transmit operating modes: | <input checked="" type="checkbox"/> Operating mode 1 (single antenna) <ul style="list-style-type: none"><li>- Equipment with 1 antenna,</li><li>- Equipment with 2 diversity antennas operating in switched diversity mode by which at any moment in time only 1 antenna is used,</li><li>- Smart antenna system with 2 or more transmit/receive chains, but operating in a mode where only 1 transmit/receive chain is used)</li></ul> <input type="checkbox"/> Operating mode 2 (multiple antennas, no beamforming) <ul style="list-style-type: none"><li>- Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously but without beamforming.</li></ul> <input type="checkbox"/> Operating mode 3 (multiple antennas, with beamforming) <ul style="list-style-type: none"><li>- Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously with beamforming.<br/>In addition to the antenna assembly gain (G), the beamforming gain (Y) may have to be taken into account when performing the measurements.</li></ul> |

## 11 Measurement results

### 11.1 Maximum transmit power

#### Measurement:

Measurements were made in accordance with the procedures detailed in FCC 95.2567 (e) and (f), 5.2.5.5 of ANSI C63.26- 2015 and FCC OET 971168 – Measurement Guidance for Certification of Licensed Digital Transmitters, Section 5.1.

| Measurement parameter   |                                  |
|-------------------------|----------------------------------|
| Detector:               | Peak                             |
| Sweep time:             | Auto                             |
| Resolution bandwidth:   | 3 MHz                            |
| Video bandwidth:        | 10 MHz                           |
| Span:                   | 20 MHz                           |
| Trace-Mode:             | Max. hold                        |
| Test setup              | See sub clause 7.2 – B & 7.4 – A |
| Measurement uncertainty | See sub clause 9                 |

#### Limits:

| FCC                                                                                                                                                                                                                                                      | IC  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 47 CFR § 95.2567 (e) and (f)                                                                                                                                                                                                                             | -/- |
| 95.2567(e): For MedRadio transmitters operating in the 2360-2390 MHz band, the M-EIRP over the bands of operation must not exceed the lesser of zero dBm (1 mW) or $10 \log (B)$ dBm, where B is the MedRadio 20 dB emission bandwidth in megahertz.     |     |
| 95.2567(f): For MedRadio transmitters operating in the 2390-2400 MHz band, the M-EIRP over the bands of operation must not exceed the lesser of 13 dBm (20 mW) or $16 + 10 \log (B)$ dBm, where B is the MedRadio 20 dB emission bandwidth in megahertz. |     |

**Result:** main report 1-2773/16-01-02-A

| Frequency [MHz] | Output power conducted [dBm] | Gain [dBi] | EIRP [dBm] | Limit [dBm] |
|-----------------|------------------------------|------------|------------|-------------|
| 2363            | -0.9                         | 0.2        | -0.7       | 0.0         |
| 2382            | -0.7                         | -0.1       | -0.8       | 0.0         |
| 2387            | -0.5                         | -0.2       | -0.7       | 0.0         |
| 2392            | -0.5                         | 0.8        | 0.3        | 13.0        |
| 2397            | -0.6                         | 0.3        | -0.3       | 13.0        |

**Result:** left module

| Frequency [MHz] | Output power conducted [dBm] | Gain [dBi] | EIRP [dBm] | Limit [dBm] |
|-----------------|------------------------------|------------|------------|-------------|
| 2363            | -/-                          | -/-        | -2.1       | 0.0         |
| 2382            | -/-                          | -/-        | -0.9       | 0.0         |
| 2387            | -/-                          | -/-        | -0.9       | 0.0         |
| 2392            | -/-                          | -/-        | 3.0        | 13.0        |
| 2397            | -/-                          | -/-        | 2.9        | 13.0        |

**Result:** right module

| Frequency [MHz] | Output power conducted [dBm] | Gain [dBi] | EIRP [dBm] | Limit [dBm] |
|-----------------|------------------------------|------------|------------|-------------|
| 2363            | -/-                          | -/-        | -2.3       | 0.0         |
| 2382            | -/-                          | -/-        | -0.9       | 0.0         |
| 2387            | -/-                          | -/-        | -0.9       | 0.0         |
| 2392            | -/-                          | -/-        | 4.1        | 13.0        |
| 2397            | -/-                          | -/-        | 4.2        | 13.0        |

## 11.2 Transmitter unwanted radiation (radiated)

### Measurement:

| Measurement parameter   |                                                                             |                                                |
|-------------------------|-----------------------------------------------------------------------------|------------------------------------------------|
| Detector:               | Prescan:<br>Final:                                                          | Peak<br>QPK below 960 MHz<br>RMS above 960 MHz |
| Resolution bandwidth:   | 9 kHz – 150 kHz:<br>150 kHz – 30 MHz:<br>30 MHz – 1 GHz:<br>1 GHz – 26 GHz: | 200 Hz<br>9 kHz<br>100 kHz<br>1 MHz            |
| Video bandwidth:        | 9 kHz – 150 kHz:<br>150 kHz – 30 MHz:<br>30 MHz – 1 GHz:<br>1 GHz – 26 GHz: | 1 kHz<br>30 kHz<br>300 kHz<br>3 MHz            |
| Span:                   | See plots                                                                   |                                                |
| Trace-Mode:             | Max Hold                                                                    |                                                |
| Test setup              | See sub clause 7.1 – A & 7.2 – A & 7.3 – A                                  |                                                |
| Measurement uncertainty | See sub clause 9                                                            |                                                |

### Limits:

| FCC                                       |                                    | IC                       |
|-------------------------------------------|------------------------------------|--------------------------|
| 47 CFR § 15.109<br>47 CFR §95.2579 (a)(5) |                                    | -/-                      |
| Transmitter unwanted radiation (radiated) |                                    |                          |
| Frequency (MHz)                           | Field strength (µV/m) <sup>1</sup> | Measurement distance (m) |
| 0.009 – 0.490                             | 2400/F(kHz)                        | 300                      |
| 0.490 – 1.705                             | 24000/F(kHz)                       | 30                       |
| 1.705 – 30.0                              | 30                                 | 30                       |
| 30 - 88                                   | 100 (40 dBµV/m)                    | 3                        |
| 30 - 88                                   | 31.6 (30 dBµV/m)                   | 10                       |
| 88 - 216                                  | 150 (43.5 dBµV/m)                  | 3                        |
| 88 - 216                                  | 47.3 (33.5 dBµV/m)                 | 10                       |
| 216 - 960                                 | 200 (46 dBµV/m)                    | 3                        |
| 216 - 960                                 | 63.1 (36 dBµV/m)                   | 10                       |
| above 960                                 | 500 (54 dBµV/m)                    | 3                        |

<sup>1</sup> Measurements in the 9 to 90 kHz, 110 to 490 kHz and above 1000 MHz ranges employ an average detector. Otherwise a quasi-peak detector is used.

**Results:** Transmitter mode, left module

| Transmitter unwanted radiation [dBμV/m]                                   |          |                |          |          |                |          |          |                |
|---------------------------------------------------------------------------|----------|----------------|----------|----------|----------------|----------|----------|----------------|
| 2363 MHz                                                                  |          |                | 2382 MHz |          |                | 2387 MHz |          |                |
| F [MHz]                                                                   | Detector | Level [dBμV/m] | F [MHz]  | Detector | Level [dBμV/m] | F [MHz]  | Detector | Level [dBμV/m] |
| For emissions below 1 GHz, please look at the table below the 1 GHz plot. |          |                |          |          |                |          |          |                |
| 1619                                                                      | Peak     | 40.0           | 1619     | Peak     | 40.0           | 1619     | Peak     | 40.0           |
|                                                                           | QPK      | -/-            |          | QPK      | -/-            |          | QPK      | -/-            |
| 1680                                                                      | Peak     | 37.3           | 1680     | Peak     | 38.1           | 1680     | Peak     | 38.1           |
|                                                                           | QPK      | -/-            |          | QPK      | -/-            |          | QPK      | -/-            |
| 1800                                                                      | Peak     | 38.5           | 1800     | Peak     | 38.2           | 1800     | Peak     | 38.2           |
|                                                                           | QPK      | -/-            |          | QPK      | -/-            |          | QPK      | -/-            |
| 1860                                                                      | Peak     | 40.2           | 1860     | Peak     | 39.8           | 1860     | Peak     | 42.1           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 1919                                                                      | Peak     | 41.6           | 1919     | Peak     | 41.6           | 1919     | Peak     | 42.0           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 1980                                                                      | Peak     | 39.3           | 1980     | Peak     | 39.1           | 1980     | Peak     | 39.1           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 2730                                                                      | Peak     | 36.7           | 2730     | Peak     | 36.7           | 2730     | Peak     | 36.7           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 2790                                                                      | Peak     | 37.2           | 2790     | Peak     | 37.2           | 2790     | Peak     | 36.0           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 2850                                                                      | Peak     | 35.0           | 2850     | Peak     | 35.0           | 2850     | Peak     | 35.0           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 4726                                                                      | Peak     | 48.0           | 4763     | Peak     | 50.1           | 4774     | Peak     | 50.0           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 6917                                                                      | Peak     | 40.8           | 6917     | Peak     | 40.8           | 6917     | Peak     | 40.3           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 17878                                                                     | Peak     | 43.9           | 17878    | Peak     | 43.9           | 17878    | Peak     | 43.7           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| -/-                                                                       | Peak     | -/-            | -/-      | Peak     | -/-            | -/-      | Peak     | -/-            |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| For emissions above 18 GHz, please look at the plots.                     |          |                |          |          |                |          |          |                |

**Results:** Transmitter mode, left module

| Transmitter unwanted radiation [dBμV/m]                                   |          |                |         |          |                |          |          |                |
|---------------------------------------------------------------------------|----------|----------------|---------|----------|----------------|----------|----------|----------------|
| 2392 MHz                                                                  |          |                | -/-     |          |                | 2397 MHz |          |                |
| F [MHz]                                                                   | Detector | Level [dBμV/m] | F [MHz] | Detector | Level [dBμV/m] | F [MHz]  | Detector | Level [dBμV/m] |
| For emissions below 1 GHz, please look at the table below the 1 GHz plot. |          |                |         |          |                |          |          |                |
| 1619                                                                      | Peak     | 38.5           | -/-     | Peak     | -/-            | 1619     | Peak     | 38.5           |
|                                                                           | QPK      | -/-            |         | QPK      | -/-            |          | QPK      | -/-            |
| 1680                                                                      | Peak     | 37.0           | -/-     | Peak     | -/-            | 1680     | Peak     | 37.0           |
|                                                                           | QPK      | -/-            |         | QPK      | -/-            |          | QPK      | -/-            |
| 1800                                                                      | Peak     | 38.3           | -/-     | Peak     | -/-            | 1800     | Peak     | 38.3           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 1860                                                                      | Peak     | 41.1           | -/-     | Peak     | -/-            | 1860     | Peak     | 41.1           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 1919                                                                      | Peak     | 41.0           | -/-     | Peak     | -/-            | 1919     | Peak     | 41.0           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 1980                                                                      | Peak     | 39.8           | -/-     | Peak     | -/-            | 1980     | Peak     | 39.8           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 2489                                                                      | Peak     | 35.3           | -/-     | Peak     | -/-            | 2489     | Peak     | 35.3           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 2790                                                                      | Peak     | 35.2           | -/-     | Peak     | -/-            | 2790     | Peak     | 35.2           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 4784                                                                      | Peak     | 51.0           | -/-     | Peak     | -/-            | 4794     | Peak     | 42.0           |
|                                                                           | AVG      | 42.5           |         | AVG      | -/-            |          | AVG      | -/-            |
| 7174                                                                      | Peak     | 45.3           | -/-     | Peak     | -/-            | 7192     | Peak     | 46.9           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 9565                                                                      | Peak     | 39.9           | -/-     | Peak     | -/-            | 9586     | Peak     | 39.3           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 17860                                                                     | Peak     | 43.0           | -/-     | Peak     | -/-            | 17880    | Peak     | 43.0           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| -/-                                                                       | Peak     | -/-            | -/-     | Peak     | -/-            | -/-      | Peak     | -/-            |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| For emissions above 18 GHz, please look at the plots.                     |          |                |         |          |                |          |          |                |

**Results:** Transmitter mode, right module

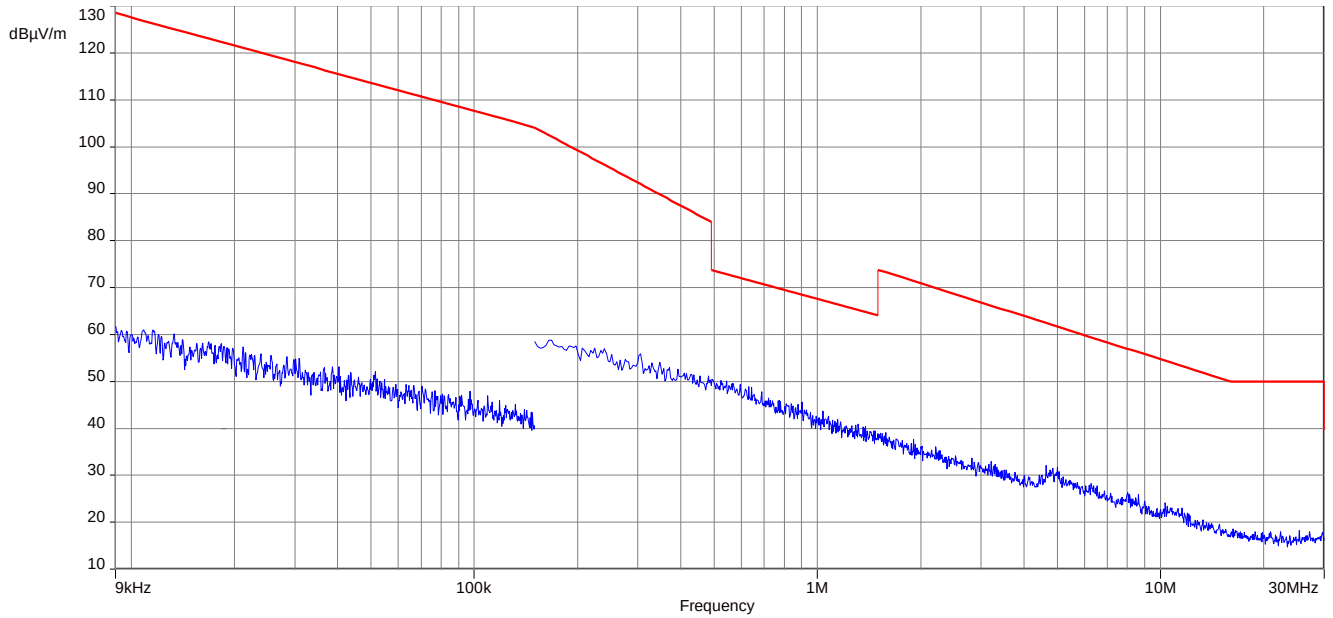
| Transmitter unwanted radiation [dBμV/m]                                   |          |                |          |          |                |          |          |                |
|---------------------------------------------------------------------------|----------|----------------|----------|----------|----------------|----------|----------|----------------|
| 2363 MHz                                                                  |          |                | 2382 MHz |          |                | 2387 MHz |          |                |
| F [MHz]                                                                   | Detector | Level [dBμV/m] | F [MHz]  | Detector | Level [dBμV/m] | F [MHz]  | Detector | Level [dBμV/m] |
| For emissions below 1 GHz, please look at the table below the 1 GHz plot. |          |                |          |          |                |          |          |                |
| 1619                                                                      | Peak     | 38.6           | 1619     | Peak     | 38.6           | 1619     | Peak     | 44.0           |
|                                                                           | QPK      | -/-            |          | QPK      | -/-            |          | QPK      | -/-            |
| 1800                                                                      | Peak     | 38.1           | 1800     | Peak     | 38.1           | 1800     | Peak     | 38.1           |
|                                                                           | QPK      | -/-            |          | QPK      | -/-            |          | QPK      | -/-            |
| 1860                                                                      | Peak     | 41.5           | 1860     | Peak     | 41.5           | 1860     | Peak     | 41.5           |
|                                                                           | QPK      | -/-            |          | QPK      | -/-            |          | QPK      | -/-            |
| 1919                                                                      | Peak     | 43.1           | 1919     | Peak     | 43.1           | 1919     | Peak     | 43.1           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 1979                                                                      | Peak     | 39.0           | 1979     | Peak     | 39.0           | 1979     | Peak     | 39.0           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 2130                                                                      | Peak     | 37.8           | 2130     | Peak     | 37.8           | 2130     | Peak     | 37.8           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 2430                                                                      | Peak     | 36.0           | 2430     | Peak     | 36.0           | 2430     | Peak     | 36.0           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 2790                                                                      | Peak     | 36.6           | 2790     | Peak     | 36.6           | 2790     | Peak     | 36.6           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 4726                                                                      | Peak     | 50.0           | 4764     | Peak     | 52.5           | 4774     | Peak     | 50.2           |
|                                                                           | AVG      | 42.8           |          | AVG      | 44.9           |          | AVG      | 42.0           |
| 7090                                                                      | Peak     | 39.0           | 7147     | Peak     | 44.2           | 6926     | Peak     | 39.7           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 14133                                                                     | Peak     | 40.1           | 14133    | Peak     | 40.1           | 14133    | Peak     | 40.1           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| 17740                                                                     | Peak     | 43.5           | 17740    | Peak     | 43.5           | 17740    | Peak     | 43.5           |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| -/-                                                                       | Peak     | -/-            | -/-      | Peak     | -/-            | -/-      | Peak     | -/-            |
|                                                                           | AVG      | -/-            |          | AVG      | -/-            |          | AVG      | -/-            |
| For emissions above 18 GHz, please look at the plots.                     |          |                |          |          |                |          |          |                |

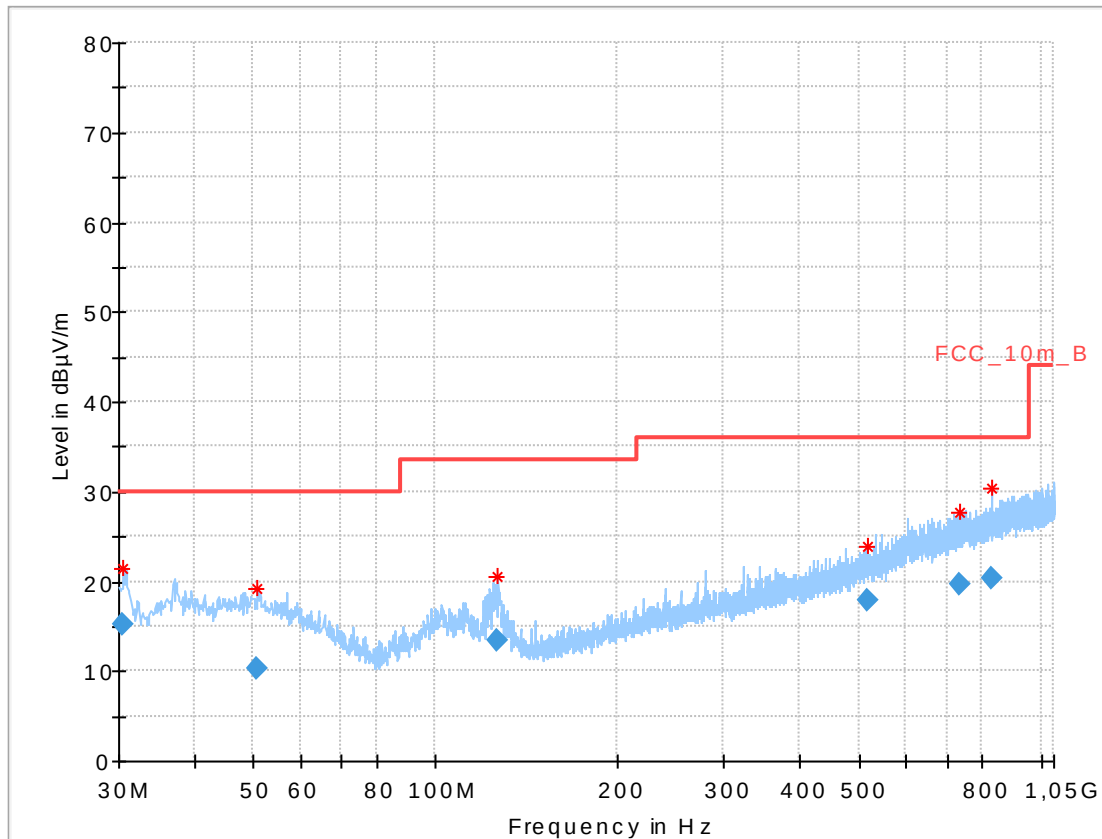
**Results:** Transmitter mode, right module

| Transmitter unwanted radiation [dBμV/m]                                   |          |                |         |          |                |          |          |                |
|---------------------------------------------------------------------------|----------|----------------|---------|----------|----------------|----------|----------|----------------|
| 2392 MHz                                                                  |          |                | -/-     |          |                | 2397 MHz |          |                |
| F [MHz]                                                                   | Detector | Level [dBμV/m] | F [MHz] | Detector | Level [dBμV/m] | F [MHz]  | Detector | Level [dBμV/m] |
| For emissions below 1 GHz, please look at the table below the 1 GHz plot. |          |                |         |          |                |          |          |                |
| 1619                                                                      | Peak     | 44.0           | -/-     | Peak     | -/-            | 1619     | Peak     | 44.0           |
|                                                                           | QPK      | -/-            |         | QPK      | -/-            |          | QPK      | -/-            |
| 1800                                                                      | Peak     | 38.1           | -/-     | Peak     | -/-            | 1800     | Peak     | 38.1           |
|                                                                           | QPK      | -/-            |         | QPK      | -/-            |          | QPK      | -/-            |
| 1860                                                                      | Peak     | 41.5           | -/-     | Peak     | -/-            | 1860     | Peak     | 41.5           |
|                                                                           | QPK      | -/-            |         | AVG      | -/-            |          | QPK      | -/-            |
| 1919                                                                      | Peak     | 43.1           | -/-     | Peak     | -/-            | 1919     | Peak     | 43.1           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 1979                                                                      | Peak     | 39.0           | -/-     | Peak     | -/-            | 1979     | Peak     | 39.0           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 2130                                                                      | Peak     | 37.8           | -/-     | Peak     | -/-            | 2130     | Peak     | 37.8           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 2430                                                                      | Peak     | 36.0           | -/-     | Peak     | -/-            | 2430     | Peak     | 36.0           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 2790                                                                      | Peak     | 36.6           | -/-     | Peak     | -/-            | 2790     | Peak     | 36.6           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 4782                                                                      | Peak     | 53.1           | -/-     | Peak     | -/-            | 4795     | Peak     | 53.5           |
|                                                                           | AVG      | 44.9           |         | AVG      | -/-            |          | AVG      | 45.7           |
| 7177                                                                      | Peak     | 56.9           | -/-     | Peak     | -/-            | 7191     | Peak     | 45.7           |
|                                                                           | AVG      | 48.9           |         | AVG      | -/-            |          | AVG      | -/-            |
| 14133                                                                     | Peak     | 40.1           | -/-     | Peak     | -/-            | 14133    | Peak     | 40.1           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| 17740                                                                     | Peak     | 43.5           | -/-     | Peak     | -/-            | 17740    | Peak     | 43.5           |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| -/-                                                                       | Peak     | -/-            | -/-     | Peak     | -/-            | -/-      | Peak     | -/-            |
|                                                                           | AVG      | -/-            |         | AVG      | -/-            |          | AVG      | -/-            |
| For emissions above 18 GHz, please look at the plots.                     |          |                |         |          |                |          |          |                |

