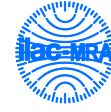


TEST REPORT

Test report no.: 1-6965/13-13-18



Deutsche
Akkreditierungsstelle
D-PL-12076-01-01

Testing laboratory

CETECOM ICT Services GmbH

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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

Area of Testing:

Radio Communications & EMC (RCE)

Applicant

Sony Mobile Communications AB

Nya Vattentornet

22188 Lund / SWEDEN

Phone: +46 46 19 30 00

Fax: -/-

Contact: Mikael Nilsson

e-mail: Micke.nilsson@sonymobile.com

Phone: +46 7 03 22 75 03

Manufacturer

Sony Mobile Communications AB

Nya Vattentornet

22188 Lund / SWEDEN

Test standard/s

RSS - 210 Issue 8

Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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

Test Item

Kind of test item: Tablet PC WLAN b/g/n/a/ac; BT 4.0; RFID; A-GPS

Type name: TS-0020-BV

Model name: SGP511

IC: 4170B-TS0020

Frequency: DTS band 2400 MHz to 2483.5 MHz
(lowest channel 01 – 2412 MHz; highest channel 11 – 2462 MHz)

Technology tested: WLAN (DSSS/b – mode; OFDM/g – mode and n HT20 – mode)

Antenna: Integrated antenna

Power supply: 3.7 V DC by Li - polymer 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.

Test report authorised:

p. o.

Stefan Bös
Senior Testing Manager

Test performed:

Marco Bertolino
Testing Manager

| | |
|----------------------------|--|
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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. CETECOM ICT Services 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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In no case this test report can be considered as a Letter of Approval.

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: | 2013-12-19 |
| Date of receipt of test item: | 2014-01-27 |
| Start of test: | 2014-01-27 |
| End of test: | 2014-01-28 |
| Person(s) present during the test: | -/- |

3 Test standard/s

| Test standard | Date | Test standard description |
|-------------------|------------|---|
| RSS - 210 Issue 8 | 01.12.2010 | Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment |

3.1 Measurement guidance

| | | |
|------------------|---------|---|
| DTS : KDB 558074 | 2013-04 | Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 |
|------------------|---------|---|

4 Test environment

| | | |
|----------------------------|-----------|---------------------------------------|
| Temperature: | T_{nom} | +22 °C during room temperature tests |
| | T_{max} | +55 °C during high temperature tests |
| | T_{min} | -20 °C during low temperature tests |
| Relative humidity content: | | 39 % |
| Barometric pressure: | | not relevant for this kind of testing |
| Power supply: | V_{nom} | 3.7 V DC by Li - polymer battery |
| | V_{max} | 4.2 V |
| | V_{min} | 3.3 V |

5 Test item

| | | | |
|----------------------------|---|--|------------|
| Kind of test item | : | Tablet PC WLAN b/g/n/a/ac; BT 4.0; RFID; A-GPS | |
| Type name | : | TS-0020-BV | |
| Model name | : | SGP511 | |
| S/N serial number | : | Conducted unit: | CB51268F4Y |
| | | Radiated unit: | CB51268FN3 |
| HW hardware status | : | AP1 | |
| SW software status | : | RF test software | |
| Frequency band [MHz] | : | DTS band 2400 MHz to 2483.5 MHz (lowest channel 01 – 2412 MHz; highest channel 11 – 2462 MHz) | |
| Type of radio transmission | : | DSSS, OFDM | |
| Use of frequency spectrum | : | | |
| Type of modulation | : | BPSK, QPSK, 16 – QAM, 64 – QAM | |
| Number of channels | : | 11 | |
| Antenna | : | Integrated antenna | |
| Power supply | : | 3.7 V DC by Li - polymer battery | |
| Temperature range | : | -20°C to +55°C | |

5.1 Additional information

Test setup- and EUT-photos are included in test report: 1-6965/13-13-01_AnnexA
 1-6965/13-13-01_AnnexB
 1-6965/13-13-01_AnnexD

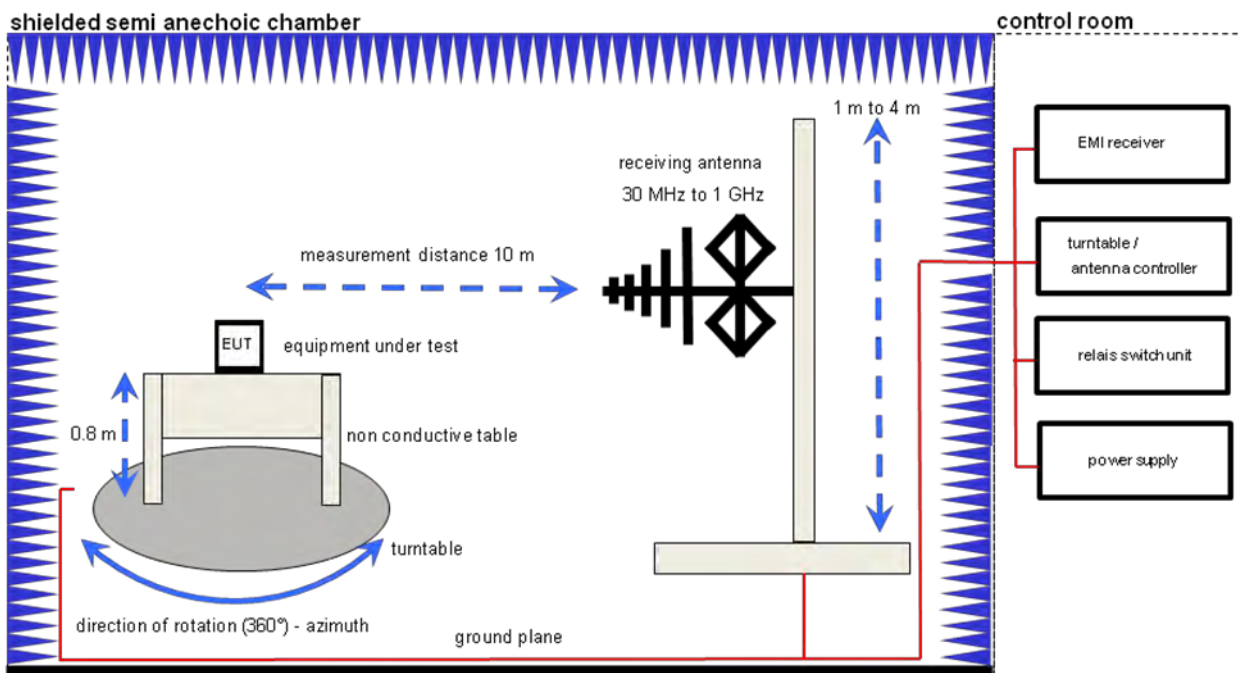
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

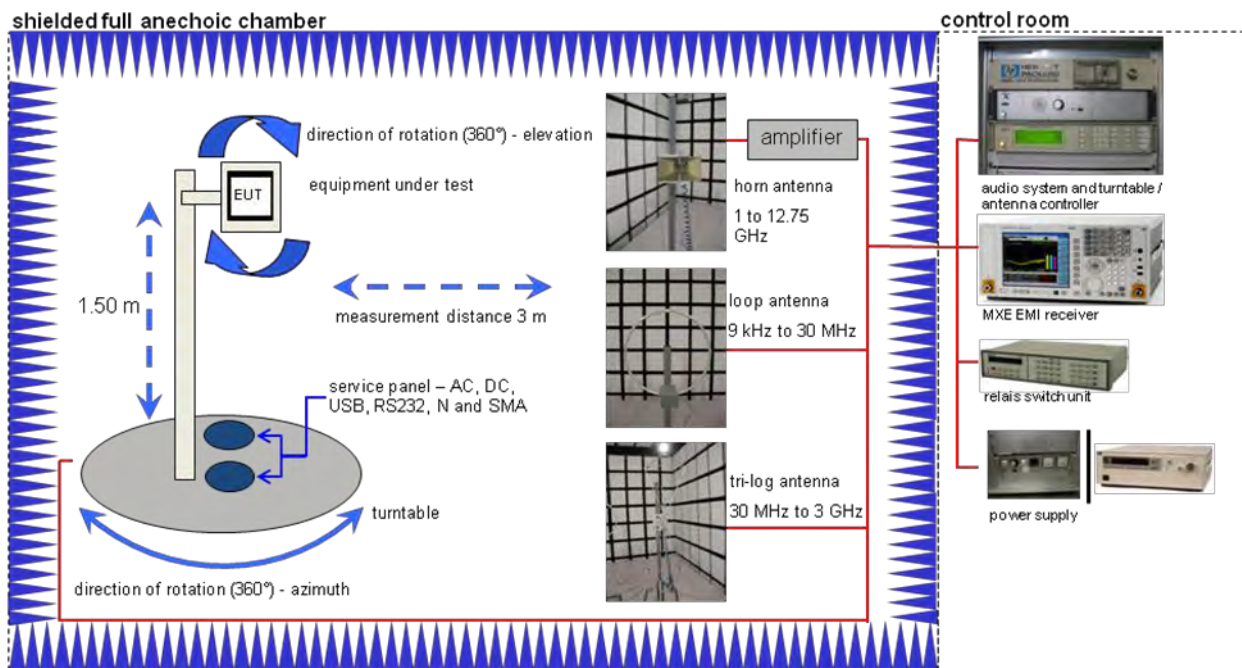
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with 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 analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Equipment table:

| Equipment | Type | Manufacturer | Serial No. | INV. No Cetecom |
|--|---------------------|---------------|------------|-----------------|
| Switch-Unit | 3488A | HP Meßtechnik | 2719A14505 | 300000368 |
| DC power supply, 60Vdc, 50A, 1200 W | 6032A | HP Meßtechnik | 2920A04466 | 300000580 |
| EMI Test Receiver | ESCI 3 | R&S | 100083 | 300003312 |
| Amplifier | JS42-00502650-28-5A | MITEQ | 1084532 | 300003379 |
| Antenna Tower | Model 2175 | ETS-LINDGREN | 64762 | 300003745 |
| Positioning Controller | Model 2090 | ETS-LINDGREN | 64672 | 300003746 |
| Turntable Interface-Box | Model 105637 | ETS-LINDGREN | 44583 | 300003747 |
| TRILOG Broadband Test-Antenna 30 MHz - 3 GHz | VULB9163 | Schwarzbeck | 295 | 300003787 |

7.2 Radiated measurements chamber C



Equipment table:

| Equipment | Type | Manufacturer | Serial No. | INV. No Cetecom |
|--|---------------------------------|----------------------|------------|-----------------|
| MXE EMI Receiver 20 Hz bis 26,5 GHz | N9038A | Agilent Technologies | MY51210197 | 300004405 |
| TRILOG Broadband Test-Antenna 30 MHz - 3 GHz | VULB9163 | Schwarzbeck | 371 | 300003854 |
| Band Reject filter | WRCG2400/2483-2375/2505-50/10SS | Wainwright | 11 | 300003351 |
| Highpass Filter | WHKX7.0/18G-8SS | Wainwright | 18 | 300003789 |
| Double-Ridged Waveguide Horn Antenna 1-18.0GHz | 3115 | EMCO | 8812-3088 | 300001032 |
| Active Loop Antenna | 6502 | EMCO | 8905-2342 | 300000256 |
| Anechoic chamber | FAC 3/5m | MWB / TDK | 87400/02 | 300000996 |
| Switch / Control Unit | 3488A | HP Meßtechnik | * | 300000199 |
| Switch / Control Unit | 3488A | HP Meßtechnik | 2719A15013 | 300001156 |
| Isolating Transformer | MPL IEC625 Bus Regeltrenntravo | Erfi | 91350 | 300001155 |
| Three-Way Power Splitter, 50 Ohm | 11850C | HP Meßtechnik | | 300000997 |
| Amplifier | js42-00502650-28-5a | Parzich GMBH | 928979 | 300003143 |

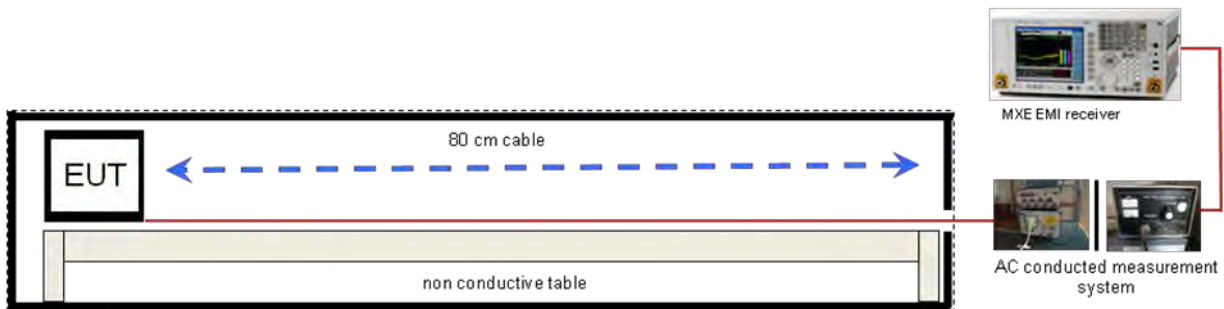
7.3 Radiated measurements 12.75 GHz to 26 GHz



