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## TEST REPORT

Test report no.: 1-2970/16-01-07



Deutsche  
Akkreditierungsstelle  
D-PL-12076-01-01

### Testing laboratory

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#### Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01.

### Applicant

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### Manufacturer

#### FLIR Systems AB

Antennvägen 6  
187 66 Täby / SWEDEN

### Test standard/s

|                   |                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 47 CFR Part 15    | Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices                                                                 |
| RSS - 247 Issue 2 | Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence - Exempt Local Area Network (LE-LAN) Devices                            |
| RSS - Gen Issue 4 | Spectrum Management and Telecommunications Radio Standards Specifications - General Requirements and Information for the Certification of Radio Apparatus |

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

### Test Item

|                    |                                |
|--------------------|--------------------------------|
| Kind of test item: | Thermal imaging camera         |
| Model name:        | FLIR-T8210                     |
| FCC ID:            | ZLV-FLIRT8210                  |
| IC:                | 5306A-FLIRT8210                |
| Frequency:         | UNII band 5150 MHz to 5250 MHz |
| Technology tested: | WLAN                           |
| Antenna:           | Integrated PIFA antenna        |
| Power supply:      | 3.65 V DC by LiOn battery      |
| Temperature range: | -20°C to +55°C                 |



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

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## 2 General information

### 2.1 Notes and disclaimer

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

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

### 2.2 Application details

|                                    |                   |
|------------------------------------|-------------------|
| Date of receipt of order:          | 2017-01-20        |
| Date of receipt of test item:      | 2017-03-13        |
| Start of test:                     | 2017-03-13        |
| End of test:                       | 2017-03-17        |
| Person(s) present during the test: | Mr. Göran Skedung |

### 2.3 Test laboratories sub-contracted

None

### 3 Test standard/s and references

| Test standard     | Date          | Description                                                                                                                                               |
|-------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 47 CFR Part 15    | -/-           | Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices                                                                 |
| RSS - 247 Issue 2 | February 2017 | Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence - Exempt Local Area Network (LE-LAN) Devices                            |
| RSS - Gen Issue 4 | November 2014 | Spectrum Management and Telecommunications Radio Standards Specifications - General Requirements and Information for the Certification of Radio Apparatus |

| Guidance             | Version | Description                                                                                                                                                         |
|----------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNII: KDB 789033 D02 | v01r03  | Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E                                            |
| ANSI C63.4-2014      | -/-     | American national standard for methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz |
| ANSI C63.10-2013     | -/-     | American national standard of procedures for compliance testing of unlicensed wireless devices                                                                      |

#### 4 Test environment

|                           |   |                                                          |                                                                                                                                                            |
|---------------------------|---|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature               | : | T <sub>nom</sub><br>T <sub>max</sub><br>T <sub>min</sub> | +23 °C during room temperature tests<br>No tests under extreme temperature conditions required!<br>No tests under extreme temperature conditions required! |
| Relative humidity content | : |                                                          | 35 %                                                                                                                                                       |
| Barometric pressure       | : |                                                          | 1021 hpa                                                                                                                                                   |
| Power supply              | : | V <sub>nom</sub><br>V <sub>max</sub><br>V <sub>min</sub> | 3.65 V DC by LiOn battery<br>No tests under extreme voltage conditions required!<br>No tests under extreme voltage conditions required!                    |

#### 5 Test item

##### 5.1 General description

|                            |   |                                                                                       |
|----------------------------|---|---------------------------------------------------------------------------------------|
| Kind of test item          | : | Thermal imaging camera                                                                |
| Type identification        | : | FLIR-T8210                                                                            |
| HMN                        | : | -/-                                                                                   |
| PMN                        | : | T530, T540, T850 and T860                                                             |
| HVIN                       | : | FLIR-T8210                                                                            |
| FVIN                       | : | -/-                                                                                   |
| S/N serial number          | : | Radiated unit: 79100425<br>Conducted unit: 79100421                                   |
| HW hardware status         | : | 1                                                                                     |
| SW software status         | : | RF test mode                                                                          |
| Frequency band             | : | UNII band 5150 MHz to 5250 MHz<br>(lowest channel 5180 MHz; highest channel 5240 MHz) |
| Type of radio transmission | : | OFDM                                                                                  |
| Use of frequency spectrum  | : |                                                                                       |
| Type of modulation         | : | (D)BPSK, (D)QPSK, 16 – QAM, 64 – QAM                                                  |
| Number of channels         | : | 4                                                                                     |
| Antenna                    | : | Integrated PIFA antenna                                                               |
| Power supply               | : | 3.65 V DC by LiOn battery                                                             |
| Temperature range          | : | -20°C to +55°C                                                                        |

##### 5.2 Additional information

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

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

1-2970/16-01-10\_AnnexA  
 1-2970/16-01-10\_AnnexB  
 1-2970/16-01-10\_AnnexD

## 6 Description of the test setup

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

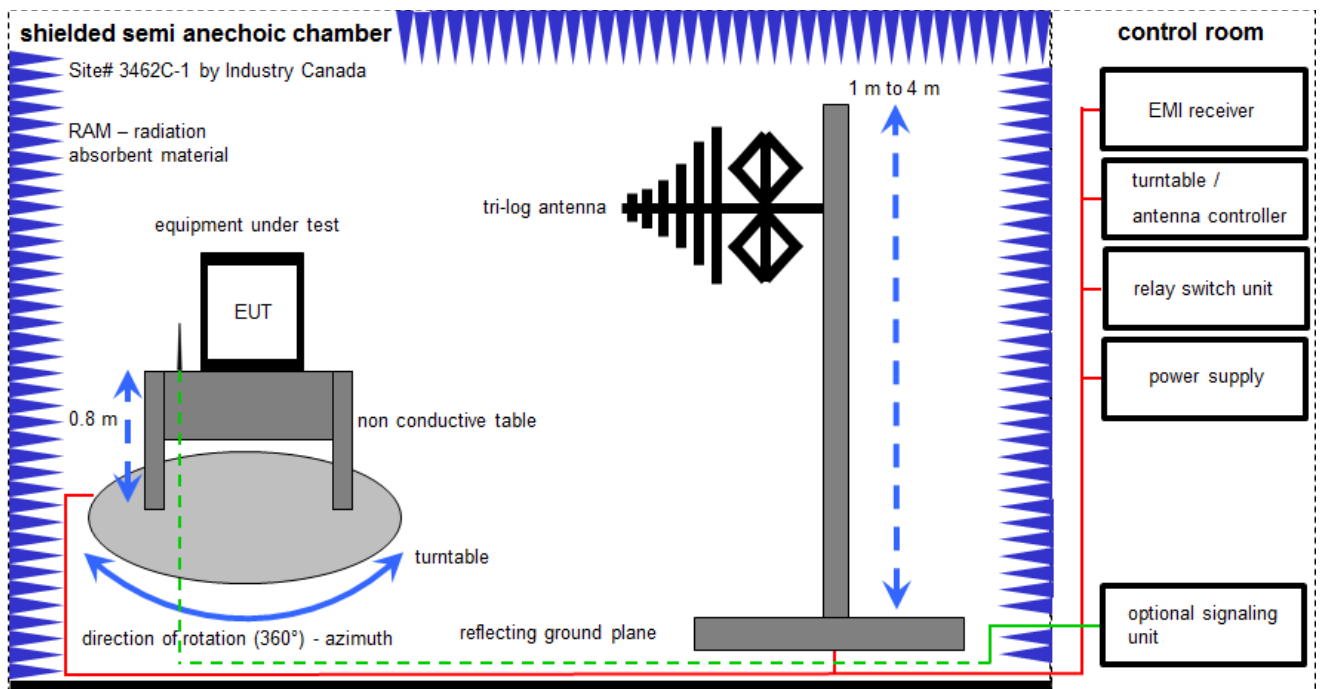
In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

**Agenda:** Kind of Calibration

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

## 6.1 Shielded semi anechoic chamber

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



Measurement distance: tri-log antenna 10 meter

$$FS = UR + CL + AF$$

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

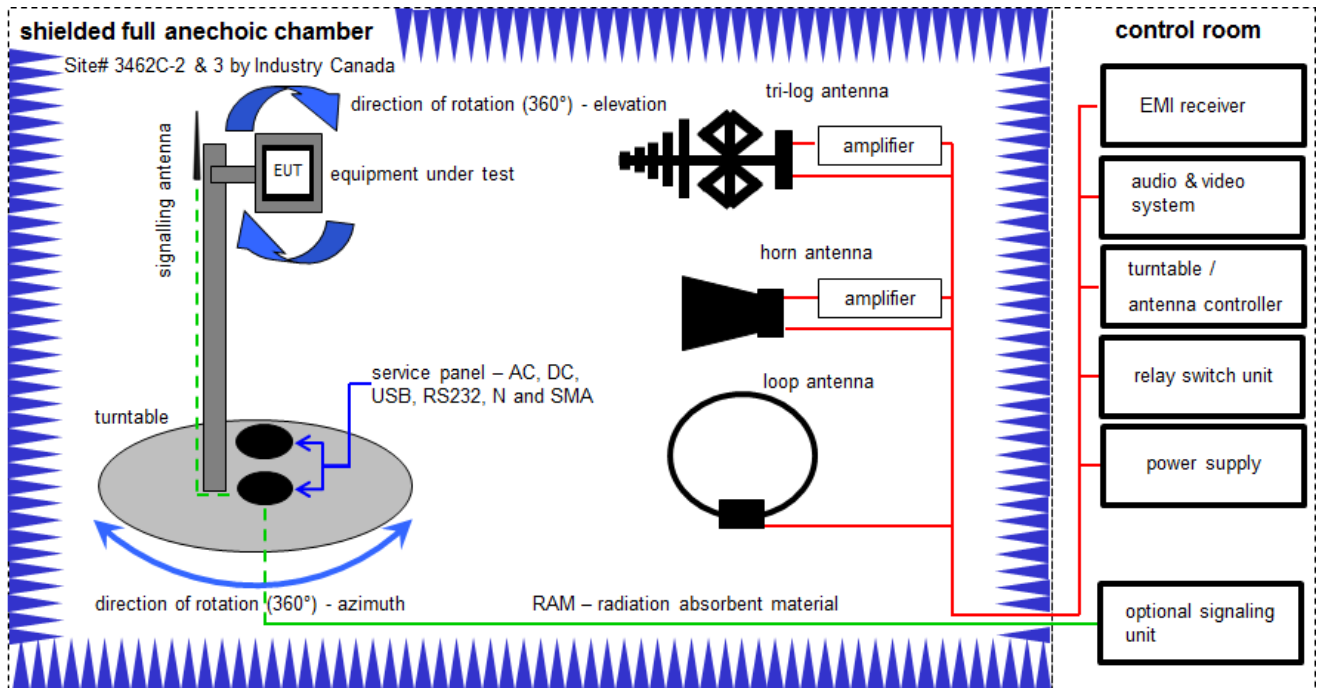
Example calculation:

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

### Equipment table:

| No. | Lab / Item | Equipment                                         | Type             | Manufacturer  | Serial No.      | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|---------------------------------------------------|------------------|---------------|-----------------|-----------|---------------------|------------------|------------------|
| 1   | A          | Switch-Unit                                       | 3488A            | HP            | 2719A14505      | 300000368 | ev                  | -/-              | -/-              |
| 2   | A          | Meßkabine 1                                       | HF-Absorberhalle | MWB AG 300023 | 101042          | 300000551 | ne                  | -/-              | -/-              |
| 3   | A          | EMI Test Receiver                                 | ESCI 3           | R&S           | 100083          | 300003312 | k                   | 08.03.2016       | 08.03.2017       |
| 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       |

## 6.2 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:

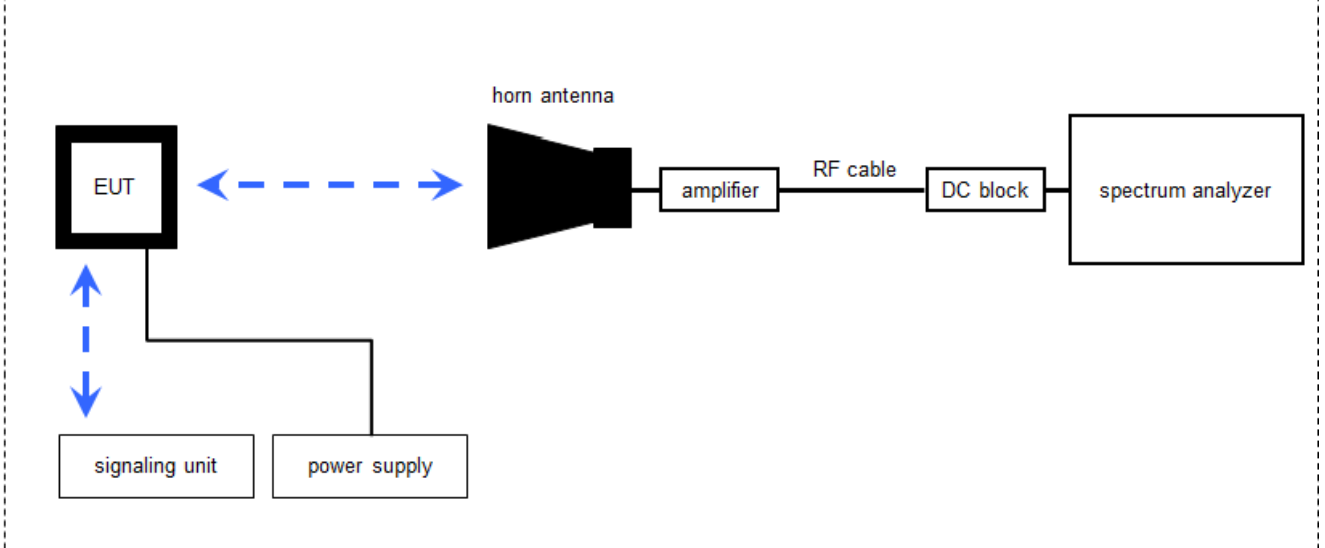
FS [dBμV/m] = 40.0 [dBμV/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dBμV/m] (71.61 μV/m)

### 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   | A          | Band Reject Filter                             | WRCG2400/2483-2375/2505-50/10SS       | Wainwright           | 26              | 300003792 | ne                  | -/-              | -/-              |
| 6   | A, B       | TRILOG Broadband Test-Antenna 30 MHz - 3 GHz   | VULB9163                              | Schwarzbeck          | 318             | 300003696 | k                   | 22.04.2014       | 22.04.2017       |
| 7   | A, B       | Broadband Amplifier 0.5-18 GHz                 | CBLU5184540                           | CERNEX               | 22051           | 300004483 | ev                  | -/-              | -/-              |
| 8   | A, B, C    | 4U RF Switch Platform                          | L4491A                                | Agilent Technologies | MY50000032      | 300004510 | ne                  | -/-              | -/-              |
| 9   | A, B, C    | Messrechner und Monitor                        | Intel Core i3 3220/3,3 GHz, Prozessor | Huber & Suhner       | 2V2403033A54 21 | 300004591 | ne                  | -/-              | -/-              |
| 10  | A, B, C    | NEXO EMV-Software                              | BAT EMC V3.16.0.49                    | EMCO                 | Batch no. 14844 | 300004682 | ne                  | -/-              | -/-              |
| 11  | A, B, C    | Anechoic chamber                               | ESH3-Z5                               | TDK                  | 893045/004      | 300003726 | ne                  | -/-              | -/-              |
| 12  | A, B, C    | EMI Test Receiver 9kHz-26,5GHz                 | ESR26                                 | R&S                  | 101376          | 300005063 | vIKI!               | 13.09.2016       | 13.03.2018       |

### 6.3 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)

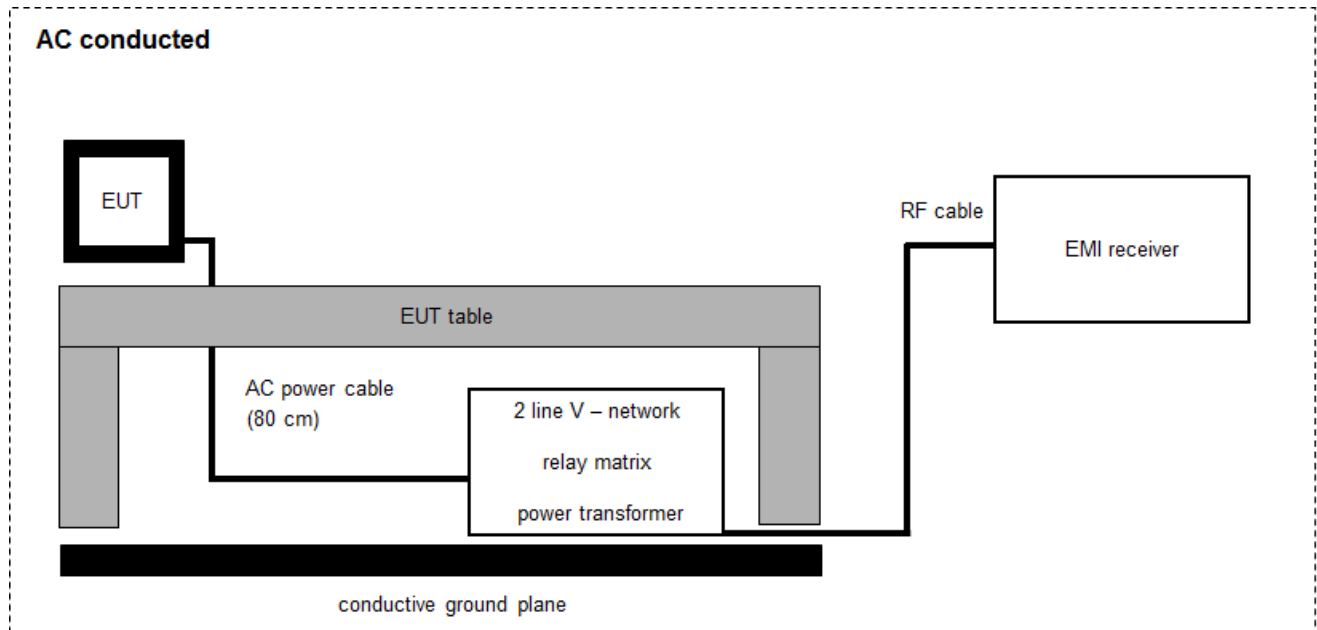
#### Example calculation:

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

#### 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   | A          | Std. Gain Horn Antenna 26.5 to 40.0 GHz | V637                | Narda          | 82-16            | 300000510 | k                   | 14.08.2015       | 14.08.2017       |

## 6.4 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:*

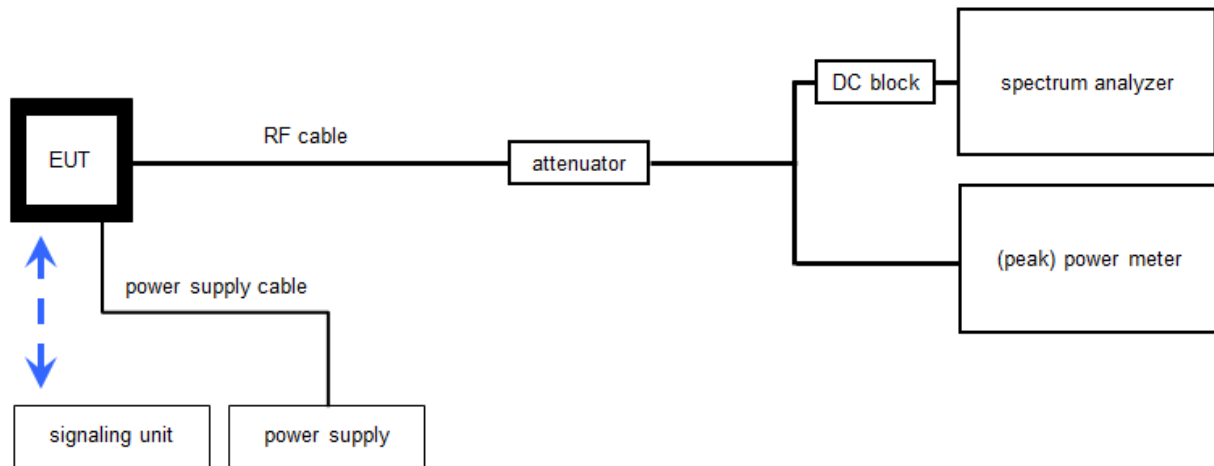
$$FS [dB\mu V/m] = 37.62 [dB\mu V/m] + 9.90 [dB] + 0.23 [dB] = 47.75 [dB\mu V/m] (244.06 \mu V/m)$$

### 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       |

## 6.5 Conducted measurements with peak power meter & spectrum analyzer

### Conducted measurements normal conditions



OP = AV + CA

(OP-output power; AV-analyzer value; CA-loss signal path)

#### Example calculation:

OP [dBm] = 6.0 [dBm] + 11.7 [dB] = 17.7 [dBm] (58.88 mW)

#### Equipment table:

| No. | Lab / Item | Equipment                                 | Type                                  | Manufacturer              | Serial No.       | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|-------------------------------------------|---------------------------------------|---------------------------|------------------|-----------|---------------------|------------------|------------------|
| 1   | A          | Switch / Control Unit                     | 3488A                                 | HP                        | 2719A15013       | 300000151 | ne                  | -/-              | -/-              |
| 2   | A          | PC-WLAN Tester                            | Intel Core i3 3220/3,3 GHz, Prozessor | R&S                       | 2V2403033A4523   | 300004589 | ne                  | -/-              | -/-              |
| 3   | A          | Teststand                                 | Teststand Custom Sequence Editor      | National Instruments GmbH | 2V2403033A4523   | 300004590 | ne                  | -/-              | -/-              |
| 4   | A          | PowerSplitter/Combiner 150-6000MHz N-Type | ZB3PD-63-N+                           | Mini-Circuits             | 100010           | 400000451 | ev                  | -/-              | -/-              |
| 5   | A          | RF-Cable                                  | ST18/SMAm/SMAm/60                     | Huber & Suhner            | Batch no. 606844 | 400001181 | ev                  | -/-              | -/-              |
| 6   | A          | Coax Attenuator 10 dB 2W 0-40 GHz         | MCL BW-K10-2W44+                      | Mini Circuits             | Batch no. 606844 | 400001186 | ev                  | -/-              | -/-              |
| 7   | A          | DC-Blocker 0.1-40 GHz                     | 8141A                                 | Inmet                     | Batch no. 127377 | 400001185 | ev                  | -/-              | -/-              |
| 8   | A          | Signal Analyzer 40 GHz                    | FSV40                                 | R&S                       | 101042           | 300004517 | k                   | 27.01.2017       | 26.01.2018       |

## 7 Sequence of testing

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

#### Setup

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

#### Premeasurement

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

#### Final measurement

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

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

### Setup

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

### Premeasurement

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

### Final measurement

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

### 7.3 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.

## 7.4 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.

## 7.5 Sequence of testing radiated spurious above 50 GHz with external mixers

### 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 for far field (e.g. 0.25 m).
- The EUT is set into operation.

### Premeasurement

- The test antenna with external mixer is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.
- Caution is taken to reduce the possible overloading of the external mixer.