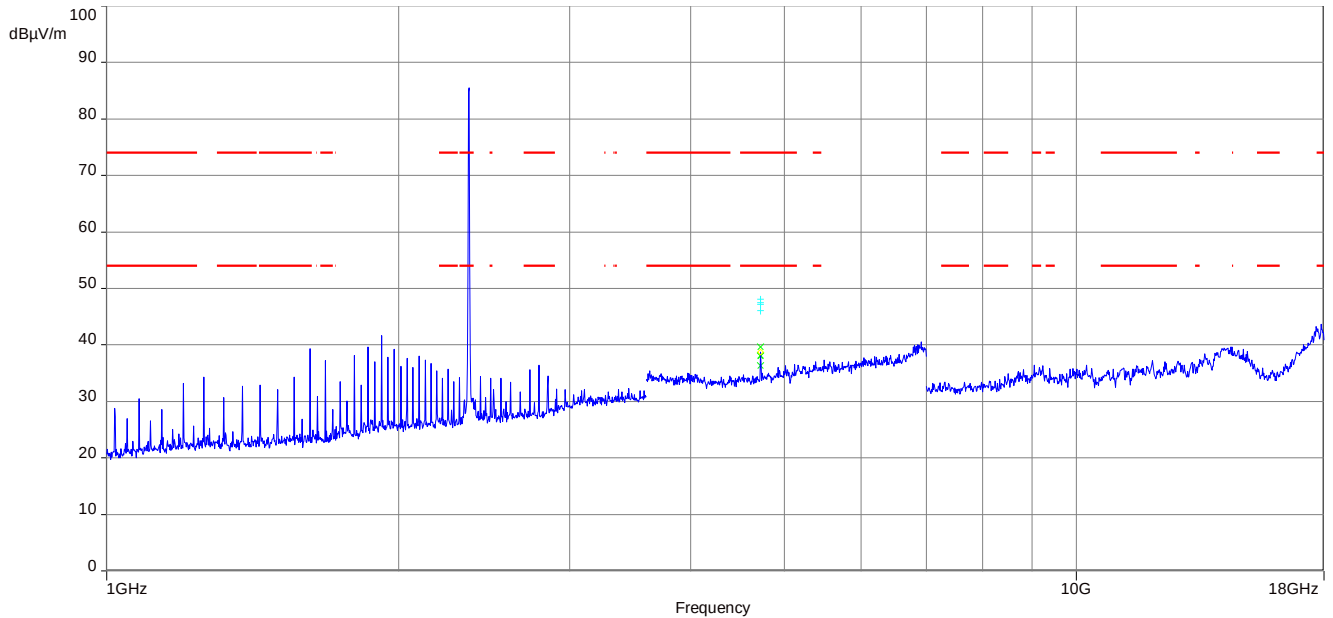
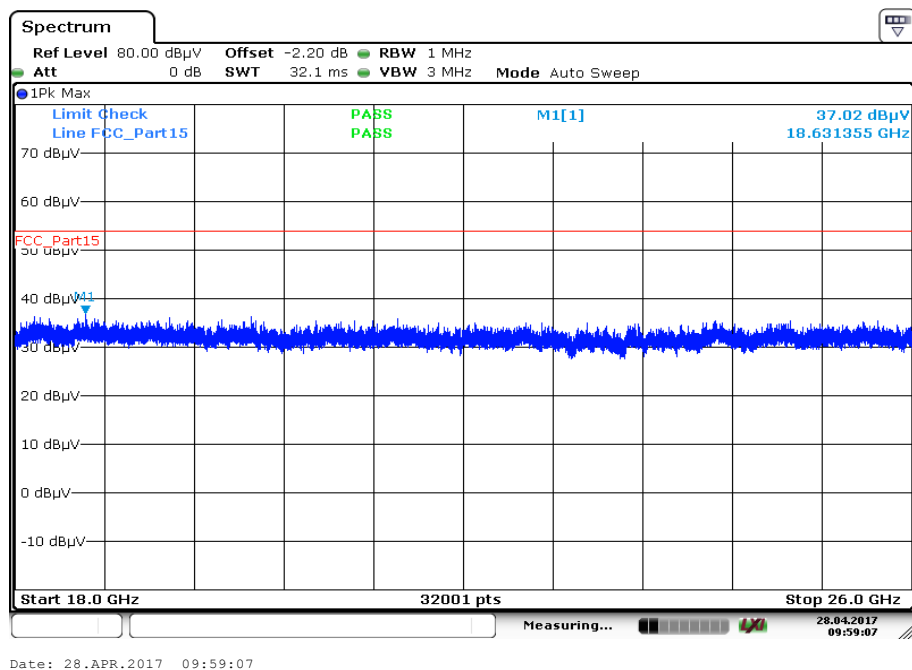
**Plots:** left module

**Plot 1:** 9 kHz – 30 MHz, channel low, lower band

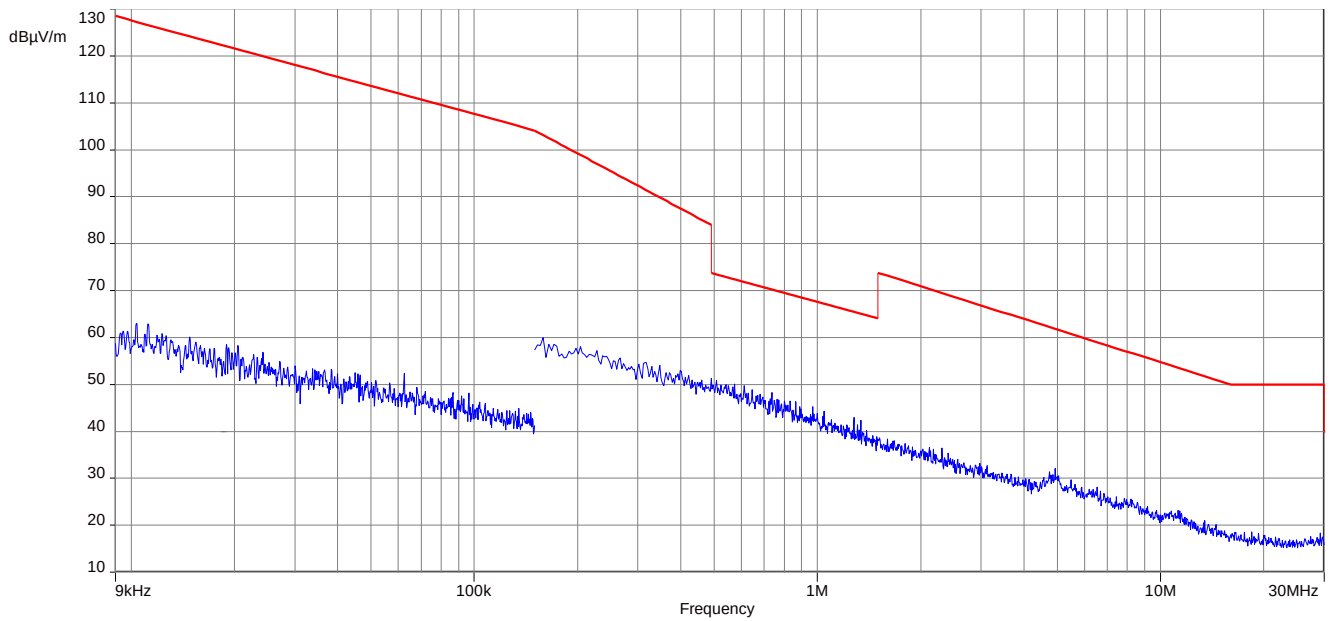


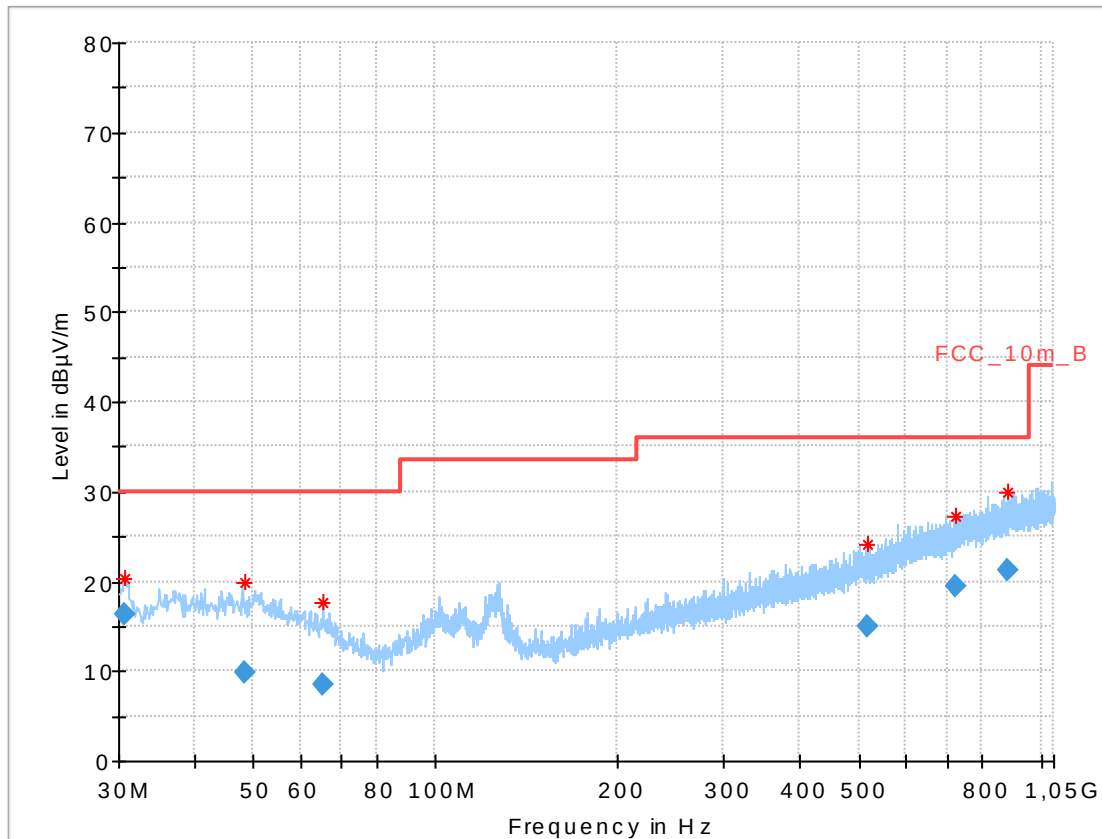
**Plot 2:** 30 MHz – 1 GHz, channel low, lower band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.380250       | 15.13              | 30.00          | 14.87       | 1000.0          | 120.000         | 101.0       | V   | 139.0         | 11.9       |
| 50.573700       | 10.31              | 30.00          | 19.69       | 1000.0          | 120.000         | 101.0       | H   | 125.0         | 13.7       |
| 126.712650      | 13.46              | 33.50          | 20.04       | 1000.0          | 120.000         | 101.0       | V   | 46.0          | 9.8        |
| 515.427150      | 17.86              | 36.00          | 18.14       | 1000.0          | 120.000         | 178.0       | H   | 176.0         | 18.9       |
| 731.585100      | 19.58              | 36.00          | 16.42       | 1000.0          | 120.000         | 180.0       | H   | 46.0          | 22.3       |
| 829.966500      | 20.44              | 36.00          | 15.56       | 1000.0          | 120.000         | 185.0       | V   | 346.0         | 23.2       |

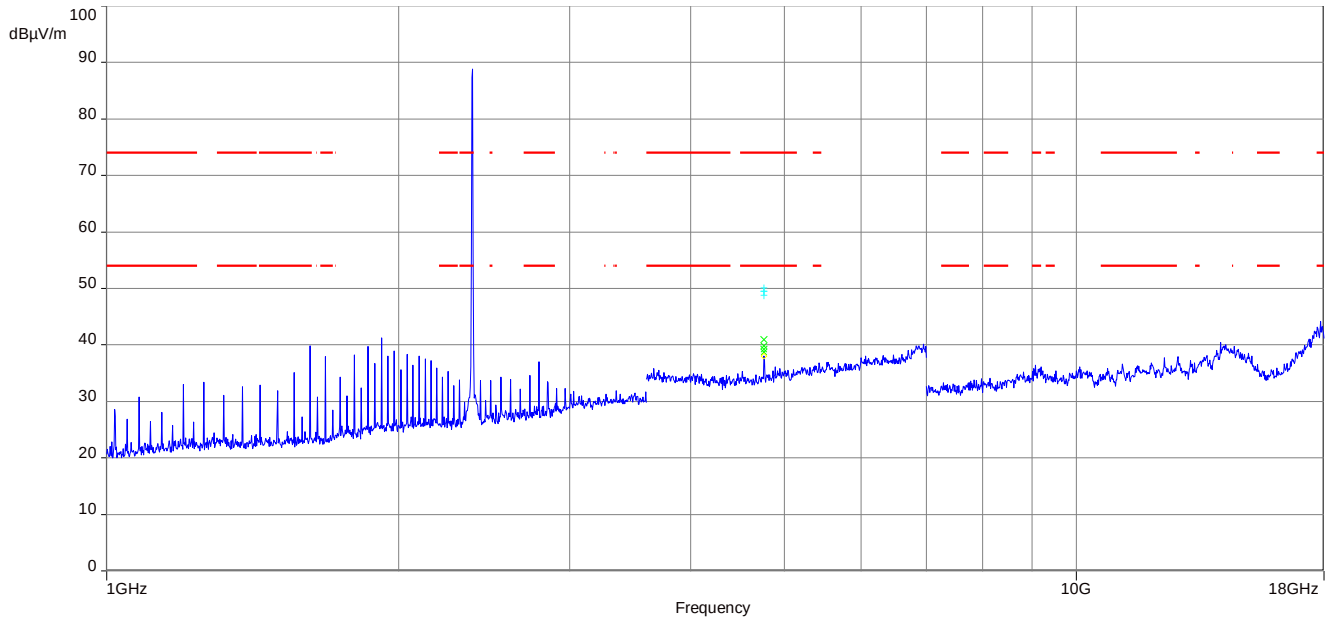
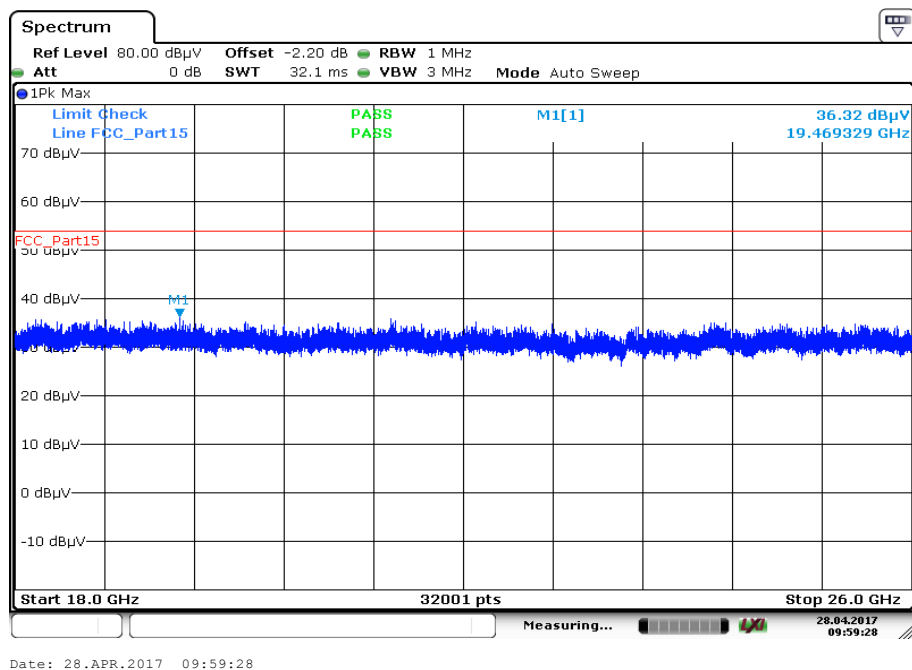
**Plot 3:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel low, lower band**Plot 4:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel low, lower band