Equipment table:

| Equipment | Type | Manufacturer | Serial No. | INV. No Cetecom |
|---|--------|---------------|------------|-----------------|
| Std. Gain Horn Antenna 12.4 to 18.0 GHz | 639 | Narda | 8402 | 300000787 |
| Std. Gain Horn Antenna 18.0 to 26.5 GHz | 638 | Narda | 8205 | 300002442 |
| Microwave System Amplifier, 0.5-26.5 GHz | 83017A | HP Meßtechnik | 00419 | 300002268 |
| Spectrum Analyzer 20 Hz - 50 GHz | FSU50 | R&S | 200012 | 300003443 |
| Signal Analyzer 40 GHz | FSV40 | R&S | 101042 | 300004517 |

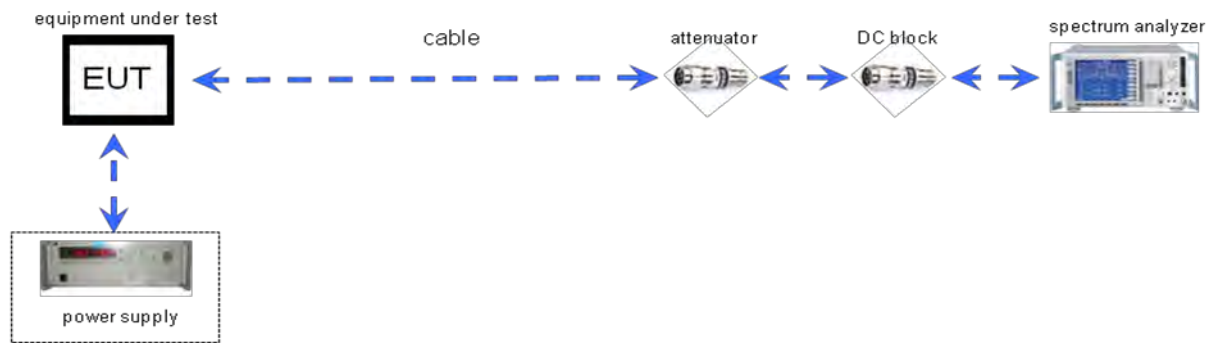
7.4 AC conducted



Equipment table:

| Equipment | Type | Manufacturer | Serial No. | INV. No Cetecom |
|-------------------------------------|--------------------------------|----------------------|------------|-----------------|
| MXE EMI Receiver 20 Hz bis 26,5 GHz | N9038A | Agilent Technologies | MY51210197 | 300004405 |
| Isolating Transformer | MPL IEC625 Bus Regeltrenntravo | Erfi | 91350 | 300001155 |
| Switch / Control Unit | 3488A | HP Meßtechnik | * | 300000199 |
| Switch / Control Unit | 3488A | HP Meßtechnik | 2719A15013 | 300001168 |
| Artificial Mains 9 kHz to 30 MHz | ESH3-Z5 | R&S | 828576/020 | 300001210 |

7.5 Conducted measurements



Equipment table:

| Equipment | Type | Manufacturer | Serial No. | INV. No Cetecom |
|------------------------|-------|--------------|------------|-----------------|
| Signal Analyzer 40 GHz | FSV40 | R&S | 101042 | 300004517 |

8 Summary of measurement results

- No deviations from the technical specifications were ascertained
- There were deviations from the technical specifications ascertained

| TC Identifier | Description | Verdict | Date | Remark |
|---------------|------------------|---------|------------|--------|
| RF-Testing | RSS 210, Issue 8 | Passed | 2014-02-05 | -/- |

| Test specification clause | Test case | Guideline | Temperature conditions | Power source voltages | Mode | Pass | Fail | NA | NP | Remark |
|---------------------------|---|--|------------------------|-----------------------|--------------------|--|--|--|--|----------|
| RSS 210 / A8.4(2) | Antenna gain | -/- | Nominal | Nominal | DSSS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | complies |
| RSS 210 / A8.2(b) | Power spectral density | KDB 558074 DTS clause: 10.2 | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS 210 / A8.2(a) | Spectrum bandwidth – 6 dB bandwidth | KDB 558074 DTS clause: 8.2 | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS Gen. clause 4.6.1 | Occupied bandwidth | -/- | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS-210 / A8.4(4) | Maximum output power | KDB 558074 DTS clause: 9.1.2 | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS-210 / A8.5 | Band edge compliance conducted | KDB 558074 DTS clause: 13.2.1 | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS-210 / A8.5 | Band edge compliance radiated | -/- | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS-210 / A8.5 | TX spurious emissions conducted | KDB 558074 DTS clause: 11.1 & 11.2 | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS-210 / A8.5 | TX spurious emissions radiated | -/- | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| RSS-Gen. | RX spurious emissions radiated | -/- | Nominal | Nominal | -/- | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | complies |
| RSS-Gen. | TX spurious emissions radiated < 30 MHz | -/- | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |
| -/- | Conducted emissions < 30 MHz | -/- | Nominal | Nominal | DSSS OFDM g & n | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | complies |

Note: NA = Not Applicable; NP = Not Performed

9 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

Test mode:

- No test mode available.
Iperf was used to ping another device with the largest support packet size
- Special software is used.
EUT is transmitting pseudo random data by itself

10 RSP100 test report cover sheet / performance test data

| | | | | | | |
|---|----------|--|-----------|-----------|---------------|---------------|
| Test report number | : | 1-6965/13-13-18 | | | | |
| Equipment model number: | | SGP511 | | | | |
| Certification number | : | 4170B-TS0020 | | | | |
| Manufacturer (complete address) | : | Sony Mobile Communications AB Nya Vattentorget 22188 Lund / SWEDEN | | | | |
| Tested to radio standards specification no. | : | RSS 210, Issue 8 | | | | |
| Open area test site IC No. : | | IC 3462C-1 | | | | |
| Frequency range | : | DTS band 2400 MHz to 2483.5 MHz | | | | |
| RF-power (max.) | : | Conducted values: | | | | |
| | | Band | b – mode | g – mode | n HT20 – mode | n HT40 – mode |
| | | 2412 – 2462 MHz | 19.77 mW | 52.36 mW | 63.97 mW | |
| | | 2422 – 2462 MHz | | | | -/- |
| | | Radiated values: | | | | |
| | | Band | b – mode | g – mode | n HT20 – mode | n HT40 – mode |
| 2412 – 2462 MHz | 22.44 mW | 59.02 mW | 72.61 mW | | | |
| 2422 – 2462 MHz | | | | -/- | | |
| Occupied bandwidth (99%-BW) | : | Band | b – mode | g – mode | n HT20 – mode | n HT40 – mode |
| | | 2412 – 2462 MHz | 11.21 MHz | 17.79 MHz | 18.43 MHz | |
| | | 2422 – 2462 MHz | | | | -/- |
| Necessary bandwidth (calculated) | : | Band | b – mode | g – mode | n HT20 – mode | n HT40 – mode |
| | | 2412 – 2462 MHz | 12.80 MHz | 16.88 MHz | 16.88 MHz | |
| | | 2422 – 2462 MHz | | | | -/- |
| Emission classification | : | (according TRC-43) | G1D | G7D | G7D | -/- |
| Type of modulation | : | DSSS & OFDM technology with BPSK, QPSK, 16 – and 64 – QAM modulation. | | | | |
| Antenna information | : | Integrated antenna | | | | |
| Transmitter spurious [dBµV/m @ 3m] | : | 60 @ 2390 MHz (peak); 39.5 @ 2390 MHz (AVG) | | | | |

ATTESTATION:**DECLARATION OF COMPLIANCE:**

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Laboratory manager:

2014-02-05
Date

Marco Bertolino
Name

Signature

11 Measurement results

11.1 Antenna gain

Limits:

| FCC | IC |
|--------------|----|
| Antenna Gain | |
| 6 dBi | |

Results:

| T _{nom} | V _{nom} | lowest channel 2412 MHz | middle channel 2437 MHz | highest channel 2462 MHz |
|--|------------------|----------------------------|----------------------------------|-----------------------------|
| Gain [dBi] Declared by the manufacturer | | 0.9 | 0.8 | 0.3 |
| Measurement uncertainty | | | ± 1.5 dB (cond.) / ± 3 dB (rad.) | |

Result: Passed

11.2 Identify worst case data rate

Measurement:

All modes of the module will be measured with an average power meter to identify the maximum transmission power on low, mid and high channel. In the case that only one or two channels are available, only these will be measured.

In further tests only the identified worst case modulation scheme or bandwidth will be measured. Additional the band edge compliance test will be performed in the lowest and highest modulation scheme.

Measurement parameters:

Average Power Meter

Results:

| Modulation Frequency | Modulation scheme / bandwidth | | |
|-------------------------|-------------------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| DSSS / b – mode | 2Mbit/s | 2Mbit/s | 2Mbit/s |
| OFDM / g – mode | 9Mbit/s | 6Mbit/s | 6Mbit/s |
| OFDM / n – mode | MCS0 | MCS0 | MCS0 |
| | | | |

11.3 Maximum output power

Description:

Measurement of the maximum output power conducted and radiated. The measurements are performed using the data rate producing the highest conducted output power.

Measurement:

| Measurement parameter | |
|--------------------------------|--|
| According to DTS clause: 9.1.2 | |
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 1 MHz |
| Video bandwidth: | 3 MHz |
| Span: | 40 MHz |
| Integration bandwidth: | 75 % power - bandwidth (DTS BW) |
| Trace-Mode: | Max hold (allow trace to fully stabilize) |
| Measurement function: | Channel power with DTS BW |

Limits:

| FCC | IC |
|--|----|
| Maximum Output Power | |
| Conducted: 1.0 W – Antenna Gain max. 6 dBi | |

Results: DSSS / b – mode

| DSSS / b – mode Frequency | Maximum Output Power [dBm] | | |
|--|----------------------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| Peak output power conducted Worst case data rate | 12.31 | 12.71 | 12.96 |
| Output Power Radiated – EIRP*) Worst case data rate | 13.21 | 13.51 | 13.26 |
| Measurement uncertainty | ± 1.5 dB (cond.) / ± 3 dB (rad.) | | |

*) calculated with Antenna gain

Result: Passed

Results: OFDM / g – mode

| OFDM / g – mode Frequency | Maximum Output Power [dBm] | | |
|--|----------------------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| Peak output power conducted Worst case data rate | 16.74 | 16.91 | 17.19 |
| Output Power Radiated – EIRP*) Worst case data rate | 17.64 | 17.71 | 17.49 |
| Measurement uncertainty | ± 1.5 dB (cond.) / ± 3 dB (rad.) | | |

*) calculated with Antenna gain

Result: Passed**Results: OFDM / n – mode HT 20**

| OFDM / n – mode HT20 Frequency | Maximum Output Power [dBm] | | |
|--|----------------------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| Peak output power conducted Worst case data rate | 17.71 | 17.79 | 18.06 |
| Output Power Radiated – EIRP*) Worst case data rate | 18.61 | 18.59 | 18.36 |
| Measurement uncertainty | ± 1.5 dB (cond.) / ± 3 dB (rad.) | | |

*) calculated with Antenna gain

Result: Passed

11.4 Power spectral density

Description:

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

Measurement:

| Measurement parameter | |
|-------------------------------|---|
| According to DTS clause: 10.2 | |
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 3 kHz |
| Video bandwidth: | 10 kHz |
| Span: | 40 MHz |
| Trace-Mode: | Max hold (allow trace to fully stabilize) |

Limits:

| FCC | IC |
|------------------------|----|
| Power Spectral Density | |
| 8 dBm (conducted) | |

Results:

| Modulation | Power Spectral density [dBm] | | |
|-------------------------|------------------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| DSSS / b – mode | -10.79 | -10.75 | -9.46 |
| OFDM / g – mode | -16.55 | -15.51 | -14.94 |
| OFDM / n – mode | -15.43 | -15.00 | -14.76 |
| Measurement uncertainty | ± 1.5 dB | | |