### 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).
- As external mixers may generate false images care is taken to ensure that any emission measured by the spectrum analyzer does indeed originate in the EUT. Signal identification feature of spectrum analyzer is used to eliminate false mixer images (i.e., it is not the fundamental emission or a harmonic falling precisely at the measured frequency).
- 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.

## 8 Measurement uncertainty

| Measurement uncertainty                                  |                                         |
|----------------------------------------------------------|-----------------------------------------|
| Test case                                                | Uncertainty                             |
| Antenna gain                                             | $\pm 3$ dB                              |
| Power spectral density                                   | $\pm 1.5$ dB                            |
| Spectrum bandwidth                                       | $\pm 100$ kHz (depends on the used RBW) |
| Occupied bandwidth                                       | $\pm 100$ kHz (depends on the used RBW) |
| Maximum output power                                     | $\pm 1.5$ dB                            |
| Minimum emissions bandwidth                              | $\pm 100$ kHz (depends on the used RBW) |
| Spurious emissions conducted                             | $\pm 3$ dB                              |
| Spurious emissions radiated below 30 MHz                 | $\pm 3$ 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                            |

## 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    | CFR Part 15<br>RSS 247, Issue 2 | see table | 2017-04-11 | -/-    |

| Test specification clause                                                                              | Test case                                       | Temperature conditions | Power source voltages | C                                   | NC                       | NA                       | NP                       | Remark                        |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------|-----------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------|
| -/-                                                                                                    | Output power verification (conducted)           | Nominal                | Nominal               | -/-                                 |                          |                          |                          | -/-                           |
| -/-                                                                                                    | Antenna gain                                    | Nominal                | Nominal               | -/-                                 |                          |                          |                          | Declared                      |
| U-NII Part 15                                                                                          | Duty cycle                                      | Nominal                | Nominal               | -/-                                 |                          |                          |                          | -/-                           |
| §15.407(a)<br>RSS - 247 (6.2.1.1)<br>RSS - 247 (6.2.2.1)<br>RSS - 247 (6.2.3.1)<br>RSS - 247 (6.2.4.1) | Maximum output power (conducted & radiated)     | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| §15.407(a)<br>RSS - 247 (6.2.1.1)<br>RSS - 247 (6.2.2.1)<br>RSS - 247 (6.2.3.1)<br>RSS - 247 (6.2.4.1) | Power spectral density                          | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| RSS - 247 (6.2.4.1)                                                                                    | Spectrum bandwidth 6dB bandwidth                | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| §15.407(a)                                                                                             | Spectrum bandwidth 26dB bandwidth               | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| RSS Gen clause 6.6                                                                                     | Spectrum bandwidth 99% bandwidth                | Nominal                | Nominal               | -/-                                 |                          |                          |                          | -/-                           |
| §15.205<br>RSS - 247 (6.2.1.2)<br>RSS - 247 (6.2.2.2)<br>RSS - 247 (6.2.3.2)<br>RSS - 247 (6.2.4.2)    | Band edge compliance radiated                   | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| §15.407(b)<br>RSS - 247 (6.2.1.2)<br>RSS - 247 (6.2.2.2)<br>RSS - 247 (6.2.3.2)<br>RSS - 247 (6.2.4.2) | TX spurious emissions radiated                  | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| §15.109<br>RSS-Gen                                                                                     | RX spurious emissions radiated                  | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| §15.209(a)<br>RSS-Gen                                                                                  | Spurious emissions radiated < 30 MHz            | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| §15.107(a)<br>§15.207                                                                                  | Spurious emissions conducted emissions < 30 MHz | Nominal                | Nominal               | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-                           |
| §15.407<br>RSS - 247 (6.3)                                                                             | DFS                                             | Nominal                | Nominal               | -/-                                 |                          |                          |                          | Not tested – No DFS band used |

**Note:** C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

## 10 Additional comments

Reference documents: Customer Questionnaire

3-3-TECH-587 920-04 Flir Lennox antenna characterization A

Special test descriptions: None

Configuration descriptions: None

Test mode: ☐ No test mode available.  
 lperf was used to ping another device with the largest support packet size

☒ Special software is used.  
 EUT is transmitting pseudo random data by itself

Antennas and transmit operating modes:

☒ Operating mode 1 (single antenna)

- Equipment with 1 antenna,
- Equipment with 2 diversity antennas operating in switched diversity mode by which at any moment in time only 1 antenna is used,
- Smart antenna system with 2 or more transmit/receive chains, but operating in a mode where only 1 transmit/receive chain is used)

☐ Operating mode 2 (multiple antennas, no beamforming)

- Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously but without beamforming.

☐ Operating mode 3 (multiple antennas, with beamforming)

- Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously with beamforming.  
 In addition to the antenna assembly gain (G), the beamforming gain (Y) may have to be taken into account when performing the measurements.

## 11 Measurement results

### 11.1 Identify worst case data rate

#### Measurement:

All modes of the module will be measured with an average power meter or spectrum analyzer to identify the maximum transmission power.

In further tests only the identified worst case modulation scheme or bandwidth will be measured and this mode is used as representative mode for all other modulation schemes.

Additional the band edge compliance test will be performed in the lowest and highest modulation scheme.

#### Measurement parameters:

| Measurement parameter    |                     |
|--------------------------|---------------------|
| Detector:                | Peak                |
| Sweep time:              | Auto                |
| Resolution bandwidth:    | 3 MHz               |
| Video bandwidth:         | 3 MHz               |
| Trace mode:              | Max hold            |
| Used test setup:         | See chapter 6.5 – A |
| Measurement uncertainty: | See chapter 8       |

#### Results:

| Modulation<br><br>Frequency | Modulation scheme / bandwidth |          |          |          |          |          |
|-----------------------------|-------------------------------|----------|----------|----------|----------|----------|
|                             | 5180 MHz                      | 5320 MHz | 5500 MHz | 5700 MHz | 5745 MHz | 5825 MHz |
| OFDM / a – mode             | 6 Mbit/s                      | -/-      | -/-      | -/-      | -/-      | -/-      |
| OFDM / n/ac HT20 – mode     | MCS0                          | -/-      | -/-      | -/-      | -/-      | -/-      |

## 11.2 Gain

### Limits:

| Antenna Gain                                                      |
|-------------------------------------------------------------------|
| 6 dBi / > 6 dBi output power and power density reduction required |

### Results:

|                                      | Antenna gain                   |
|--------------------------------------|--------------------------------|
|                                      | UNII band 5150 MHz to 5250 MHz |
| Gain<br>Declared by the manufacturer | 2.0                            |

**Plots:** antenna characterization and gain (provided by the customer)

**Plot 1:** plane definitions



Figure 3 Measurement plane definitions

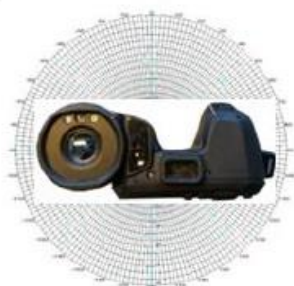


Figure 4 XY-plane



Figure 5 XZ-plane



Figure 6 YZ-plane

## Plot 2: XY-plane

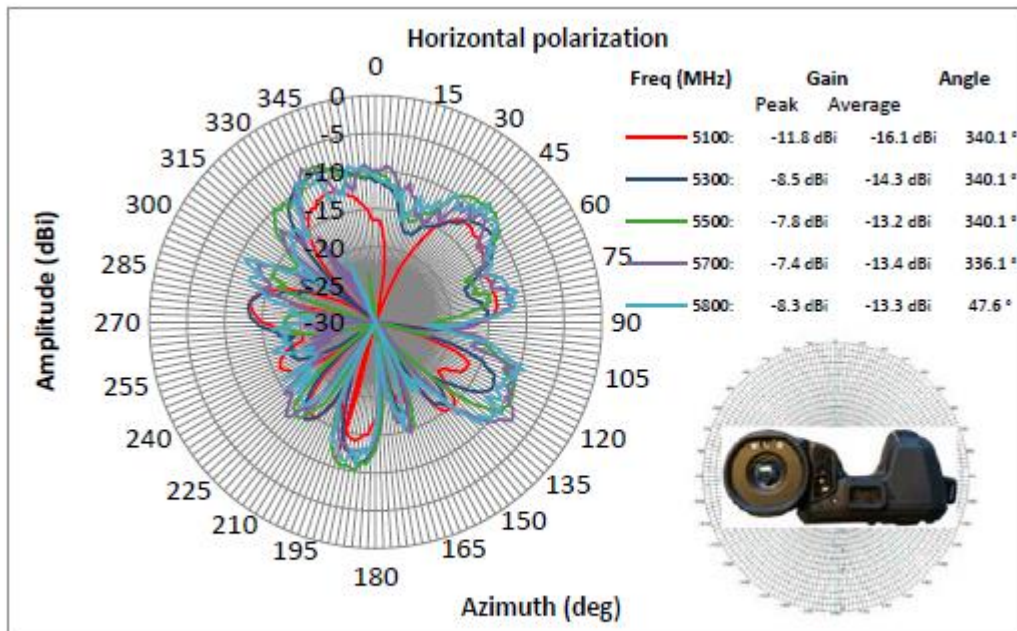


Figure 10 5GHz XY-plane, horizontal polarization

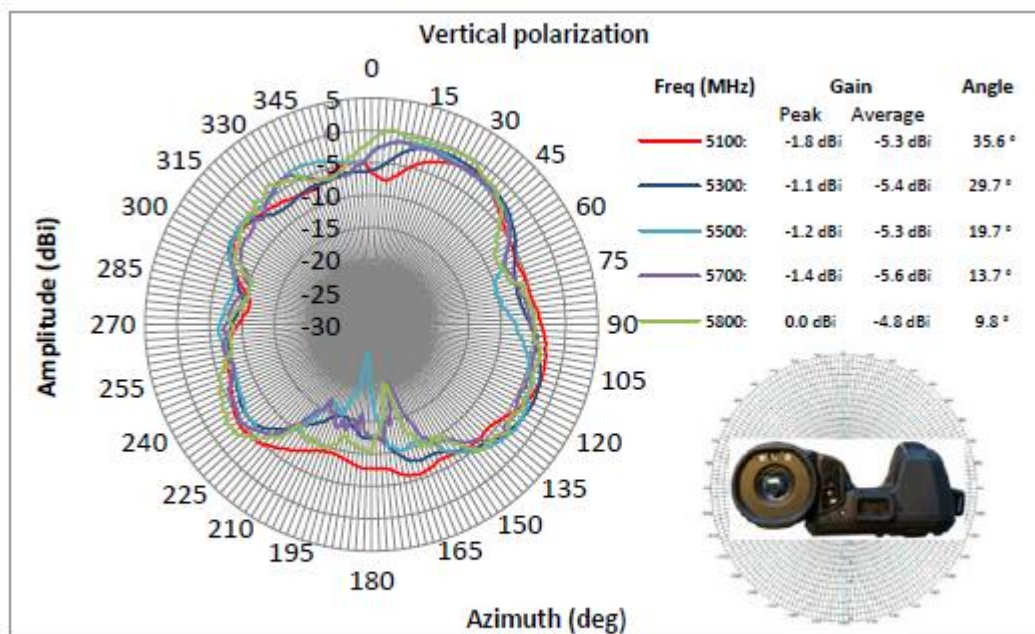


Figure 11 5GHz XY-plane, vertical polarization

Plot 3: XZ-plane

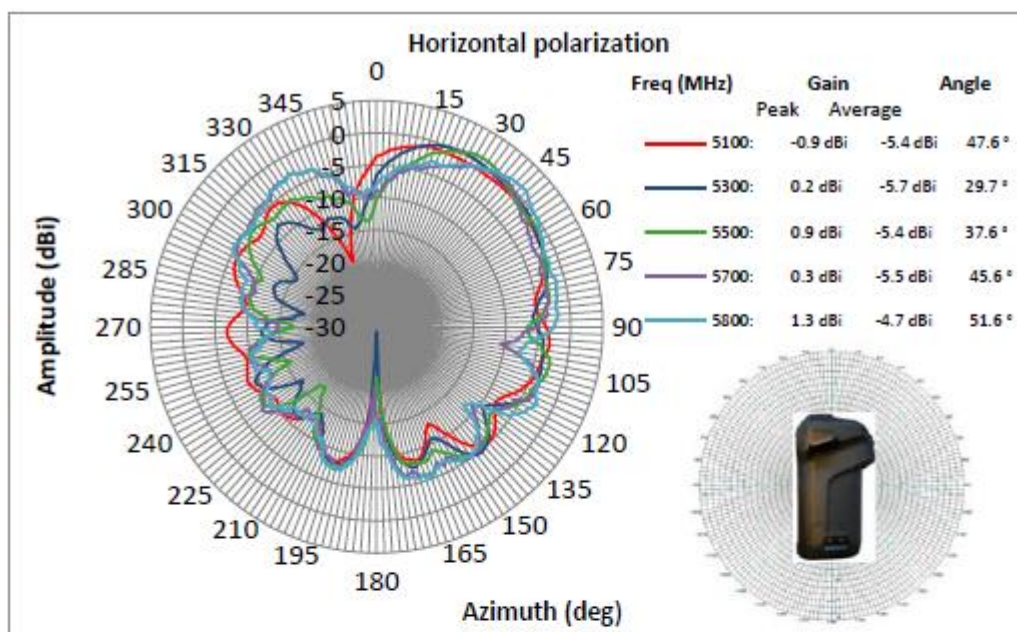


Figure 14 5GHz XZ-plane, horizontal polarization

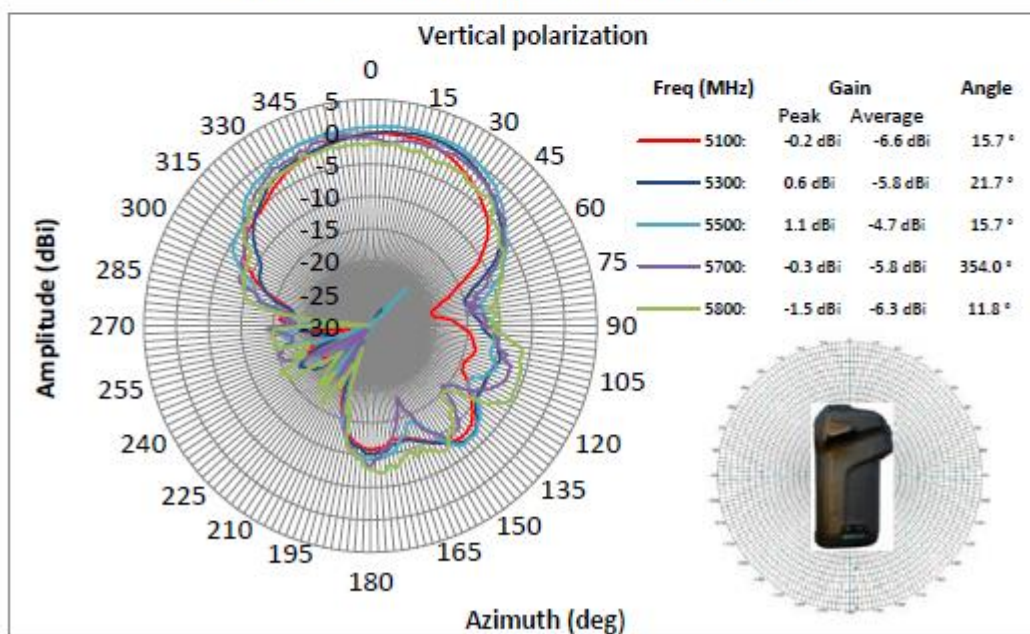


Figure 15 5GHz XZ-plane, vertical polarization

Plot 4: YZ-plane

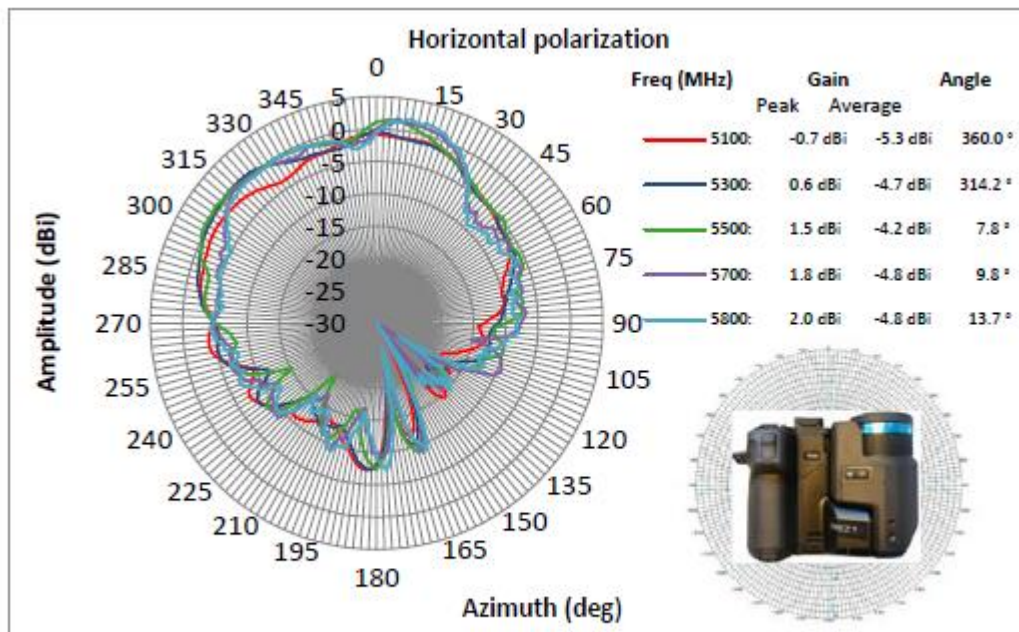


Figure 18 5GHz YZ-plane, horizontal polarization

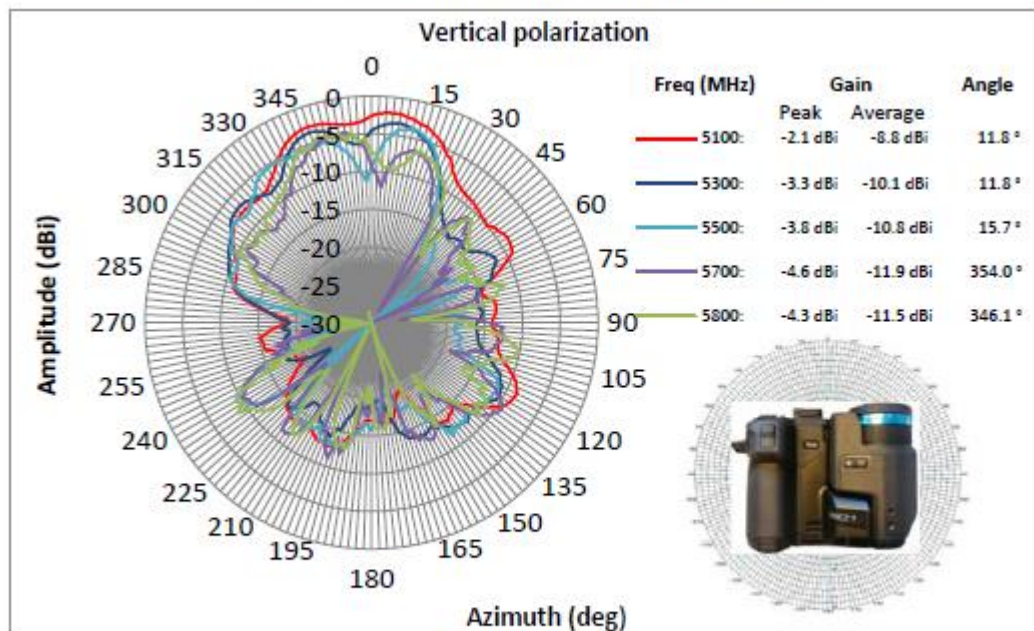


Figure 19 5GHz YZ-plane, vertical polarization

**Plot 5:** summary

### 3 Summary

The WiFi antenna within the *Flir Lennox* thermal camera has been characterized.  
The maximum antenna gain has been measured to be -1,5dBi for the 2.4GHz band  
and 2,0dBi for the 5GHz band.