**Plot 5:** 9 kHz – 30 MHz, channel mid, lower band

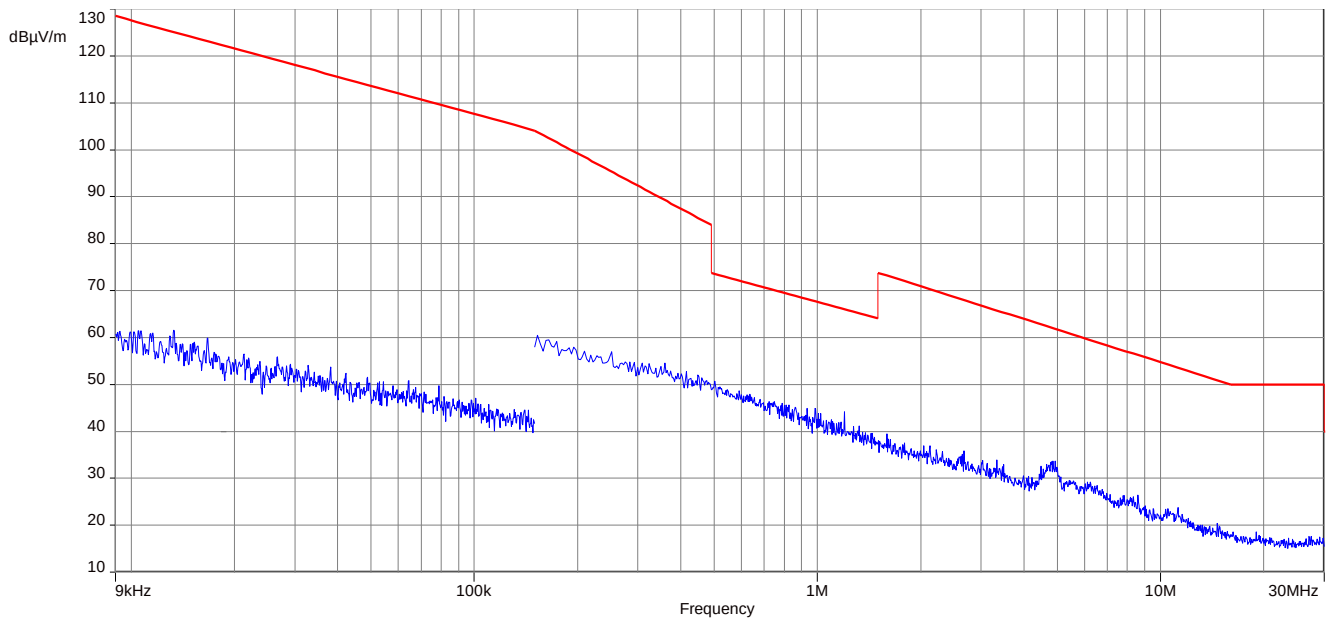


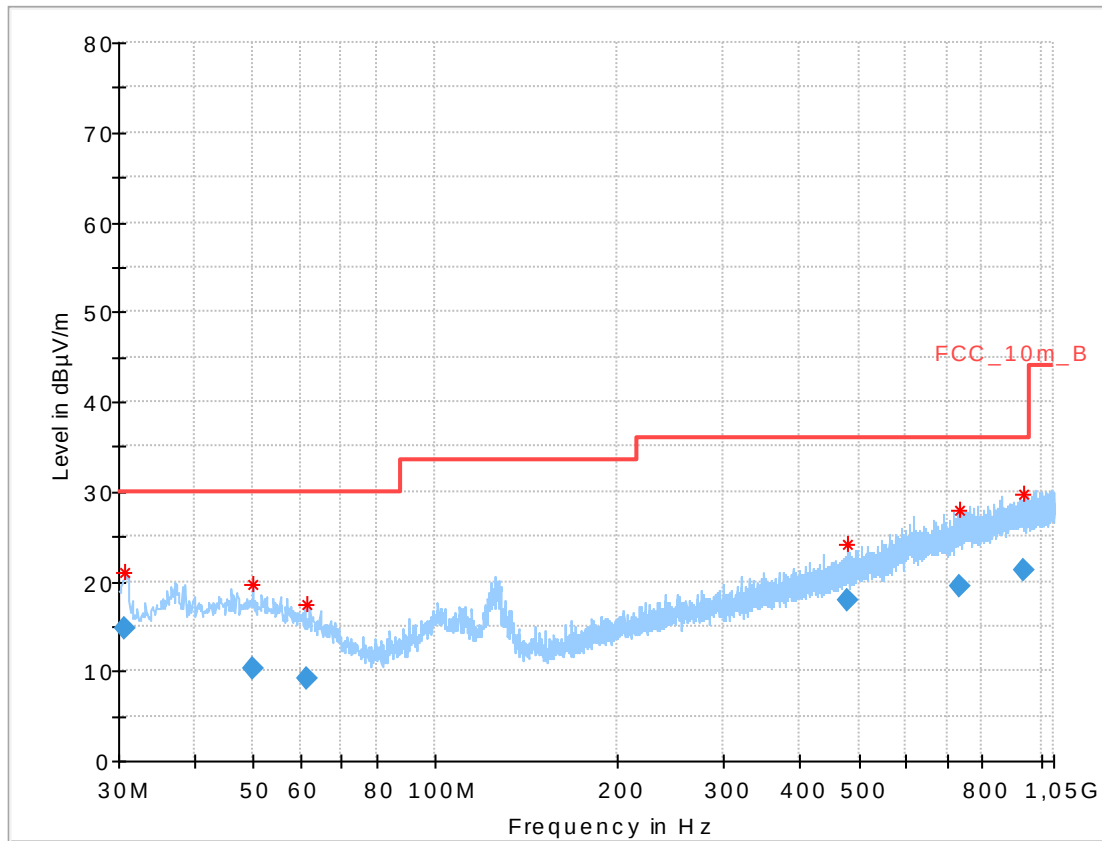
**Plot 6:** 30 MHz – 1 GHz, channel mid, lower band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.740648       | 16.24              | 30.00          | 13.76       | 1000.0          | 120.000         | 101.0       | V   | 331.0         | 12.0       |
| 48.478500       | 9.76               | 30.00          | 20.24       | 1000.0          | 120.000         | 101.0       | V   | 176.0         | 13.7       |
| 65.027700       | 8.48               | 30.00          | 21.52       | 1000.0          | 120.000         | 98.0        | V   | 208.0         | 10.7       |
| 515.725200      | 15.08              | 36.00          | 20.92       | 1000.0          | 120.000         | 178.0       | V   | 54.0          | 18.9       |
| 724.745850      | 19.44              | 36.00          | 16.56       | 1000.0          | 120.000         | 179.0       | V   | 112.0         | 22.1       |
| 879.490950      | 21.25              | 36.00          | 14.75       | 1000.0          | 120.000         | 101.0       | H   | 36.0          | 23.9       |

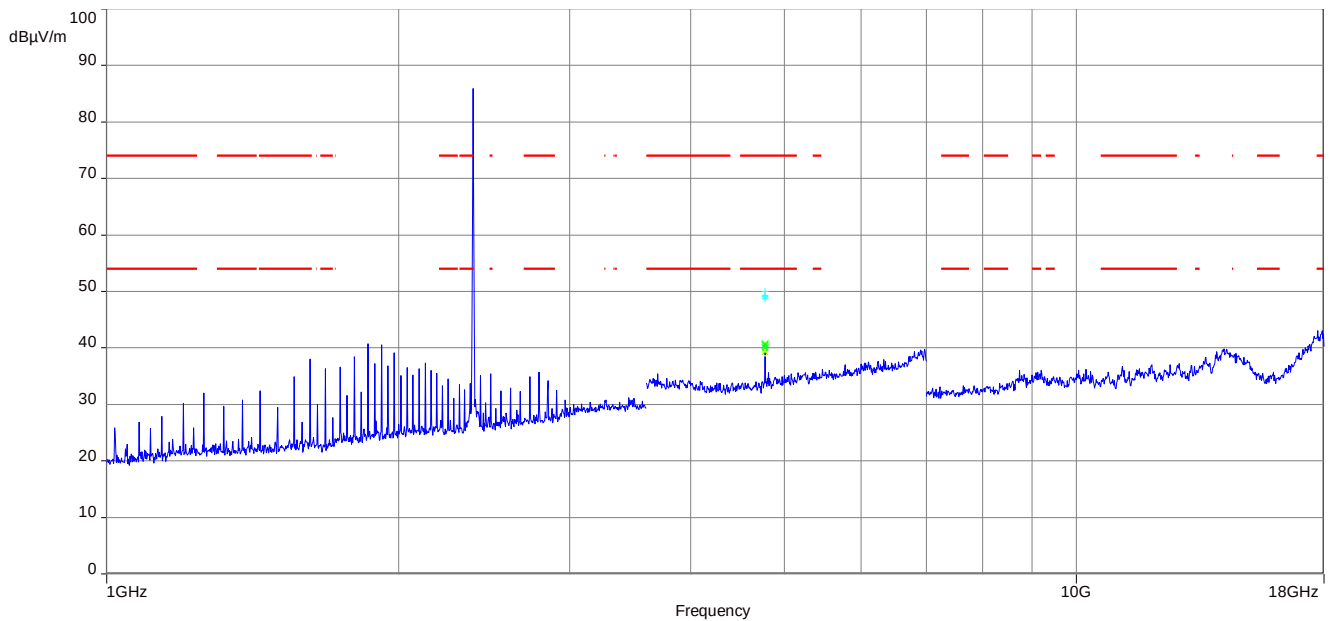
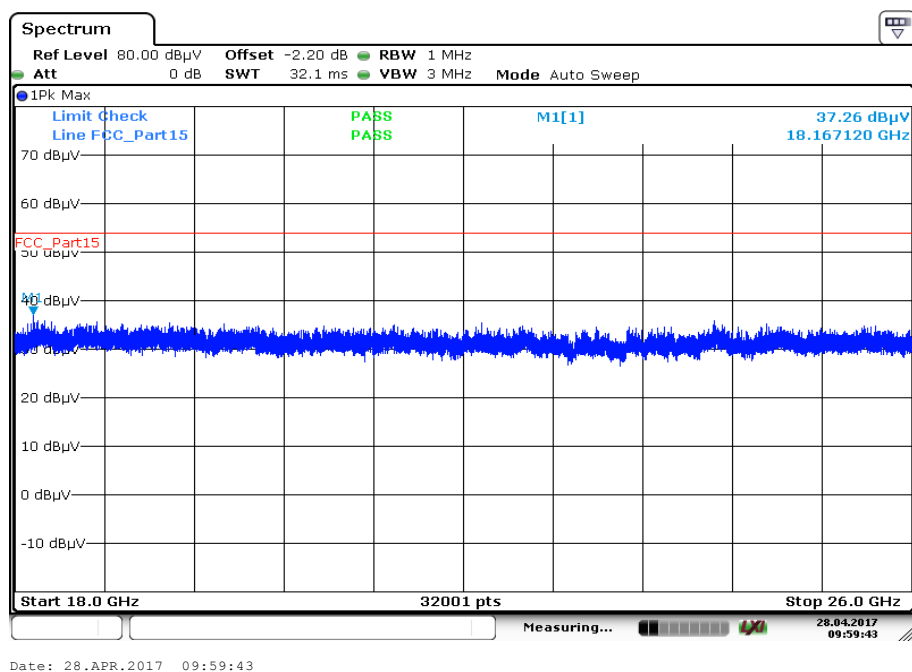
**Plot 7:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel mid, lower band**Plot 8:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel mid, lower band

**Plot 9:** 9 kHz – 30 MHz, channel high, lower band

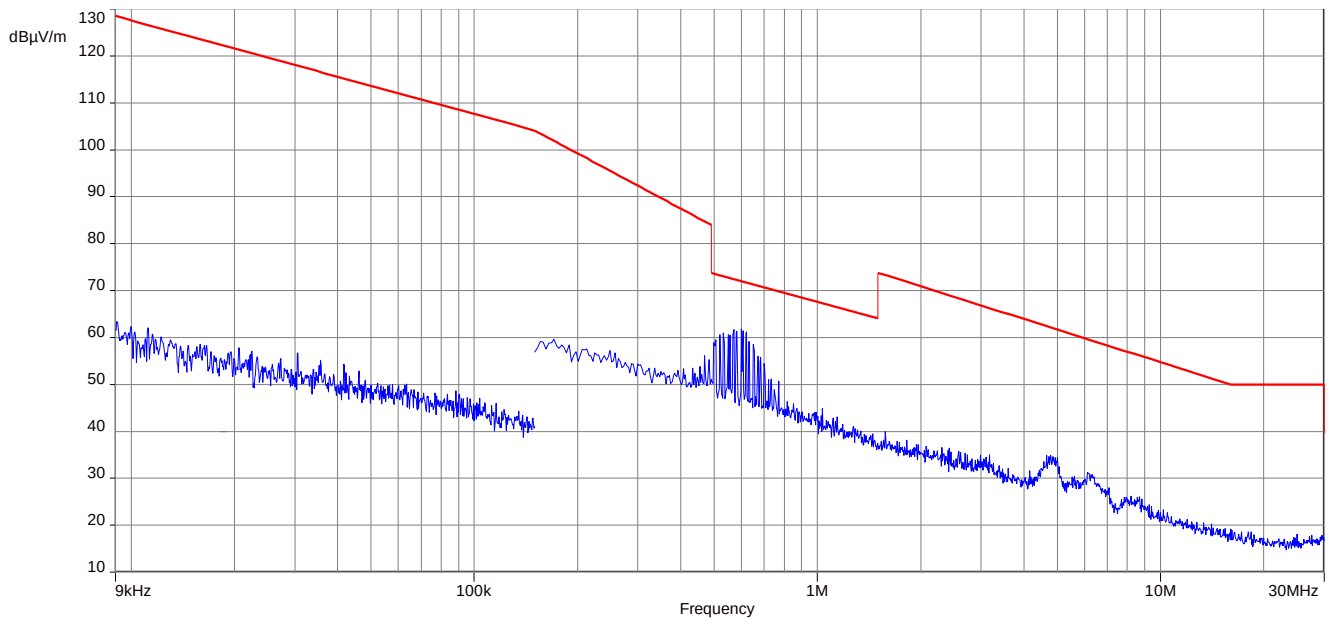


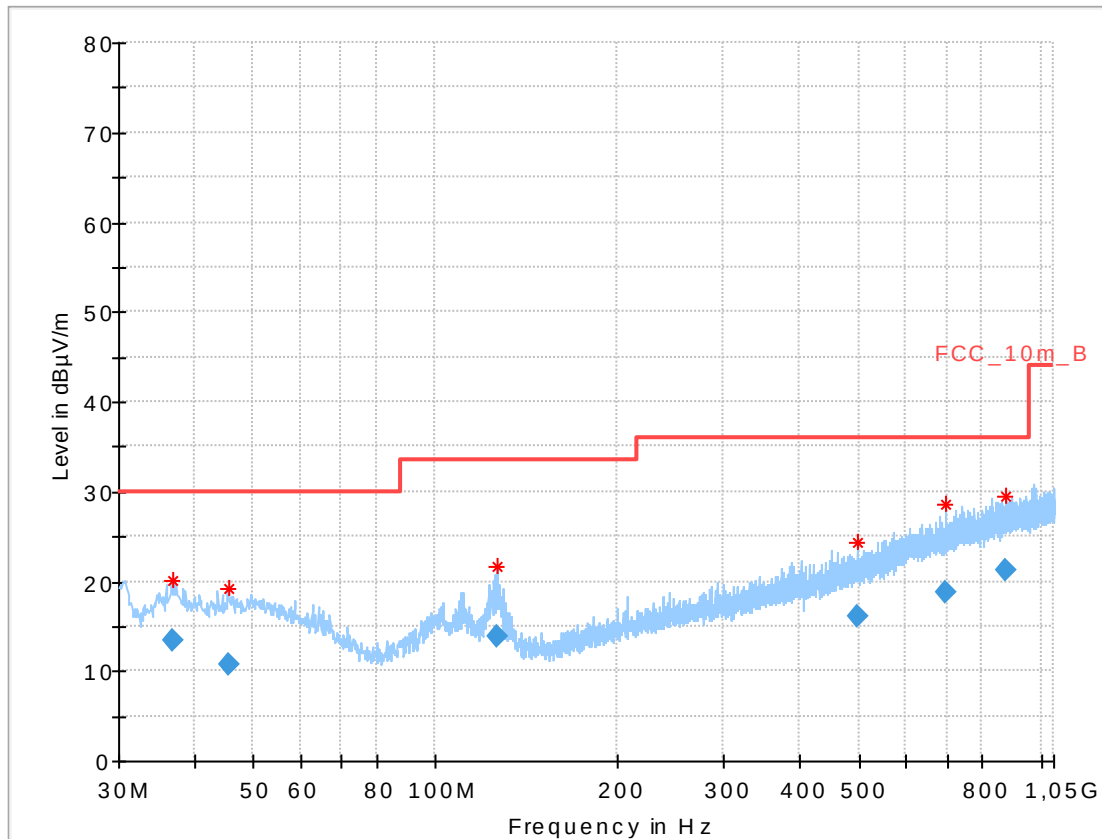
**Plot 10:** 30 MHz – 1 GHz, channel high, lower band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.637050       | 14.77              | 30.00          | 15.23       | 1000.0          | 120.000         | 179.0       | V   | 208.0         | 11.9       |
| 50.094000       | 10.29              | 30.00          | 19.71       | 1000.0          | 120.000         | 98.0        | H   | 260.0         | 13.7       |
| 61.409250       | 9.15               | 30.00          | 20.85       | 1000.0          | 120.000         | 101.0       | V   | 53.0          | 11.5       |
| 480.034800      | 17.90              | 36.00          | 18.10       | 1000.0          | 120.000         | 100.0       | V   | 353.0         | 18.3       |
| 731.881950      | 19.52              | 36.00          | 16.48       | 1000.0          | 120.000         | 185.0       | H   | 340.0         | 22.3       |
| 935.071350      | 21.27              | 36.00          | 14.73       | 1000.0          | 120.000         | 185.0       | V   | 292.0         | 24.3       |

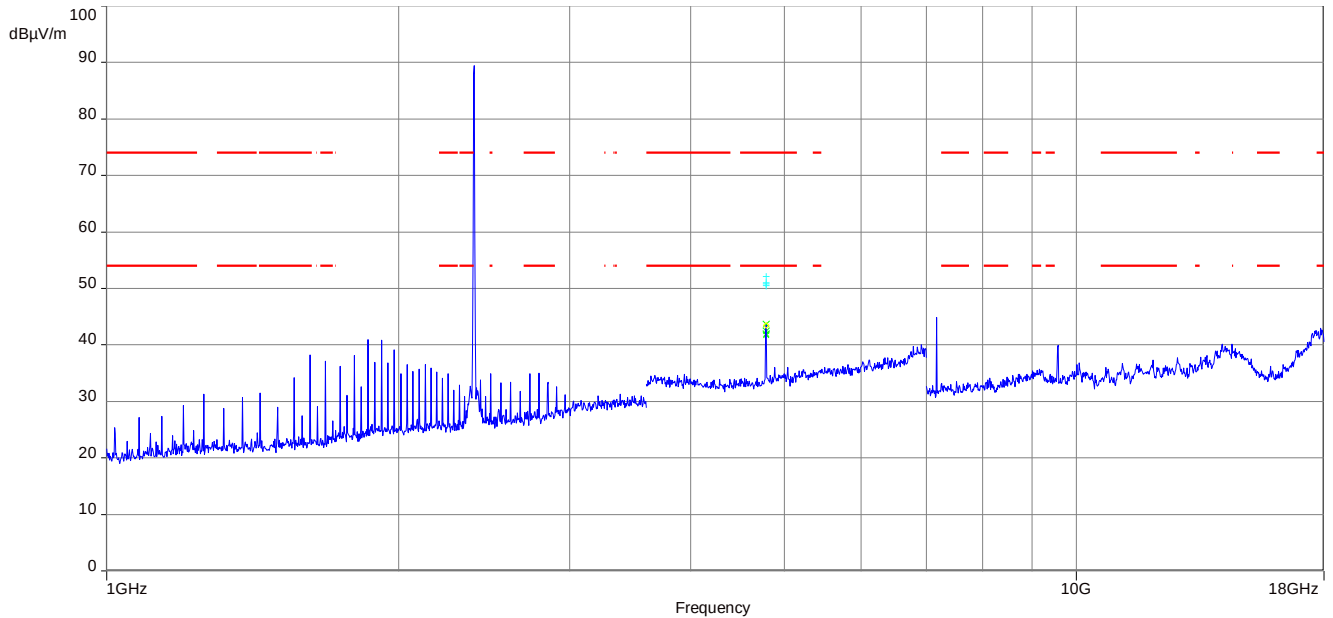
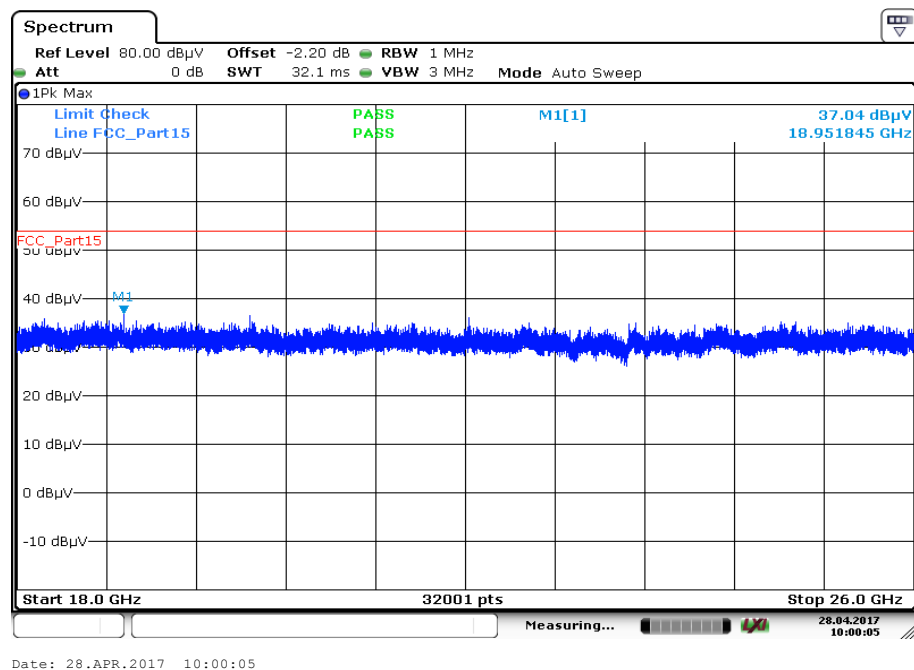
**Plot 11:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel high, lower band**Plot 12:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel high, lower band