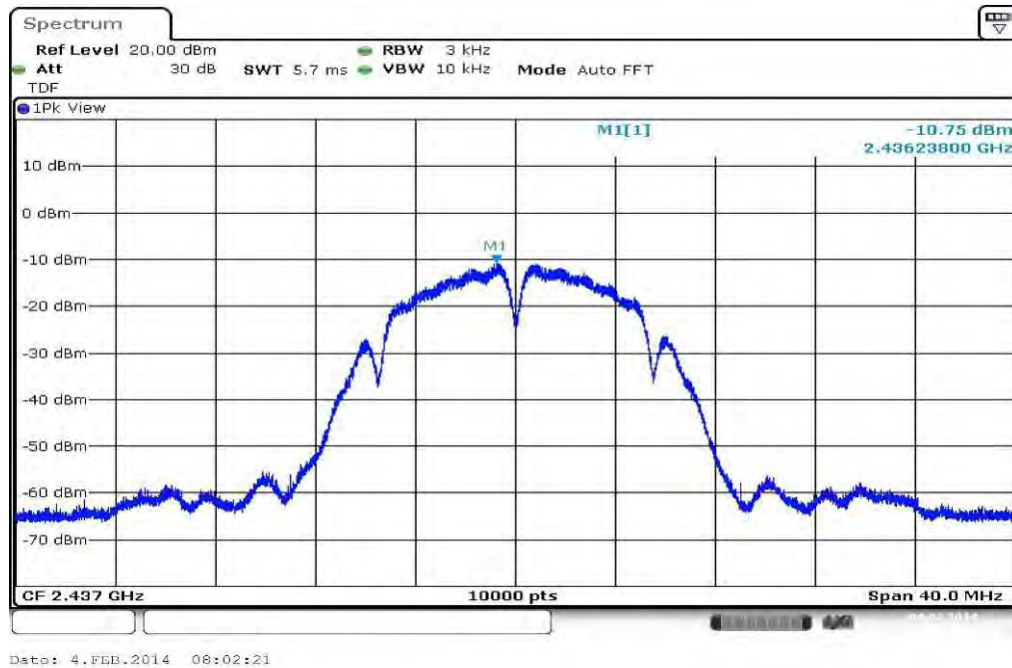
Result: **Passed**

Plots: DSSS / b – mode

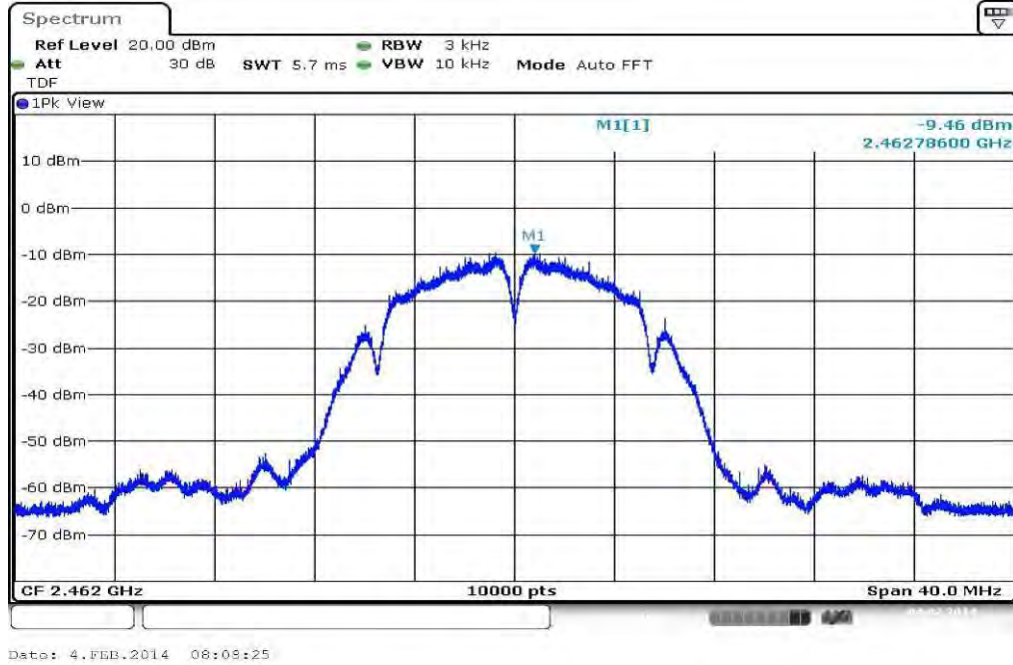
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel

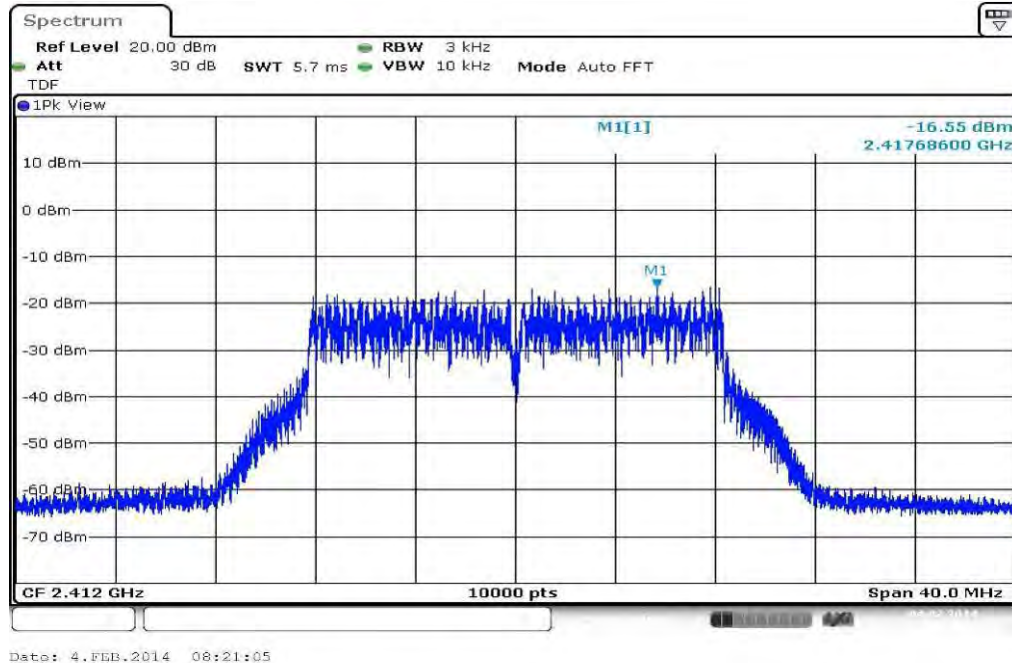


Plot 3: TX mode, highest channel

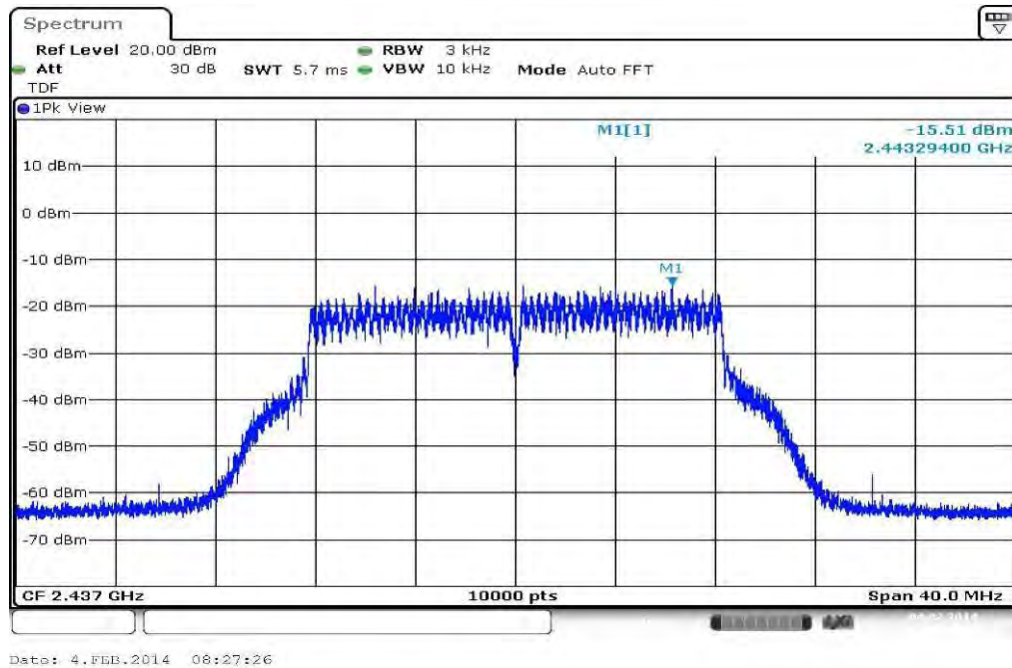


Plots: OFDM / g – mode

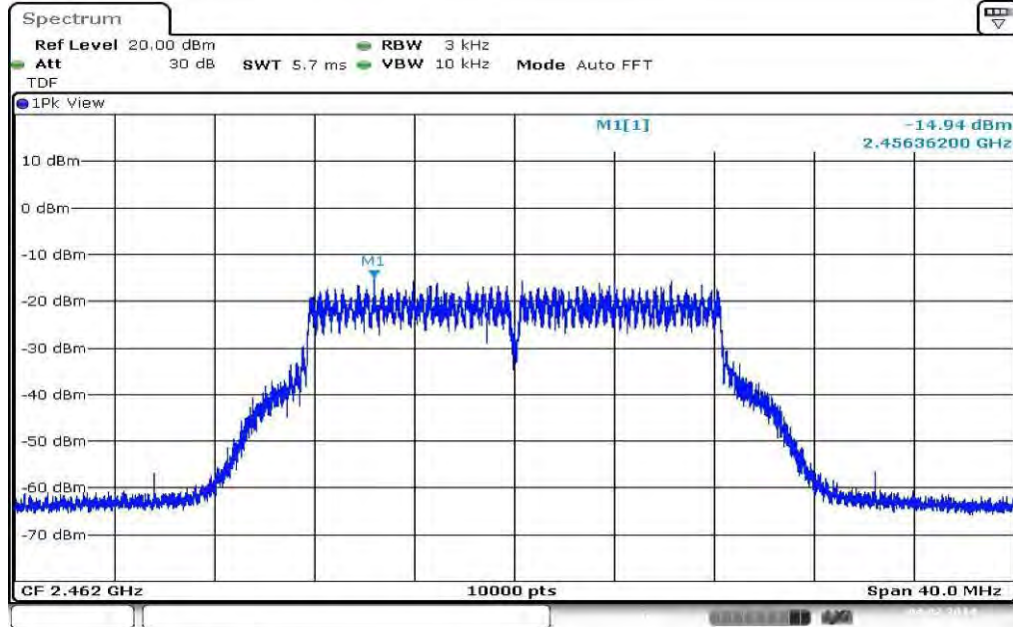
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