### 11.3 Duty cycle

#### Description:

The duty cycle is necessary to compute the maximum power during an actual transmission. The shown plots and values are to show an example of the measurement procedure. The real value is measured direct during the power measurement or power density measurement. The correction value is shown in each plot of these measurements.

#### Measurement:

| Measurement parameter           |                                     |
|---------------------------------|-------------------------------------|
| According to: KDB789033 D02, B. |                                     |
| Detector:                       | Peak                                |
| Sweep time:                     | Auto                                |
| Resolution bandwidth:           | 10 MHz                              |
| Video bandwidth:                | 10 MHz                              |
| Span:                           | Zero                                |
| Trace mode:                     | Video trigger / view / single sweep |
| Used test setup:                | See chapter 6.5 – A                 |
| Measurement uncertainty:        | See chapter 8                       |

#### Results:

##### Duty cycle and correction factor:

OFDM / a – mode:                      100 % duty cycle                      =>                      0.00 dB

OFDM / n/ac HT20 – mode:                      100 % duty cycle                      =>                      0.00 dB

## 11.4 Maximum output power

### 11.4.1 Maximum output power conducted – for FCC requirements

#### Description:

Measurement of the maximum output power conducted

#### Measurement:

| Measurement parameter               |                                                                      |
|-------------------------------------|----------------------------------------------------------------------|
| According to: KDB789033 D02, E.2.e. |                                                                      |
| Detector:                           | RMS                                                                  |
| Sweep time:                         | $\geq 10 \cdot (\text{swp points}) \cdot (\text{total on/off time})$ |
| Resolution bandwidth:               | 1 MHz                                                                |
| Video bandwidth:                    | 3 MHz                                                                |
| Span:                               | > EBW                                                                |
| Trace mode:                         | Max hold                                                             |
| Analyzer function                   | Band power / channel power<br>Interval > 26 dB EBW                   |
| Used test setup:                    | See chapter 6.5 – A                                                  |
| Measurement uncertainty:            | See chapter 8                                                        |

#### Limits:

| Radiated output power                | Conducted output power for mobile equipment                                                                                                                                                                                  |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conducted power + 6 dBi antenna gain | 250mW 5.150-5.250 GHz<br>The lesser one of<br>250mW or 11 dBm + 10 log Bandwidth 5.250-5.350 GHz<br>250mW or 11 dBm + 10 log Bandwidth 5.470-5.725 GHz<br>(where Bandwidth is the 26dB Bandwidth [MHz])<br>1W 5.725-5.85 GHz |

**Result:** OFDM / a – mode

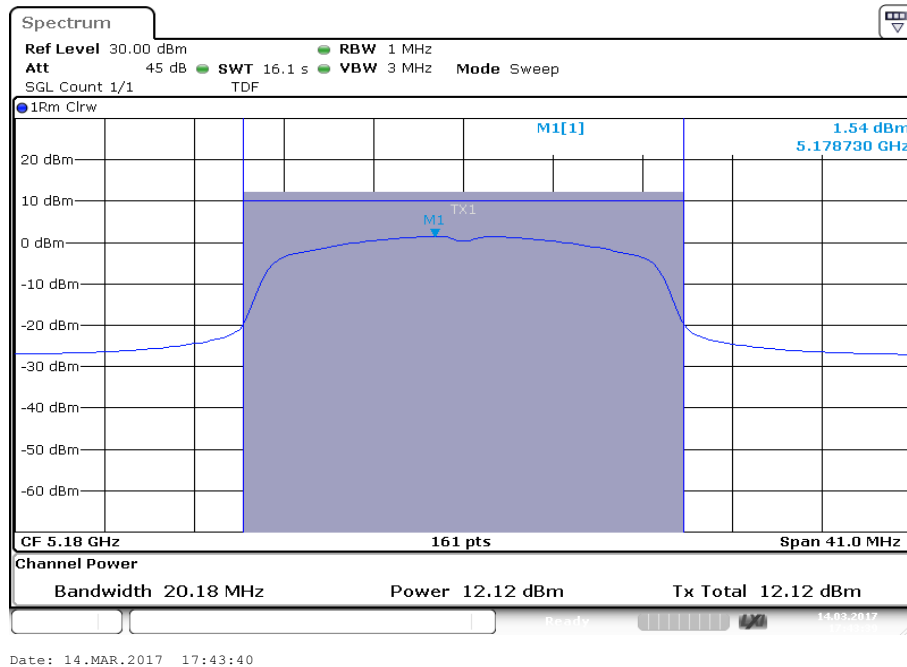
| OFDM / a – mode<br><br>Channel | Maximum output power conducted [dBm] |          |          |     |
|--------------------------------|--------------------------------------|----------|----------|-----|
|                                | 5180 MHz                             | 5200 MHz | 5240 MHz | -/- |
|                                | 12.12                                | 12.21    | 12.06    | -/- |

**Result:** OFDM / n/ac HT20 – mode

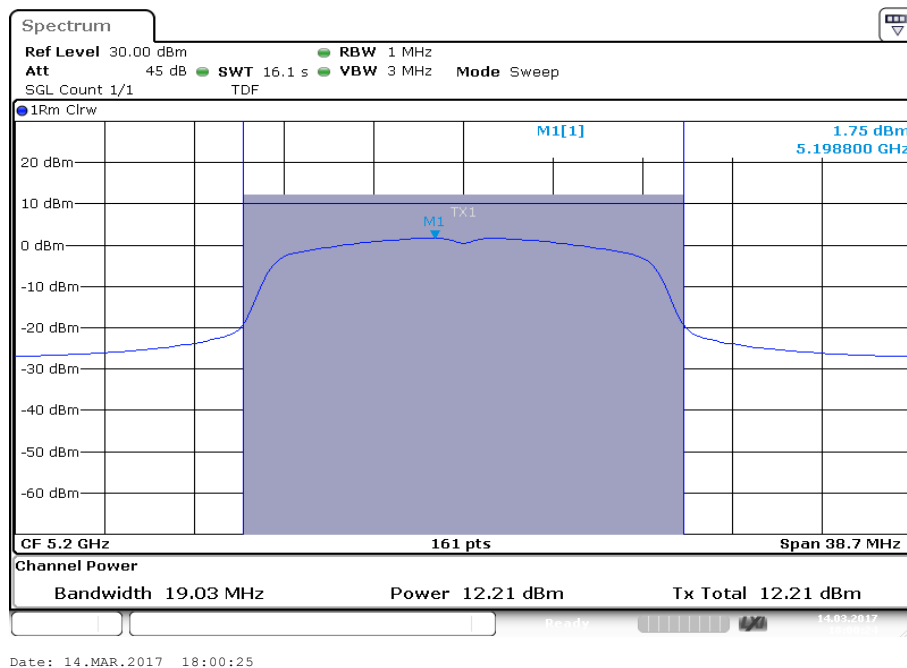
| OFDM / n/ac HT20 – mode<br><br>Channel | Maximum output power conducted [dBm] |          |          |     |
|----------------------------------------|--------------------------------------|----------|----------|-----|
|                                        | 5180 MHz                             | 5200 MHz | 5240 MHz | -/- |
|                                        | 12.59                                | 12.32    | 12.16    | -/- |

**Plots:** OFDM / a – mode

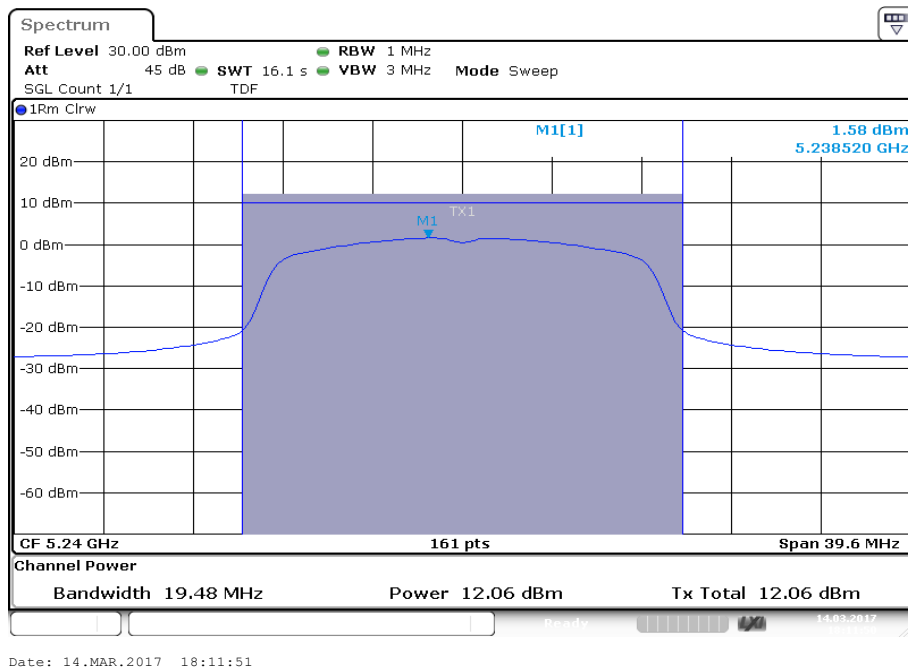
**Plot 1:** 5180 MHz



**Plot 2:** 5200 MHz

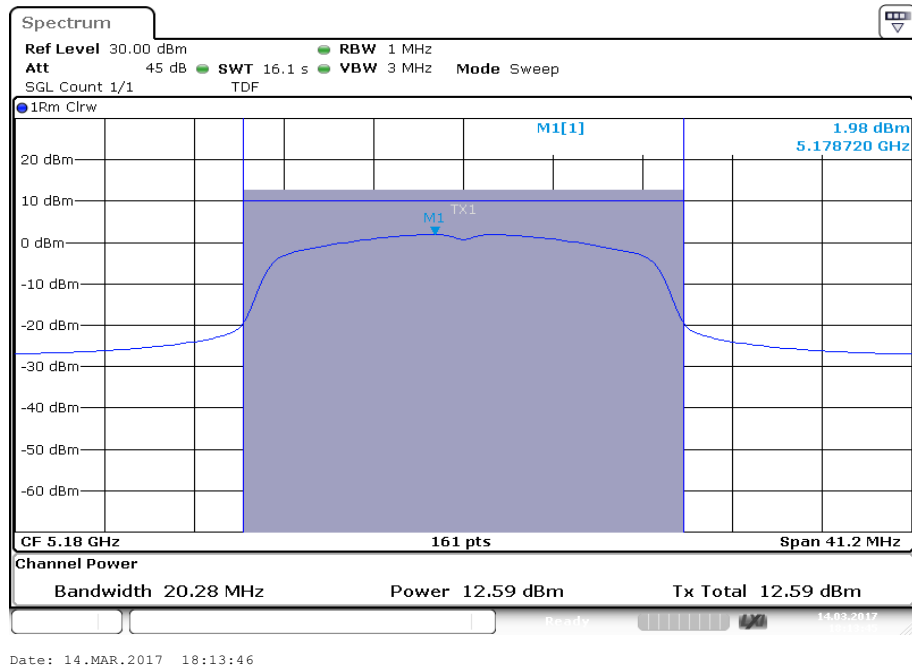


Plot 3: 5240 MHz

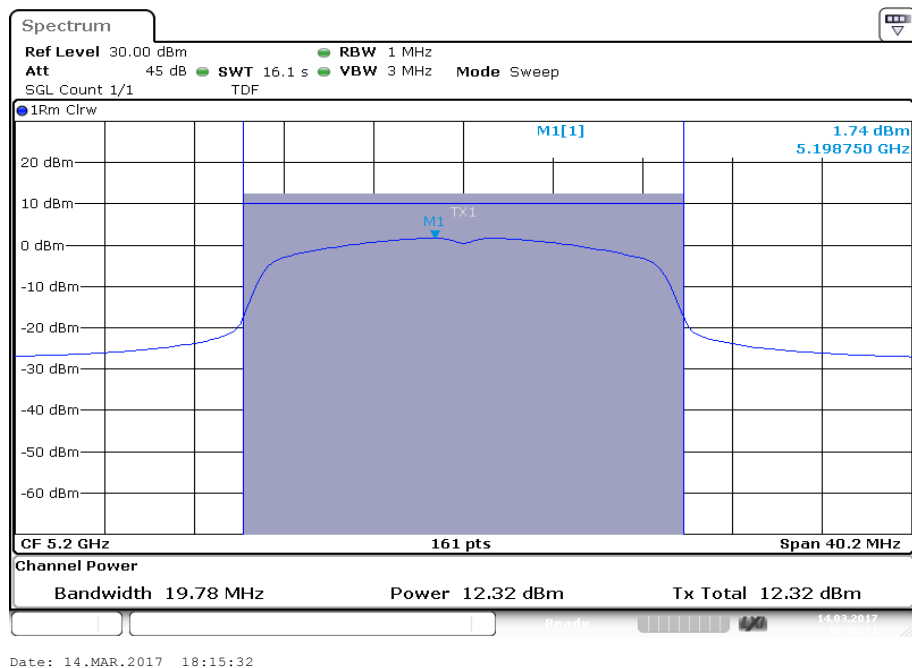


**Plots:** OFDM / n/ac HT20 – mode

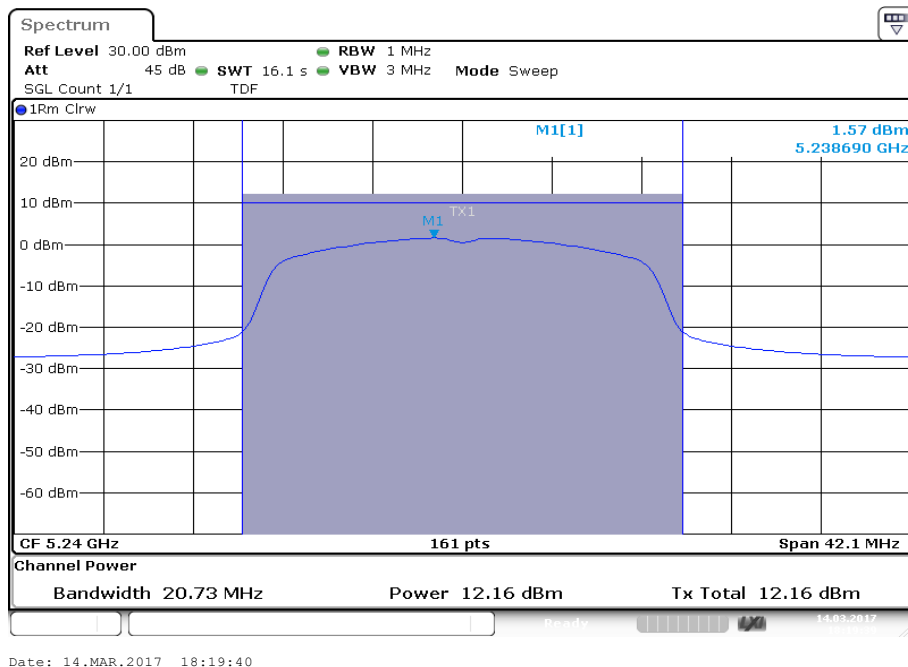
**Plot 1:** 5180 MHz



**Plot 2:** 5200 MHz



Plot 3: 5240 MHz



#### 11.4.2 Maximum output power – for IC requirements

##### Description:

Measurement of the maximum output power conducted + radiated

##### Measurement:

| Measurement parameter    |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Detector:                | RMS                                                                  |
| Sweep time:              | $\geq 10 \cdot (\text{swp points}) \cdot (\text{total on/off time})$ |
| Resolution bandwidth:    | 1 MHz                                                                |
| Video bandwidth:         | $\geq 3$ MHz                                                         |
| Span:                    | > EBW                                                                |
| Trace mode:              | Max hold                                                             |
| Analyzer function        | Band power / channel power<br>Interval > 99% OBW                     |
| Used test setup:         | See chapter 6.5 – A                                                  |
| Measurement uncertainty: | See chapter 8                                                        |

##### Limits:

| Radiated output power                                                                                                                                                                                                                                                                   | Conducted output power for mobile equipment                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The lesser one of<br>200 mW or 10 dBm + 10 log Bandwidth 5.150-5.250 GHz<br>1 W or 17 dBm + 10 log Bandwidth 5.250-5.350 GHz<br>1 W or 17 dBm + 10 log Bandwidth 5.470-5.725 GHz<br>(where Bandwidth is the 99% Bandwidth [MHz])<br>Conducted power + 6dBi antenna gain 5.725-5.825 GHz | The lesser one of<br>250mW or 11 dBm + 10 log Bandwidth 5.250-5.350 GHz<br>250mW or 11 dBm + 10 log Bandwidth 5.470-5.725 GHz<br>(where Bandwidth is the 99% Bandwidth [MHz])<br>1W 5.725-5.825 GHz |

**Result:** OFDM / a – mode

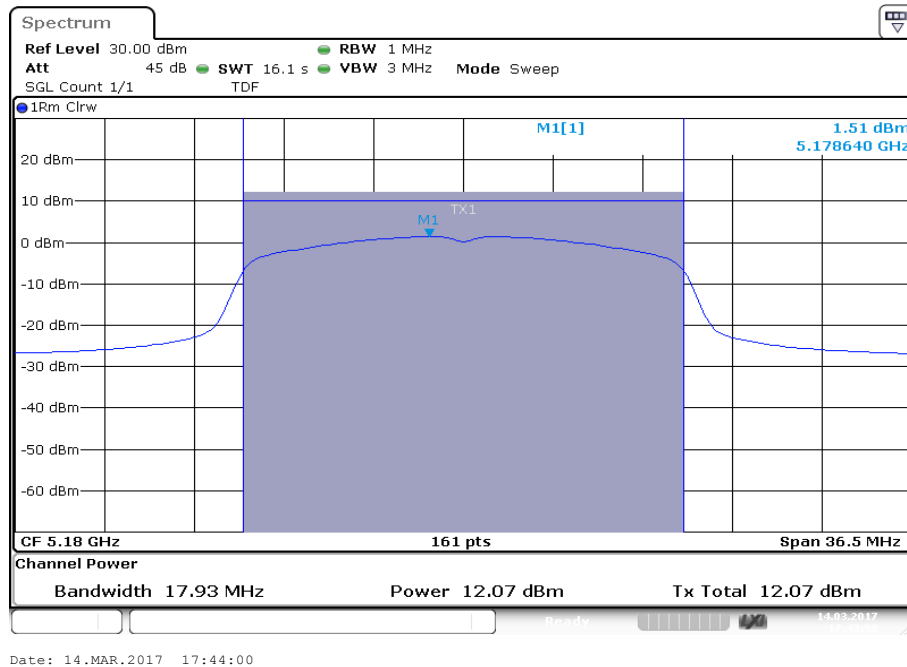
| OFDM / a – mode                        | Maximum output power [dBm] |          |          |          |     |
|----------------------------------------|----------------------------|----------|----------|----------|-----|
|                                        | Channel                    | 5180 MHz | 5200 MHz | 5240 MHz | -/- |
| Including duty cycle correction factor |                            | 12.07    | 12.17    | 12.02    | -/- |

**Result:** OFDM / n/ac HT20 – mode

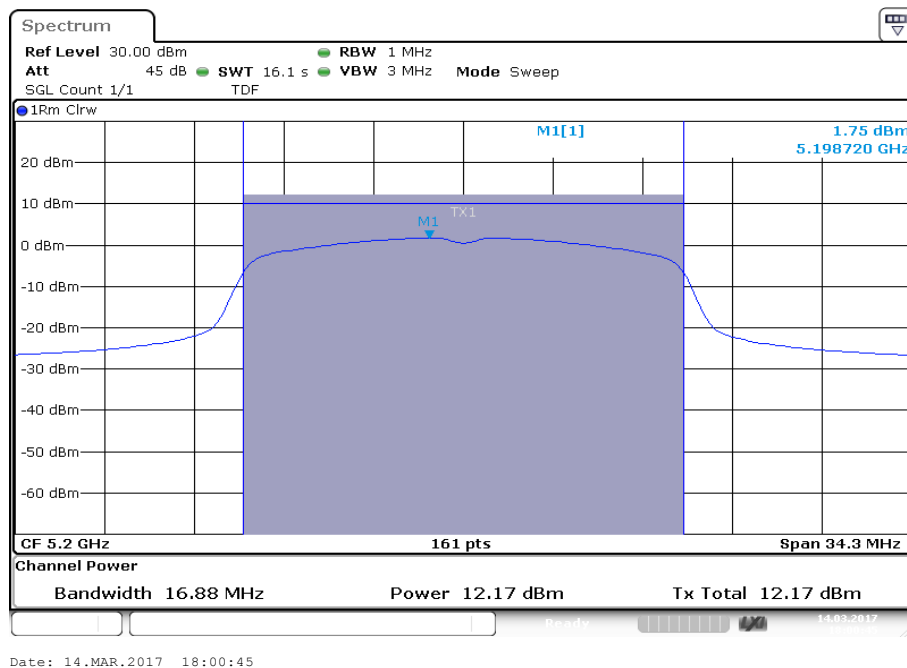
| OFDM / n/ac HT20 – mode                | Maximum output power [dBm] |          |          |     |
|----------------------------------------|----------------------------|----------|----------|-----|
| Channel                                | 5180 MHz                   | 5200 MHz | 5240 MHz | -/- |
| Including duty cycle correction factor | 12.55                      | 12.29    | 12.12    | -/- |