**Plot 13:** 9 kHz – 30 MHz, channel low, upper band

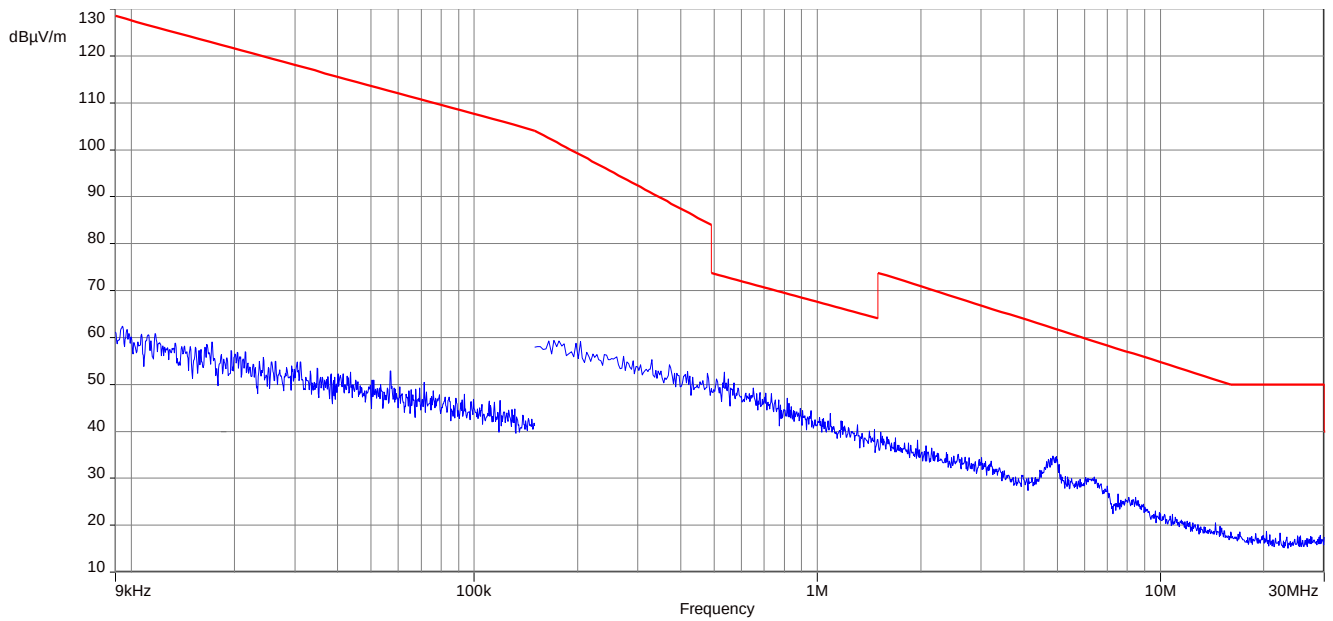


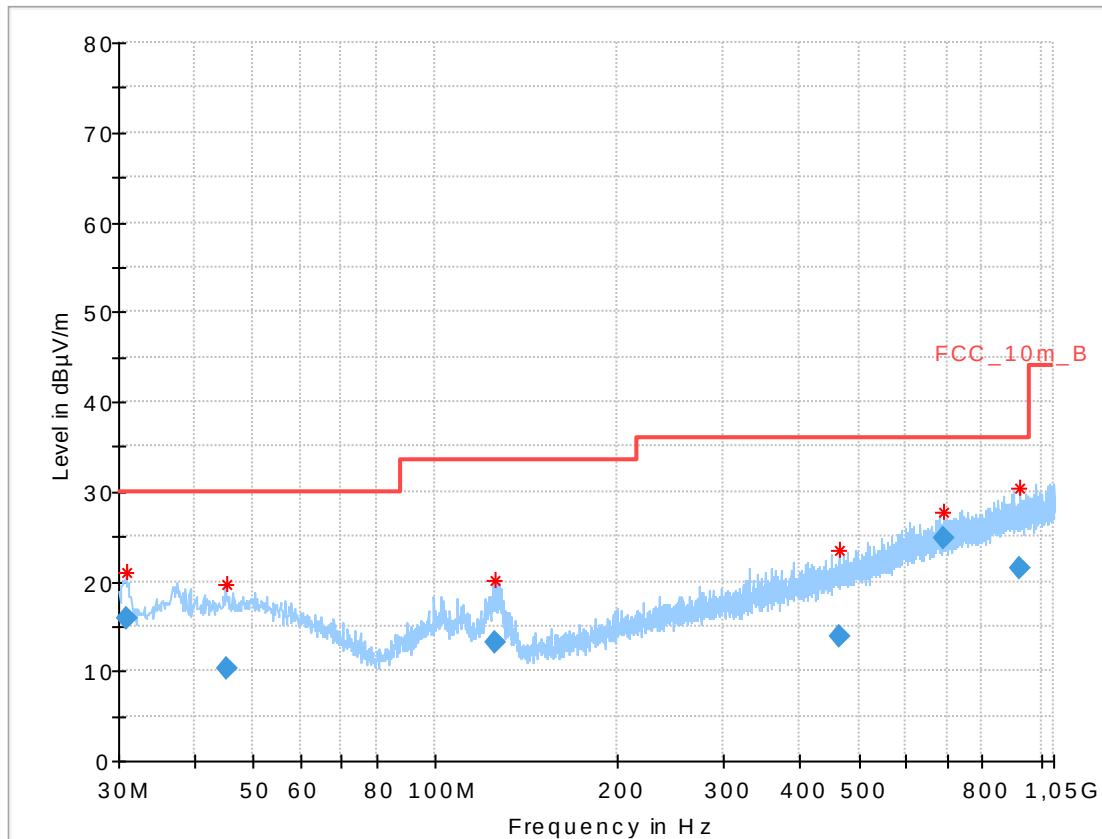
**Plot 14:** 30 MHz – 1 GHz, channel low, upper band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 36.868950       | 13.36              | 30.00          | 16.64       | 1000.0          | 120.000         | 101.0       | V   | 353.0         | 12.9       |
| 45.730650       | 10.64              | 30.00          | 19.36       | 1000.0          | 120.000         | 101.0       | V   | 11.0          | 13.6       |
| 126.931800      | 13.94              | 33.50          | 19.56       | 1000.0          | 120.000         | 101.0       | V   | 80.0          | 9.8        |
| 497.939850      | 15.99              | 36.00          | 20.01       | 1000.0          | 120.000         | 98.0        | V   | 347.0         | 18.7       |
| 697.958400      | 18.80              | 36.00          | 17.20       | 1000.0          | 120.000         | 101.0       | V   | 39.0          | 21.5       |
| 871.800300      | 21.21              | 36.00          | 14.79       | 1000.0          | 120.000         | 185.0       | V   | 262.0         | 23.8       |

**Plot 15:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel low, upper band**Plot 16:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel low, upper band

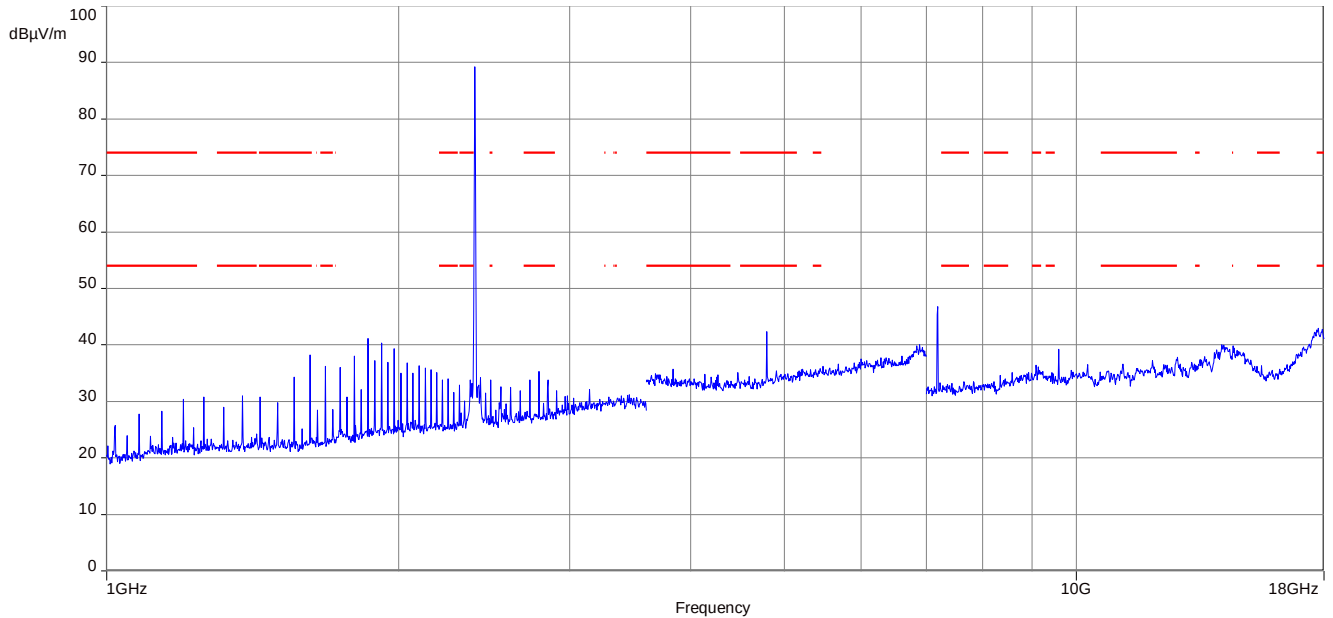
**Plot 17:** 9 kHz – 30 MHz, channel high, upper band



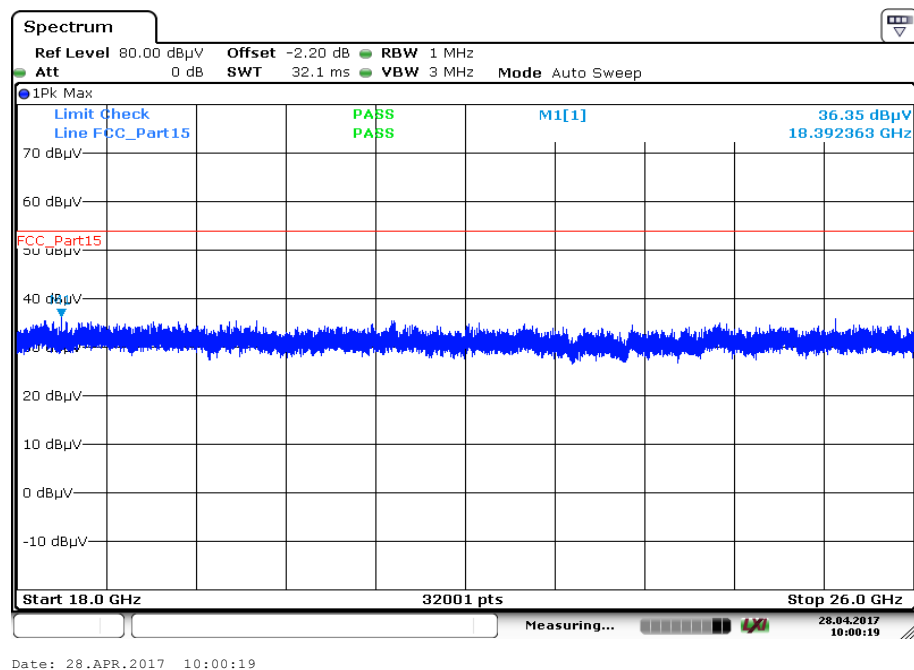
**Plot 18:** 30 MHz – 1 GHz, channel high, upper band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.982500       | 15.84              | 30.00          | 14.16       | 1000.0          | 120.000         | 101.0       | V   | 70.0          | 12.0       |
| 45.221250       | 10.27              | 30.00          | 19.73       | 1000.0          | 120.000         | 101.0       | H   | 20.0          | 13.6       |
| 125.193450      | 13.28              | 33.50          | 20.22       | 1000.0          | 120.000         | 98.0        | V   | 45.0          | 9.9        |
| 463.558050      | 13.90              | 36.00          | 22.10       | 1000.0          | 120.000         | 98.0        | H   | 288.0         | 17.9       |
| 689.992350      | 24.81              | 36.00          | 11.19       | 1000.0          | 120.000         | 100.0       | H   | 148.0         | 21.5       |
| 925.855650      | 21.36              | 36.00          | 14.64       | 1000.0          | 120.000         | 178.0       | H   | 82.0          | 24.3       |

**Plot 19:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel high, upper band

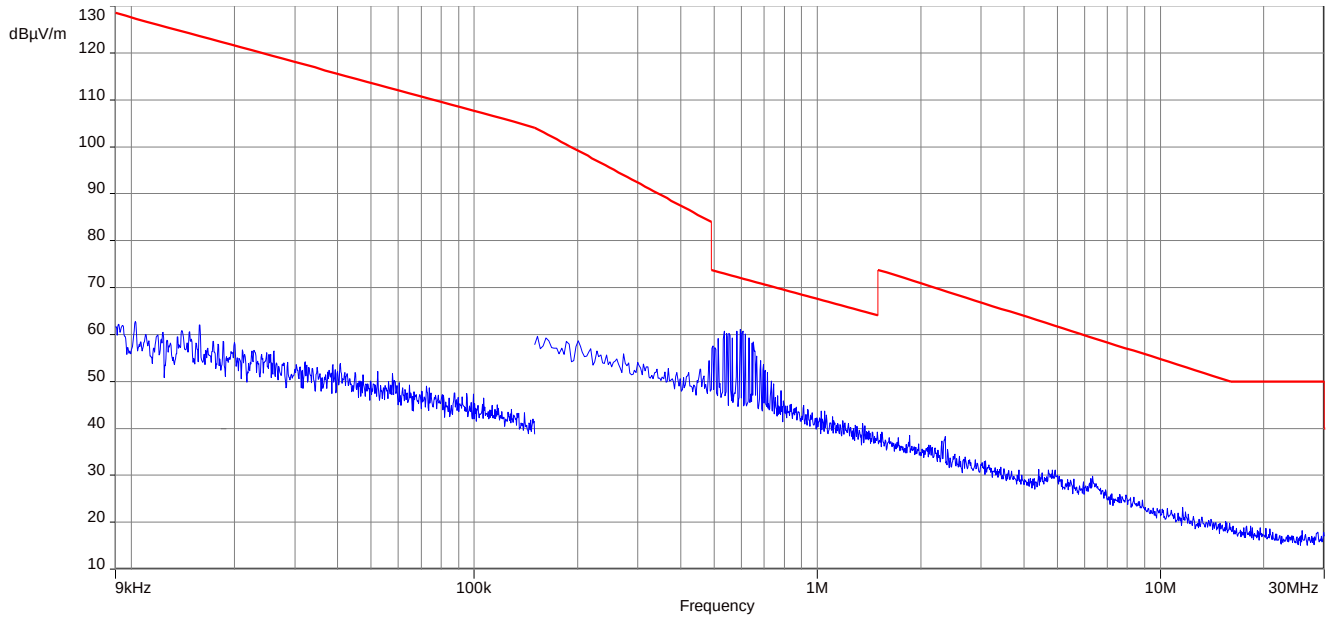


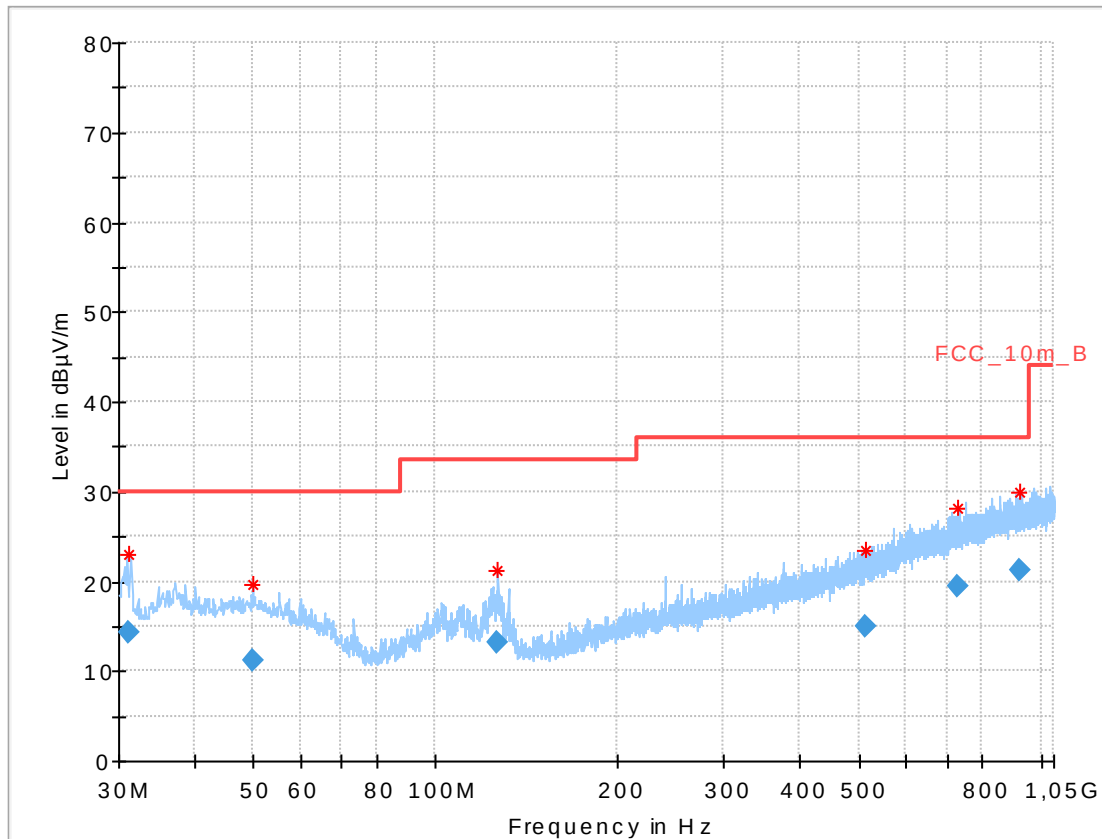
**Plot 20:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel high, upper band



**Plots:** right module

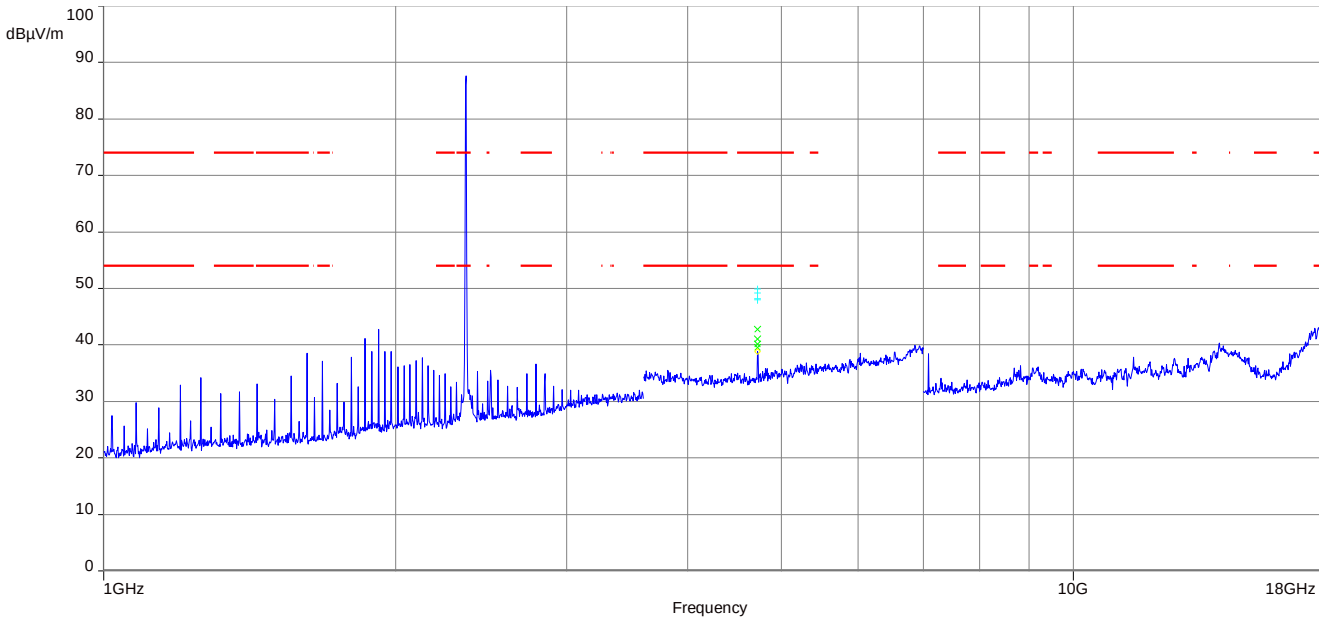
**Plot 1:** 9 kHz – 30 MHz, channel low, lower band



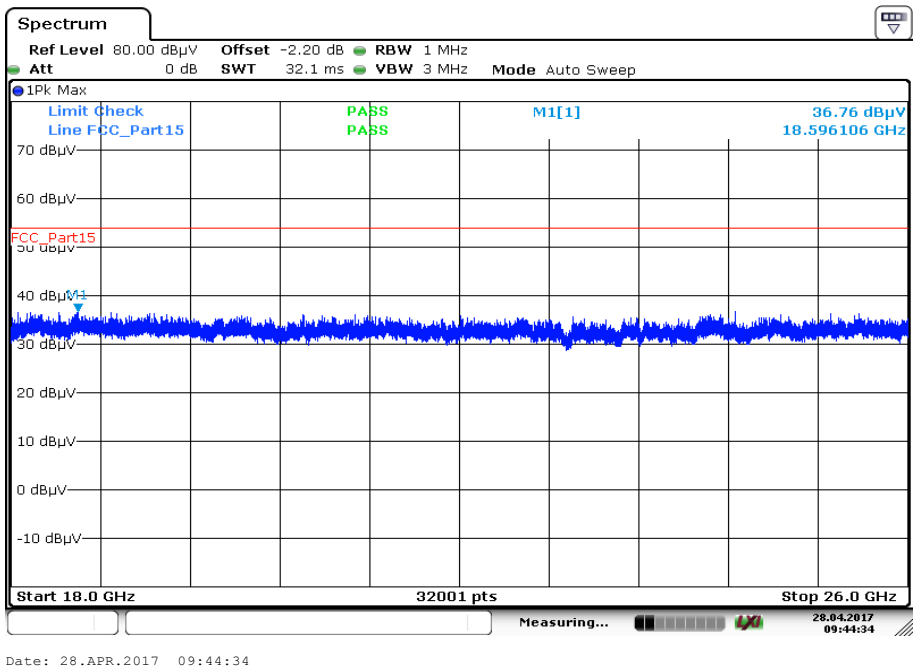
**Plot 2:** 30 MHz – 1 GHz, channel low, lower band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 31.131150       | 14.29              | 30.00          | 15.71       | 1000.0          | 120.000         | 101.0       | V   | 295.0         | 12.0       |
| 49.946700       | 11.14              | 30.00          | 18.86       | 1000.0          | 120.000         | 98.0        | V   | 94.0          | 13.7       |
| 126.779250      | 13.11              | 33.50          | 20.39       | 1000.0          | 120.000         | 101.0       | V   | 134.0         | 9.8        |
| 512.538750      | 15.07              | 36.00          | 20.93       | 1000.0          | 120.000         | 185.0       | H   | 101.0         | 18.9       |
| 726.730800      | 19.39              | 36.00          | 16.61       | 1000.0          | 120.000         | 98.0        | H   | 203.0         | 22.2       |
| 924.291300      | 21.24              | 36.00          | 14.76       | 1000.0          | 120.000         | 185.0       | H   | 295.0         | 24.3       |