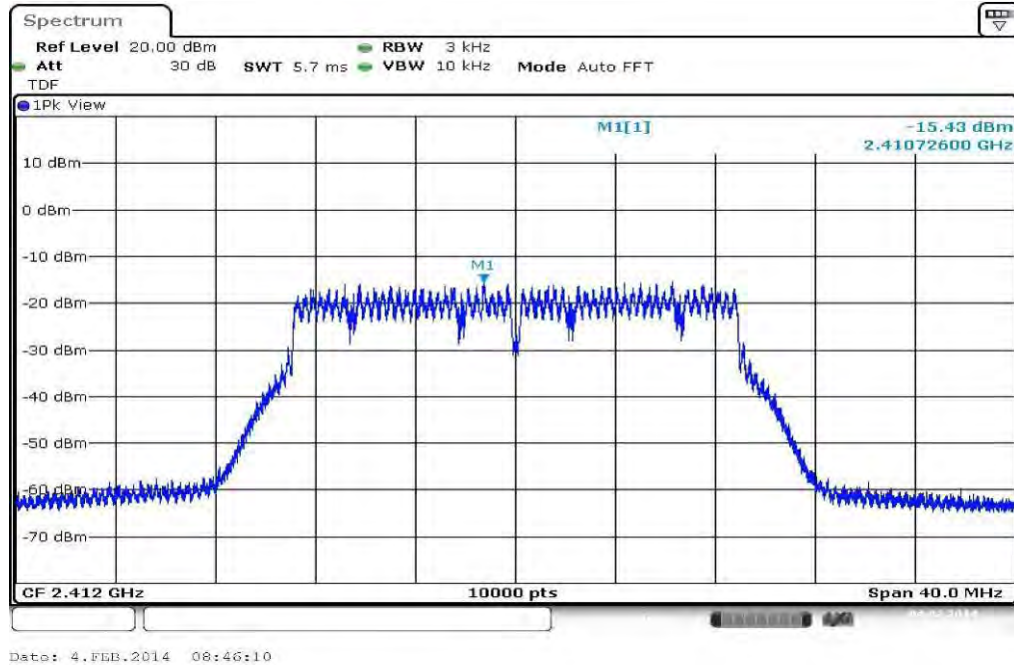
Plot 3: TX mode, highest channel



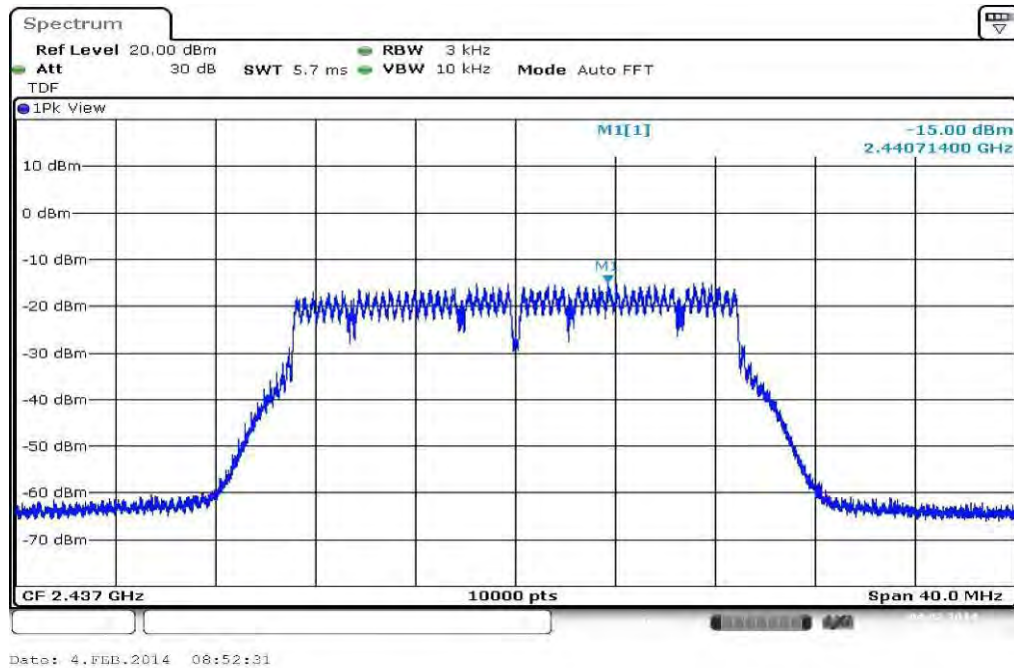
Date: 4.FEB.2014 08:33:30

Plots: OFDM / n – mode

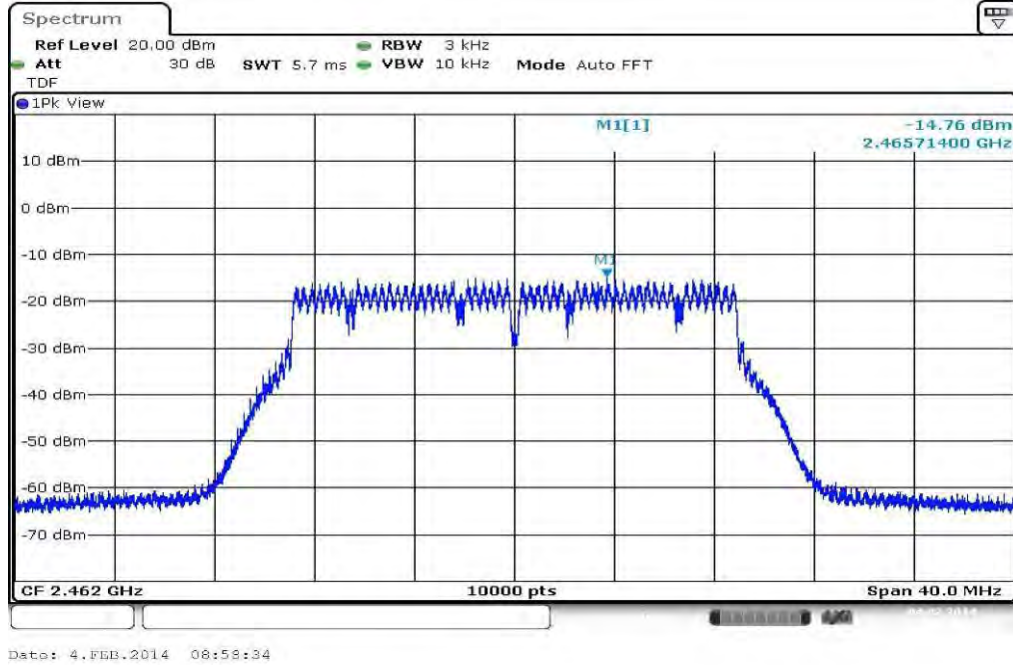
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



Plot 3: TX mode, highest channel



11.5 Spectrum bandwidth – 6 dB

Description:

Measurement of the 6 dB bandwidth of the modulated signal.

Measurement:

| Measurement parameter | |
|------------------------------|---|
| According to DTS clause: 8.2 | |
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 100 kHz |
| Video bandwidth: | 300 kHz |
| Span: | 40 MHz |
| Measurement procedure: | Measurement of the 75% bandwidth using the integration function of the analyzer |
| Trace-Mode: | Max hold (allow trace to stabilize) |

Limits:

| FCC | IC |
|---|----|
| Spectrum Bandwidth – 6 dB | |
| Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz. | |

Results: DSSS / b – mode

| Modulation Frequency | 6 dB bandwidth [MHz] | | |
|-------------------------|----------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| DSSS / b – mode | 5.74 | 5.70 | 5.74 |
| Measurement uncertainty | ± RBW | | |

Result: Passed

Results: OFDM / g – mode

| Modulation Frequency | 6 dB bandwidth [MHz] | | |
|-------------------------|----------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| OFDM / g – mode | 12.50 | 12.08 | 12.44 |
| Measurement uncertainty | ± RBW | | |

Result: Passed**Results: OFDM / n – mode**

| Modulation Frequency | 6 dB bandwidth [MHz] | | |
|-------------------------|----------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| OFDM / n – mode HT20 | 13.32 | 12.98 | 13.30 |
| Measurement uncertainty | ± RBW | | |

Result: Passed

11.6 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: | 500 kHz |
| Video bandwidth: | 3 MHz |
| Span: | 40 MHz |
| Measurement procedure: | Measurement of the 99% bandwidth using the integration function of the analyzer |
| Trace-Mode: | Max hold (allow trace to stabilize) |

Usage:

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

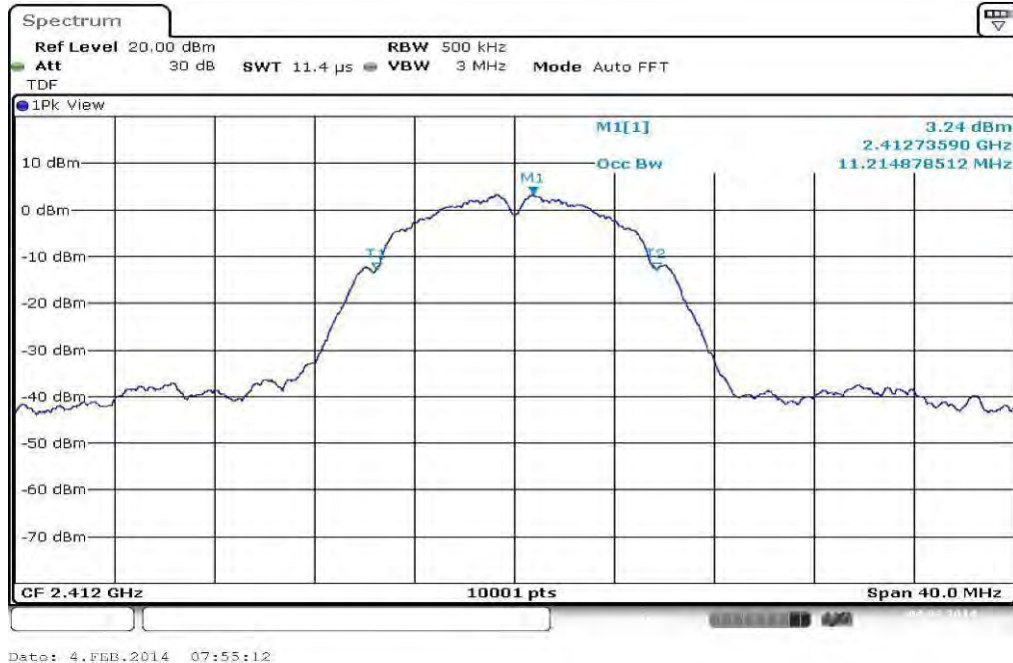
Results:

| Modulation Frequency | 99 % bandwidth [MHz] | | |
|-------------------------|----------------------|----------|----------|
| | 2412 MHz | 2437 MHz | 2462 MHz |
| DSSS / b – mode | 11.21 | 11.05 | 11.21 |
| OFDM / g – mode | 17.38 | 17.69 | 17.79 |
| OFDM / n – mode | 18.34 | 18.43 | 18.34 |
| Measurement uncertainty | ± RBW | | |

Result: Passed

Plots: DSSS / b – mode

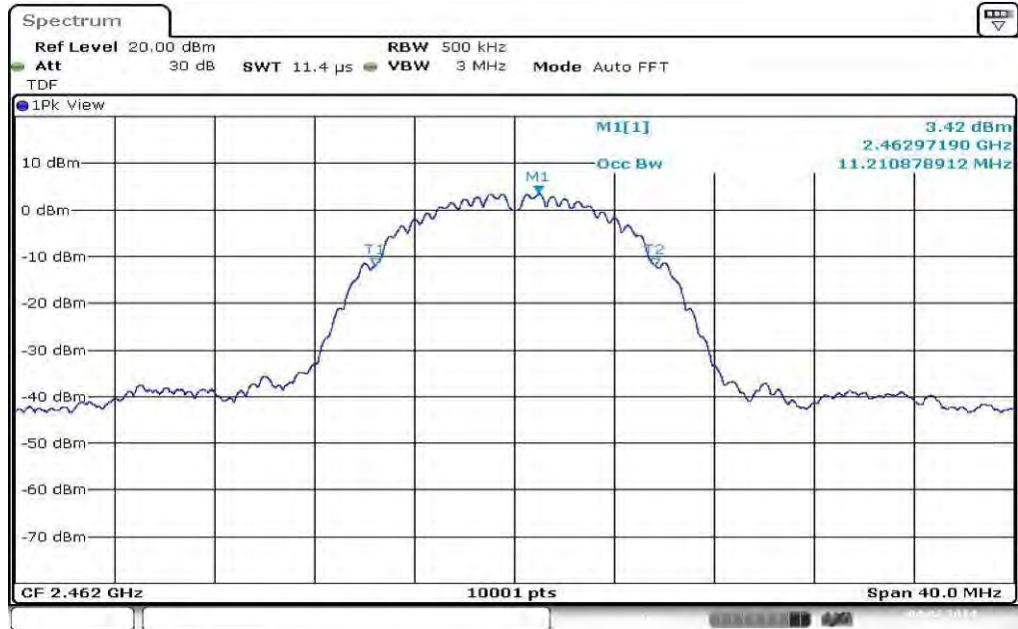
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



Plot 3: TX mode, highest channel



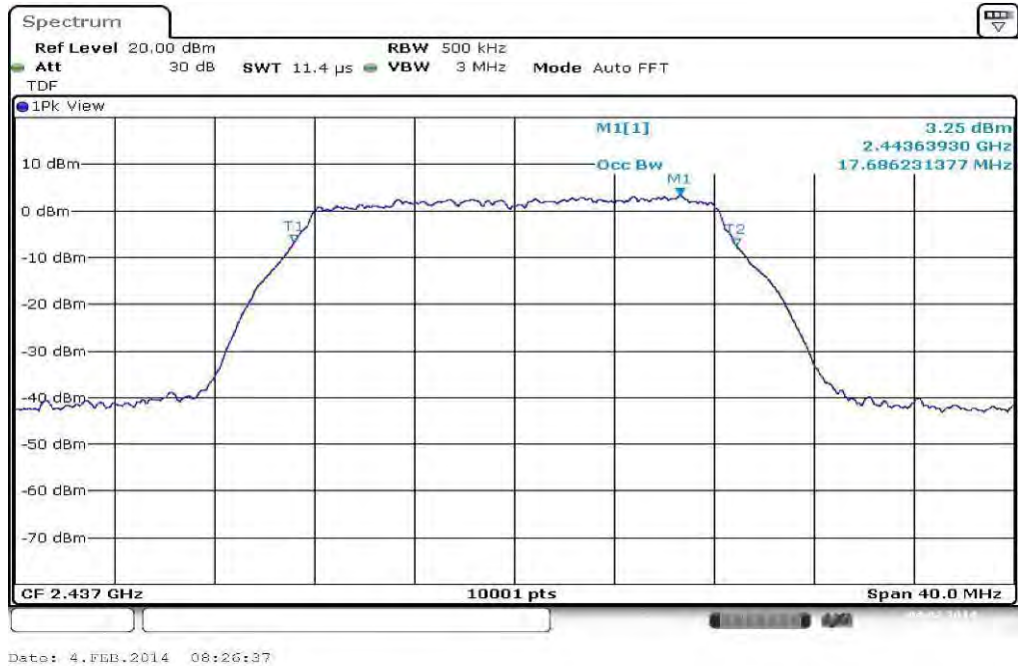
Date: 4.FEB.2014 08:07:36

Plots: OFDM / g – mode

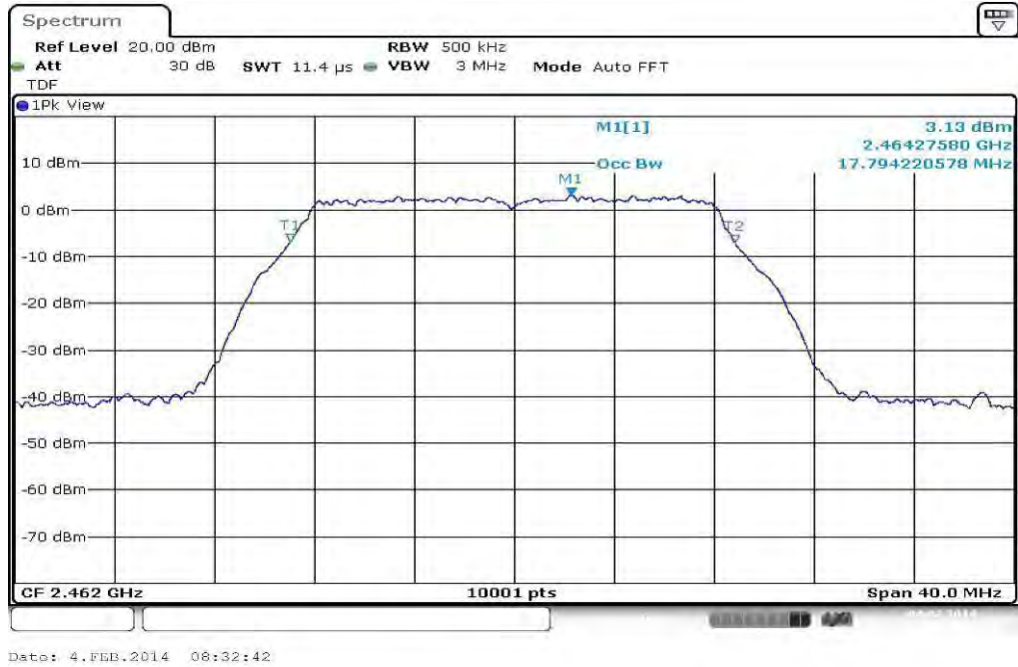
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