**Plots:** OFDM / a – mode

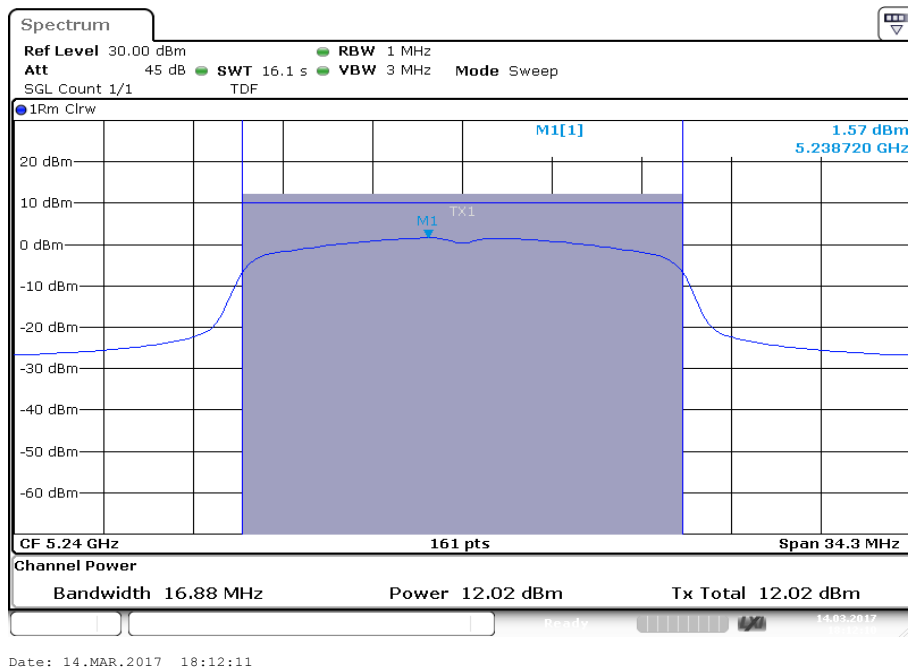
**Plot 1:** 5180 MHz



**Plot 2:** 5200 MHz

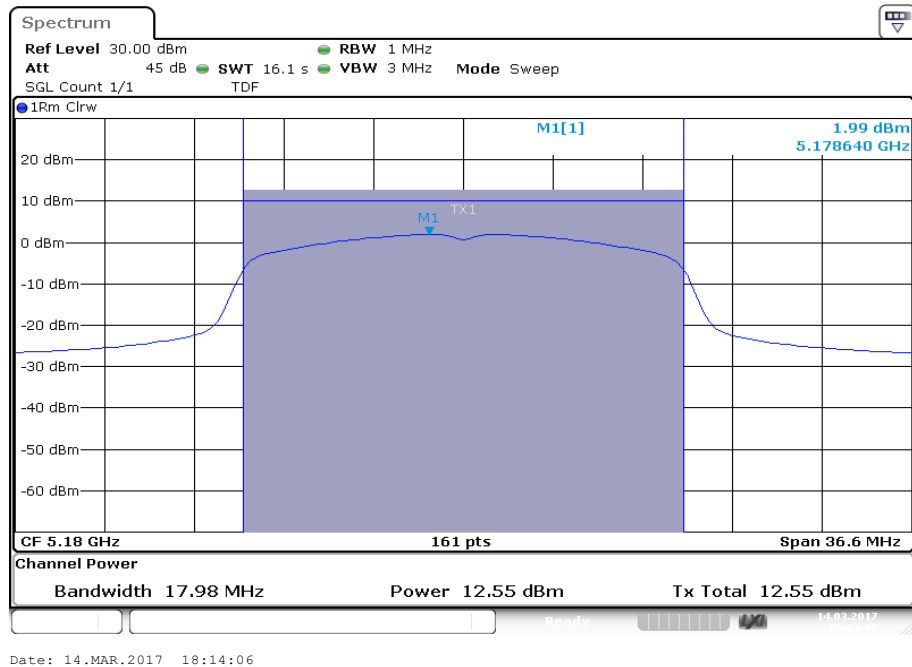


Plot 3: 5240 MHz

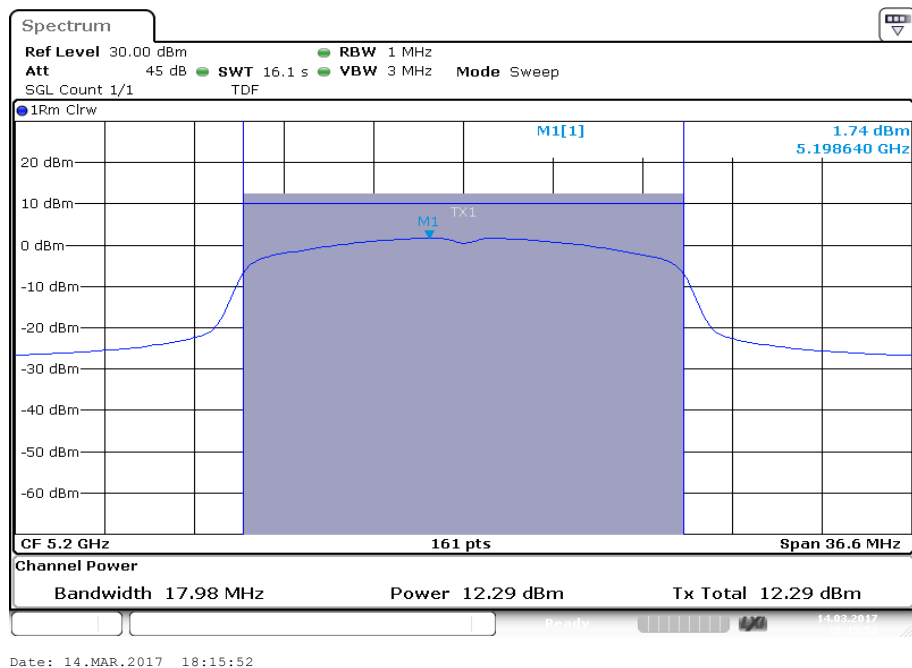


**Plots:** OFDM / n/ac HT20 – mode

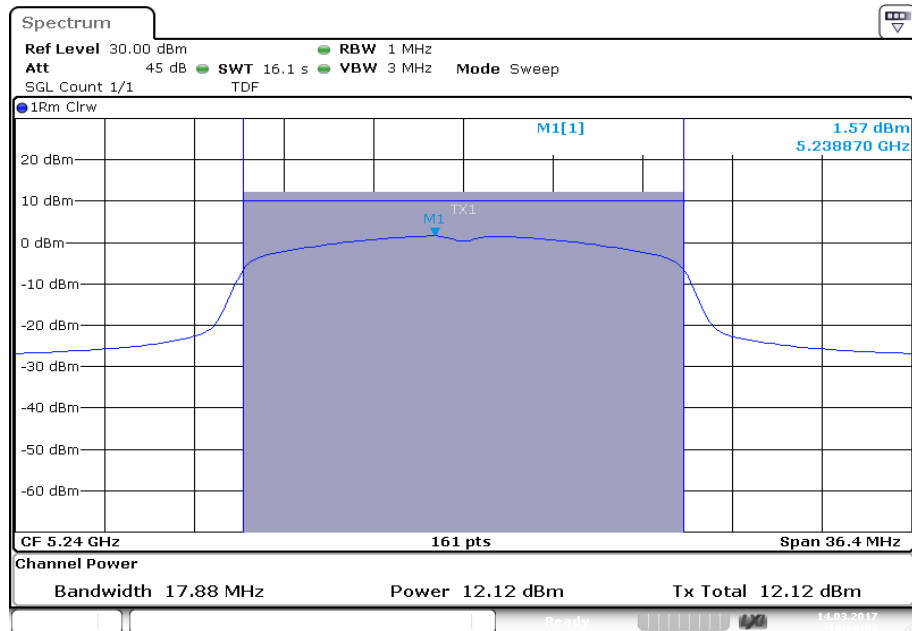
**Plot 1:** 5180 MHz



**Plot 2:** 5200 MHz



Plot 3: 5240 MHz



Date: 14.MAR.2017 18:20:01

## 11.5 Power spectral density

### 11.5.1 Power spectral density – for FCC requirements

#### Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated at the lowest, middle and highest channel.

#### Measurement:

| Measurement parameter           |                                                                      |
|---------------------------------|----------------------------------------------------------------------|
| According to: KDB789033 D02, F. |                                                                      |
| Detector:                       | RMS                                                                  |
| Sweep time:                     | $\geq 10 \cdot (\text{swp points}) \cdot (\text{total on/off time})$ |
| Resolution bandwidth:           | 1 MHz (500 kHz for 5.8 GHz band)                                     |
| Video bandwidth:                | $\geq 3 \cdot \text{RBW}$                                            |
| Span:                           | > EBW                                                                |
| Trace mode:                     | Max hold                                                             |
| Used test setup:                | See chapter 6.5 – A                                                  |
| Measurement uncertainty:        | See chapter 8                                                        |

#### Limits:

| Power Spectral Density                                                                    |
|-------------------------------------------------------------------------------------------|
| power spectral density conducted $\leq 11$ dBm in any 1 MHz band (band 5150 – 5250 MHz)   |
| power spectral density conducted $\leq 11$ dBm in any 1 MHz band (band 5250 – 5350 MHz)   |
| power spectral density conducted $\leq 11$ dBm in any 1 MHz band (band 5470 – 5725 MHz)   |
| power spectral density conducted $\leq 30$ dBm in any 500 kHz band (band 5725 – 5850 MHz) |

**Result:** OFDM / a – mode

| OFDM / a – mode<br>Channel | Power spectral density [dBm/MHz] |          |          |     |
|----------------------------|----------------------------------|----------|----------|-----|
|                            | 5180 MHz                         | 5200 MHz | 5240 MHz | -/- |
|                            | 1.54                             | 1.75     | 1.58     | -/- |

**Result:** OFDM / n/ac HT20 – mode

| OFDM / n/ac HT20 – mode<br>Channel | Power spectral density [dBm/MHz] |          |          |     |
|------------------------------------|----------------------------------|----------|----------|-----|
|                                    | 5180 MHz                         | 5200 MHz | 5240 MHz | -/- |
|                                    | 1.98                             | 1.74     | 1.57     | -/- |

### 11.5.2 Power spectral density – for IC requirements

#### Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated at the lowest, middle and highest channel.

#### Measurement:

| Measurement parameter    |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| Detector:                | RMS                                                                  |
| Sweep time:              | $\geq 10 \cdot (\text{swp points}) \cdot (\text{total on/off time})$ |
| Resolution bandwidth:    | 1 MHz (500 kHz for 5.8 GHz band)                                     |
| Video bandwidth:         | $\geq 3 \cdot \text{RBW}$                                            |
| Span:                    | $> \text{EBW}$                                                       |
| Trace mode:              | Max hold                                                             |
| Used test setup:         | See chapter 6.5 – A                                                  |
| Measurement uncertainty: | See chapter 8                                                        |

#### Limits:

| Power Spectral Density                                                                    |
|-------------------------------------------------------------------------------------------|
| power spectral density e.i.r.p. $\leq 10$ dBm in any 1 MHz band (band 5150 – 5250 MHz)    |
| power spectral density conducted $\leq 11$ dBm in any 1 MHz band (band 5250 – 5350 MHz)   |
| power spectral density conducted $\leq 11$ dBm in any 1 MHz band (band 5470 – 5725 MHz)   |
| power spectral density conducted $\leq 30$ dBm in any 500 kHz band (band 5725 – 5850 MHz) |

**Result:** OFDM / a – mode

| OFDM / a – mode | Power spectral density [dBm/MHz] |          |          |     |
|-----------------|----------------------------------|----------|----------|-----|
| Channel         | 5180 MHz                         | 5200 MHz | 5240 MHz | -/- |
|                 | 3.51                             | 3.75     | 3.57     | -/- |

**Result:** OFDM / n/ac HT20 – mode

| OFDM / n/ac HT20 – mode | Power spectral density [dBm/MHz] |          |          |     |
|-------------------------|----------------------------------|----------|----------|-----|
| Channel                 | 5180 MHz                         | 5200 MHz | 5240 MHz | -/- |
|                         | 3.99                             | 3.74     | 3.57     | -/- |

## 11.6 Spectrum bandwidth – 26 dB bandwidth

### Description:

Measurement of the 26 dB bandwidth of the modulated signal.

### Measurement:

| Measurement parameter             |                     |
|-----------------------------------|---------------------|
| According to: KDB789033 D02, C.1. |                     |
| Detector:                         | Peak                |
| Sweep time:                       | Auto                |
| Resolution bandwidth:             | 1% EBW              |
| Video bandwidth:                  | ≥ RBW               |
| Span:                             | > complete signal!  |
| Trace-Mode:                       | Max hold            |
| Used test setup:                  | See chapter 6.5 – A |
| Measurement uncertainty:          | See chapter 8       |

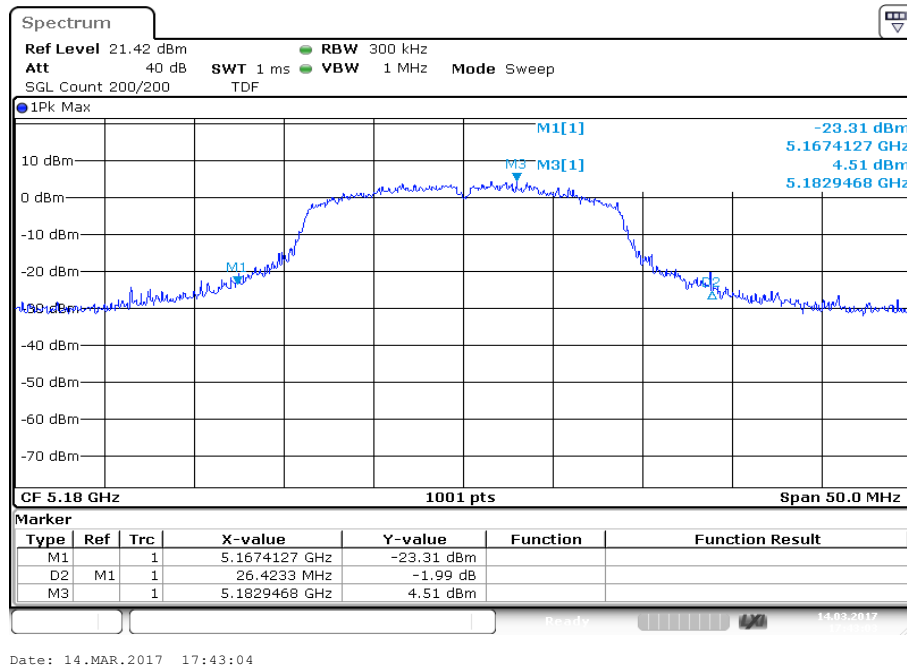
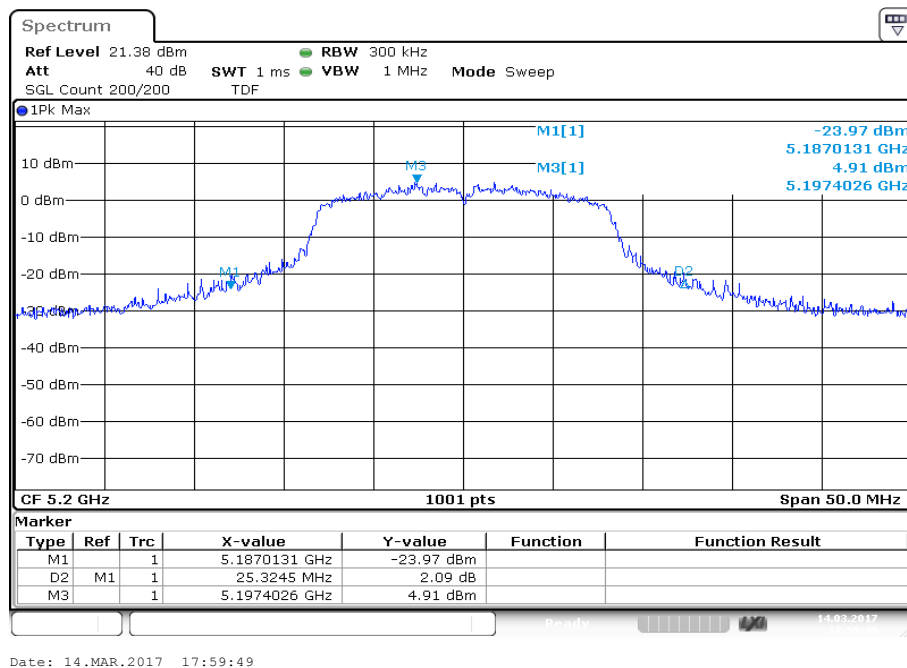
### Limits:

| Spectrum Bandwidth – 26 dB Bandwidth |
|--------------------------------------|
| -/-                                  |

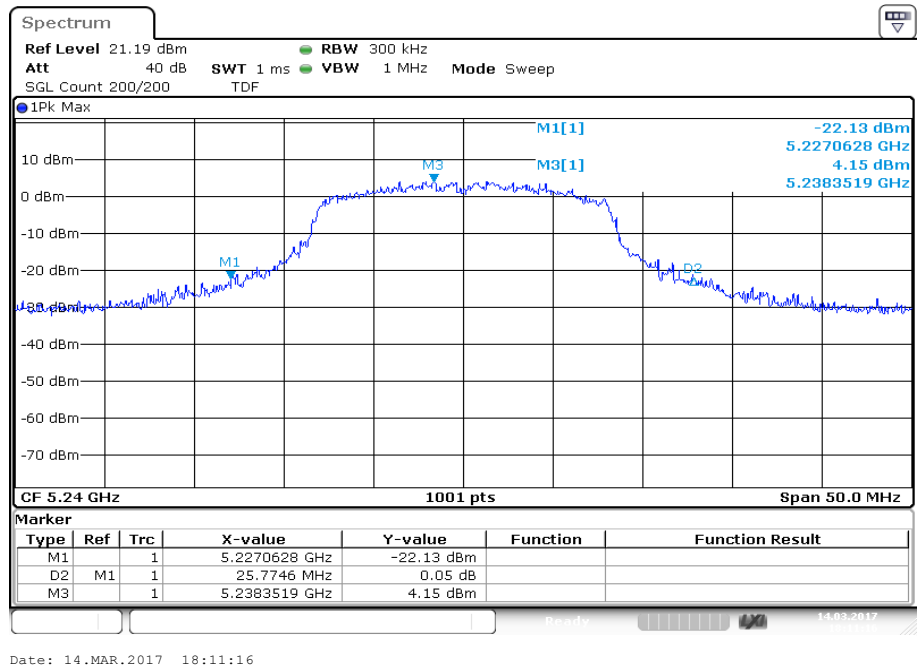
**Result:**

| OFDM / a – mode | 26 dB bandwidth [MHz] |          |          |     |
|-----------------|-----------------------|----------|----------|-----|
| Channel         | 5180 MHz              | 5200 MHz | 5240 MHz | -/- |
|                 | 26.4                  | 25.3     | 25.8     | -/- |

| OFDM / n/ac HT20 – mode | 26 dB bandwidth [MHz] |          |          |     |
|-------------------------|-----------------------|----------|----------|-----|
| Channel                 | 5180 MHz              | 5200 MHz | 5240 MHz | -/- |
|                         | 26.3                  | 25.6     | 28.8     | -/- |

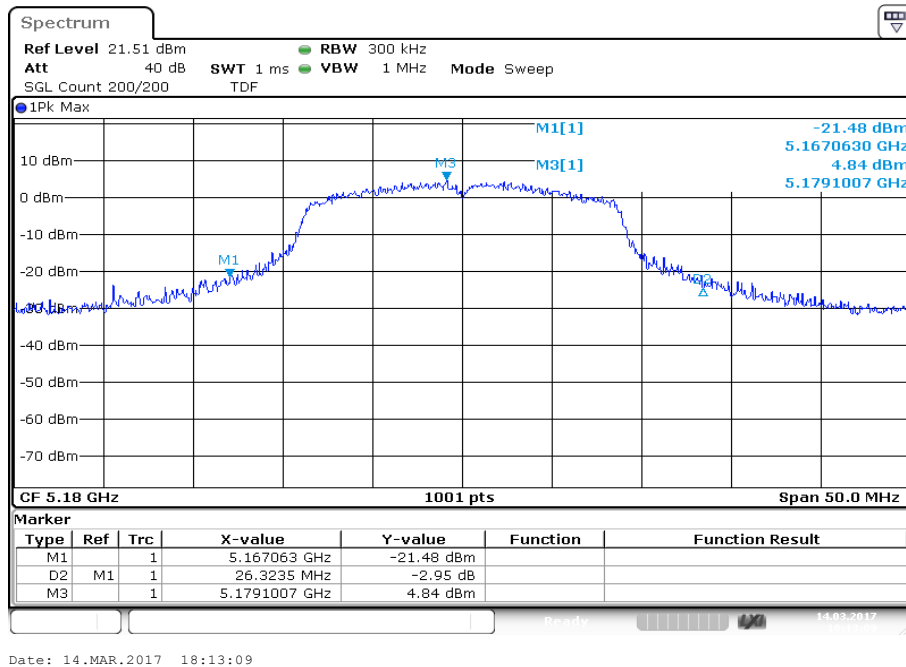
**Plots:** OFDM / a – mode**Plot 1:** 5180 MHz**Plot 2:** 5240 MHz