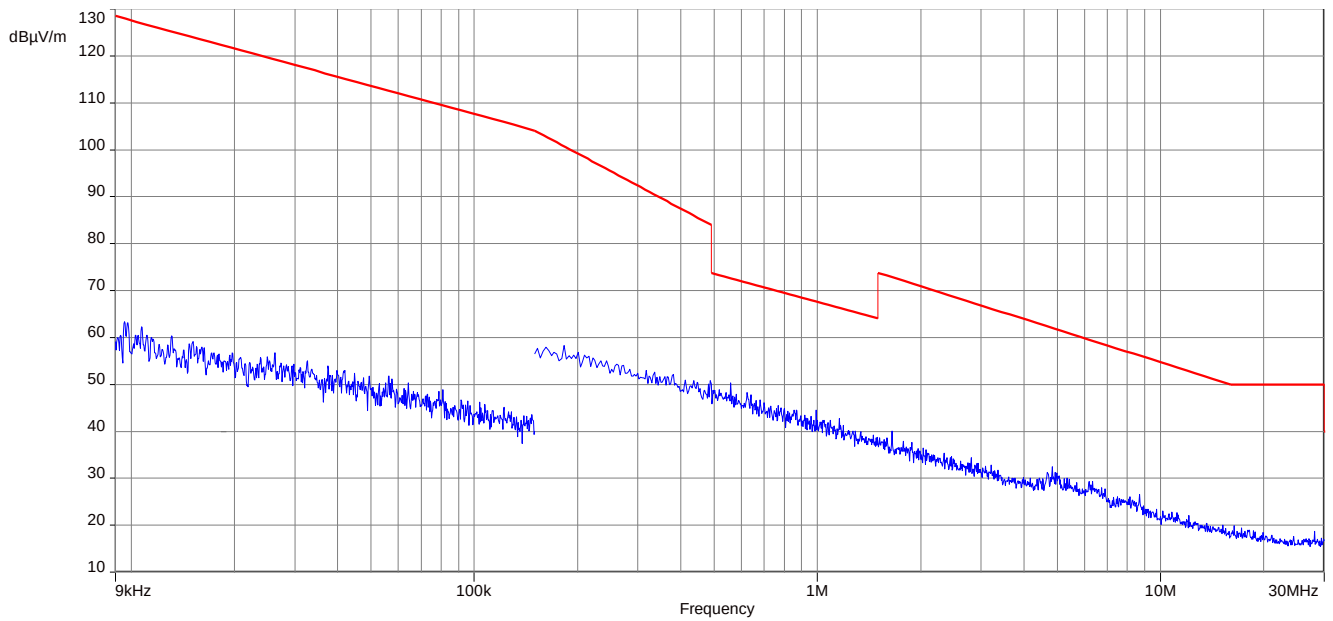
**Plot 3:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel low, lower band

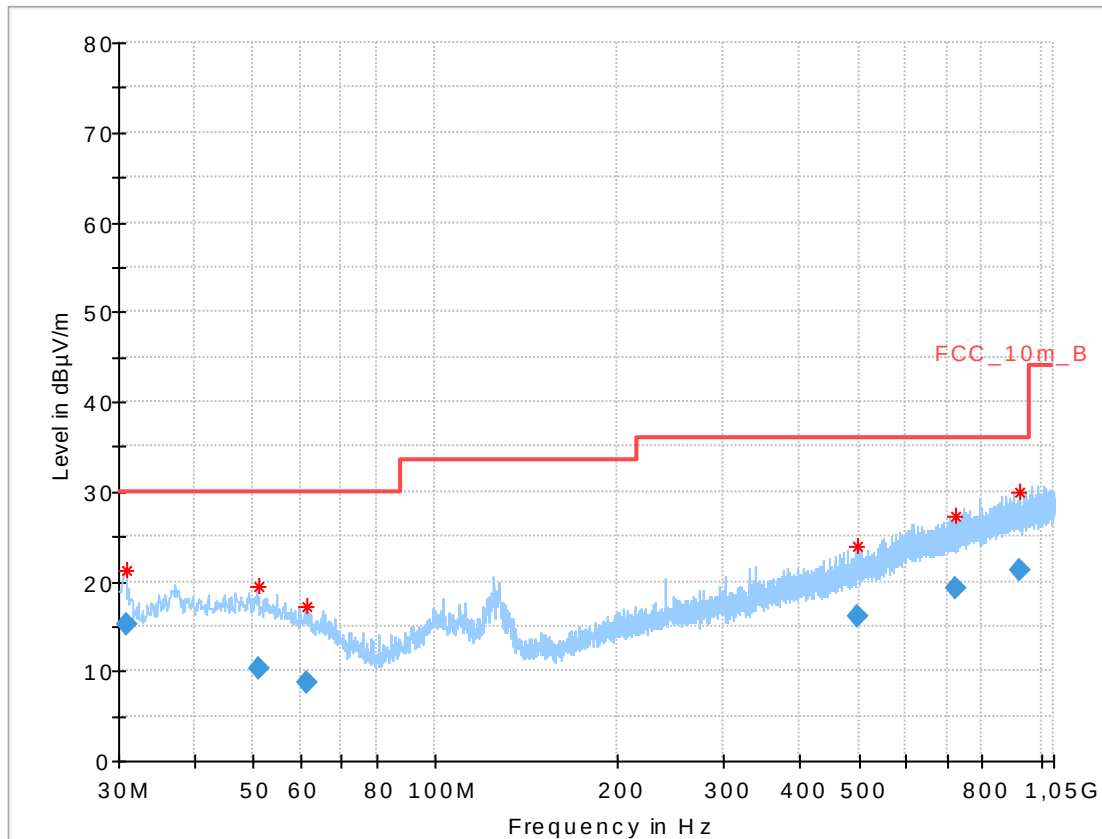


**Plot 4:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel low, lower band

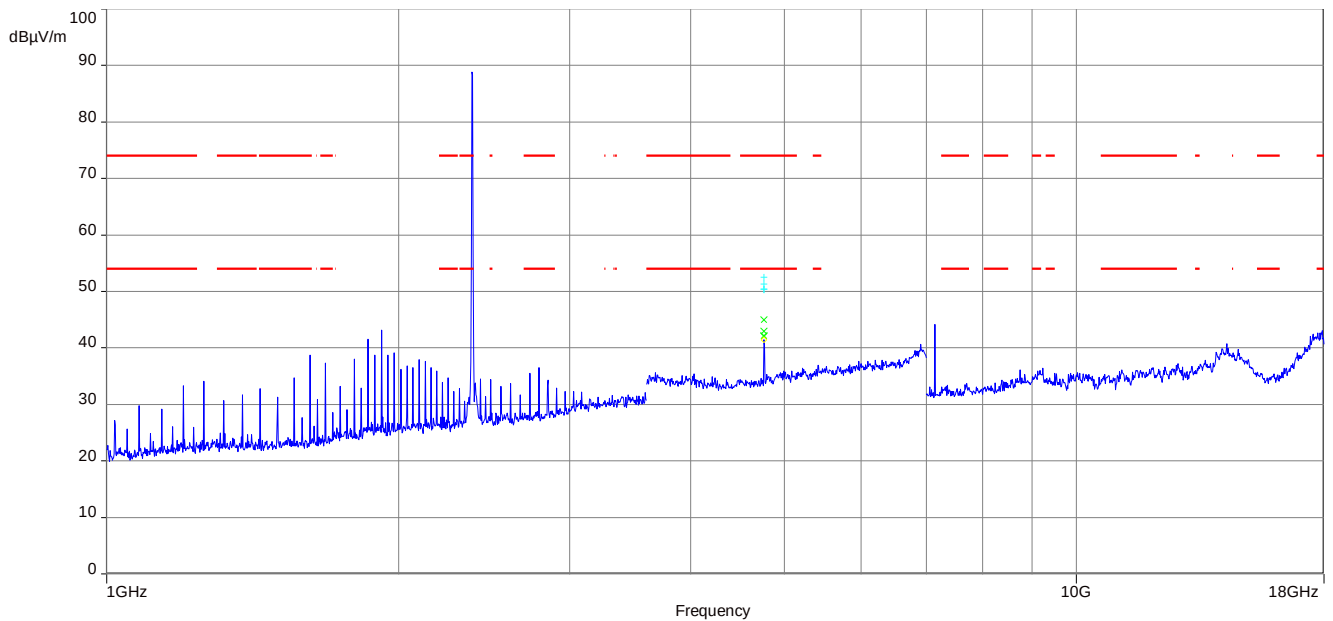
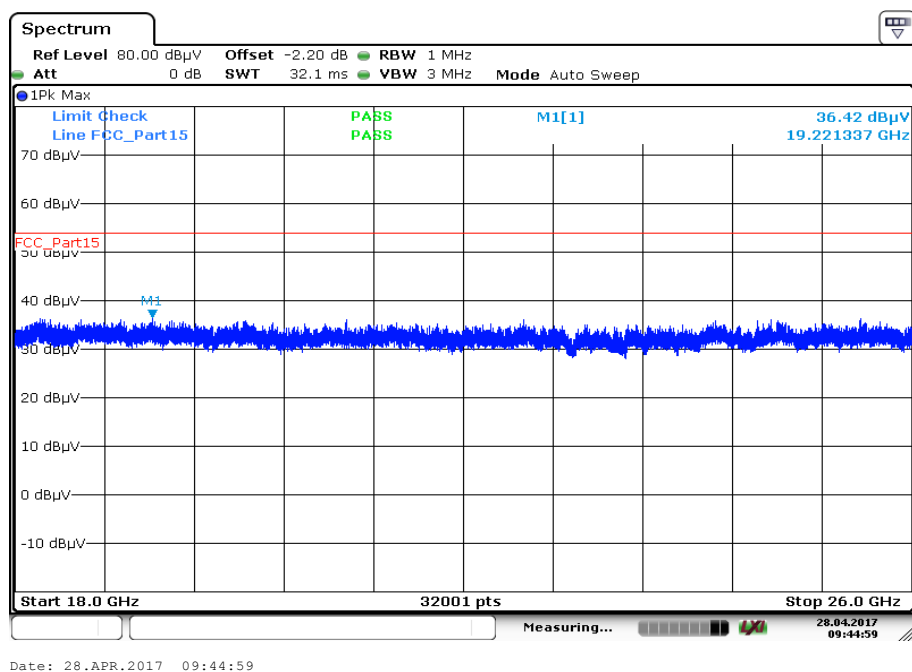


**Plot 5:** 9 kHz – 30 MHz, channel mid, lower band

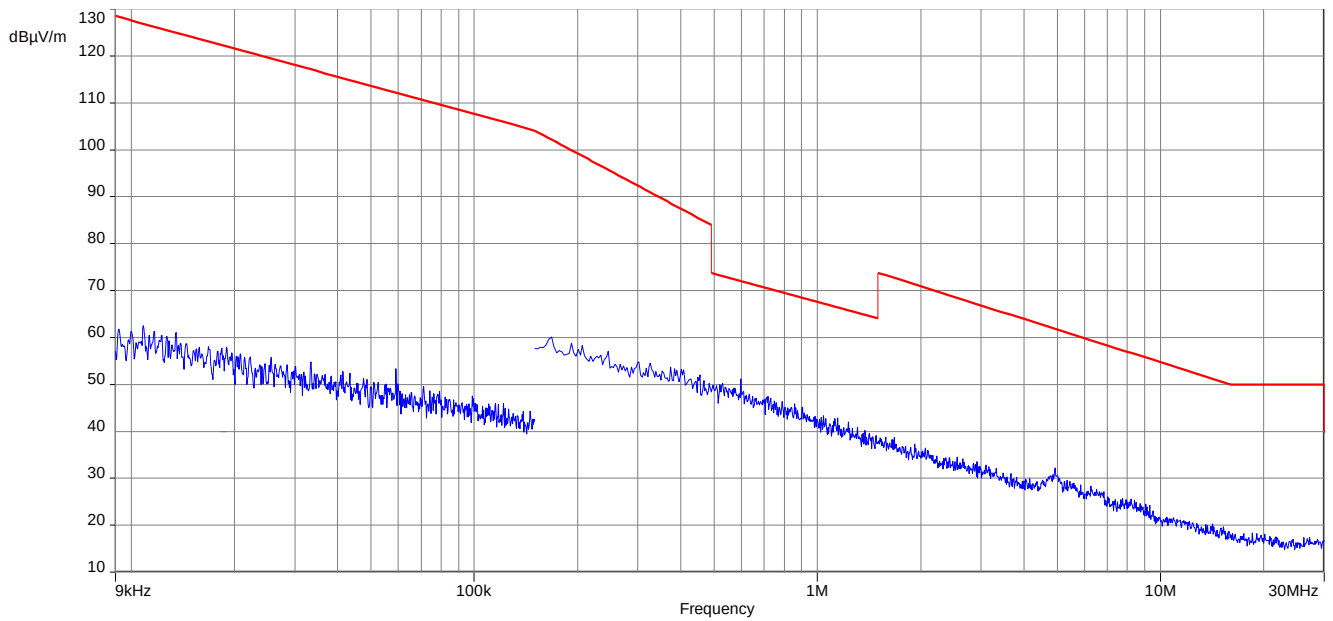


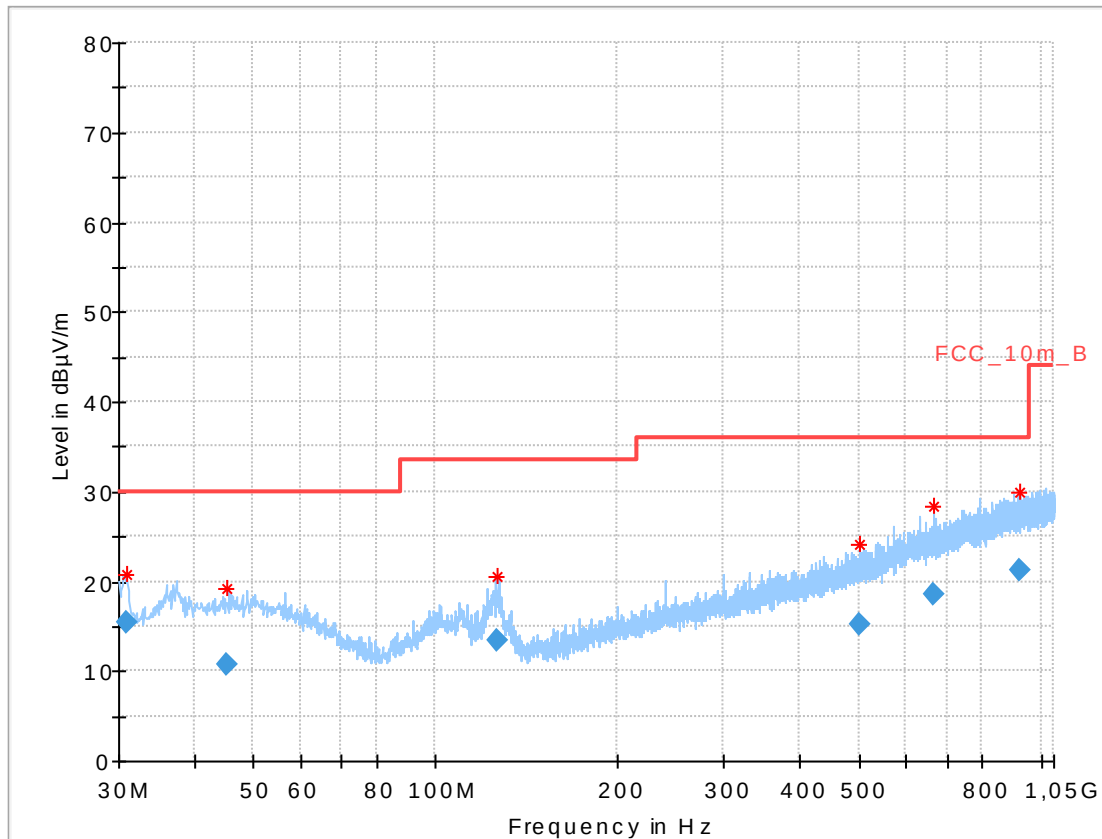
**Plot 6:** 30 MHz – 1 GHz, channel mid, lower band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.893100       | 15.23              | 30.00          | 14.77       | 1000.0          | 120.000         | 101.0       | V   | 318.0         | 12.0       |
| 50.997000       | 10.28              | 30.00          | 19.72       | 1000.0          | 120.000         | 178.0       | H   | 19.0          | 13.6       |
| 61.338150       | 8.82               | 30.00          | 21.18       | 1000.0          | 120.000         | 185.0       | V   | 272.0         | 11.6       |
| 499.124700      | 16.03              | 36.00          | 19.97       | 1000.0          | 120.000         | 179.0       | H   | 345.0         | 18.7       |
| 722.223450      | 19.30              | 36.00          | 16.70       | 1000.0          | 120.000         | 98.0        | H   | 149.0         | 22.1       |
| 924.655950      | 21.25              | 36.00          | 14.75       | 1000.0          | 120.000         | 98.0        | V   | 195.0         | 24.3       |

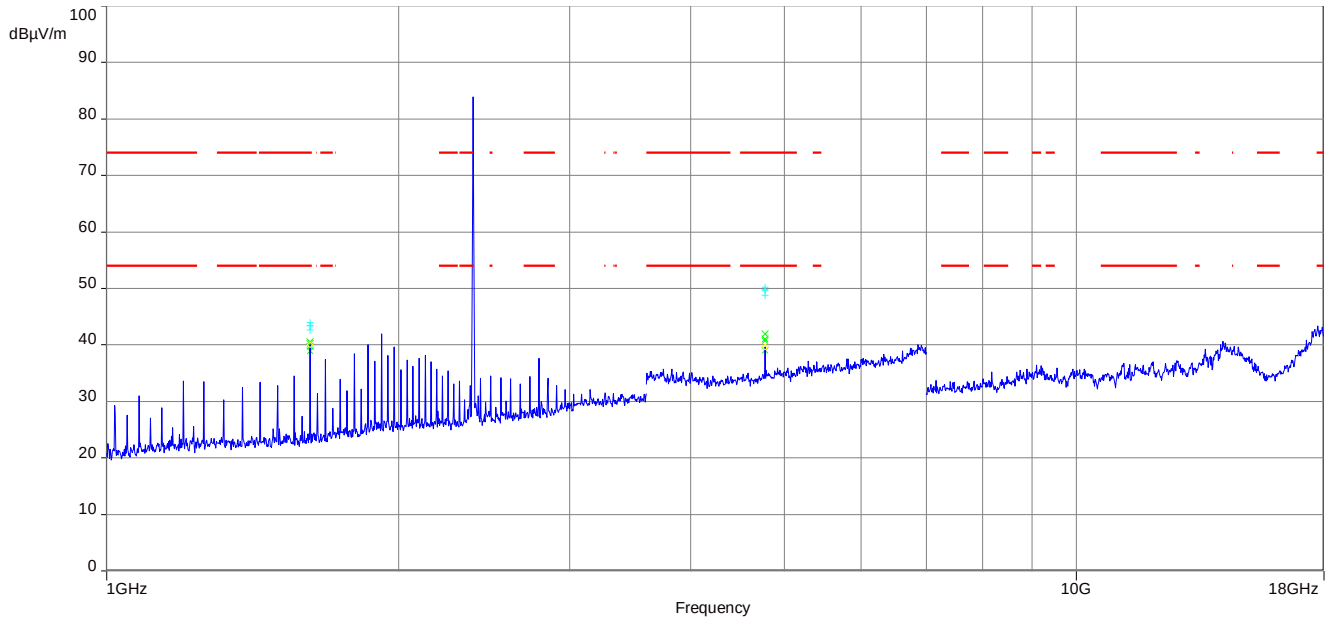
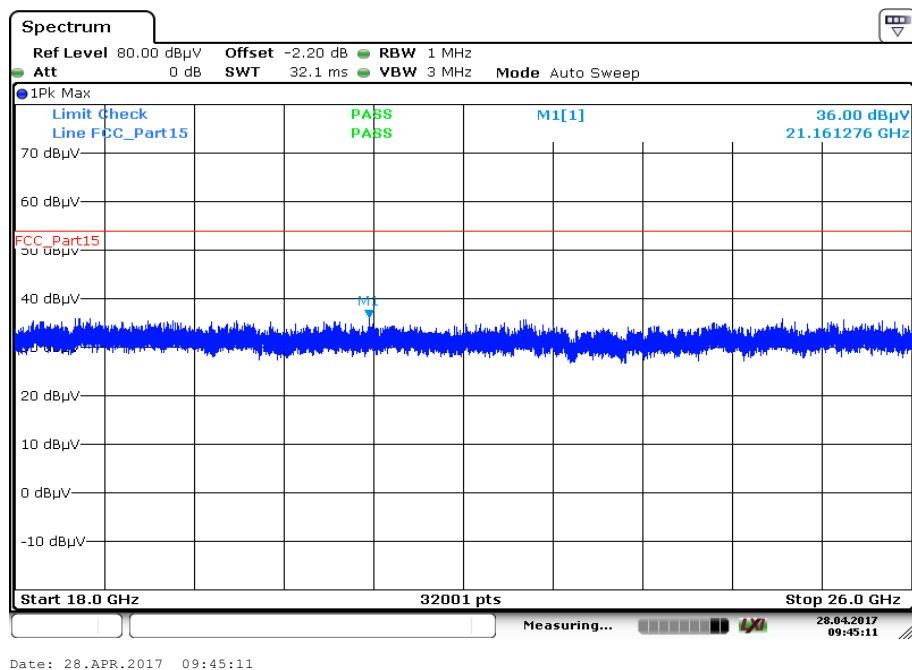
**Plot 7:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel mid, lower band**Plot 8:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel mid, lower band