Plot 3: TX mode, highest channel

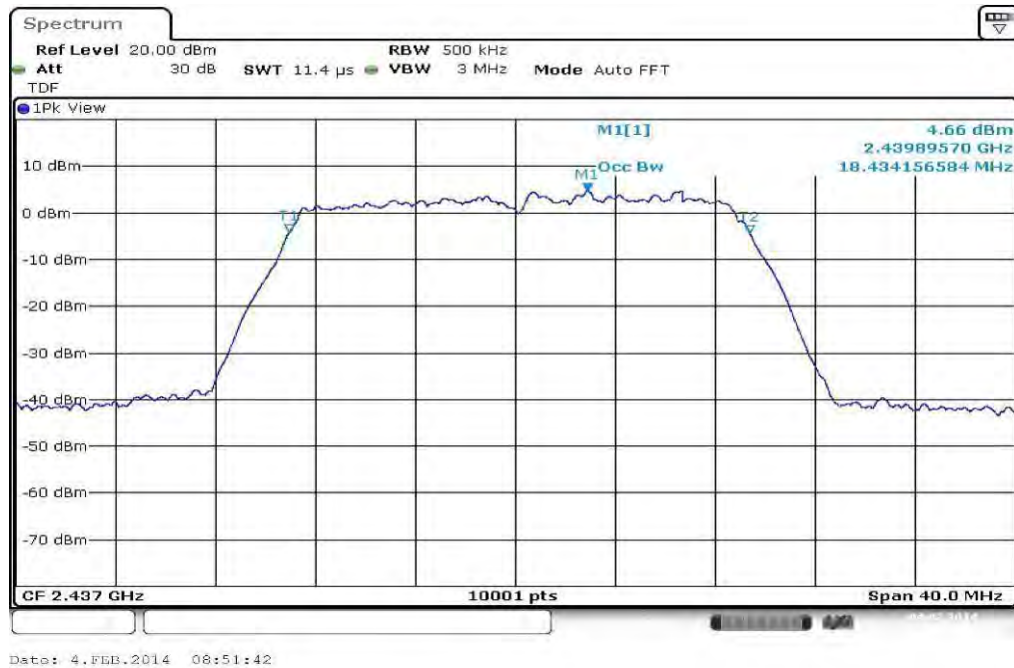


Plots: OFDM / n – mode

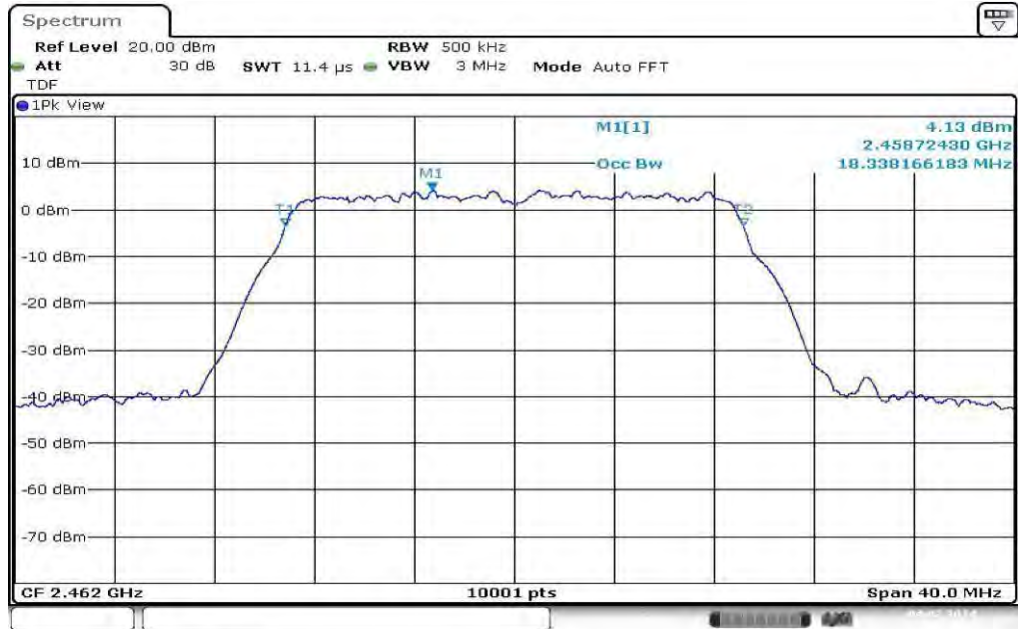
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



Plot 3: TX mode, highest channel



11.7 Band edge compliance conducted

Description:

Measurement of the conducted band edge compliance. EUT is measured at the lower and upper band edge in both modes.

Measurement:

| Measurement parameter | |
|---------------------------------|--|
| According to DTS clause: 13.2.1 | |
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 100 kHz |
| Video bandwidth: | 500 kHz |
| Span: | Lower Band Edge: 2300 – 2425 MHz Upper Band Edge: 2450 – 2550 MHz |
| Trace-Mode: | Max hold |

Limits:

| FCC | IC |
|--|----|
| Band Edge Compliance Conducted | |
| <p>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 RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.</p> | |

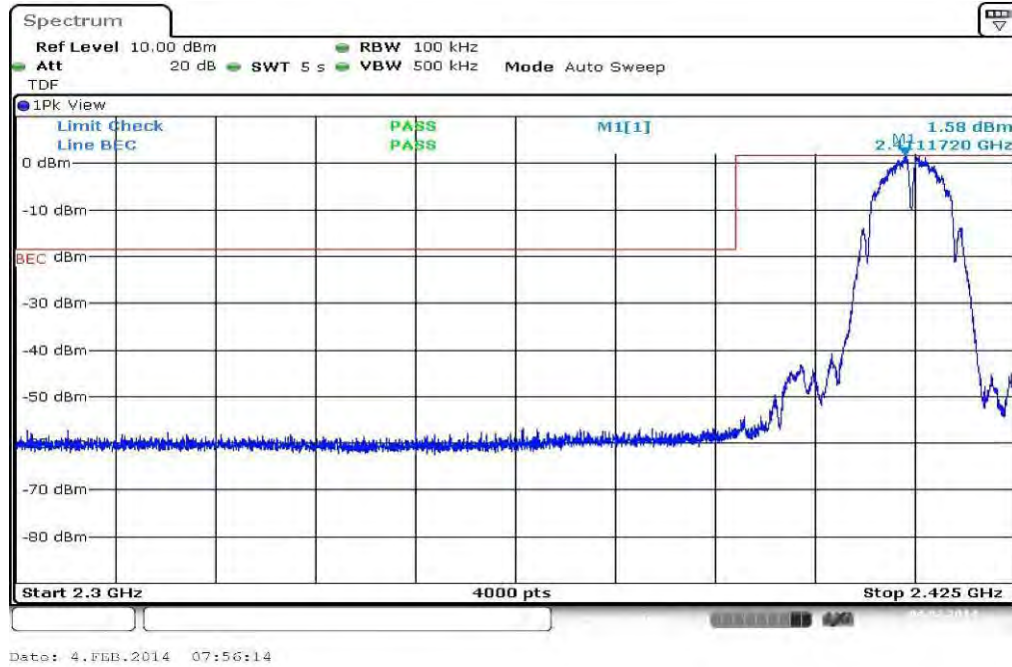
Results:

| Scenario Modulation | Band Edge Compliance Conducted [dB] | | |
|------------------------------|-------------------------------------|-----------------|-----------------|
| | DSSS / b – mode | OFDM / g – mode | OFDM / n – mode |
| Lower Band Edge – Channel 1 | > 20 dB | > 20 dB | > 20 dB |
| Upper Band Edge – Channel 11 | > 20 dB | > 20 dB | > 20 dB |
| Measurement uncertainty | ± 1.5 dB | | |