Plot 3: 5260 MHz

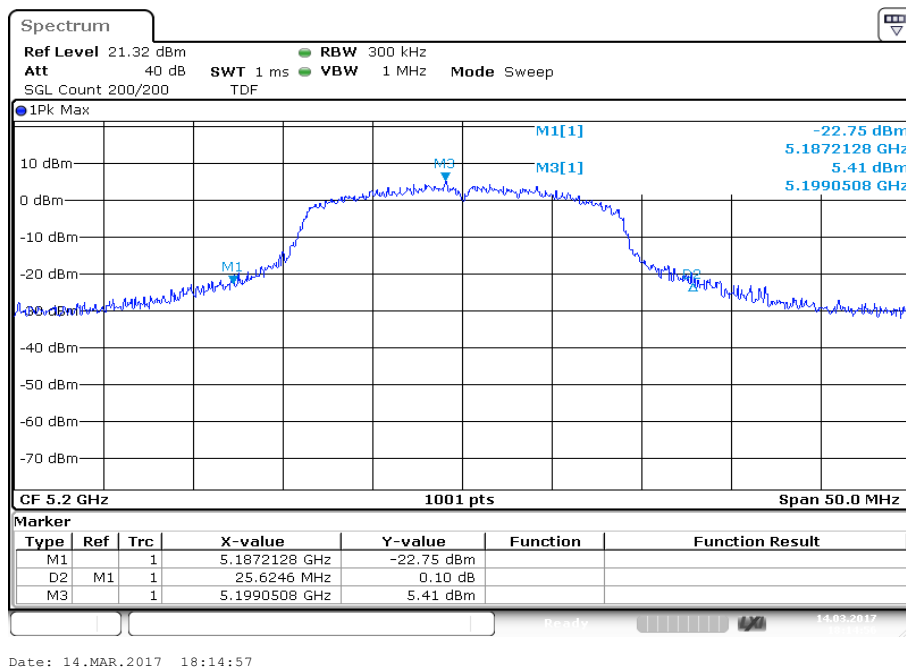


**Plots:** OFDM / n/ac HT20 – mode

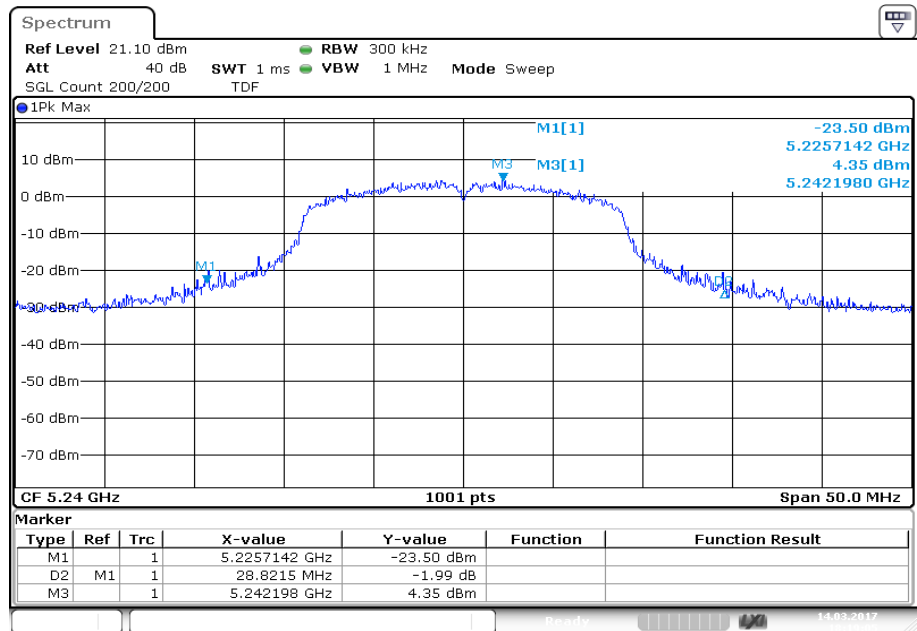
**Plot 1:** 5180 MHz



**Plot 2:** 5200 MHz



Plot 3: 5240 MHz



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## 11.7 Occupied bandwidth – 99% emission bandwidth

### Description:

Measurement of the 99% bandwidth of the modulated signal acc. RSS-GEN.

### Measurement:

| Measurement parameter    |                                                                                 |
|--------------------------|---------------------------------------------------------------------------------|
| Detector:                | Peak                                                                            |
| Sweep time:              | Auto                                                                            |
| Resolution bandwidth:    | 300 kHz / 500 kHz                                                               |
| Video bandwidth:         | 1 MHz / 3 MHz                                                                   |
| Span:                    | 50 MHz / 100 MHz                                                                |
| Measurement procedure:   | Measurement of the 99% bandwidth using the integration function of the analyzer |
| Trace – mode:            | Max hold (allow trace to stabilize)                                             |
| Test setup:              | See sub clause 6.5 – B                                                          |
| Measurement uncertainty: | See sub clause 8                                                                |

### Usage:

| -/-                                         | IC |
|---------------------------------------------|----|
| Occupied Bandwidth – 99% emission bandwidth |    |
| OBW is necessary for Emission Designator    |    |

**Result:**

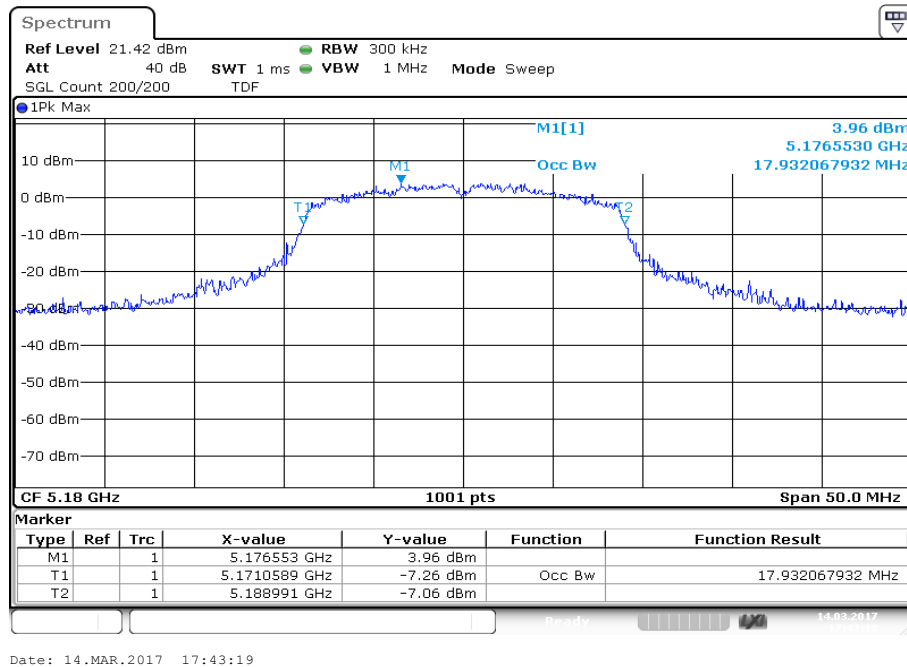
| OFDM / a – mode<br><br>Channel | 99% bandwidth [kHz] |          |          |     |
|--------------------------------|---------------------|----------|----------|-----|
|                                | 5180 MHz            | 5200 MHz | 5240 MHz | -/- |
|                                | 17932               | 16883    | 16883    | -/- |

**Result:**

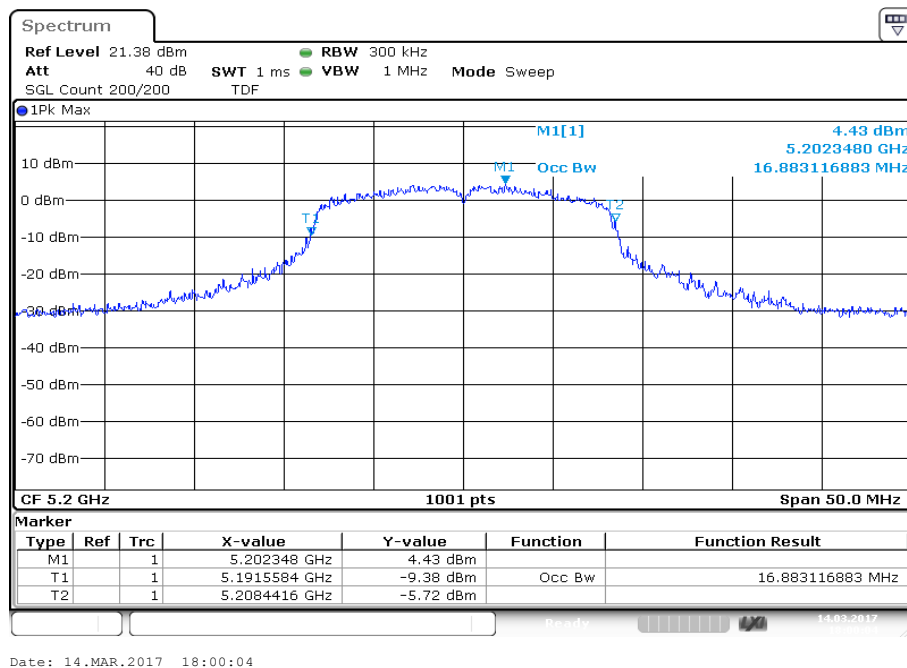
| OFDM / n/ac HT20 – mode<br><br>Channel | 99% bandwidth [kHz] |          |          |     |
|----------------------------------------|---------------------|----------|----------|-----|
|                                        | 5180 MHz            | 5200 MHz | 5240 MHz | -/- |
|                                        | 17982               | 17982    | 17882    | -/- |

**Plots:** OFDM / a – mode

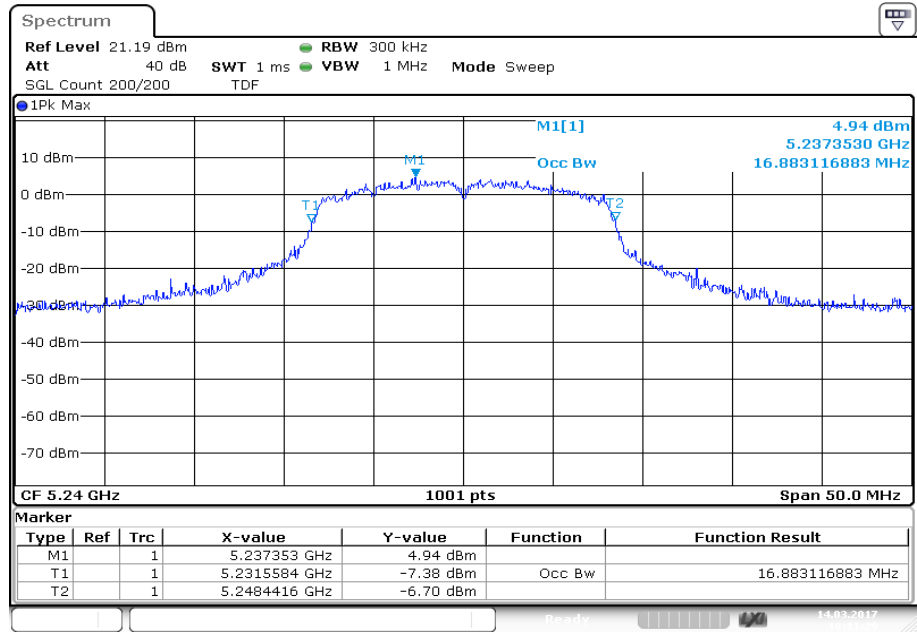
**Plot 1:** 5180 MHz



**Plot 2:** 5200 MHz



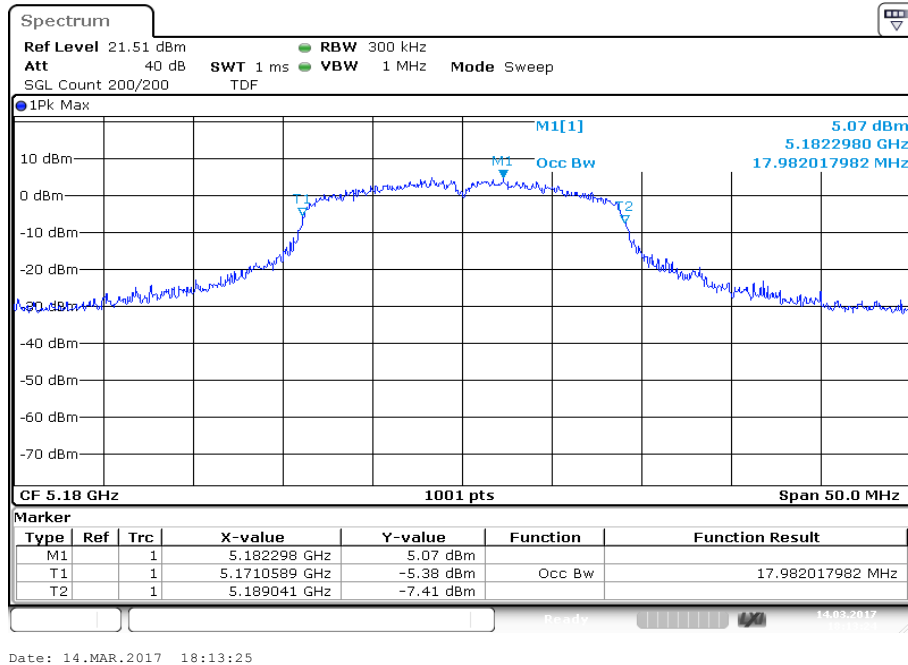
Plot 3: 5260 MHz



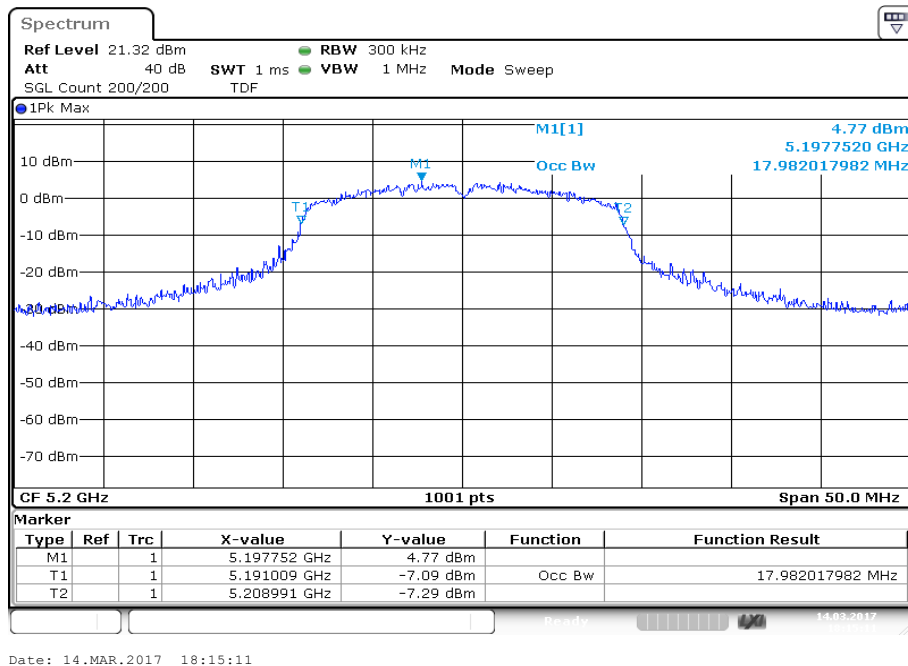
Date: 14.MAR.2017 18:11:30

**Plots:** OFDM / n/ac HT20 – mode

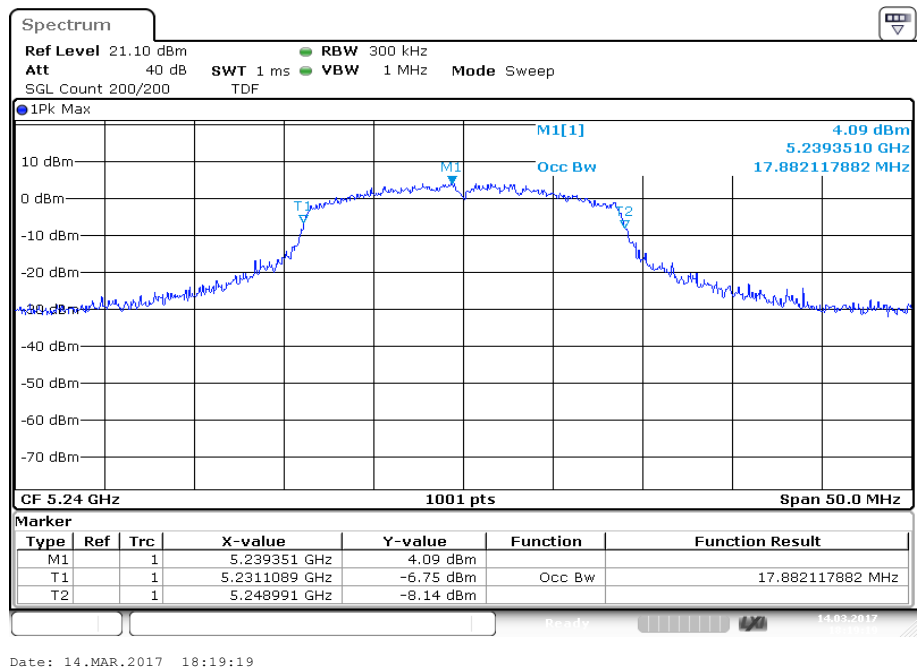
**Plot 1:** 5180 MHz



**Plot 2:** 5200 MHz



Plot 3: 5240 MHz



Date: 14.MAR.2017 18:19:19

## 11.8 Band edge compliance radiated

### Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to the lowest channel for the lower restricted band and to the highest channel for the upper restricted band. Measurement distance is 3m.

### Measurement:

| Measurement parameter    |                            |
|--------------------------|----------------------------|
| Detector:                | Peak / RMS                 |
| Sweep time:              | Auto                       |
| Resolution bandwidth:    | 1 MHz                      |
| Video bandwidth:         | $\geq 3 \times \text{RBW}$ |
| Span:                    | See plots!                 |
| Trace – mode:            | Max Hold                   |
| Test setup:              | See sub clause 6.2 – A     |
| Measurement uncertainty: | See sub clause 8           |

### Limits:

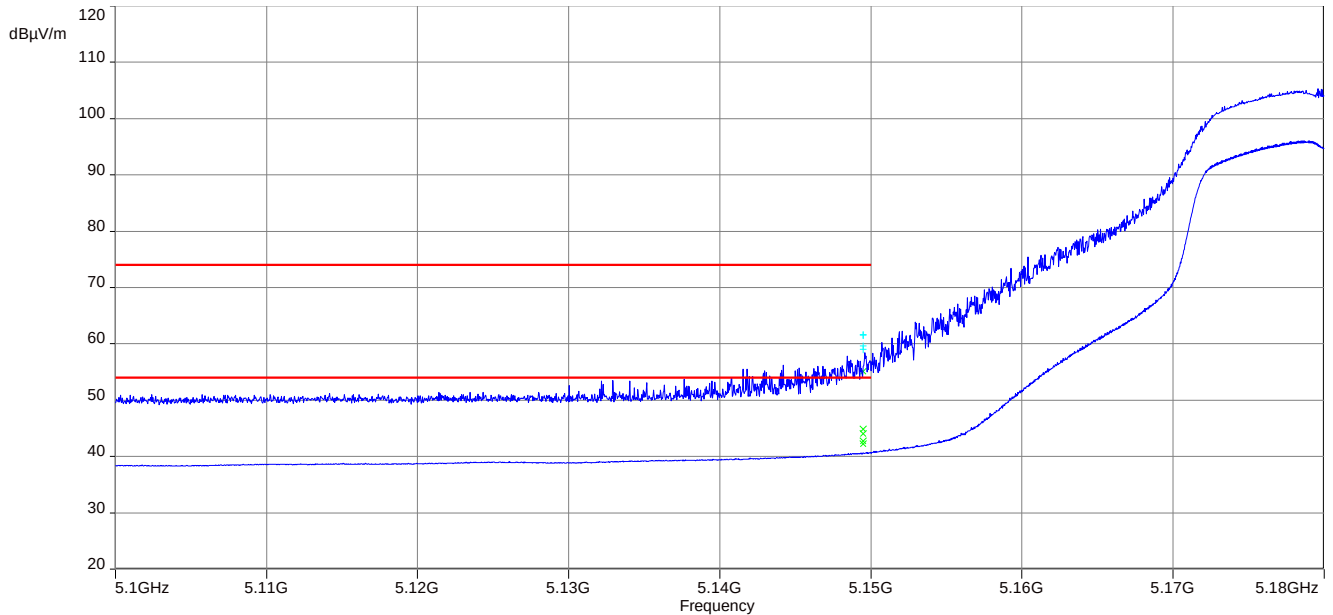
| Band Edge Compliance Radiated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an R F conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)). |
| 74 dB $\mu$ V/m (peak)<br>54 dB $\mu$ V/m (average)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Result:

| Scenario  | Band Edge Compliance Radiated [dB $\mu$ V/m]            |
|-----------|---------------------------------------------------------|
| band edge | < 74 dB $\mu$ V/m (peak)<br>< 54 dB $\mu$ V/m (average) |

**Plots:**

**Plot 1:** lower band edge, vertical & horizontal polarization – OFDM 20 MHz, 5180 MHz



**Plot 2:** upper band edge, vertical & horizontal polarization – OFDM 20 MHz, 5240 MHz

Not necessary because the channel 48 is more than 100 MHz away from the band edge 5350 MHz

## 11.9 TX spurious emissions radiated

### Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at lowest, middle and highest channel.