**Plot 9:** 9 kHz – 30 MHz, channel high, lower band

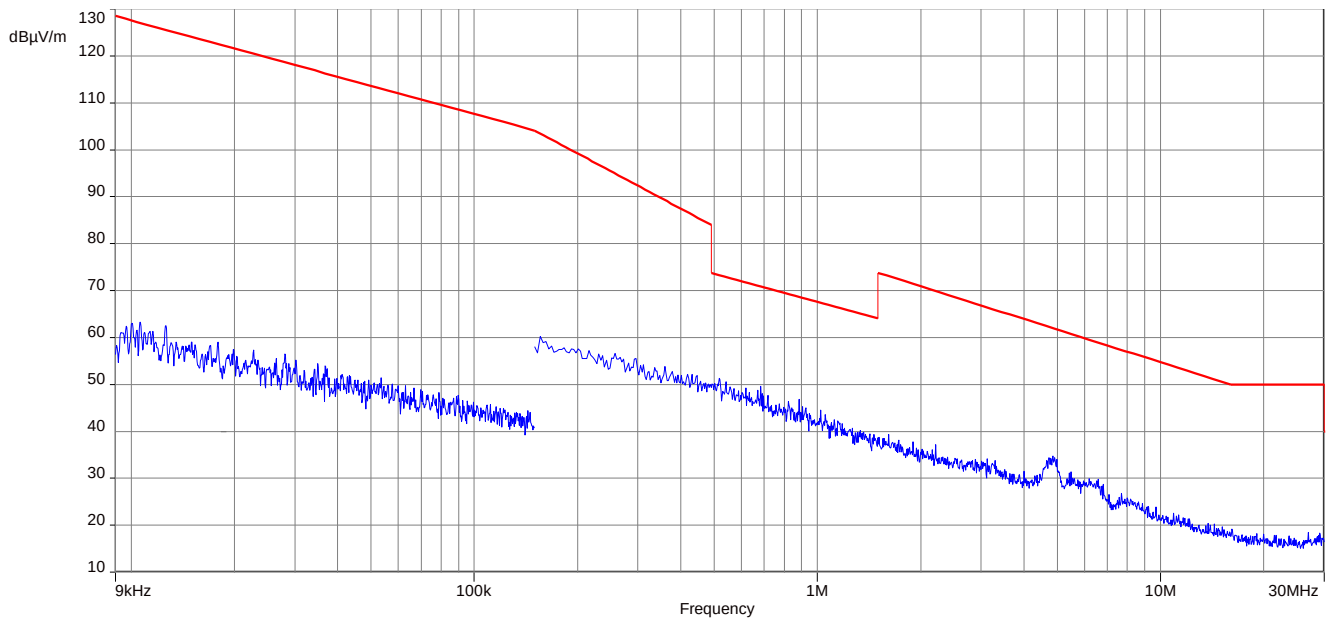


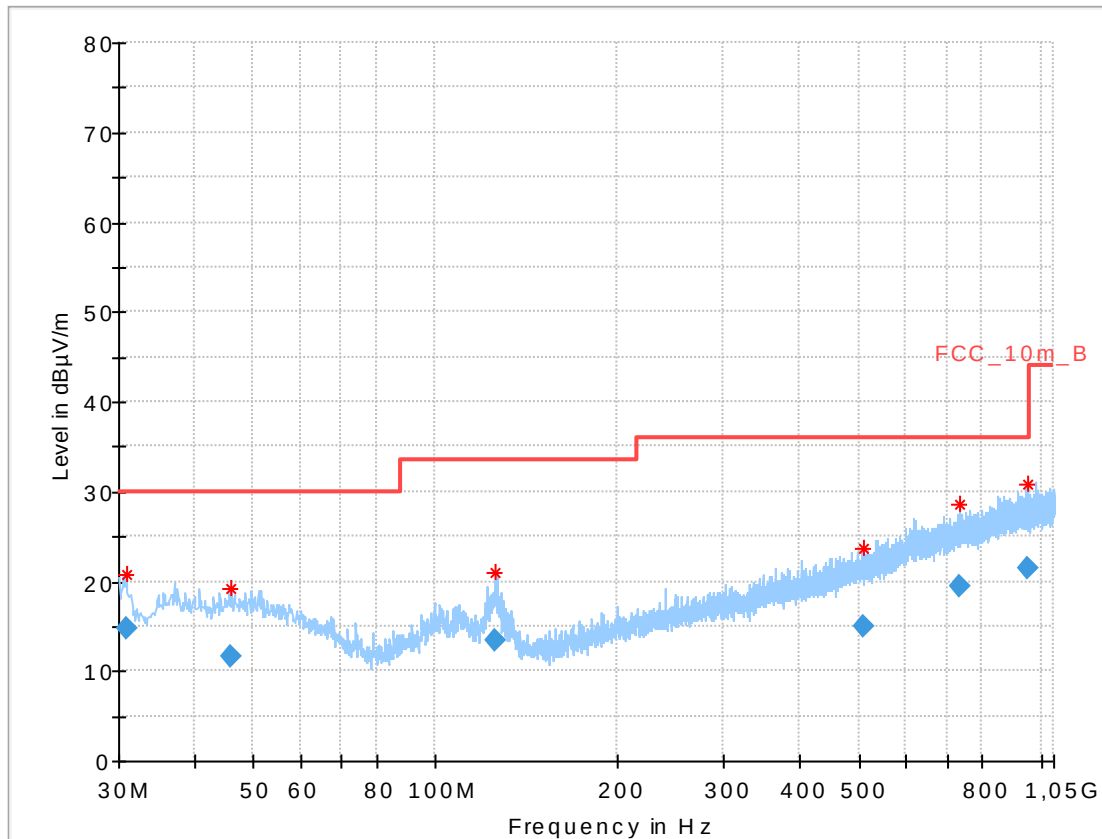
**Plot 10:** 30 MHz – 1 GHz, channel high, lower band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.817515       | 15.43              | 30.00          | 14.57       | 1000.0          | 120.000         | 101.0       | V   | 20.0          | 12.0       |
| 45.342300       | 10.63              | 30.00          | 19.37       | 1000.0          | 120.000         | 100.0       | V   | 0.0           | 13.6       |
| 126.003000      | 13.42              | 33.50          | 20.08       | 1000.0          | 120.000         | 101.0       | V   | 89.0          | 9.8        |
| 500.232150      | 15.13              | 36.00          | 20.87       | 1000.0          | 120.000         | 101.0       | V   | 55.0          | 18.7       |
| 665.012700      | 18.44              | 36.00          | 17.56       | 1000.0          | 120.000         | 185.0       | V   | 202.0         | 21.3       |
| 919.456500      | 21.29              | 36.00          | 14.71       | 1000.0          | 120.000         | 98.0        | H   | 121.0         | 24.2       |

**Plot 11:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel high, lower band**Plot 12:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel high, lower band

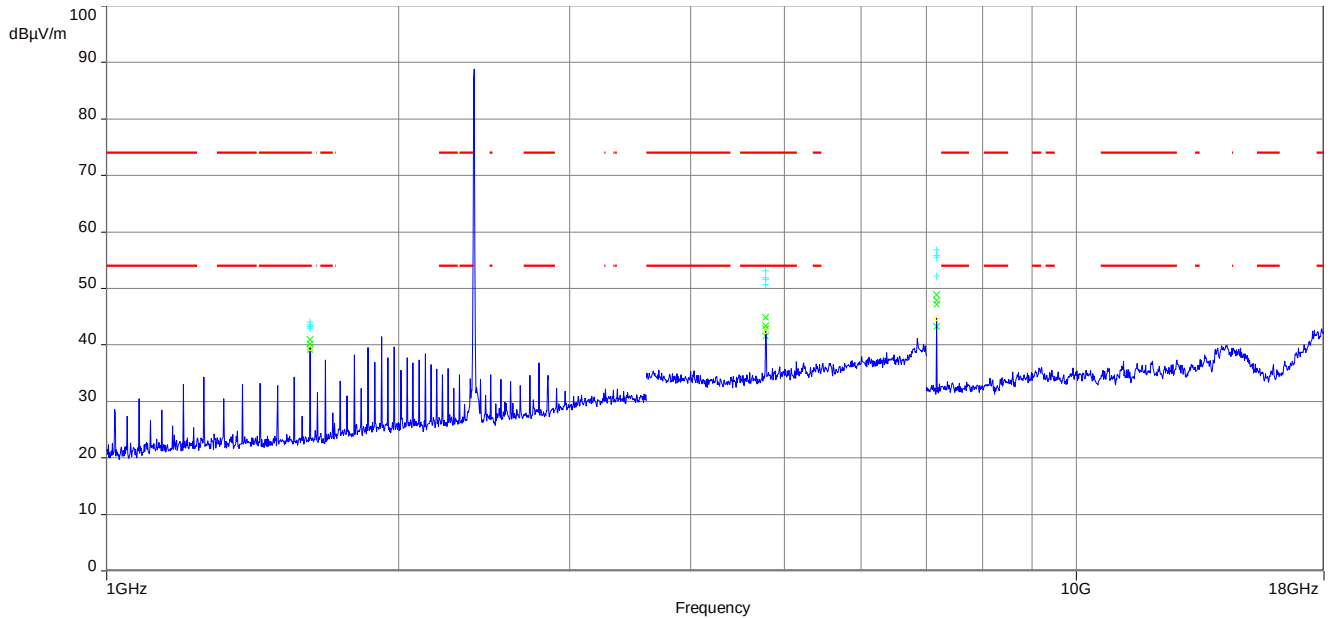
**Plot 13:** 9 kHz – 30 MHz, channel low, upper band



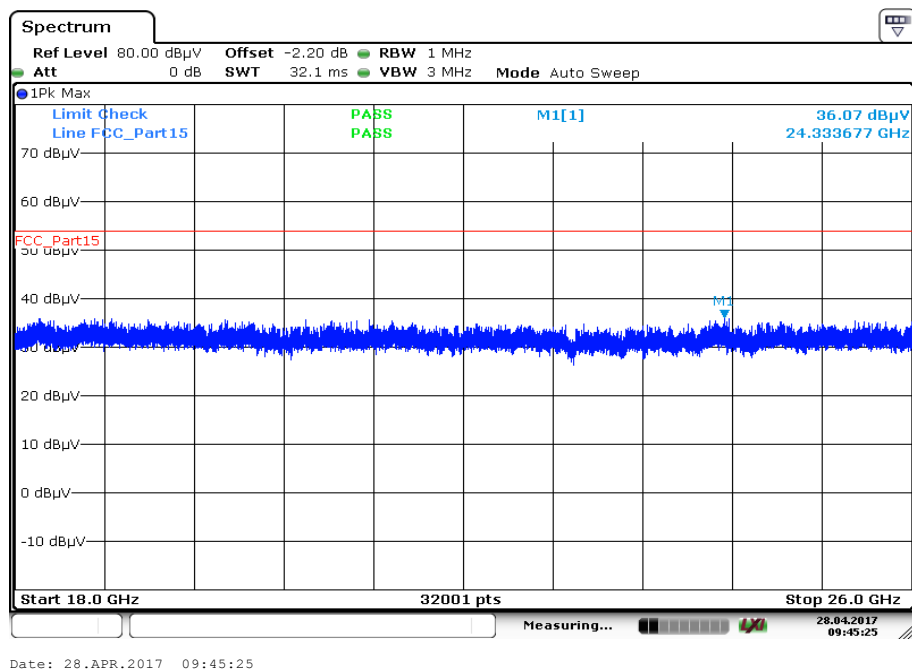
**Plot 14:** 30 MHz – 1 GHz, channel low, upper band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.845550       | 14.79              | 30.00          | 15.21       | 1000.0          | 120.000         | 101.0       | V   | 114.0         | 12.0       |
| 46.088250       | 11.60              | 30.00          | 18.40       | 1000.0          | 120.000         | 178.0       | V   | 148.0         | 13.7       |
| 125.950650      | 13.44              | 33.50          | 20.06       | 1000.0          | 120.000         | 100.0       | V   | 121.0         | 9.8        |
| 508.053450      | 14.95              | 36.00          | 21.05       | 1000.0          | 120.000         | 185.0       | H   | 172.0         | 18.8       |
| 732.411750      | 19.43              | 36.00          | 16.57       | 1000.0          | 120.000         | 185.0       | H   | 229.0         | 22.3       |
| 950.099400      | 21.43              | 36.00          | 14.57       | 1000.0          | 120.000         | 179.0       | H   | 202.0         | 24.3       |

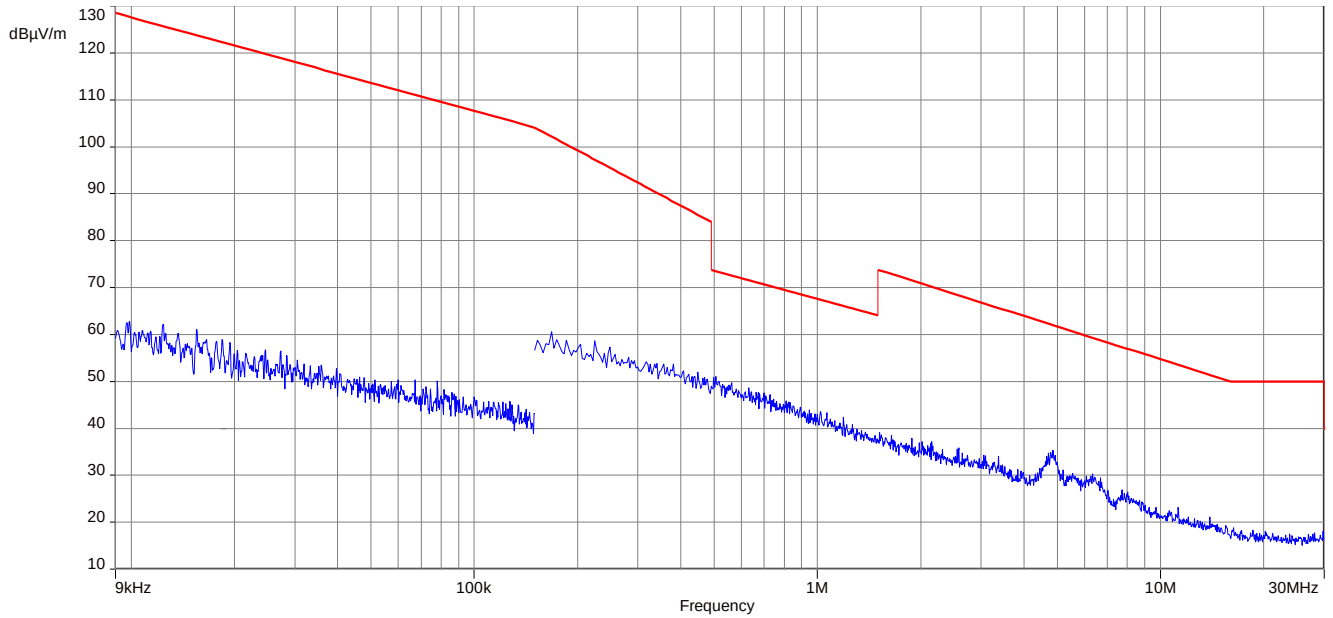
**Plot 15:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel low, upper band

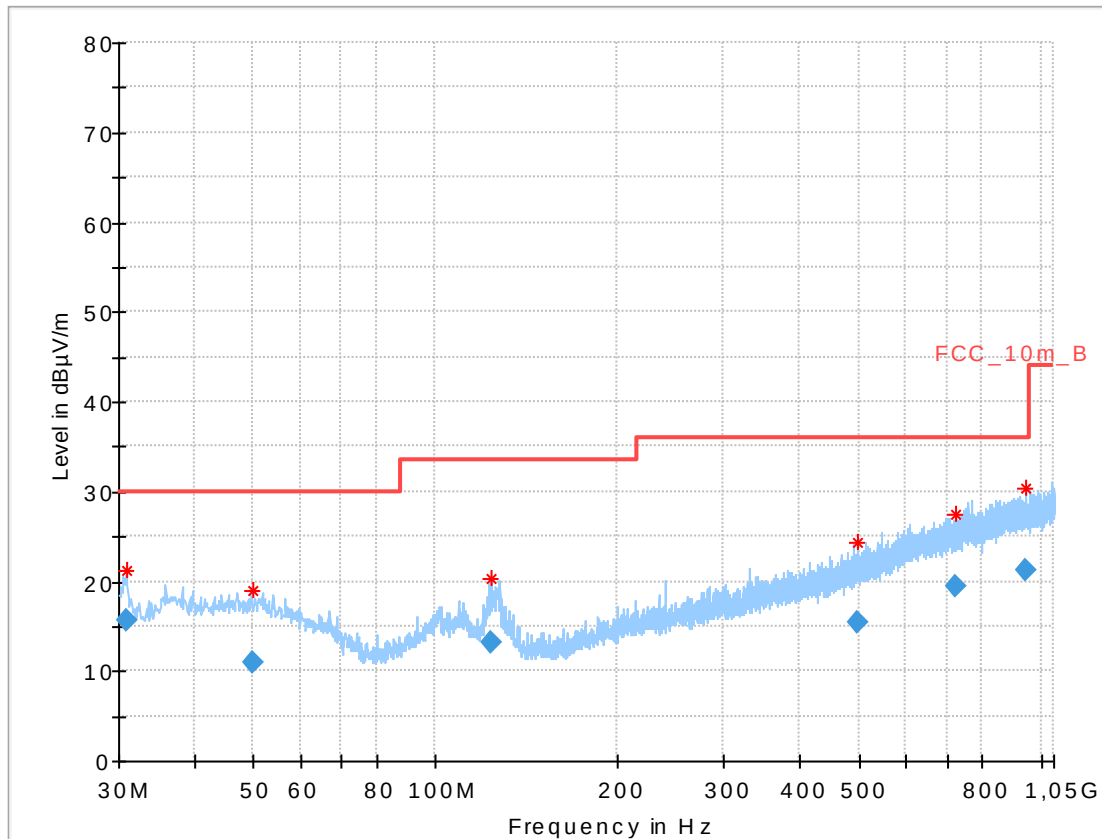


**Plot 16:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel low, upper band

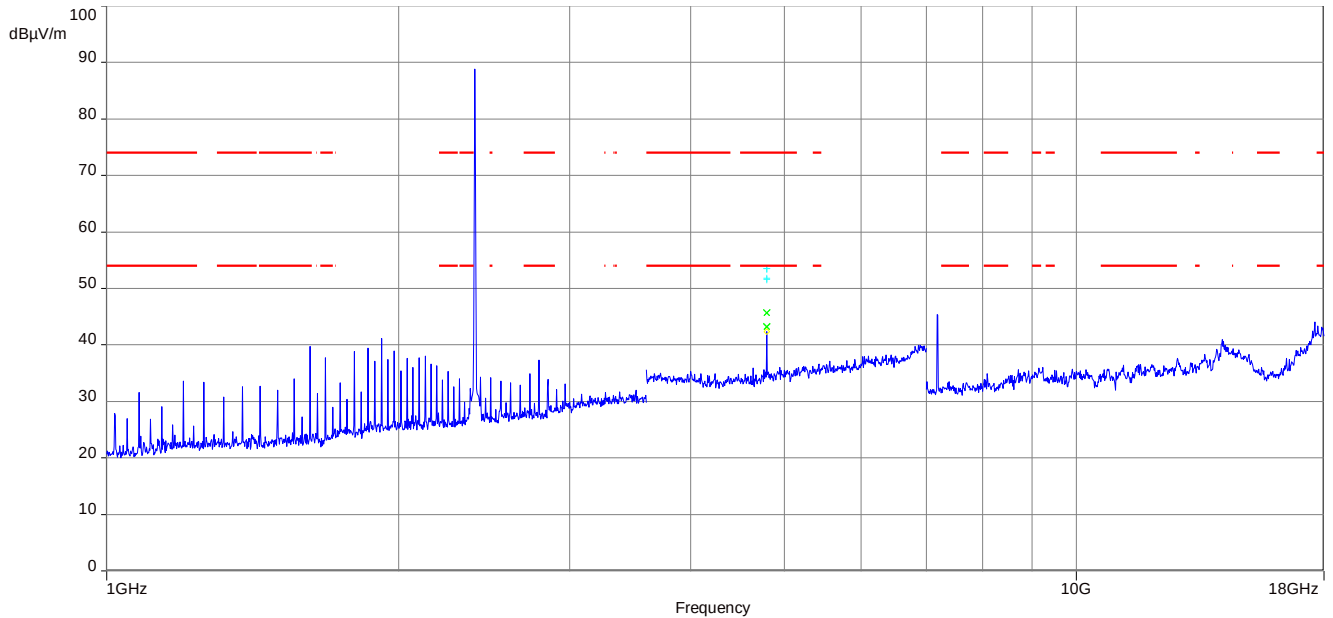
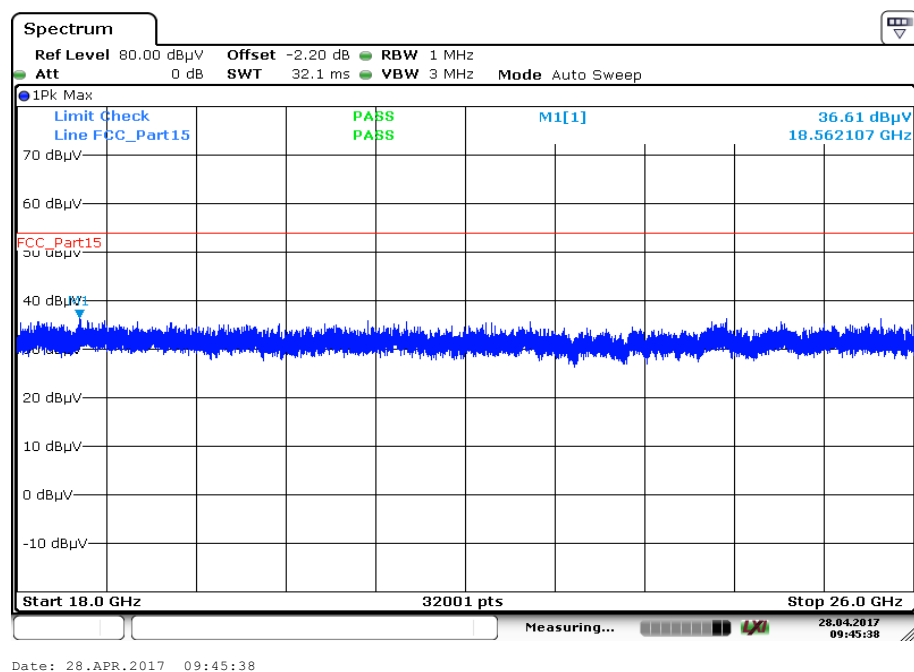