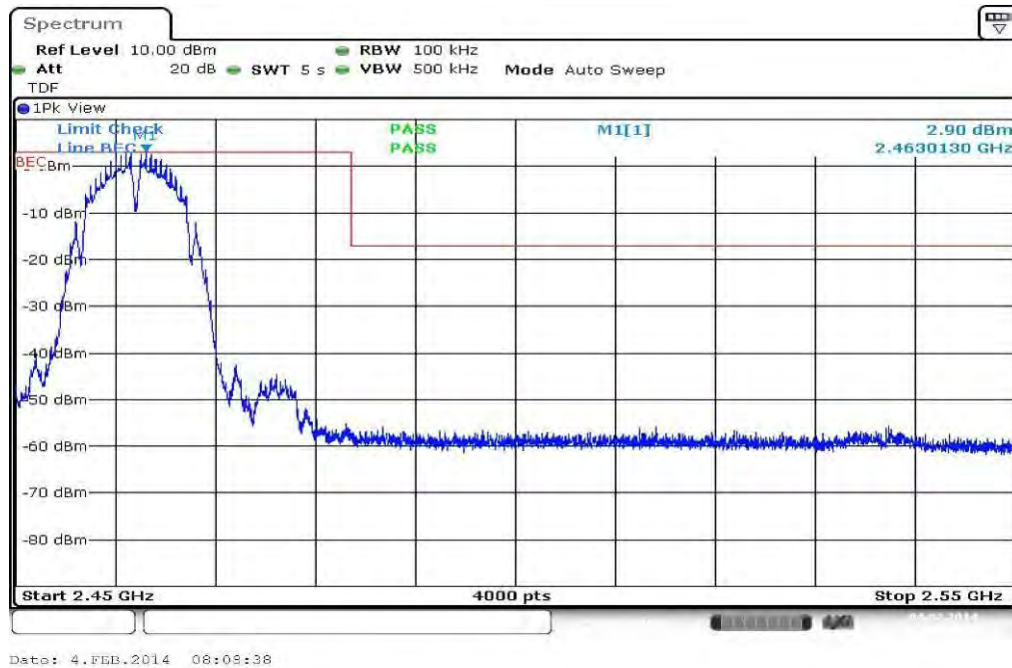
Result: Passed

Plots: DSSS / b – mode

Plot 1: TX mode, lower band edge

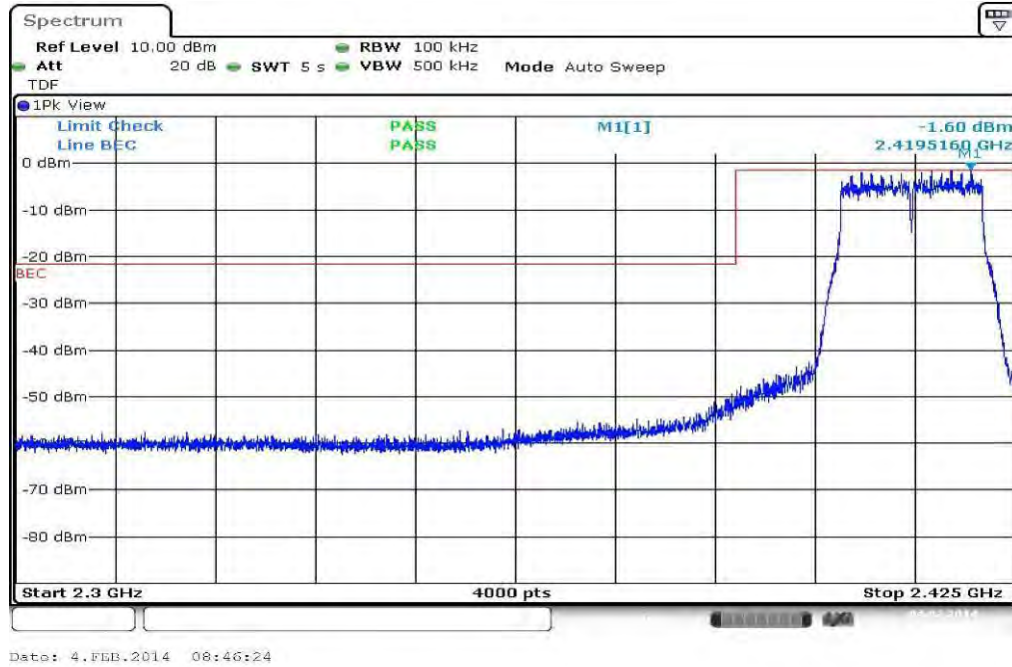


Plot 2: TX mode, upper band edge

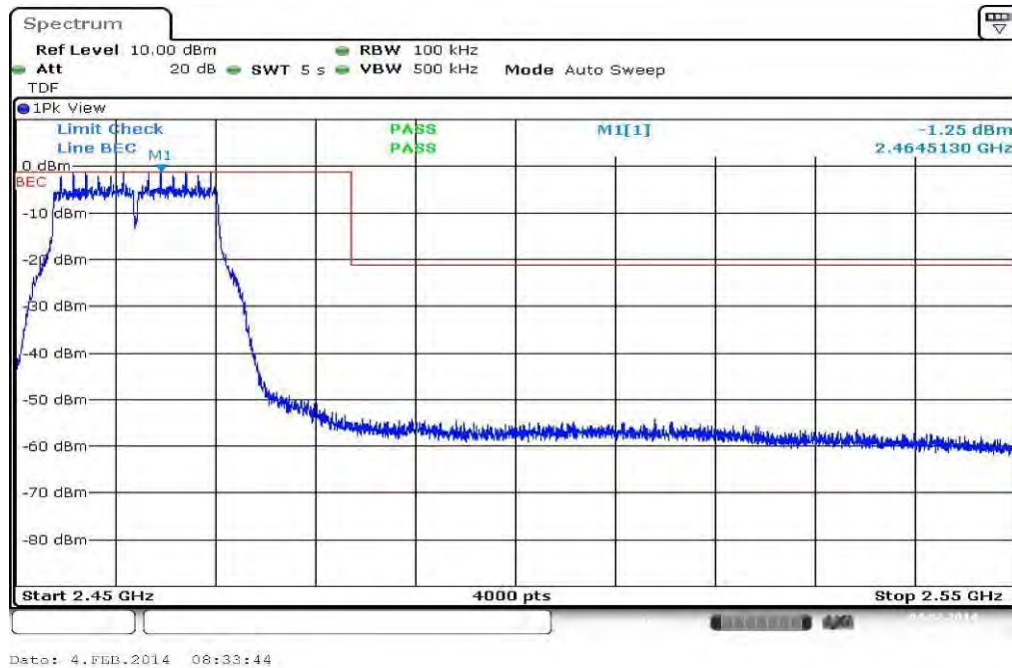


Plots: OFDM / n – mode

Plot 1: TX mode, lower band edge



Plot 2: TX mode, upper band edge



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 channel 1 for the lower restricted band and to channel 11 for the upper restricted band. The measurement is repeated for all modulations. Measurement distance is 3m.

Measurement:

| Measurement parameter | |
|-----------------------|---------------|
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 1 MHz / 1 MHz |
| Video bandwidth: | 1 MHz / 10 Hz |
| Span: | See plot! |
| Trace-Mode: | Max Hold |

Limits:

| FCC | IC |
|---|----|
| Band Edge Compliance Radiated | |
| <p>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 RF 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)).</p> | |
| 54 dBµV/m AVG | |

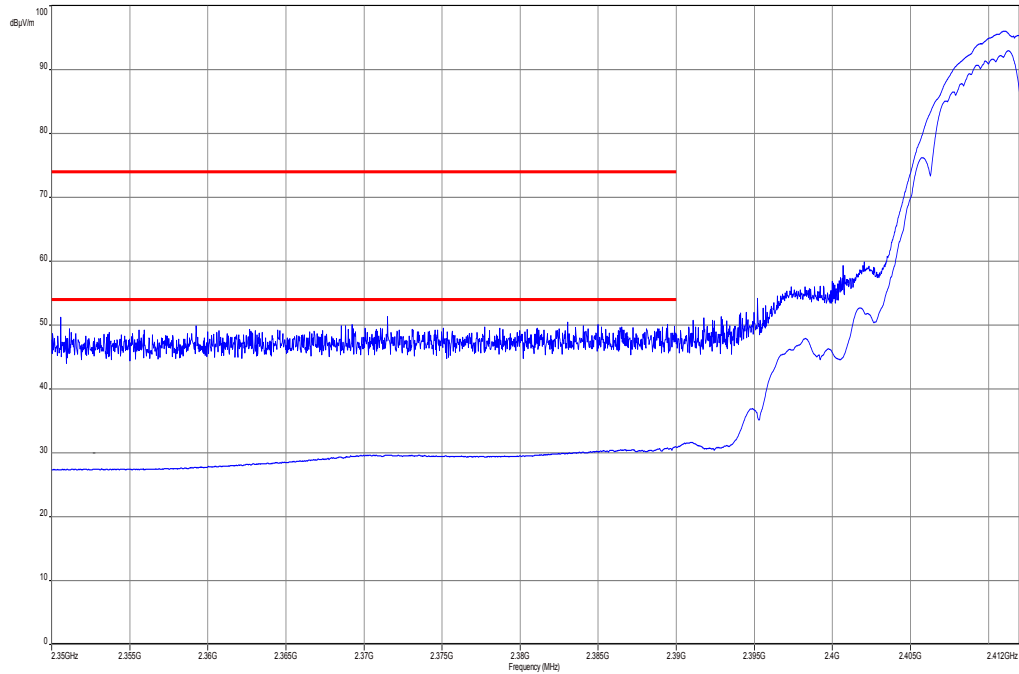
Results:

| Scenario Modulation | Band Edge Compliance Conducted [dB] | | |
|------------------------------|-------------------------------------|---------------------------------|---------------------------------|
| | DSSS / b – mode | OFDM / g – mode | OFDM / n – mode |
| Lower Band Edge – Channel 1 | > 20 dB (Peak) > 20 dB (AVG) | > 10 dB (Peak) > 10 dB (AVG) | > 10 dB (Peak) > 10 dB (AVG) |
| Upper Band Edge – Channel 11 | > 20 dB (Peak) > 20 dB (AVG) | > 10 dB (Peak) > 10 dB (AVG) | > 10 dB (Peak) > 10 dB (AVG) |
| Measurement uncertainty | ± 3 dB | | |

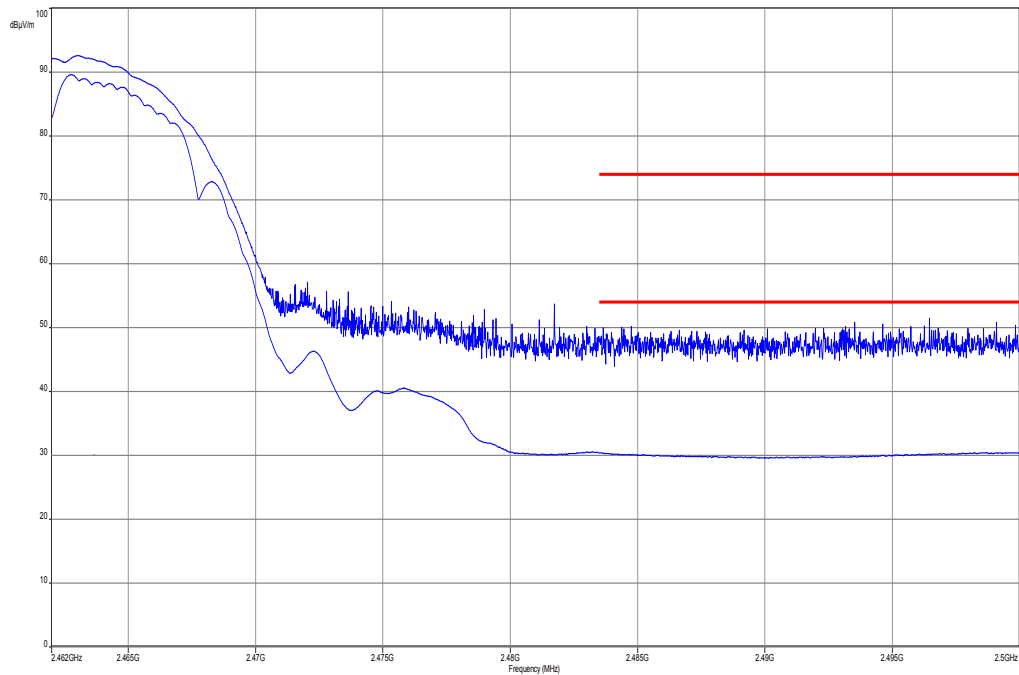
Result: Passed

Plots: DSSS/ b – mode peak / average

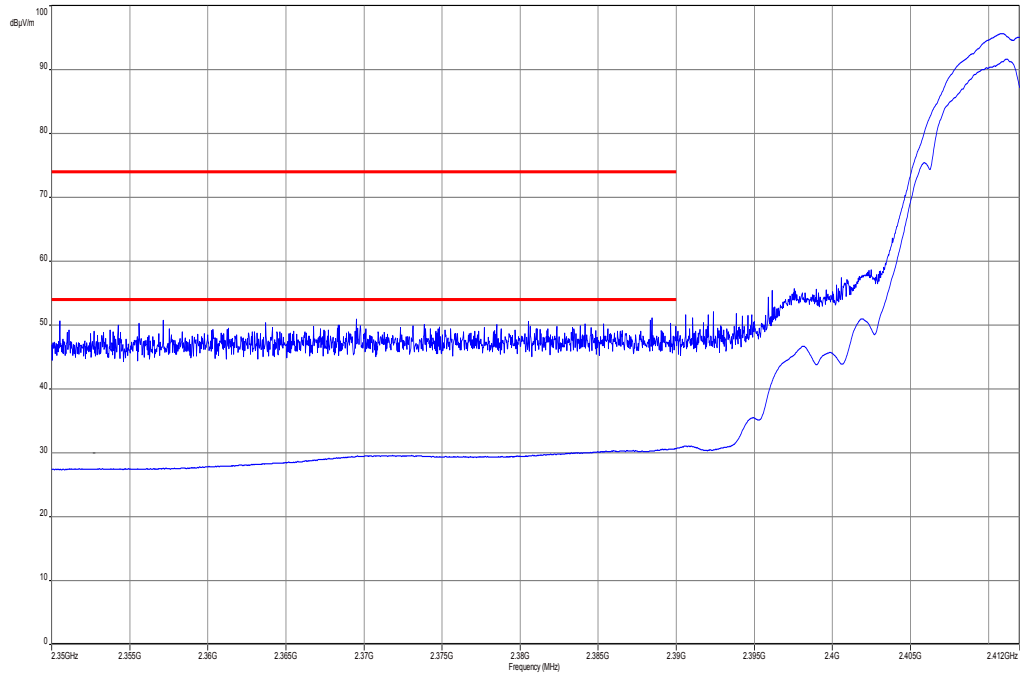
Plot 1: TX mode, lower band edge, vertical & horizontal polarization, low data rate



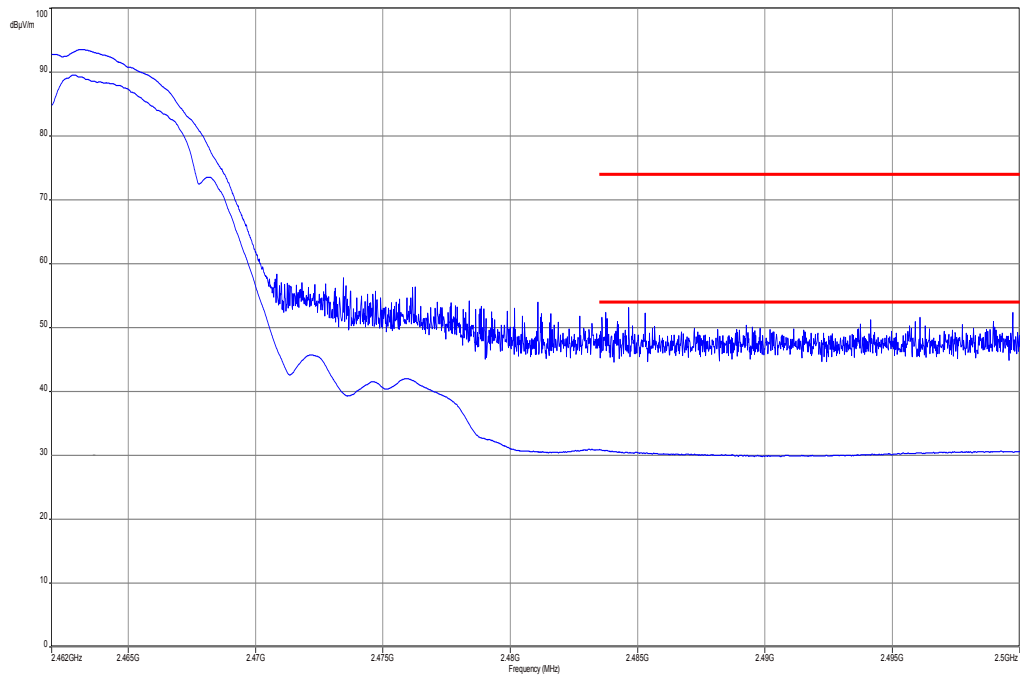
Plot 2: TX mode, upper band edge, vertical & horizontal polarization, low data rate