### Measurement:

| Measurement parameter    |                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------|
| Detector:                | Quasi Peak below 1 GHz<br>(alternative Peak)<br>Peak above 1 GHz / RMS                    |
| Sweep time:              | Auto                                                                                      |
| Resolution bandwidth:    | F < 1 GHz: 100 kHz<br>F > 1 GHz: 1 MHz                                                    |
| Video bandwidth:         | F < 1 GHz: 100 kHz<br>F > 1 GHz: ≥ 3 MHz / 1 MHz                                          |
| Span:                    | 30 MHz to 40 GHz                                                                          |
| Trace – mode:            | Max Hold / Average with 100 counts +<br>20 log (1 / X) for duty cycle lower than<br>100 % |
| Test setup:              | See sub clause 6.1 – A<br>See sub clause 6.2 – B<br>See sub clause 6.3 – A                |
| Measurement uncertainty: | See sub clause 8                                                                          |

### Limits:

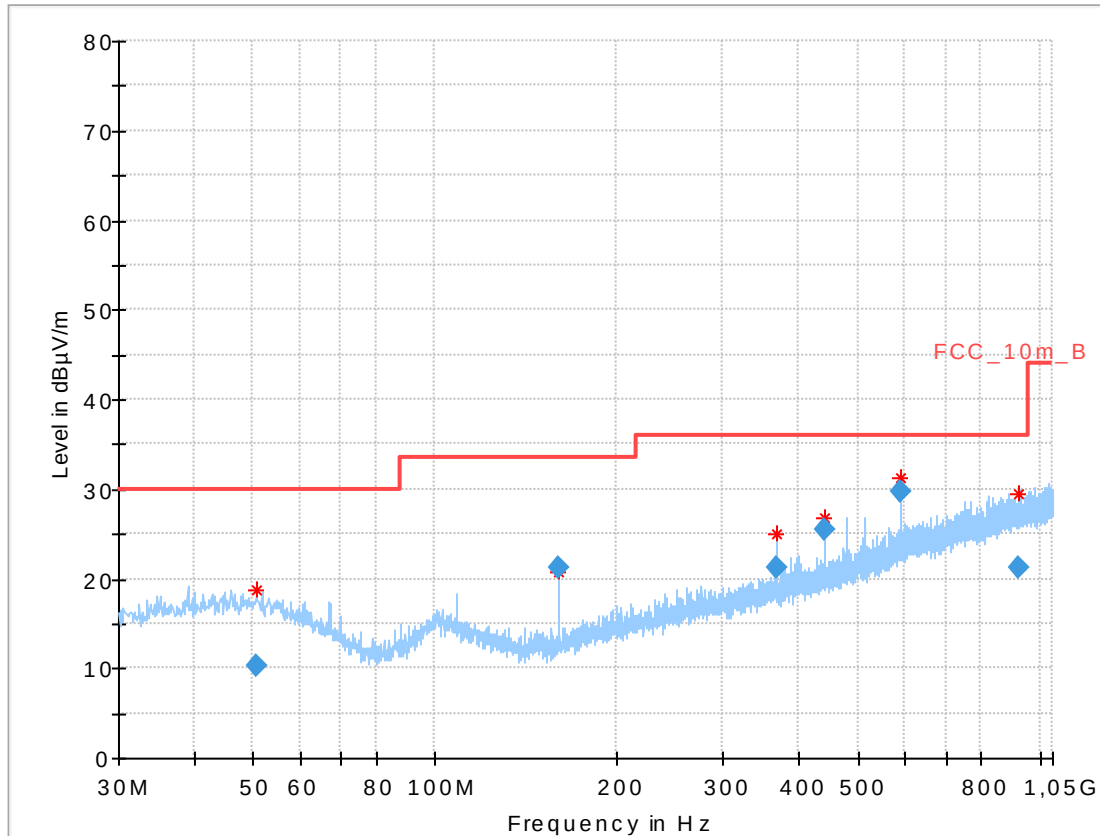
| TX Spurious Emissions Radiated |                         |                      |
|--------------------------------|-------------------------|----------------------|
| §15.209                        |                         |                      |
| Frequency (MHz)                | Field Strength (dBμV/m) | Measurement distance |
| 30 - 88                        | 30.0                    | 10                   |
| 88 – 216                       | 33.5                    | 10                   |
| 216 – 960                      | 36.0                    | 10                   |
| Above 960                      | 54.0                    | 3                    |
| §15.407                        |                         |                      |
| Outside the restricted bands!  | -27 dBm / MHz           |                      |

**Results:** OFDM (20 MHz bandwidth)

| TX Spurious Emissions Radiated [dBμV/m] / dBm                |          |                   |                                                              |          |                   |                                                              |          |                   |
|--------------------------------------------------------------|----------|-------------------|--------------------------------------------------------------|----------|-------------------|--------------------------------------------------------------|----------|-------------------|
| Lowest channel<br>5180 MHz                                   |          |                   | Middle channel<br>5200 MHz                                   |          |                   | Highest channel<br>5240 MHz                                  |          |                   |
| F [MHz]                                                      | Detector | Level<br>[dBμV/m] | F [MHz]                                                      | Detector | Level<br>[dBμV/m] | F [MHz]                                                      | Detector | Level<br>[dBμV/m] |
| All emissions are more than<br>20 dB below the peak limit.   |          |                   | All emissions are more than<br>20 dB below the peak limit.   |          |                   | All emissions are more than<br>20 dB below the peak limit.   |          |                   |
|                                                              | Peak     |                   |                                                              | Peak     |                   |                                                              | Peak     |                   |
|                                                              | AVG      |                   |                                                              | AVG      |                   |                                                              | AVG      |                   |
|                                                              | Peak     |                   |                                                              | Peak     |                   |                                                              | Peak     |                   |
|                                                              | AVG      |                   |                                                              | AVG      |                   |                                                              | AVG      |                   |
| For emissions above 18 GHz please<br>take look at the plots. |          |                   | For emissions above 18 GHz please<br>take look at the plots. |          |                   | For emissions above 18 GHz please<br>take look at the plots. |          |                   |

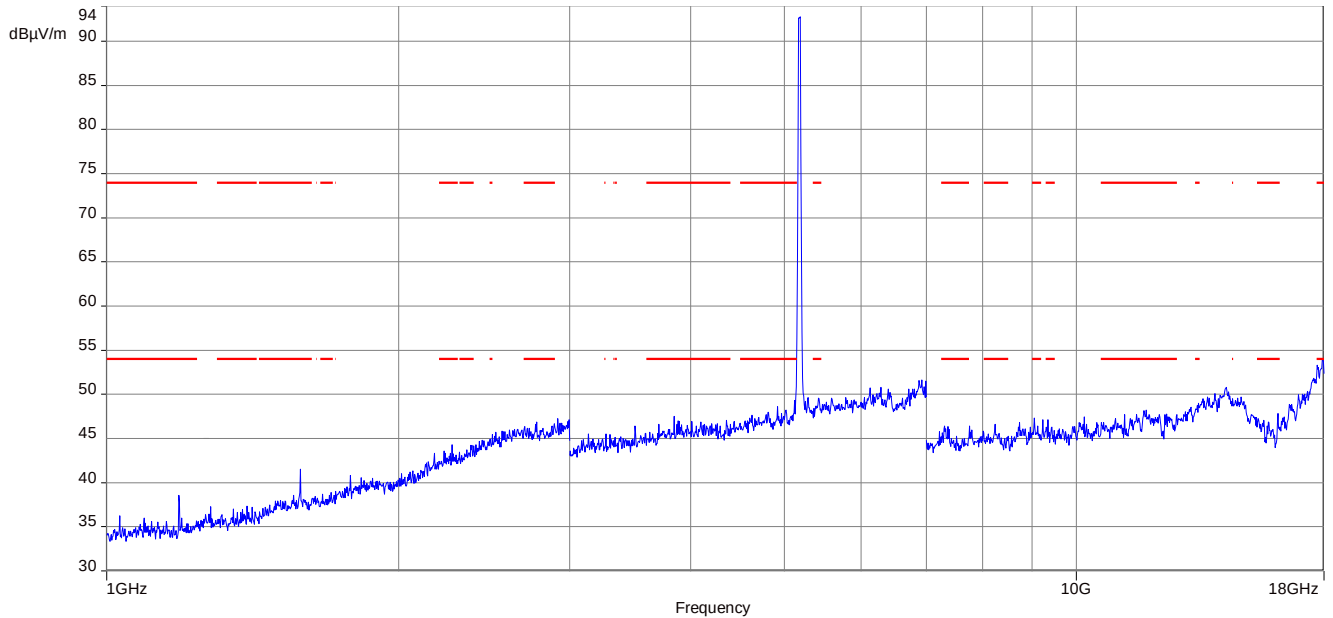
**Plots:** OFDM / 20 MHz bandwidth

**Plot 1:** 30 MHz to 1 GHz, 5180 MHz, vertical & horizontal polarization

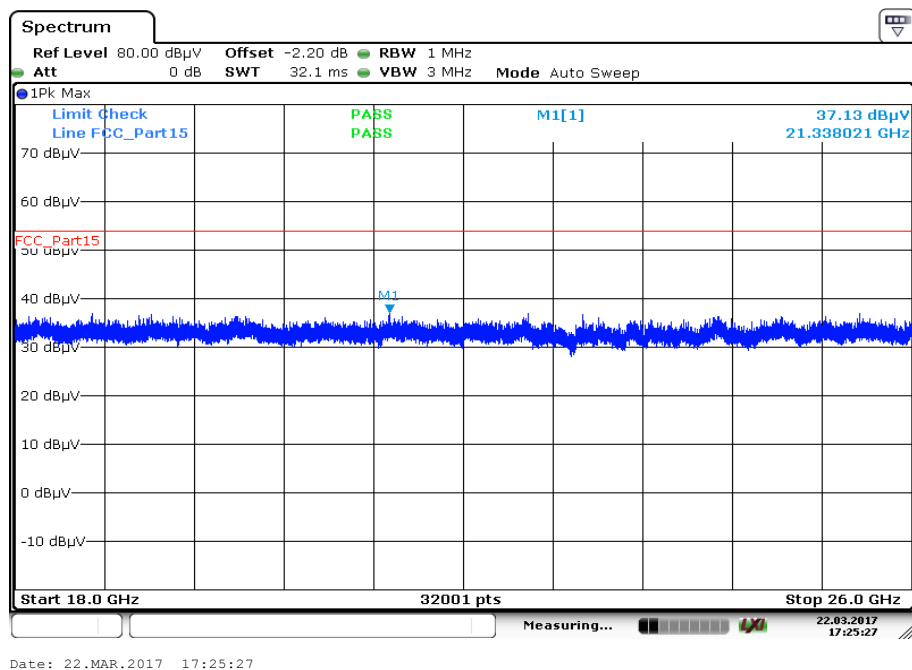


| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 50.717250       | 10.30              | 30.00          | 19.70       | 1000.0          | 120.000         | 101.0       | V   | 156.0         | 13.6       |
| 160.003500      | 21.17              | 33.50          | 12.33       | 1000.0          | 120.000         | 178.0       | H   | 134.0         | 9.7        |
| 367.522350      | 21.31              | 36.00          | 14.69       | 1000.0          | 120.000         | 178.0       | H   | 140.0         | 16.3       |
| 440.000550      | 25.41              | 36.00          | 10.59       | 1000.0          | 120.000         | 178.0       | H   | 351.0         | 17.5       |
| 588.003600      | 29.71              | 36.00          | 6.29        | 1000.0          | 120.000         | 101.0       | H   | 351.0         | 20.4       |
| 920.309400      | 21.30              | 36.00          | 14.70       | 1000.0          | 120.000         | 185.0       | V   | 140.0         | 24.3       |

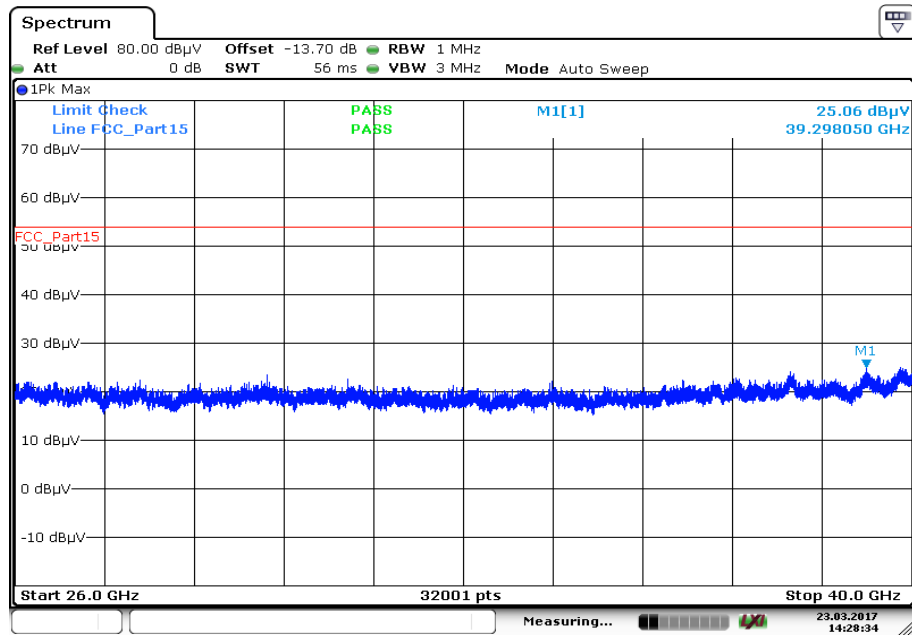
**Plot 2:** 1 GHz to 18 GHz, 5180 MHz, vertical & horizontal polarization



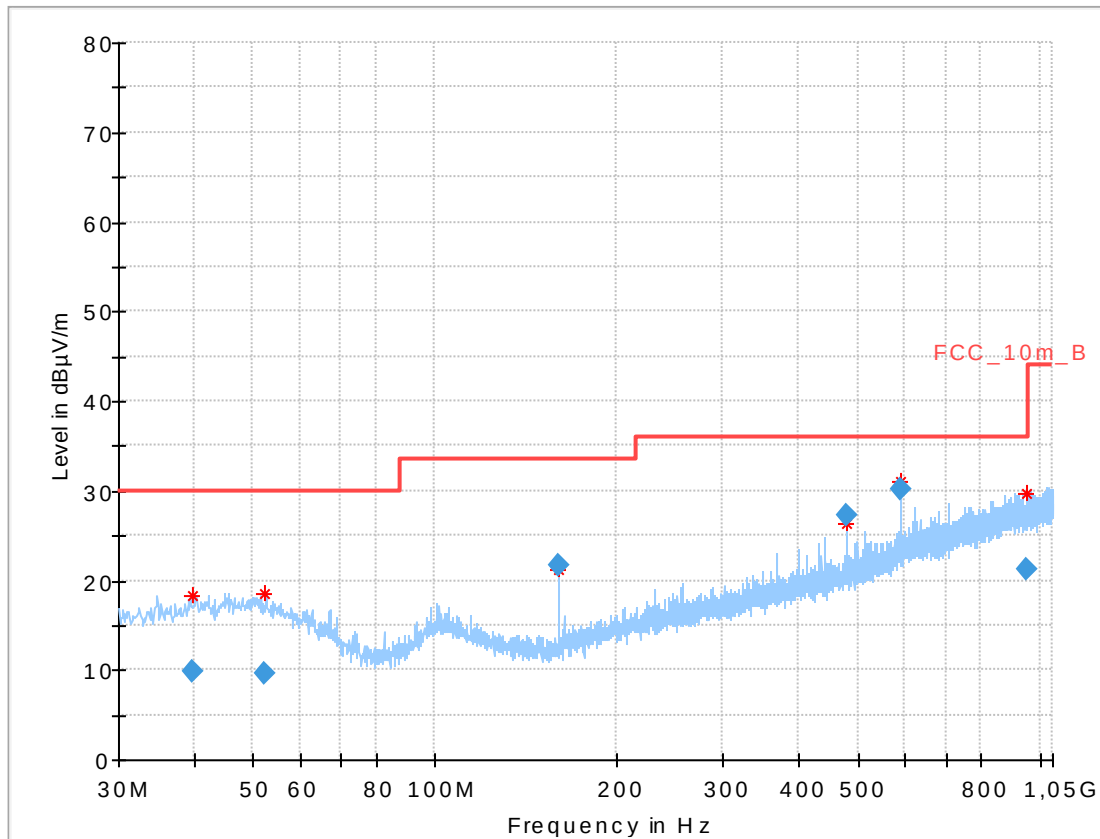
**Plot 3:** 18 GHz to 26 GHz, 5180 MHz, vertical & horizontal polarization



**Plot 4:** 26 GHz to 40 GHz, 5180 MHz, vertical & horizontal polarization

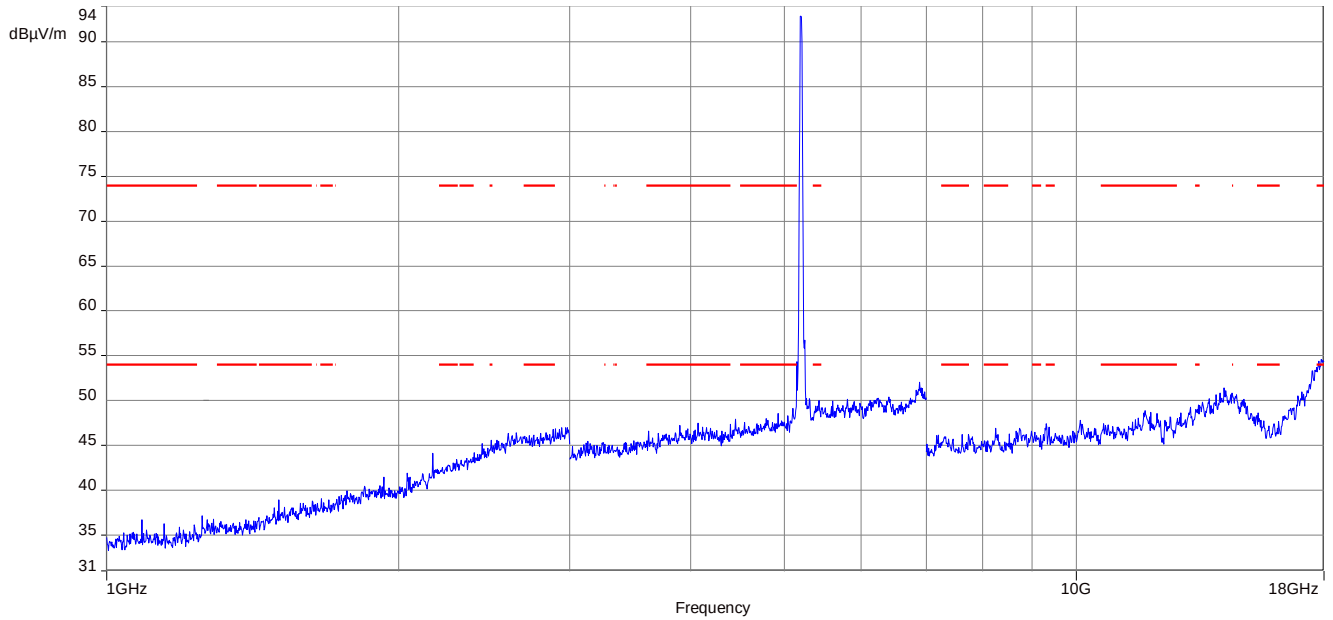


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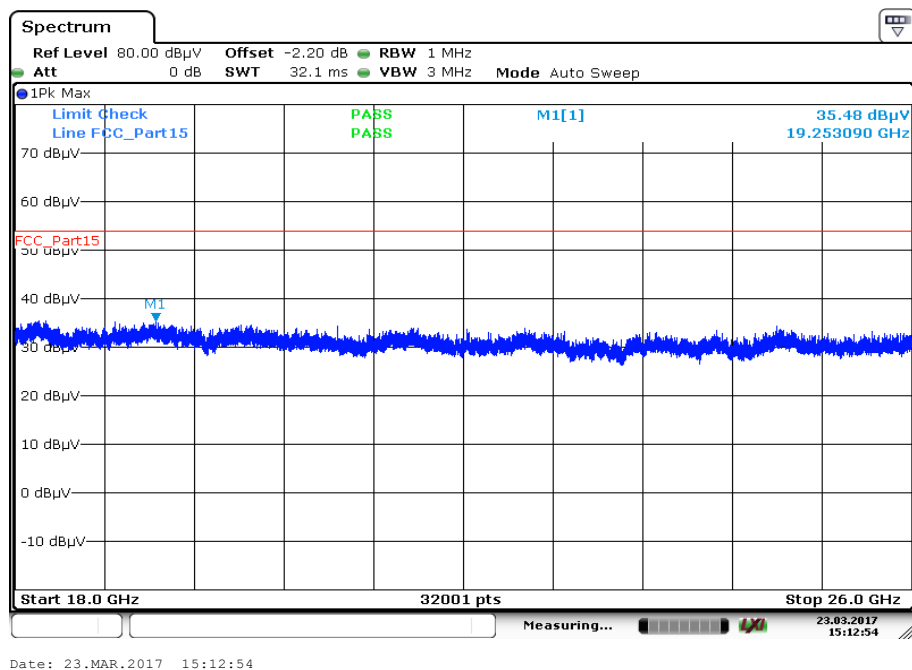
**Plot 5:** 30 MHz to 1 GHz, 5200 MHz, vertical & horizontal polarization