**Plot 17:** 9 kHz – 30 MHz, channel high, upper band



**Plot 18:** 30 MHz – 1 GHz, channel high, upper band**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.972000       | 15.69              | 30.00          | 14.31       | 1000.0          | 120.000         | 101.0       | V   | 297.0         | 12.0       |
| 49.944000       | 11.00              | 30.00          | 19.00       | 1000.0          | 120.000         | 101.0       | V   | 53.0          | 13.7       |
| 123.419700      | 13.12              | 33.50          | 20.38       | 1000.0          | 120.000         | 101.0       | V   | 46.0          | 10.0       |
| 499.380300      | 15.36              | 36.00          | 20.64       | 1000.0          | 120.000         | 185.0       | V   | 227.0         | 18.7       |
| 725.606550      | 19.39              | 36.00          | 16.61       | 1000.0          | 120.000         | 98.0        | H   | 123.0         | 22.2       |
| 944.948700      | 21.30              | 36.00          | 14.70       | 1000.0          | 120.000         | 101.0       | H   | 194.0         | 24.3       |

**Plot 19:** 1 GHz – 18 GHz, antenna horizontal/vertical, channel high, upper band**Plot 20:** 18 GHz – 26 GHz, antenna horizontal/vertical, channel high, upper band

### 11.3 Receiver unwanted radiation (radiated)

#### Measurement:

| Measurement parameter   |                                                                             |                                                |
|-------------------------|-----------------------------------------------------------------------------|------------------------------------------------|
| Detector:               | Prescan:<br>Final:                                                          | Peak<br>QPK below 960 MHz<br>RMS above 960 MHz |
| Resolution bandwidth:   | 9 kHz – 150 kHz:<br>150 kHz – 30 MHz:<br>30 MHz – 1 GHz:<br>1 GHz – 26 GHz: | 200 Hz<br>9 kHz<br>100 kHz<br>1 MHz            |
| Video bandwidth:        | 9 kHz – 150 kHz:<br>150 kHz – 30 MHz:<br>30 MHz – 1 GHz:<br>1 GHz – 26 GHz: | 1 kHz<br>30 kHz<br>300 kHz<br>3 MHz            |
| Span:                   | See plots                                                                   |                                                |
| Trace mode:             | Max Hold                                                                    |                                                |
| Test setup              | See sub clause 7.1 – A & 7.2 – A & 7.3 – A                                  |                                                |
| Measurement uncertainty | See sub clause 9                                                            |                                                |

#### Limits:

| FCC                                    |                                    | IC                       |
|----------------------------------------|------------------------------------|--------------------------|
| 47 CFR § 15.109                        |                                    | -/-                      |
| Receiver unwanted radiation (radiated) |                                    |                          |
| Frequency (MHz)                        | Field strength (µV/m) <sup>1</sup> | Measurement distance (m) |
| 0.009 – 0.490                          | 2400/F(kHz)                        | 300                      |
| 0.490 – 1.705                          | 24000/F(kHz)                       | 30                       |
| 1.705 – 30.0                           | 30                                 | 30                       |
| 30 - 88                                | 100 (40 dBµV/m)                    | 3                        |
| 30 - 88                                | 31.6 (30 dBµV/m)                   | 10                       |
| 88 - 216                               | 150 (43.5 dBµV/m)                  | 3                        |
| 88 - 216                               | 47.3 (33.5 dBµV/m)                 | 10                       |
| 216 - 960                              | 200 (46 dBµV/m)                    | 3                        |
| 216 - 960                              | 63.1 (36 dBµV/m)                   | 10                       |
| above 960                              | 500 (54 dBµV/m)                    | 3                        |

<sup>1</sup> Measurements in the 9 to 90 kHz, 110 to 490 kHz and above 1000 MHz ranges employ an average detector. Otherwise a quasi-peak detector is used.

**Results:** Receiver mode, left module

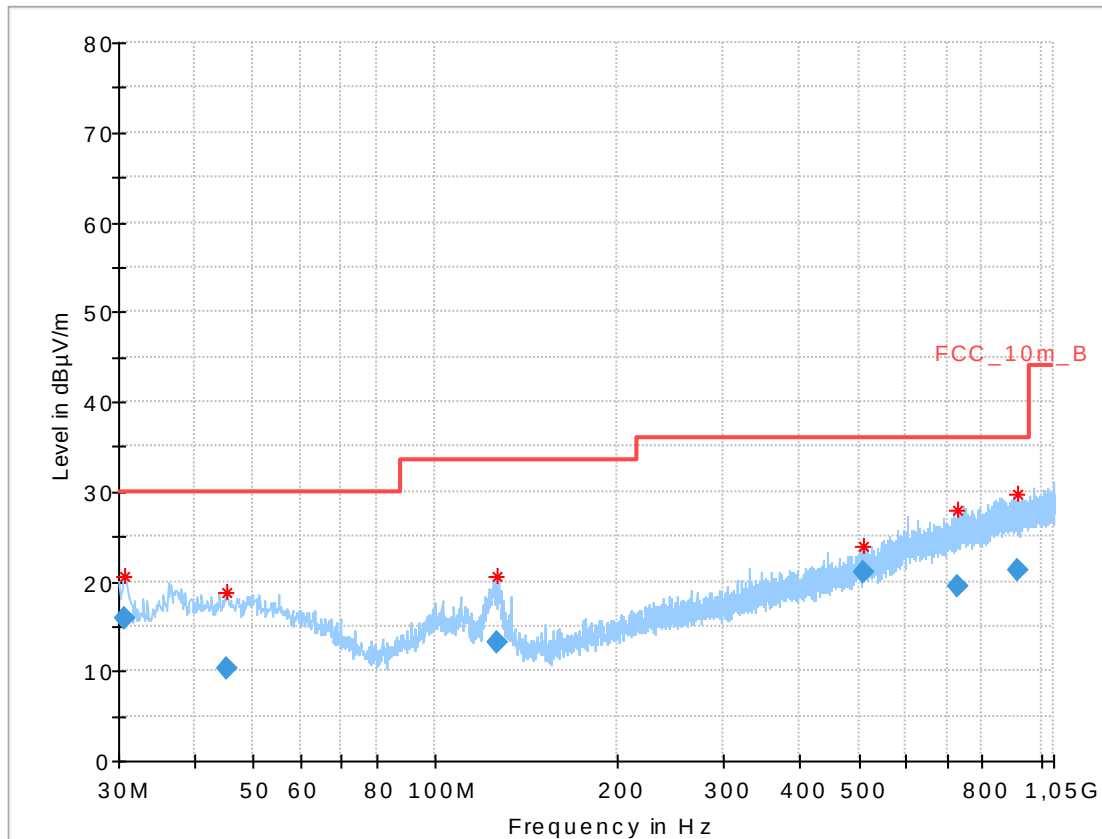
| Receiver unwanted radiation [dB $\mu$ V/m] |          |                      |
|--------------------------------------------|----------|----------------------|
| F [MHz]                                    | Detector | Level [dB $\mu$ V/m] |
| See plots!                                 |          |                      |
|                                            | AVG      |                      |
|                                            | Peak     |                      |
|                                            | AVG      |                      |

**Results:** Receiver mode, right module

| Receiver unwanted radiation [dB $\mu$ V/m] |          |                      |
|--------------------------------------------|----------|----------------------|
| F [MHz]                                    | Detector | Level [dB $\mu$ V/m] |
| See plots!                                 |          |                      |
|                                            | AVG      |                      |
|                                            | Peak     |                      |
|                                            | AVG      |                      |

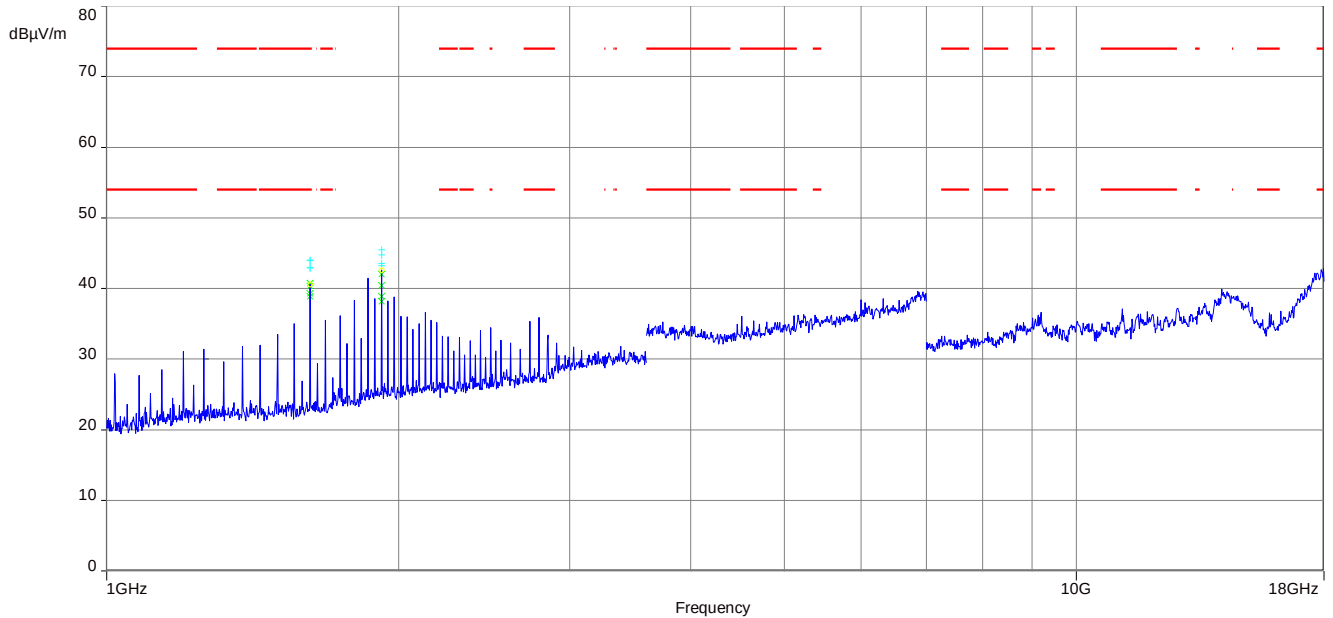
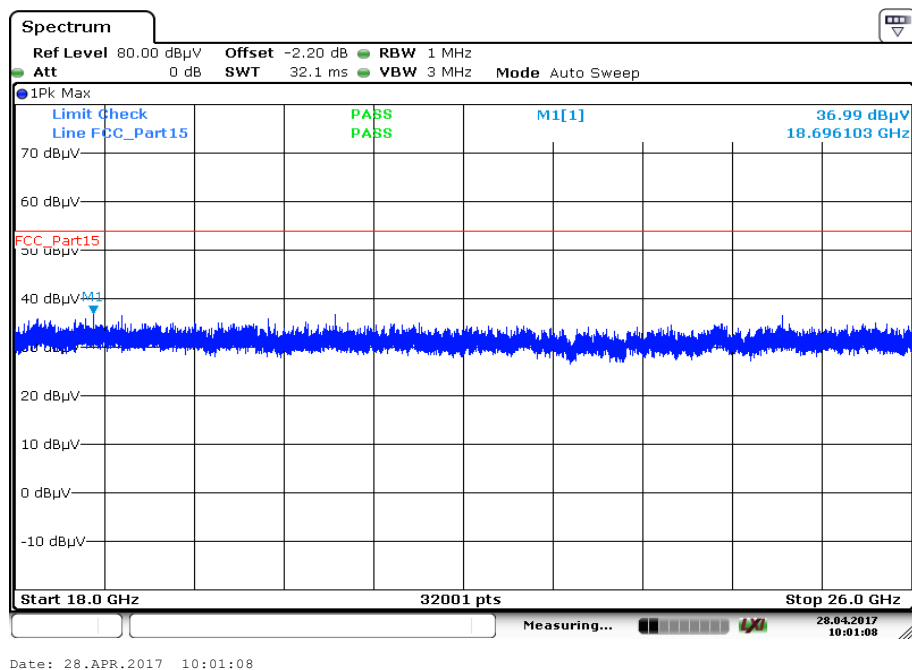
**Plots:** left module

**Plot 1:** 30 MHz – 1 GHz



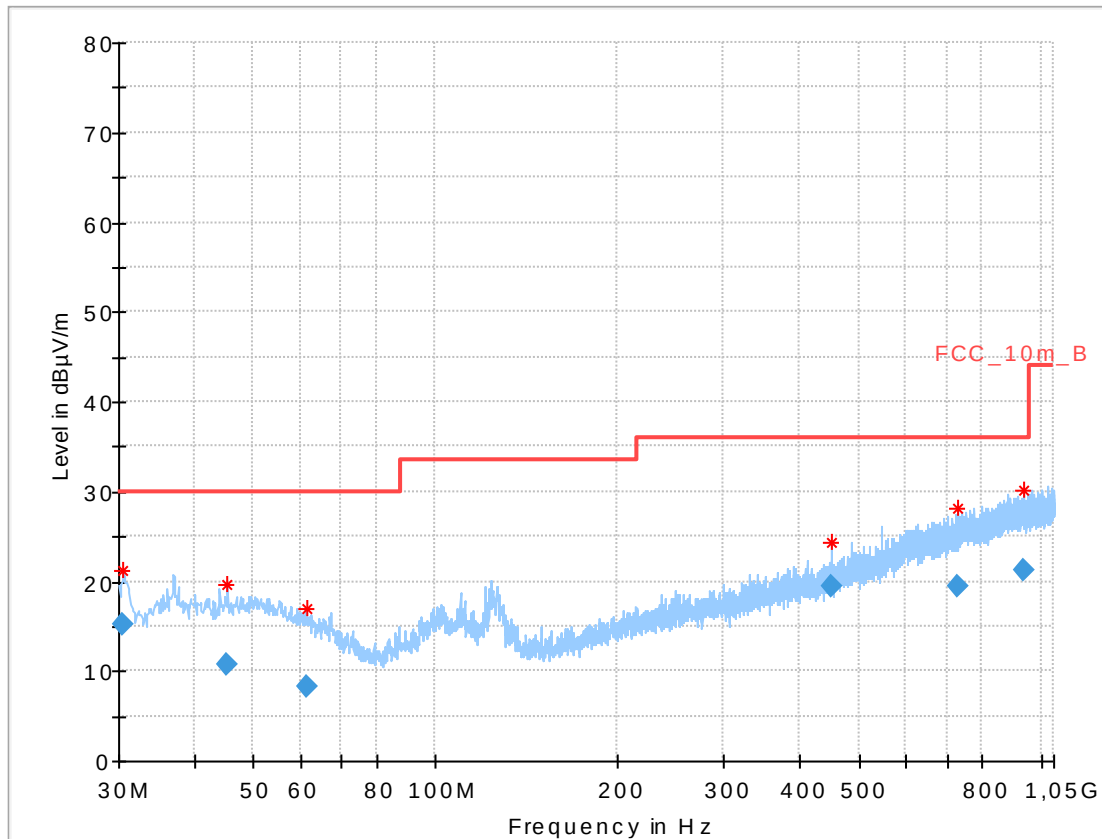
**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.640748       | 15.84              | 30.00          | 14.16       | 1000.0          | 120.000         | 98.0        | V   | 154.0         | 11.9       |
| 45.188100       | 10.26              | 30.00          | 19.74       | 1000.0          | 120.000         | 98.0        | H   | 68.0          | 13.6       |
| 126.884700      | 13.09              | 33.50          | 20.41       | 1000.0          | 120.000         | 101.0       | V   | 0.0           | 9.8        |
| 510.019200      | 21.04              | 36.00          | 14.96       | 1000.0          | 120.000         | 185.0       | H   | 204.0         | 18.8       |
| 728.986500      | 19.49              | 36.00          | 16.51       | 1000.0          | 120.000         | 185.0       | H   | 348.0         | 22.2       |
| 914.288700      | 21.32              | 36.00          | 14.68       | 1000.0          | 120.000         | 98.0        | H   | 177.0         | 24.2       |

**Plot 2:** 1 GHz – 18 GHz, antenna horizontal/vertical**Plot 3:** 18 GHz – 26 GHz, antenna horizontal/vertical

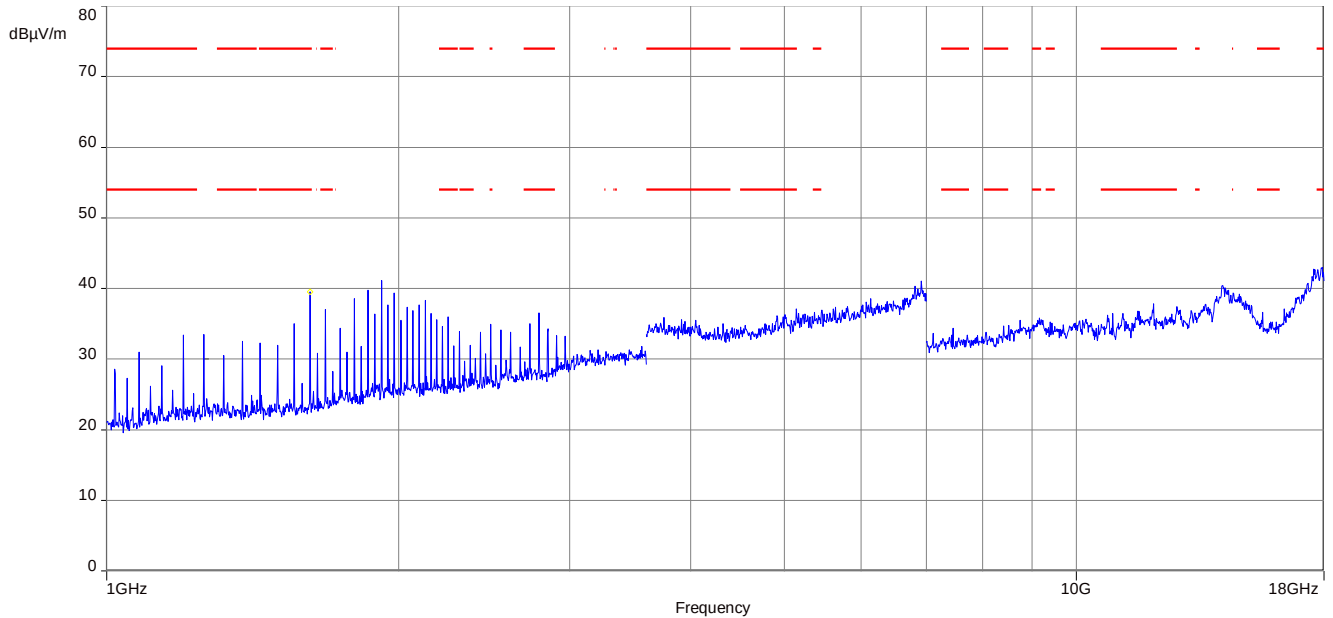
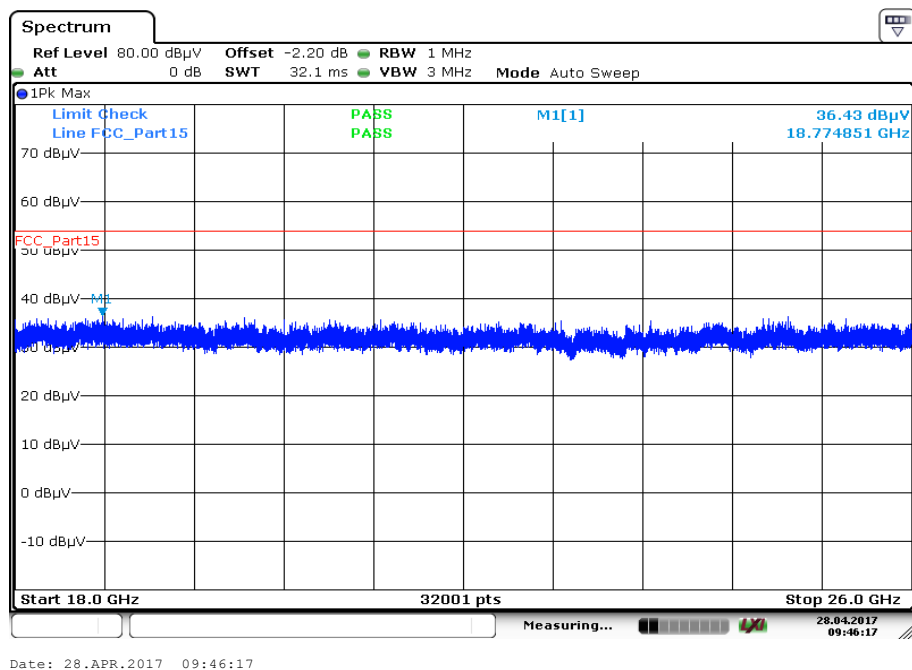
**Plots:** right module