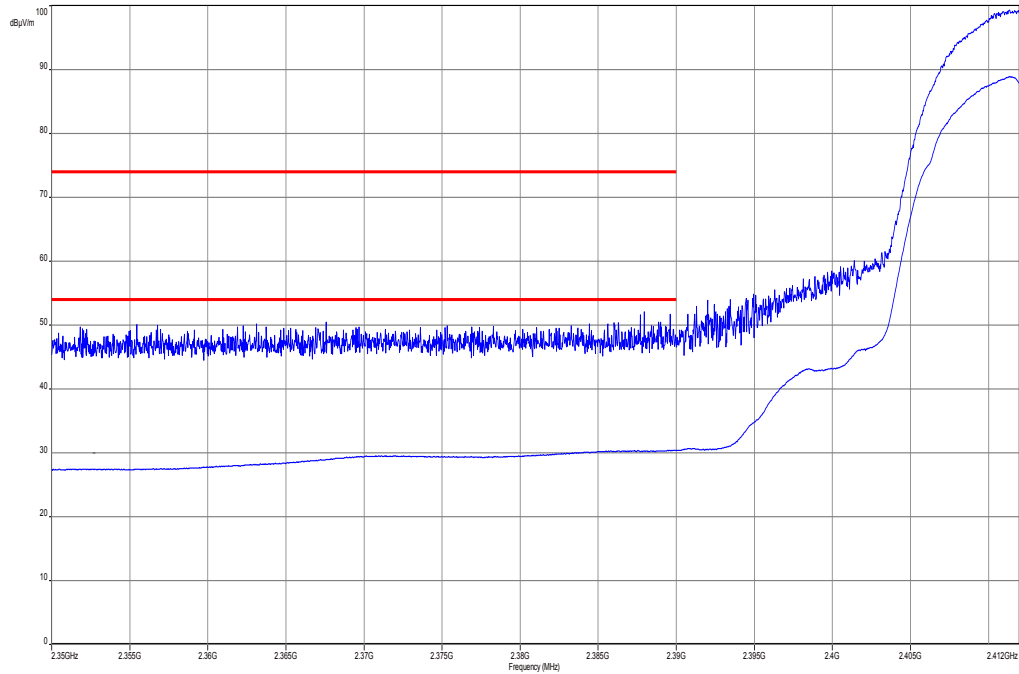
Plot 3: TX mode, lower band edge, vertical & horizontal polarization, high power data rate



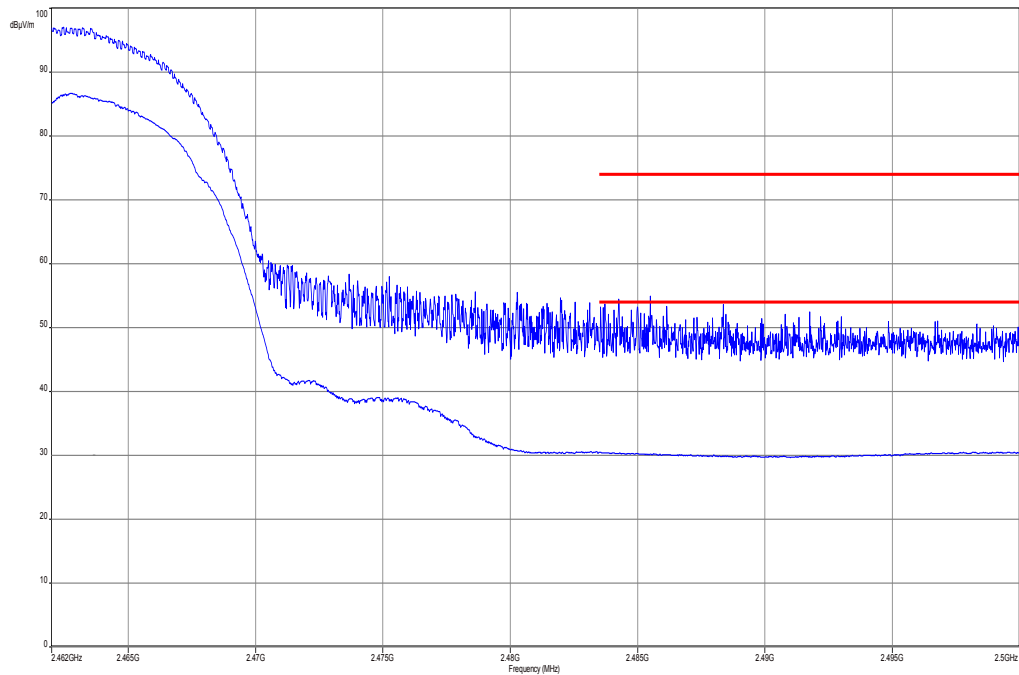
Plot 4: TX mode, upper band edge, vertical & horizontal polarization, high power data rate



Plot 5: TX mode, lower band edge, vertical & horizontal polarization, high data rate

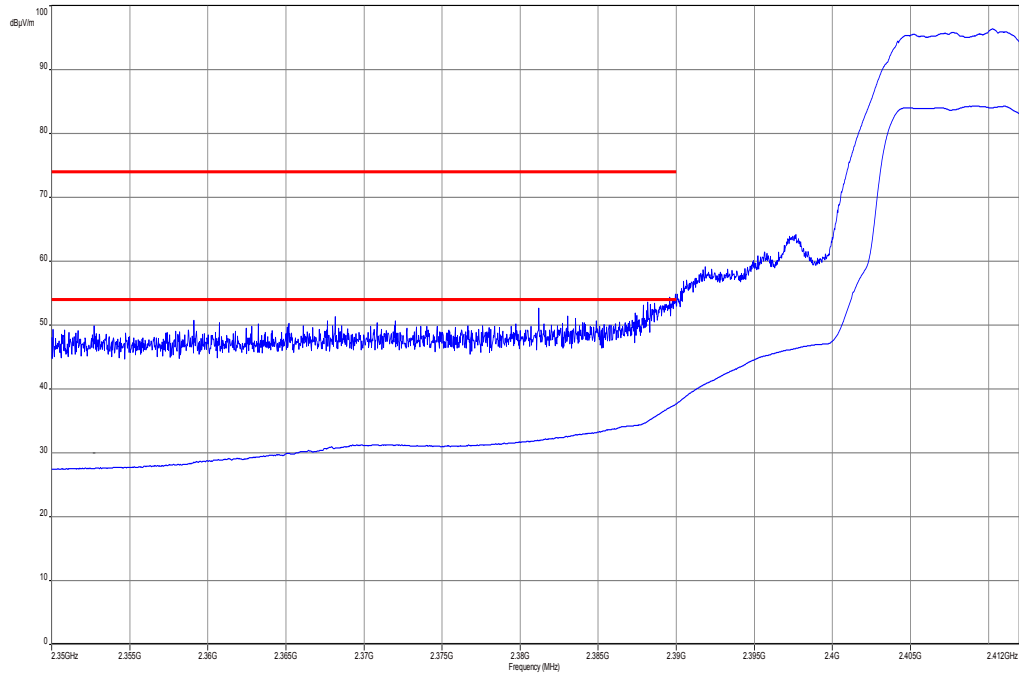


Plot 6: TX mode, upper band edge, vertical & horizontal polarization, high data rate

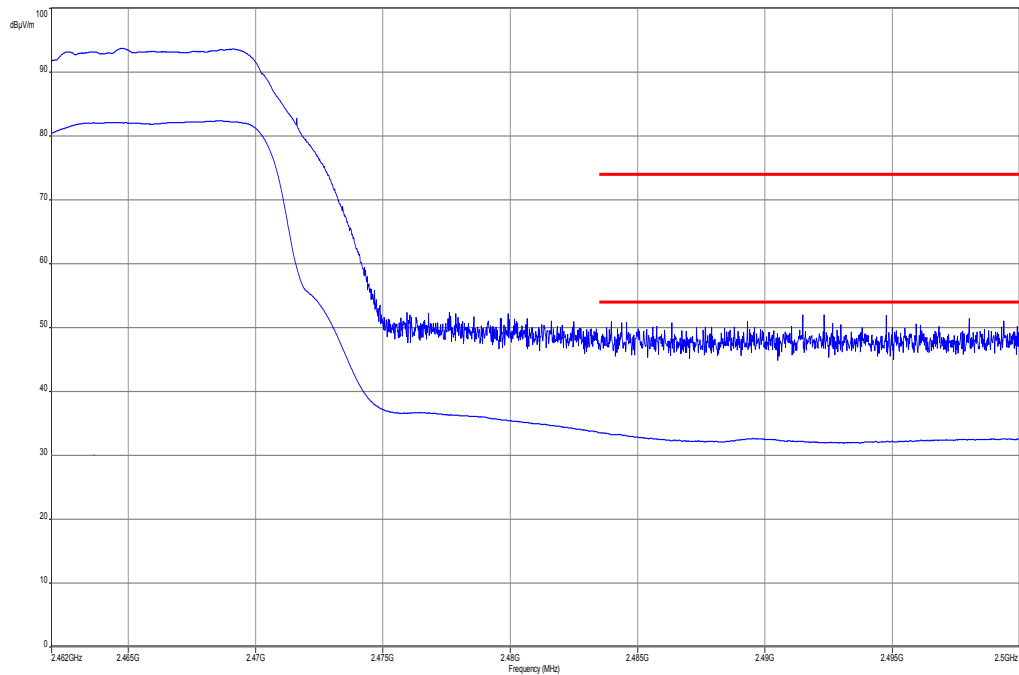


Plots: OFDM / g – mode peak / average

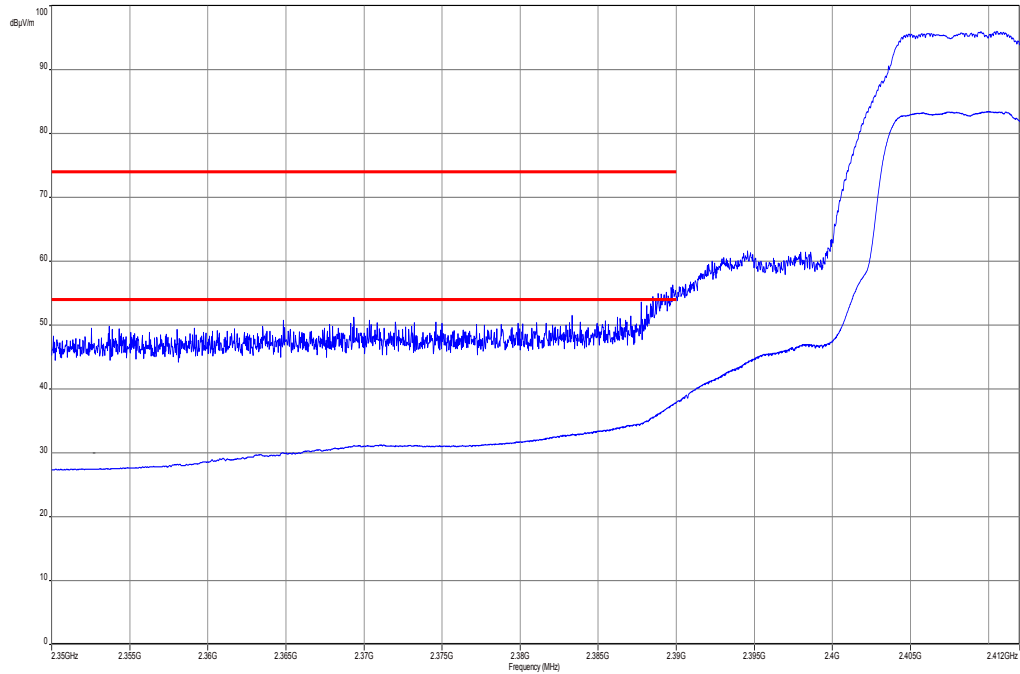
Plot 1: TX mode, lower band edge, vertical & horizontal polarization, low data rate