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 39.826200       | 9.88               | 30.00          | 20.12       | 1000.0          | 120.000         | 100.0       | V   | 231.0         | 13.2       |
| 52.309800       | 9.55               | 30.00          | 20.45       | 1000.0          | 120.000         | 101.0       | V   | 140.0         | 13.4       |
| 160.010250      | 21.73              | 33.50          | 11.77       | 1000.0          | 120.000         | 185.0       | H   | 125.0         | 9.7        |
| 479.999100      | 27.35              | 36.00          | 8.65        | 1000.0          | 120.000         | 185.0       | H   | 170.0         | 18.3       |
| 588.024300      | 30.24              | 36.00          | 5.76        | 1000.0          | 120.000         | 100.0       | H   | 295.0         | 20.4       |
| 947.532450      | 21.34              | 36.00          | 14.66       | 1000.0          | 120.000         | 185.0       | V   | 49.0          | 24.3       |

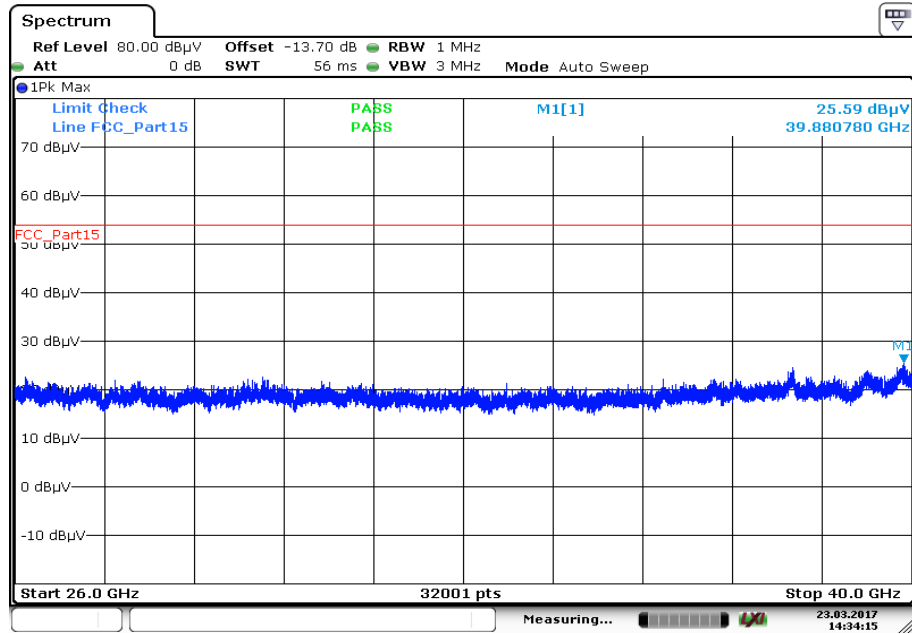
**Plot 6:** 1 GHz to 18 GHz, 5200 MHz, vertical & horizontal polarization



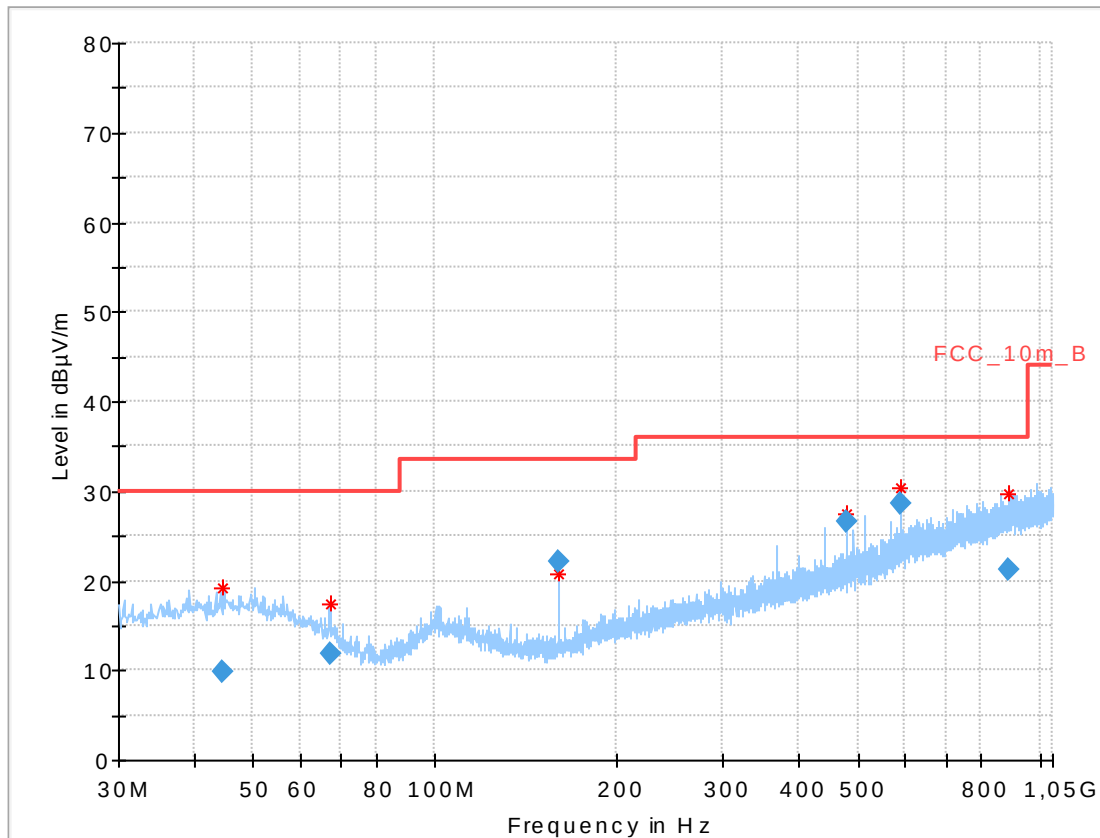
**Plot 7:** 18 GHz to 26 GHz, 5200 MHz, vertical & horizontal polarization



**Plot 8:** 26 GHz to 40 GHz, 5200 MHz, vertical & horizontal polarization

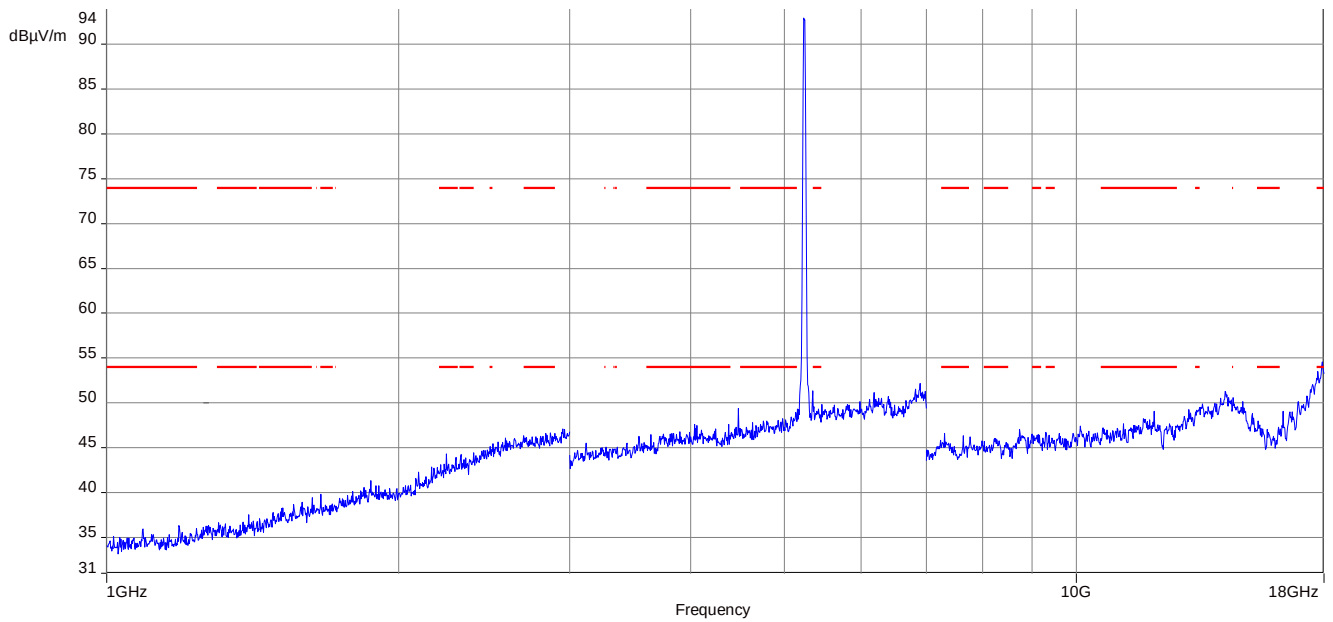


Date: 23.MAR.2017 14:34:14

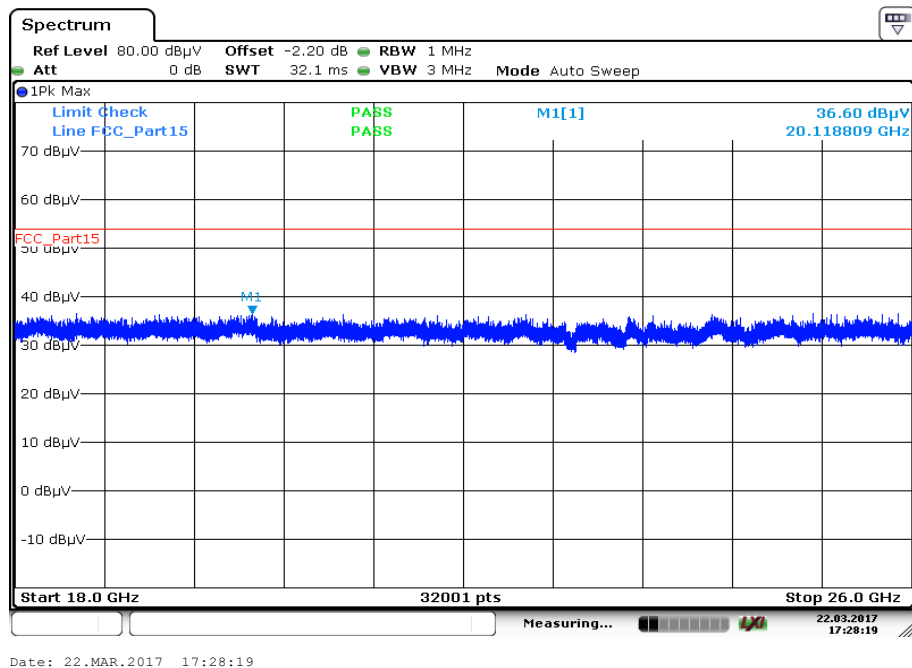
**Plot 9:** 30 MHz to 1 GHz, 5240 MHz, vertical & horizontal polarization

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 44.598450       | 9.94               | 30.00          | 20.06       | 1000.0          | 120.000         | 101.0       | H   | 142.0         | 13.6       |
| 67.226250       | 11.91              | 30.00          | 18.09       | 1000.0          | 120.000         | 101.0       | V   | 11.0          | 10.3       |
| 159.999300      | 22.17              | 33.50          | 11.33       | 1000.0          | 120.000         | 185.0       | H   | 99.0          | 9.7        |
| 480.012000      | 26.57              | 36.00          | 9.43        | 1000.0          | 120.000         | 185.0       | H   | 311.0         | 18.3       |
| 588.041400      | 28.66              | 36.00          | 7.34        | 1000.0          | 120.000         | 100.0       | H   | 277.0         | 20.4       |
| 886.260450      | 21.20              | 36.00          | 14.80       | 1000.0          | 120.000         | 185.0       | H   | 341.0         | 24.0       |

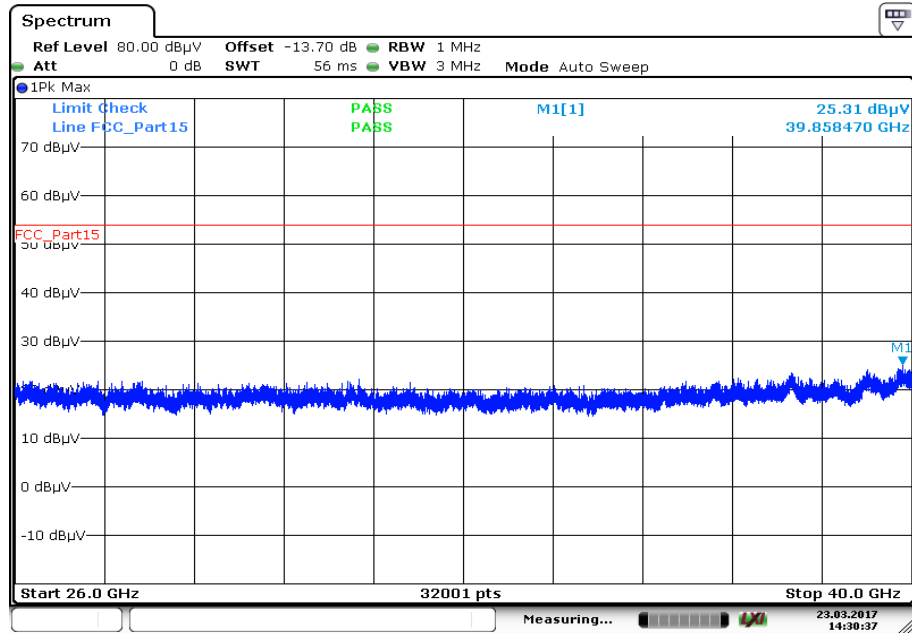
**Plot 10:** 1 GHz to 18 GHz, 5240 MHz, vertical & horizontal polarization



**Plot 11:** 18 GHz to 26 GHz, 5240 MHz, vertical & horizontal polarization



**Plot 12:** 26 GHz to 40 GHz, 5240 MHz, vertical & horizontal polarization



Date: 23.MAR.2017 14:30:37

## 11.10 RX spurious emissions radiated

### Description:

Measurement of the radiated spurious emissions in idle/receive mode.

### Measurement:

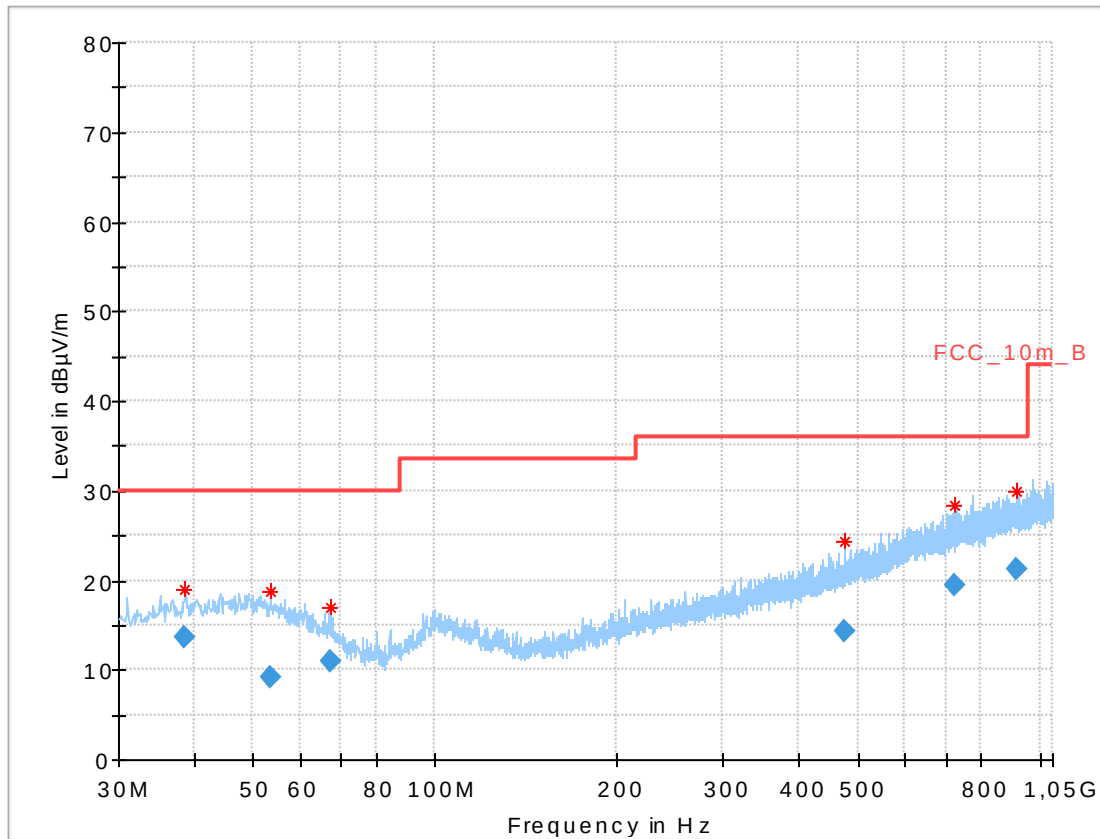
| Measurement parameter    |                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------|
| Detector:                | Quasi Peak below 1 GHz<br>(alternative Peak)<br>Peak above 1 GHz / RMS                    |
| Sweep time:              | Auto                                                                                      |
| Resolution bandwidth:    | F < 1 GHz: 100 kHz<br>F > 1 GHz: 1 MHz                                                    |
| Video bandwidth:         | F < 1 GHz: 100 kHz<br>F > 1 GHz: ≥ 3 MHz                                                  |
| Span:                    | 30 MHz to 40 GHz                                                                          |
| Trace – mode:            | Max Hold / Average with 100 counts +<br>20 log (1 / X) for duty cycle lower than<br>100 % |
| Test setup:              | See sub clause 6.2 – B                                                                    |
| Measurement uncertainty: | See sub clause 8                                                                          |

### Limits:

| RX Spurious Emissions Radiated |                         |                      |
|--------------------------------|-------------------------|----------------------|
| Frequency (MHz)                | Field Strength (dBμV/m) | Measurement distance |
| 30 - 88                        | 30.0                    | 10                   |
| 88 – 216                       | 33.5                    | 10                   |
| 216 – 960                      | 36.0                    | 10                   |
| Above 960                      | 54.0                    | 3                    |

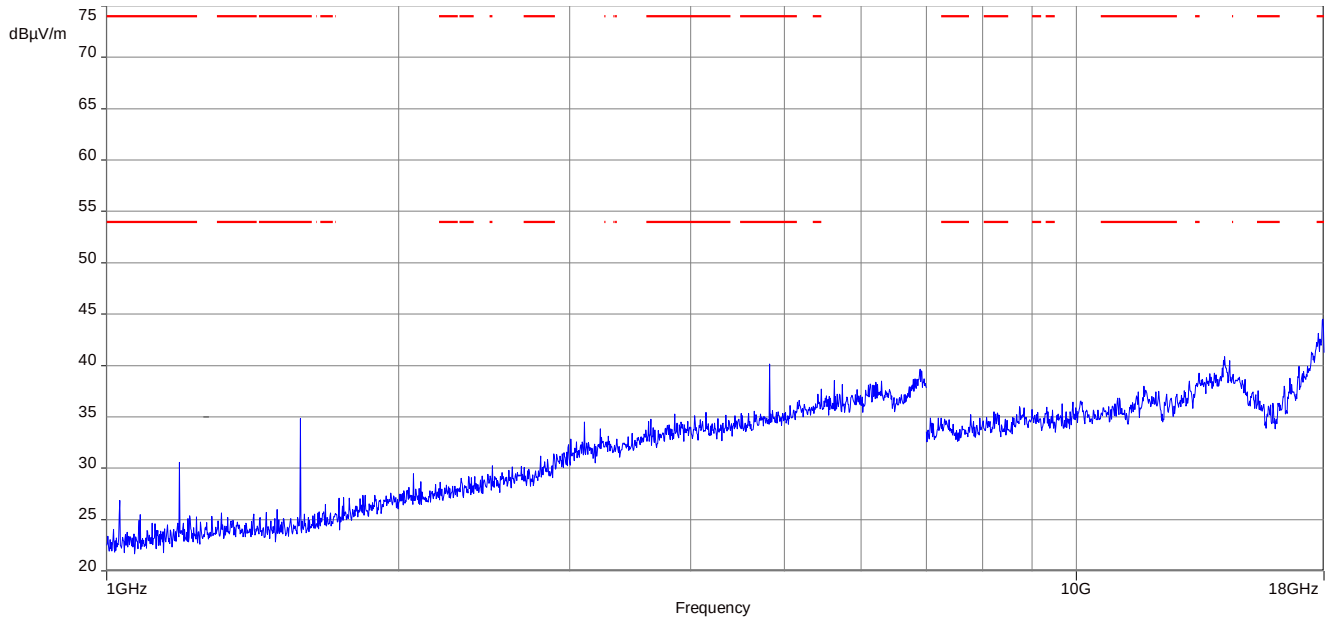
### Results:

| RX Spurious Emissions Radiated [dBμV/m]                 |          |                |
|---------------------------------------------------------|----------|----------------|
| F [MHz]                                                 | Detector | Level [dBμV/m] |
| All emissions are more than 20 dB below the peak limit. |          |                |
|                                                         |          |                |
|                                                         |          |                |