**Plot 1:** 30 MHz – 1 GHz



**Final results:**

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 30.469530       | 15.28              | 30.00          | 14.72       | 1000.0          | 120.000         | 101.0       | V   | 169.0         | 11.9       |
| 45.141450       | 10.76              | 30.00          | 19.24       | 1000.0          | 120.000         | 101.0       | V   | 284.0         | 13.6       |
| 61.351500       | 8.24               | 30.00          | 21.76       | 1000.0          | 120.000         | 181.0       | H   | 0.0           | 11.6       |
| 449.985750      | 19.45              | 36.00          | 16.55       | 1000.0          | 120.000         | 185.0       | H   | 0.0           | 17.6       |
| 727.285950      | 19.39              | 36.00          | 16.61       | 1000.0          | 120.000         | 98.0        | H   | 291.0         | 22.2       |
| 939.291450      | 21.29              | 36.00          | 14.71       | 1000.0          | 120.000         | 185.0       | V   | 108.0         | 24.3       |

**Plot 2:** 1 GHz – 18 GHz, antenna horizontal/vertical**Plot 3:** 18 GHz – 26 GHz, antenna horizontal/vertical

## 11.4 Spurious emissions conducted below 30 MHz (AC-conducted)

### Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to single channel mode and the transmit channel is channel 39. This measurement is representative for all channels and modes. If critical peaks are found channel 00 and channel 78 will be measured too. The measurement is performed in the mode with the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

| Measurement parameters  |                                            |
|-------------------------|--------------------------------------------|
| Detector                | Peak - Quasi peak / average                |
| Sweep time              | Auto                                       |
| Resolution bandwidth    | F < 150 kHz: 200 Hz<br>F > 150 kHz: 9 kHz  |
| Video bandwidth         | F < 150 kHz: 1 kHz<br>F > 150 kHz: 100 kHz |
| Span:                   | 9 kHz to 30 MHz                            |
| Trace mode:             | Max hold                                   |
| Test setup              | See sub clause 7.4 A                       |
| Measurement uncertainty | See sub clause 9                           |

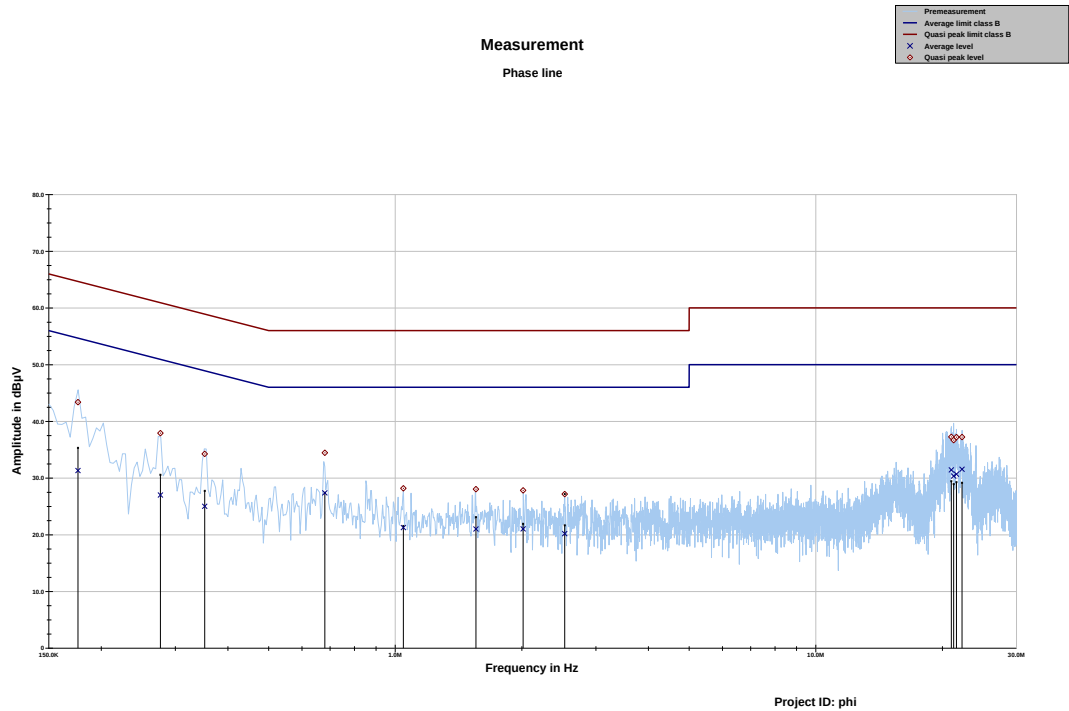
### Limits:

| FCC                                      |                     | IC               |
|------------------------------------------|---------------------|------------------|
| TX spurious emissions conducted < 30 MHz |                     |                  |
| Frequency (MHz)                          | Quasi-peak (dBμV/m) | Average (dBμV/m) |
| 0.15 – 0.5                               | 66 to 56*           | 56 to 46*        |
| 0.5 – 5                                  | 56                  | 46               |
| 5 – 30.0                                 | 60                  | 50               |

\*Decreases with the logarithm of the frequency

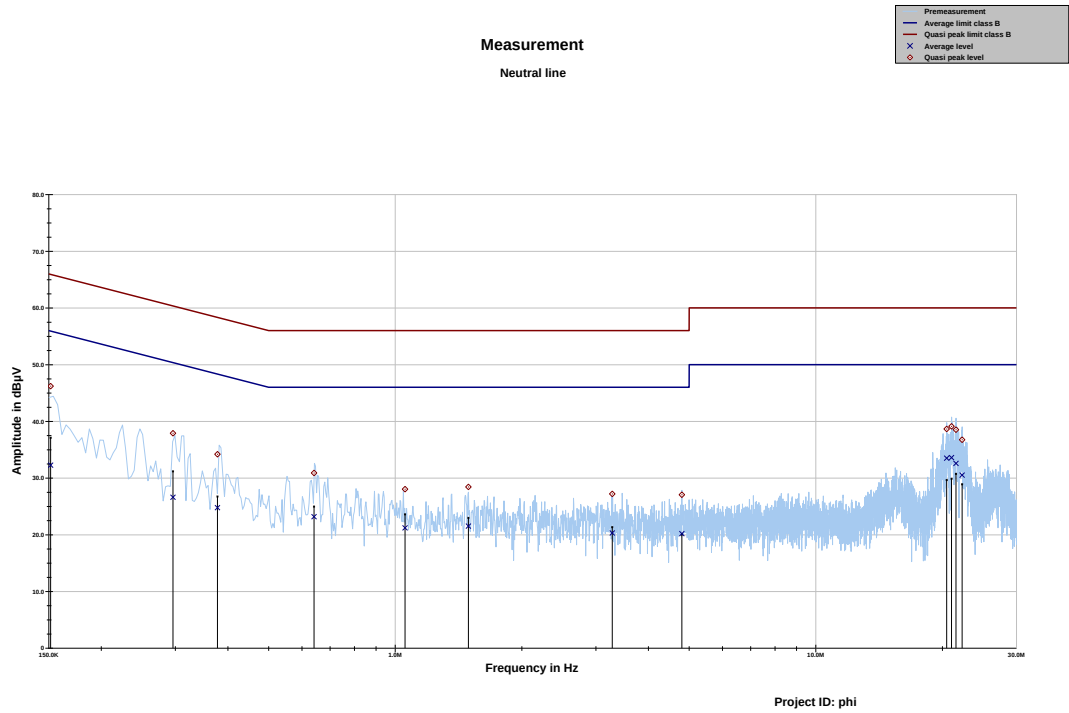
**Plots:** left module

**Plot 1:** 150 kHz to 30 MHz, phase line



**Final results:**

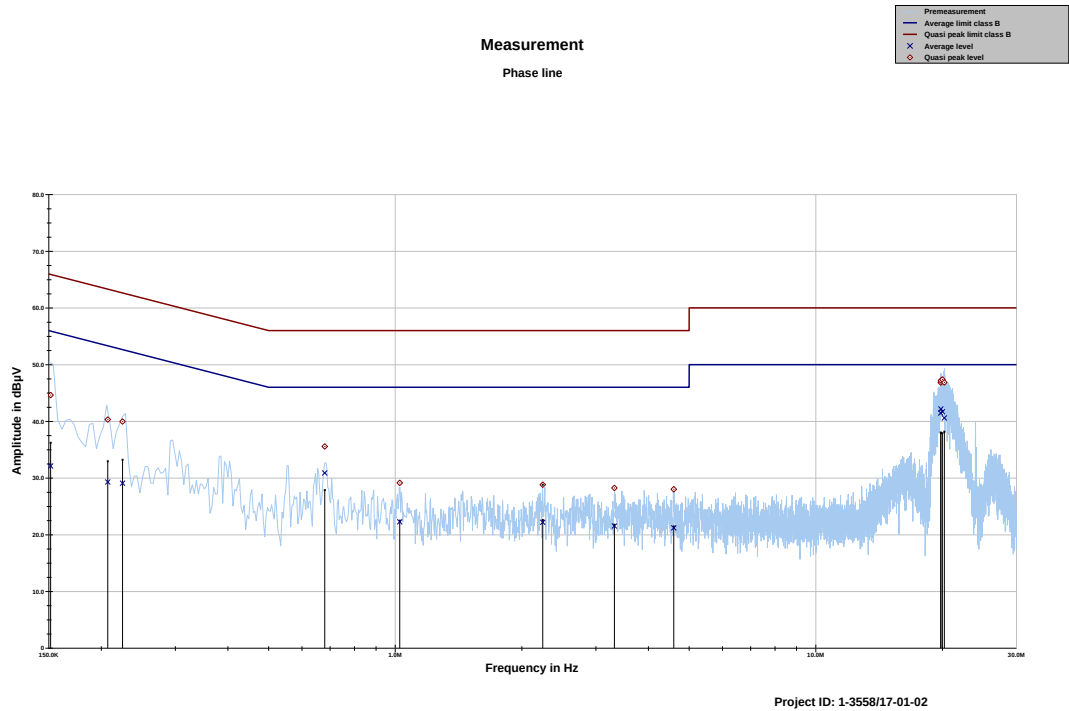
| Frequency | Quasi peak level | Margin quasi peak | Limit QP | Average level | Margin average | Limit AV |
|-----------|------------------|-------------------|----------|---------------|----------------|----------|
| MHz       | dBµV             | dB                | dBµV     | dBµV          | dB             | dBµV     |
| 0.176022  | 43.39            | 21.28             | 64.671   | 31.32         | 23.94          | 55.257   |
| 0.276508  | 37.92            | 23.00             | 60.920   | 27.00         | 25.38          | 52.385   |
| 0.352299  | 34.25            | 24.66             | 58.908   | 25.01         | 25.21          | 50.220   |
| 0.680124  | 34.45            | 21.55             | 56.000   | 27.39         | 18.61          | 46.000   |
| 1.045714  | 28.19            | 27.81             | 56.000   | 21.27         | 24.73          | 46.000   |
| 1.555707  | 28.04            | 27.96             | 56.000   | 21.01         | 24.99          | 46.000   |
| 2.014368  | 27.82            | 28.18             | 56.000   | 21.03         | 24.97          | 46.000   |
| 2.529923  | 27.17            | 28.83             | 56.000   | 20.19         | 25.81          | 46.000   |
| 21.003564 | 37.26            | 22.74             | 60.000   | 31.43         | 18.57          | 50.000   |
| 21.272785 | 36.68            | 23.32             | 60.000   | 30.36         | 19.64          | 50.000   |
| 21.602943 | 37.21            | 22.79             | 60.000   | 30.69         | 19.31          | 50.000   |
| 22.273868 | 37.22            | 22.78             | 60.000   | 31.55         | 18.45          | 50.000   |

**Plot 2:** 150 kHz to 30 MHz, neutral line**Final results:**

| Frequency | Quasi peak level | Margin quasi peak | Limit QP | Average level | Margin average | Limit AV |
|-----------|------------------|-------------------|----------|---------------|----------------|----------|
| MHz       | dBµV             | dB                | dBµV     | dBµV          | dB             | dBµV     |
| 0.151607  | 46.20            | 19.71             | 65.911   | 32.27         | 23.68          | 55.954   |
| 0.296135  | 37.90            | 22.45             | 60.351   | 26.62         | 25.21          | 51.825   |
| 0.377938  | 34.19            | 24.14             | 58.325   | 24.77         | 24.71          | 49.487   |
| 0.641237  | 30.89            | 25.11             | 56.000   | 23.18         | 22.82          | 46.000   |
| 1.055466  | 28.03            | 27.97             | 56.000   | 21.22         | 24.78          | 46.000   |
| 1.493025  | 28.44            | 27.56             | 56.000   | 21.52         | 24.48          | 46.000   |
| 3.281758  | 27.20            | 28.80             | 56.000   | 20.30         | 25.70          | 46.000   |
| 4.803941  | 27.06            | 28.94             | 56.000   | 20.20         | 25.80          | 46.000   |
| 20.477843 | 38.65            | 21.35             | 60.000   | 33.50         | 16.50          | 50.000   |
| 21.022885 | 39.11            | 20.89             | 60.000   | 33.60         | 16.40          | 50.000   |
| 21.544123 | 38.52            | 21.48             | 60.000   | 32.58         | 17.42          | 50.000   |
| 22.283881 | 36.75            | 23.25             | 60.000   | 30.52         | 19.48          | 50.000   |

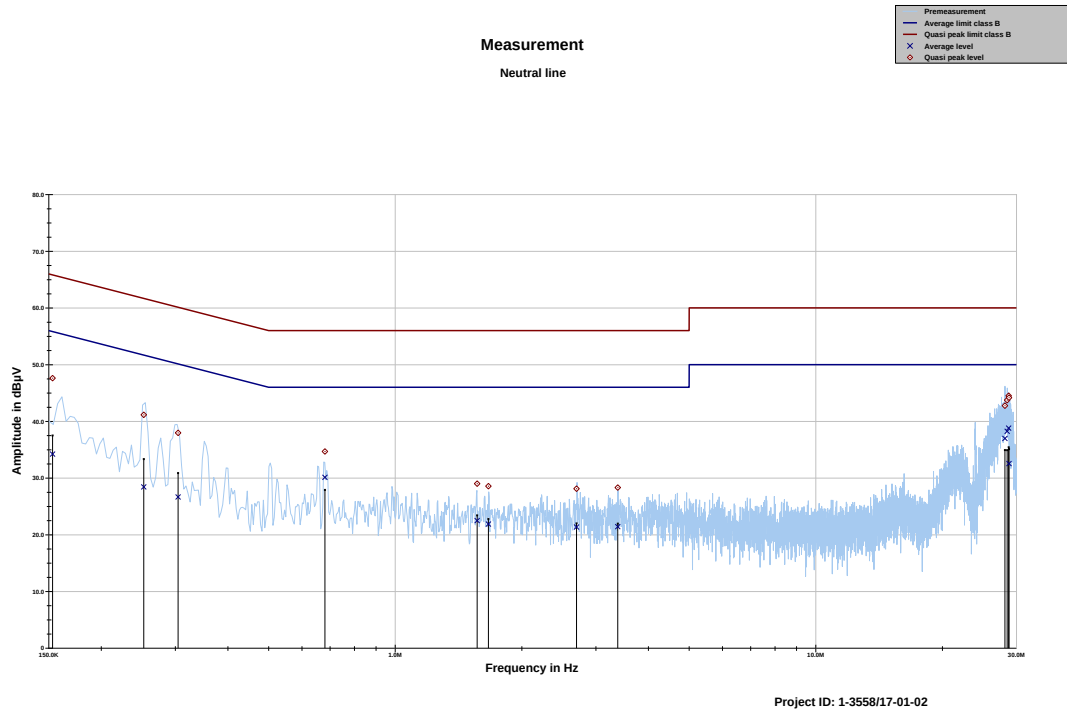
**Plots:** right module

**Plot 1:** 150 kHz to 30 MHz, phase line



**Final results:**

| Frequency | Quasi peak level | Margin quasi peak | Limit QP | Average level | Margin average | Limit AV |
|-----------|------------------|-------------------|----------|---------------|----------------|----------|
| MHz       | dBµV             | dB                | dBµV     | dBµV          | dB             | dBµV     |
| 0.151592  | 44.63            | 21.28             | 65.912   | 32.12         | 23.83          | 55.955   |
| 0.207237  | 40.30            | 23.01             | 63.315   | 29.29         | 25.07          | 54.365   |
| 0.224703  | 39.97            | 22.68             | 62.643   | 29.09         | 24.78          | 53.866   |
| 0.680029  | 35.57            | 20.43             | 56.000   | 30.89         | 15.11          | 46.000   |
| 1.025047  | 29.16            | 26.84             | 56.000   | 22.28         | 23.72          | 46.000   |
| 2.243176  | 28.83            | 27.17             | 56.000   | 22.20         | 23.80          | 46.000   |
| 3.320899  | 28.26            | 27.74             | 56.000   | 21.54         | 24.46          | 46.000   |
| 4.594920  | 28.02            | 27.98             | 56.000   | 21.21         | 24.79          | 46.000   |
| 19.817912 | 46.85            | 13.15             | 60.000   | 41.46         | 8.54           | 50.000   |
| 19.842781 | 47.19            | 12.81             | 60.000   | 42.18         | 7.82           | 50.000   |
| 20.000256 | 47.38            | 12.62             | 60.000   | 41.69         | 8.31           | 50.000   |
| 20.221435 | 46.86            | 13.14             | 60.000   | 40.59         | 9.41           | 50.000   |

**Plot 2:** 150 kHz to 30 MHz, neutral line**Final results:**

| Frequency | Quasi peak level | Margin quasi peak | Limit QP | Average level | Margin average | Limit AV |
|-----------|------------------|-------------------|----------|---------------|----------------|----------|
| MHz       | dBµV             | dB                | dBµV     | dBµV          | dB             | dBµV     |
| 0.153217  | 47.61            | 18.22             | 65.824   | 34.22         | 21.68          | 55.908   |
| 0.252430  | 41.15            | 20.52             | 61.677   | 28.43         | 24.65          | 53.073   |
| 0.304668  | 37.97            | 22.14             | 60.115   | 26.65         | 24.93          | 51.581   |
| 0.680513  | 34.68            | 21.32             | 56.000   | 30.12         | 15.88          | 46.000   |
| 1.565904  | 29.01            | 26.99             | 56.000   | 22.50         | 23.50          | 46.000   |
| 1.665534  | 28.57            | 27.43             | 56.000   | 21.88         | 24.12          | 46.000   |
| 2.699182  | 28.12            | 27.88             | 56.000   | 21.35         | 24.65          | 46.000   |
| 3.382506  | 28.32            | 27.68             | 56.000   | 21.42         | 24.58          | 46.000   |
| 28.176701 | 42.76            | 17.24             | 60.000   | 36.98         | 13.02          | 50.000   |
| 28.521265 | 43.74            | 16.26             | 60.000   | 38.24         | 11.76          | 50.000   |
| 28.756896 | 44.52            | 15.48             | 60.000   | 38.80         | 11.20          | 50.000   |
| 28.802505 | 44.17            | 15.83             | 60.000   | 32.56         | 17.44          | 50.000   |

## 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            | 2017-05-18      |
| A       | Editorial Changes (FCC ID) | 2018-02-27      |
| B       | Editorial changes          | 2018-02-28      |
| C       | Editorial changes          | 2018-03-02      |

## 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Deutsche Akkreditierungsstelle GmbH</p> <p>Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV<br/>Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition</p> <p><b>Accreditation</b> </p> <p>The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory<br/><b>CTC advanced GmbH</b><br/>Untertürkheimer Straße 6-10, 66117 Saarbrücken</p> <p>is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:<br/><b>Telecommunication</b></p> <p>The accreditation certificate shall only apply in connection with the notice of accreditation of 02.06.2017 with the accreditation number D-PL-12076-01 and is valid until 21.04.2021. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 43 pages.</p> <p>Registration number of the certificate: D-PL-12076-01-03</p> <p>Frankfurt, 02.06.2017 <br/>Heads of Division</p> <p><small>See notes on sheet 4.</small></p> | <p>Deutsche Akkreditierungsstelle GmbH</p> <p>Office Berlin<br/>Spittelmarkt 10<br/>10117 Berlin</p> <p>Office Frankfurt am Main<br/>Europa-Allee 52<br/>60327 Frankfurt am Main</p> <p>Office Braunschweig<br/>Bundesallee 100<br/>38116 Braunschweig</p> <p>The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.</p> <p>No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkKS.</p> <p>The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkKS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.</p> <p>The up-to-date state of membership can be retrieved from the following websites:<br/>EA: <a href="http://www.european-accreditation.org">www.european-accreditation.org</a><br/>ILAC: <a href="http://www.ilac.org">www.ilac.org</a><br/>IAF: <a href="http://www.iaf.nu">www.iaf.nu</a></p> |

**Note: The current certificate annex is published on the website (link see below) of the Accreditation Body DAkKS or may be received by CTC advanced GmbH on request**

<http://www.dakks.de/as/ast/d/D-PL-12076-01-03.pdf>