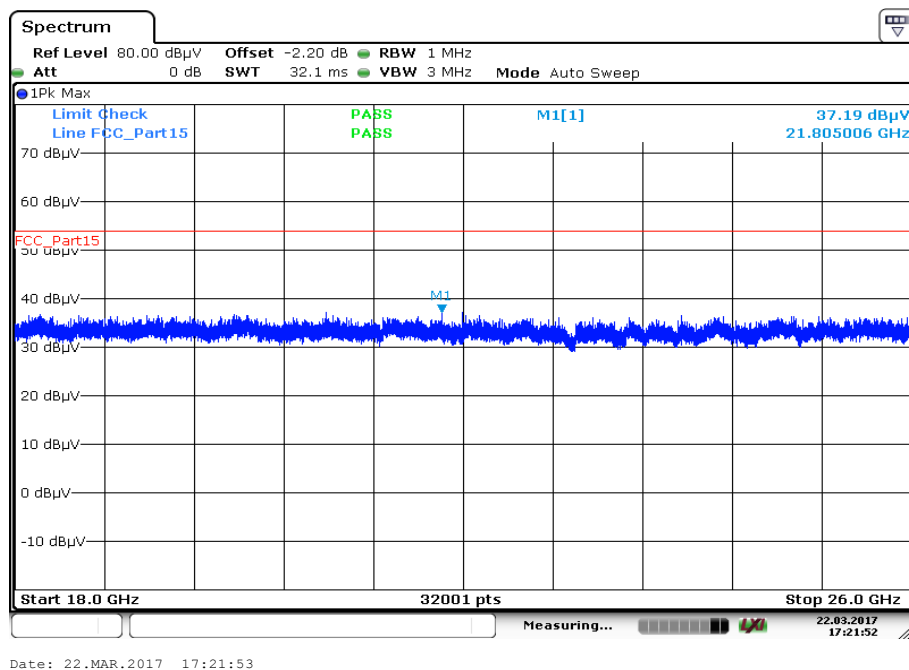
**Plots:****Plot 1:** 30 MHz to 1 GHz, vertical & horizontal polarization

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 38.713800       | 13.65              | 30.00          | 16.35       | 1000.0          | 120.000         | 101.0       | V   | 318.0         | 13.1       |
| 53.668650       | 9.10               | 30.00          | 20.90       | 1000.0          | 120.000         | 101.0       | H   | 335.0         | 13.3       |
| 67.095450       | 10.90              | 30.00          | 19.10       | 1000.0          | 120.000         | 101.0       | V   | 59.0          | 10.3       |
| 477.243300      | 14.28              | 36.00          | 21.72       | 1000.0          | 120.000         | 185.0       | H   | 191.0         | 18.2       |
| 723.951000      | 19.40              | 36.00          | 16.60       | 1000.0          | 120.000         | 178.0       | H   | 108.0         | 22.1       |
| 913.528050      | 21.27              | 36.00          | 14.73       | 1000.0          | 120.000         | 98.0        | V   | 38.0          | 24.2       |

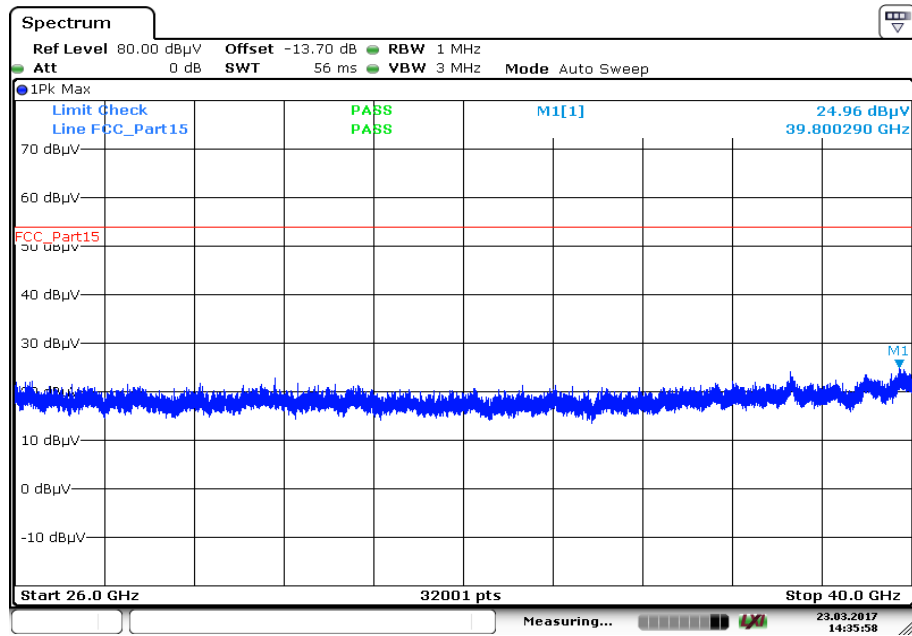
**Plot 2:** 1 GHz to 18 GHz, vertical & horizontal polarization



**Plot 3:** 18 GHz to 26 GHz, vertical & horizontal polarization



**Plot 4:** 26 GHz to 40 GHz, vertical & horizontal polarization



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### 11.11 Spurious emissions radiated < 30 MHz

#### Description:

Measurement of the radiated spurious emissions in transmit mode and receive mode below 30 MHz. The EUT is set first to middle channel. This measurement is representative for all channels and modes. If critical peaks are found the lowest channel and the highest channel will be measured too. Then the EUT is set to receive or idle mode. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

#### Measurement:

| Measurement parameter    |                                            |
|--------------------------|--------------------------------------------|
| Detector:                | Peak / Quasi Peak                          |
| Sweep time:              | Auto                                       |
| Video bandwidth:         | F < 150 kHz: 200 Hz<br>F > 150 kHz: 9 kHz  |
| Resolution 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 6.2 – C                     |
| Measurement uncertainty: | See sub clause 8                           |

#### Limits:

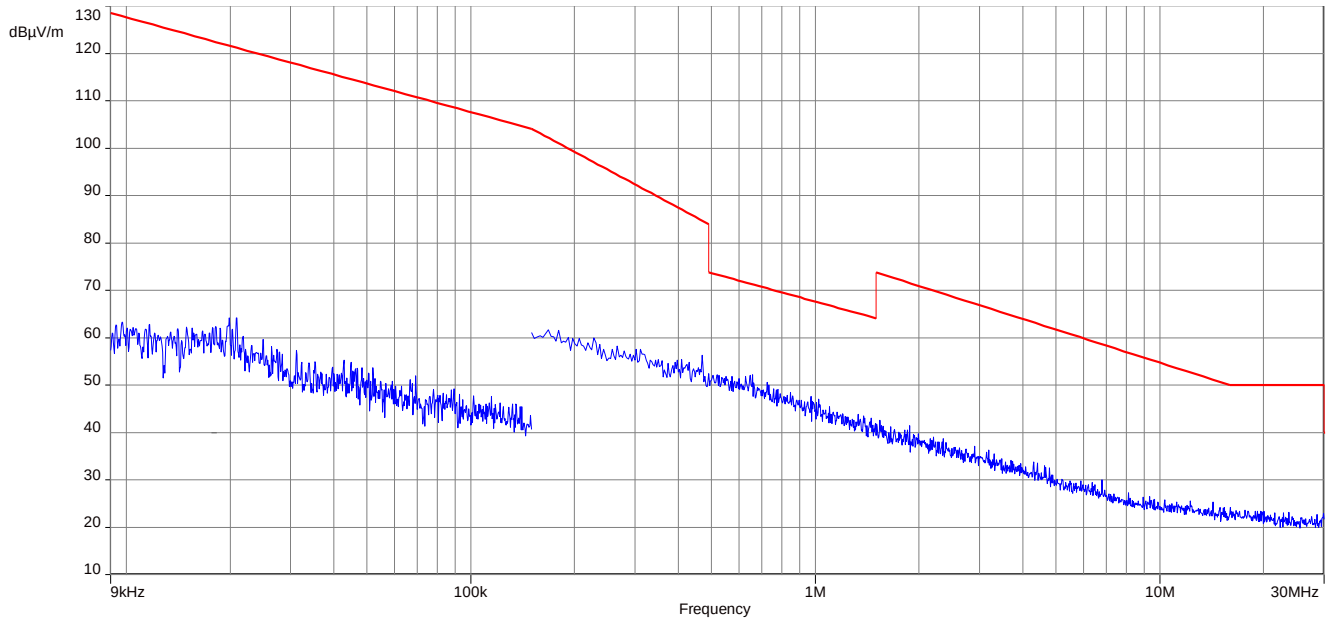
| Spurious Emissions Radiated < 30 MHz |                         |                      |
|--------------------------------------|-------------------------|----------------------|
| Frequency (MHz)                      | Field Strength (dBμV/m) | Measurement distance |
| 0.009 – 0.490                        | 2400/F(kHz)             | 300                  |
| 0.490 – 1.705                        | 24000/F(kHz)            | 30                   |
| 1.705 – 30.0                         | 30                      | 30                   |

#### Results:

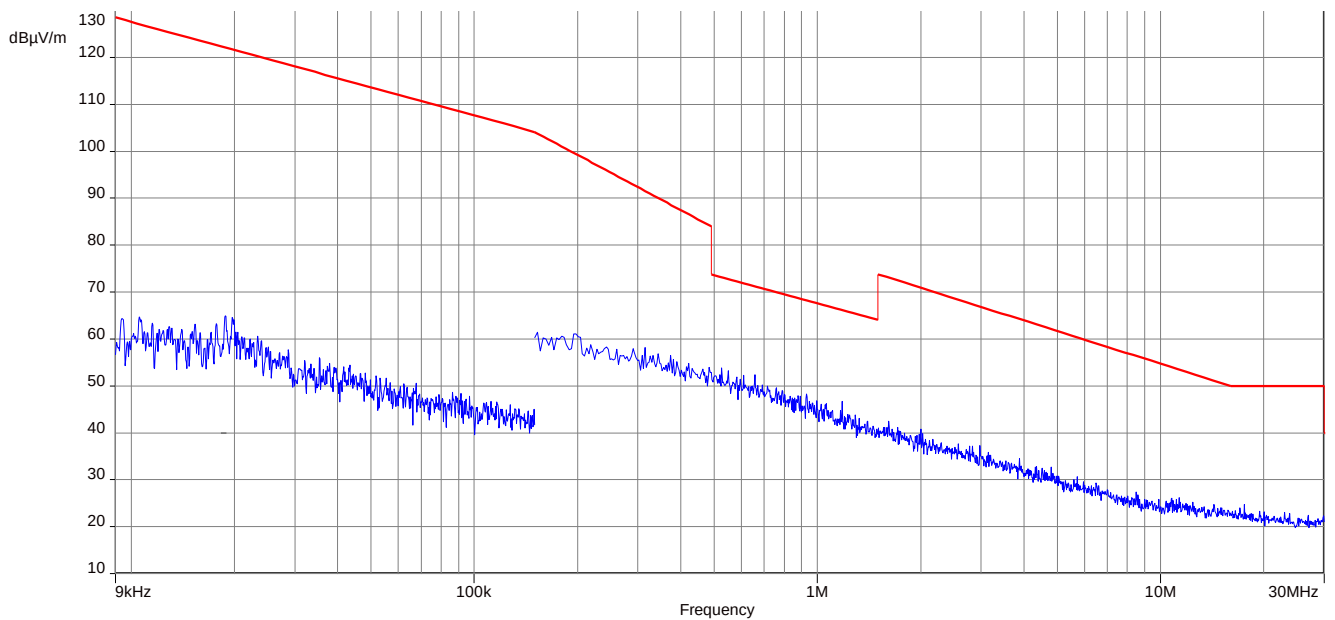
| Spurious Emissions Radiated < 30 MHz [dBμV/m]               |          |                |
|-------------------------------------------------------------|----------|----------------|
| F [MHz]                                                     | Detector | Level [dBμV/m] |
| All detected emissions are more than 20 dB below the limit. |          |                |
|                                                             |          |                |
|                                                             |          |                |

**Plots:**

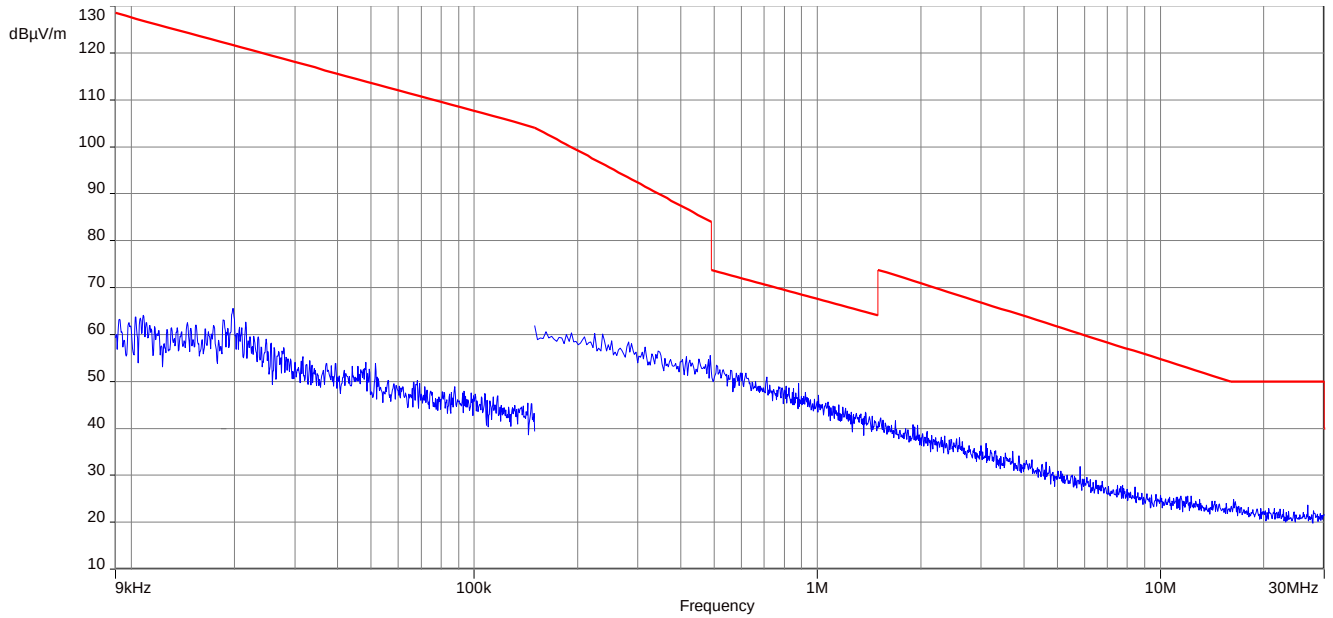
**Plot 1:** 9 kHz to 30 MHz, OFDM 20 MHz, 5180 MHz



**Plot 2:** 9 kHz to 30 MHz, OFDM 20 MHz, 5200 MHz



**Plot 3:** 9 kHz to 30 MHz, OFDM 20 MHz, 5240 MHz



## 11.12 Spurious emissions conducted < 30 MHz

### Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to middle channel. If critical peaks are found the lowest channel and the highest channel will be measured too. Both power lines, phase and neutral line, are measured. Found peaks are re-measured with average and quasi peak detection to show compliance to the limits.

### Measurement:

| Measurement parameter    |                             |
|--------------------------|-----------------------------|
| Detector:                | Peak - Quasi Peak / Average |
| Sweep time:              | Auto                        |
| Video bandwidth:         | 9 kHz                       |
| Resolution bandwidth:    | 100 kHz                     |
| Span:                    | 150 kHz to 30 MHz           |
| Trace – mode:            | Max Hold                    |
| Test setup:              | See sub clause 6.4 – A      |
| Measurement uncertainty: | See sub clause 8            |

### Limits:

| 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               |

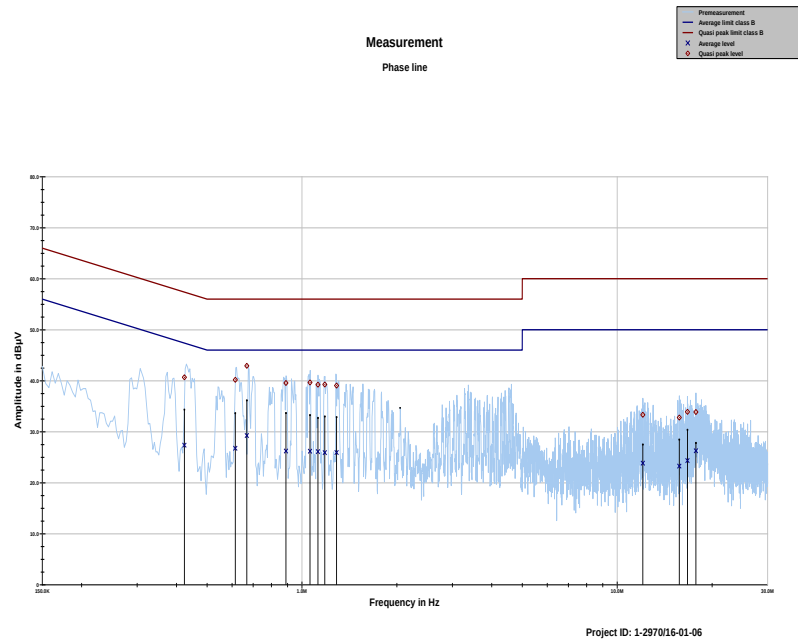
\*Decreases with the logarithm of the frequency

### Results:

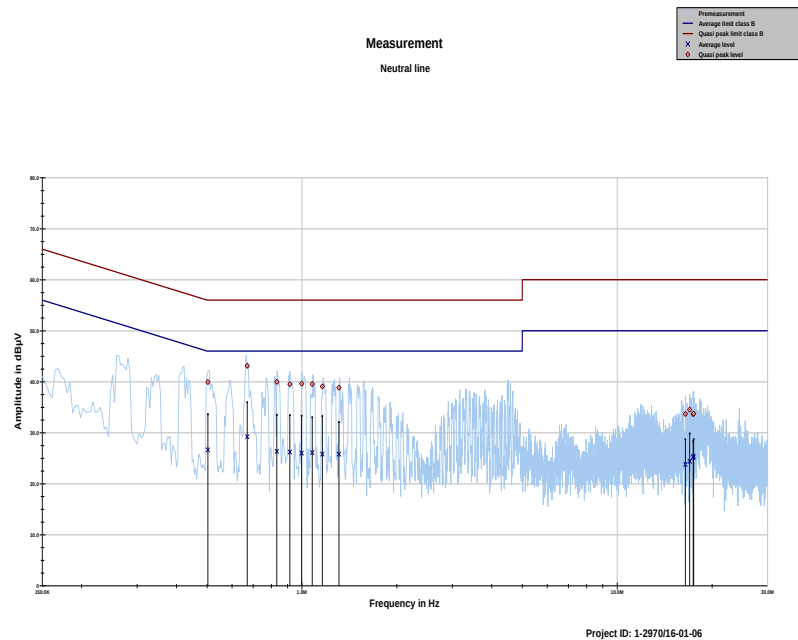
| Spurious Emissions Conducted < 30 MHz [dBμV/m]              |          |                |
|-------------------------------------------------------------|----------|----------------|
| F [MHz]                                                     | Detector | Level [dBμV/m] |
| All detected emissions are more than 20 dB below the limit. |          |                |
|                                                             |          |                |

## Plots:

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



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



## 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 | 2017-04-11      |

## 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

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last page



Deutsche Akkreditierungsstelle GmbH

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

### Akkreditierung



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

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

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

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

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

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

Frankfurt, 25.11.2016

Stelle Minister auf der Rückseite

Im Auftrag Dipl.-Ing. Gert Ralf Eigner  
Abteilungsleiter

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60327 Frankfurt am Main

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38116 Braunschweig

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

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

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

### Note:

The current certificate including annex can be received on request.