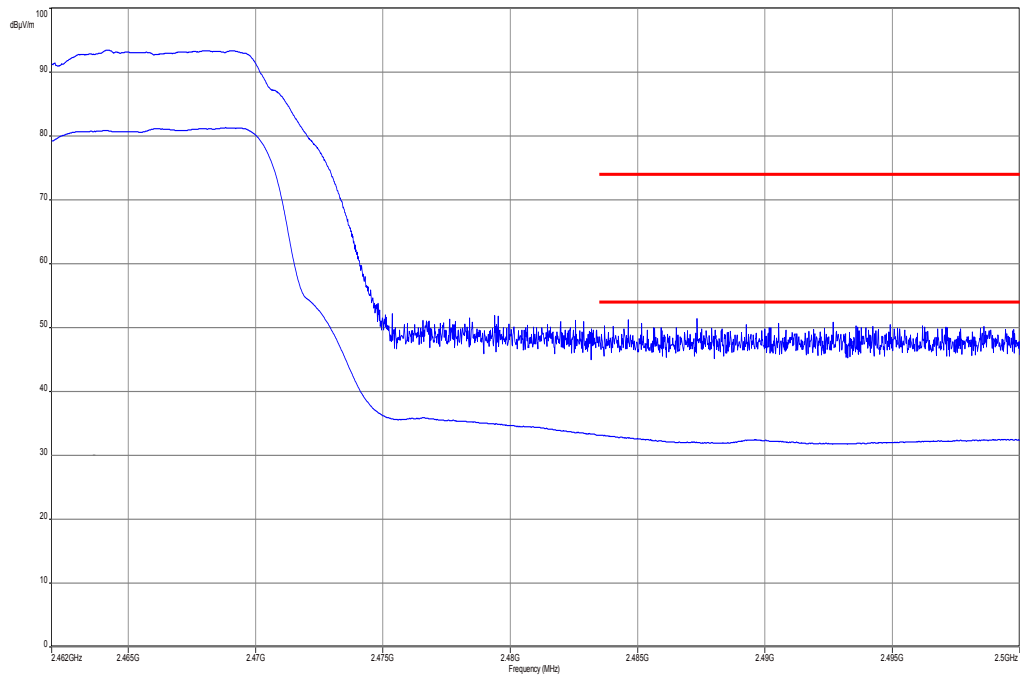
Plot 2: TX mode, upper band edge, vertical & horizontal polarization, low data rate



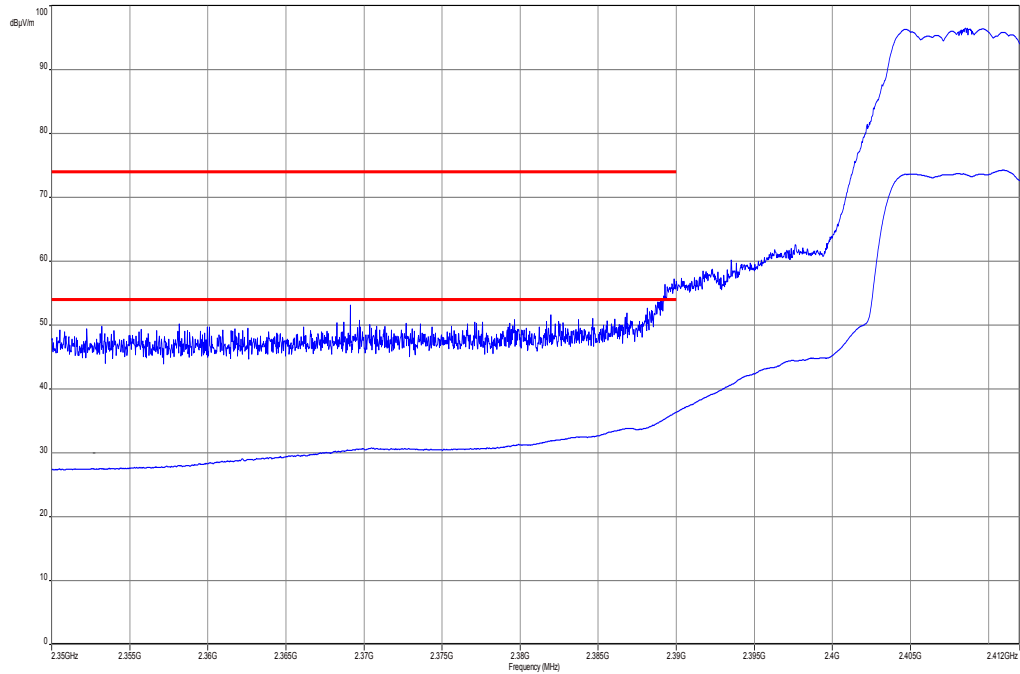
Plot 3: TX mode, lower band edge, vertical & horizontal polarization, high power data rate



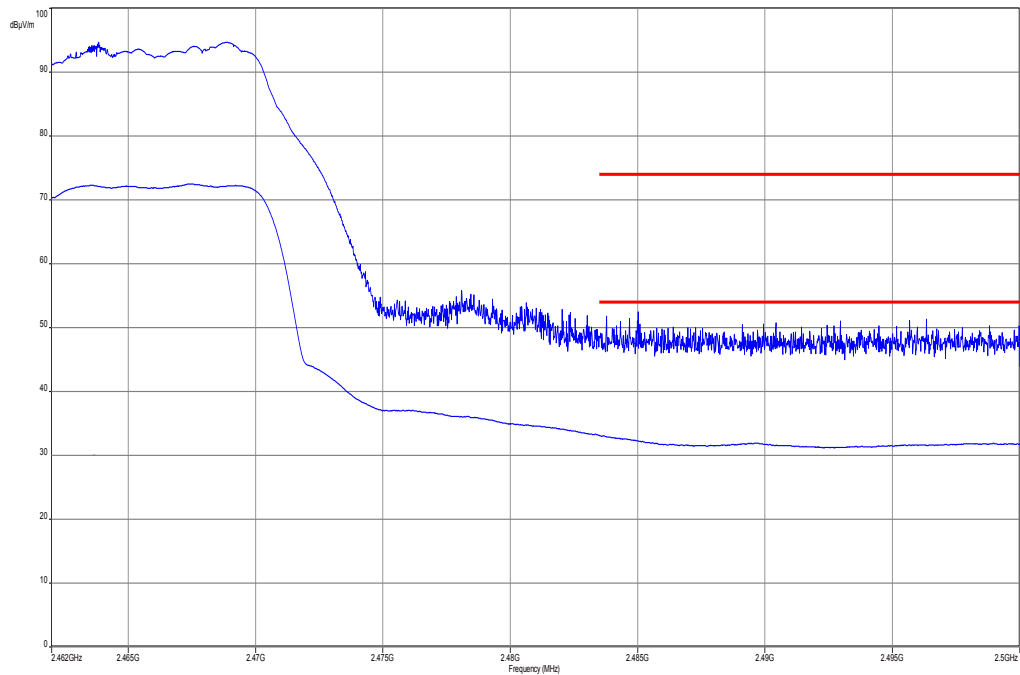
Plot 4: TX mode, upper band edge, vertical & horizontal polarization, high power data rate



Plot 5: TX mode, lower band edge, vertical & horizontal polarization, high data rate

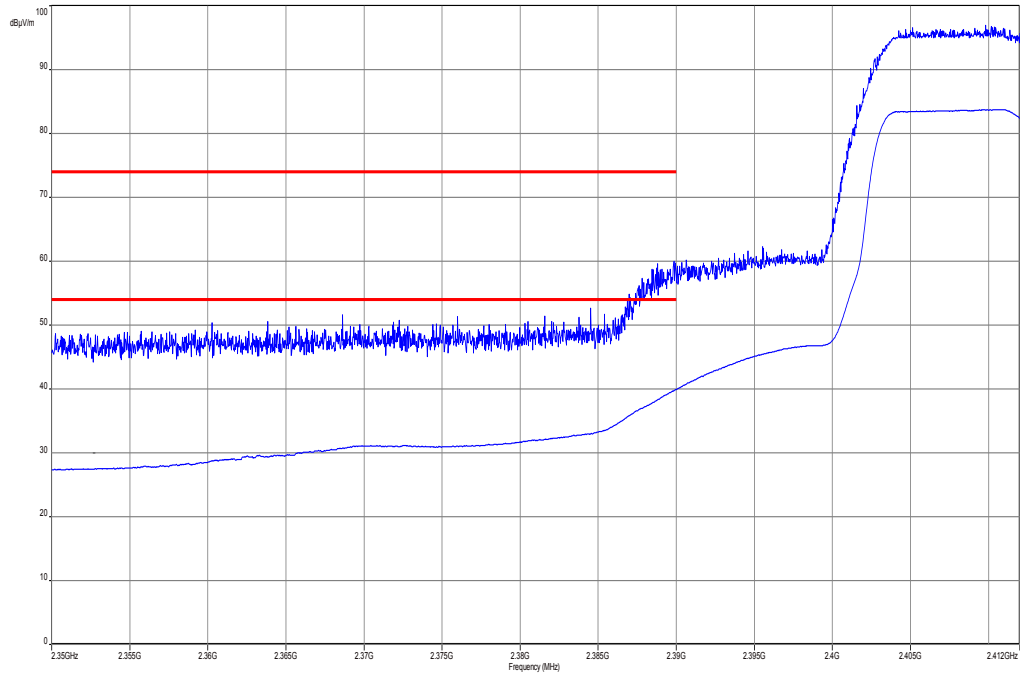


Plot 6: TX mode, upper band edge, vertical & horizontal polarization, high data rate

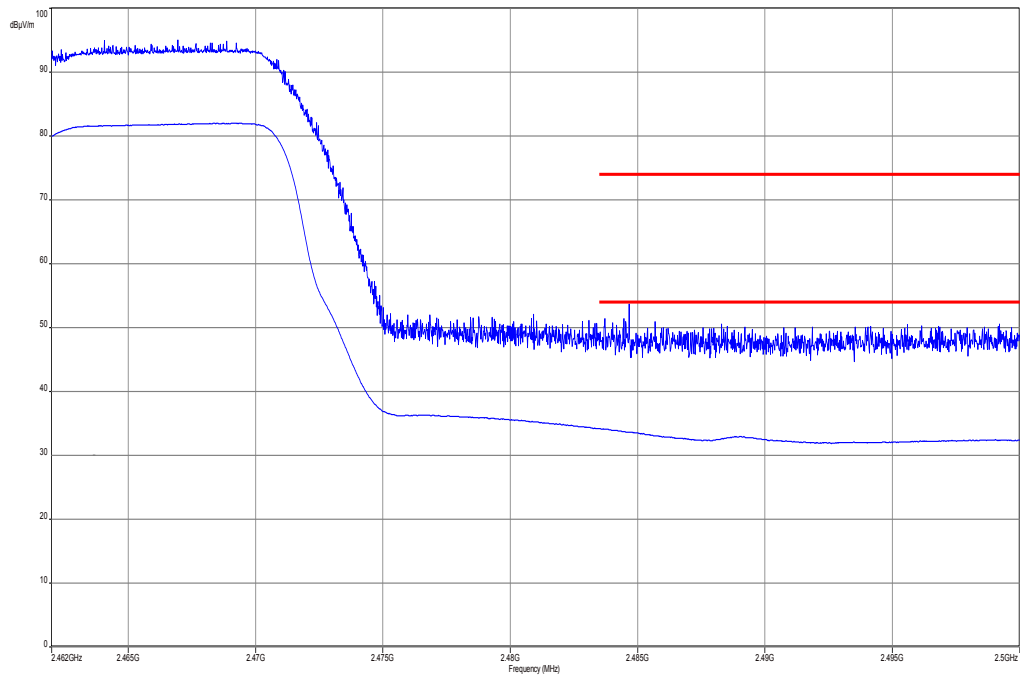


Plots: OFDM / n – mode peak / average

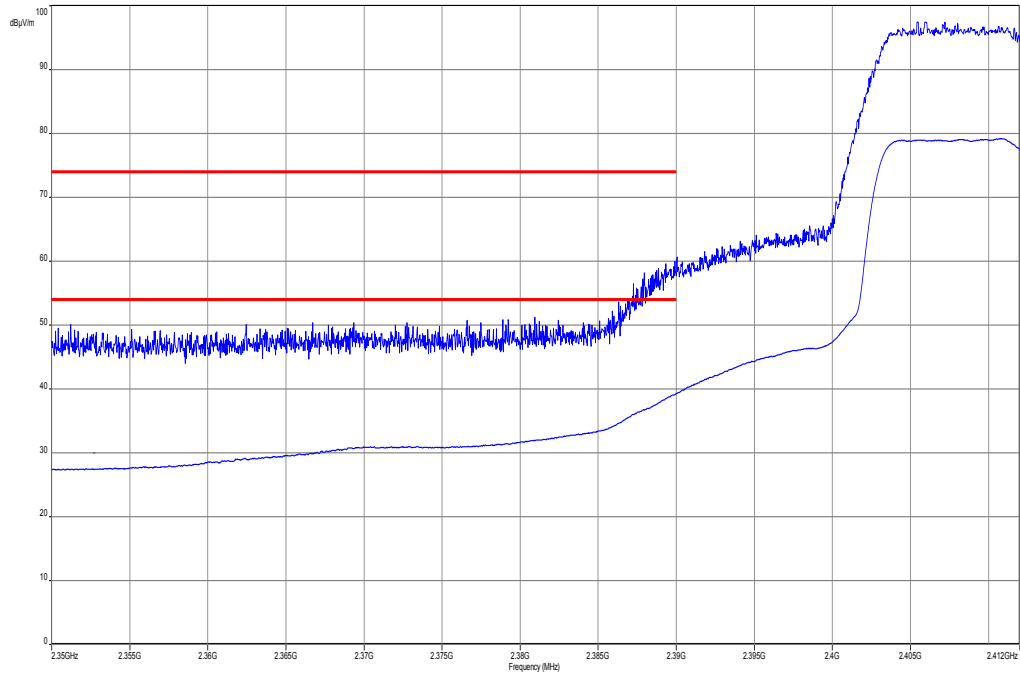
Plot 1: TX mode, lower band edge, vertical & horizontal polarization, low data rate



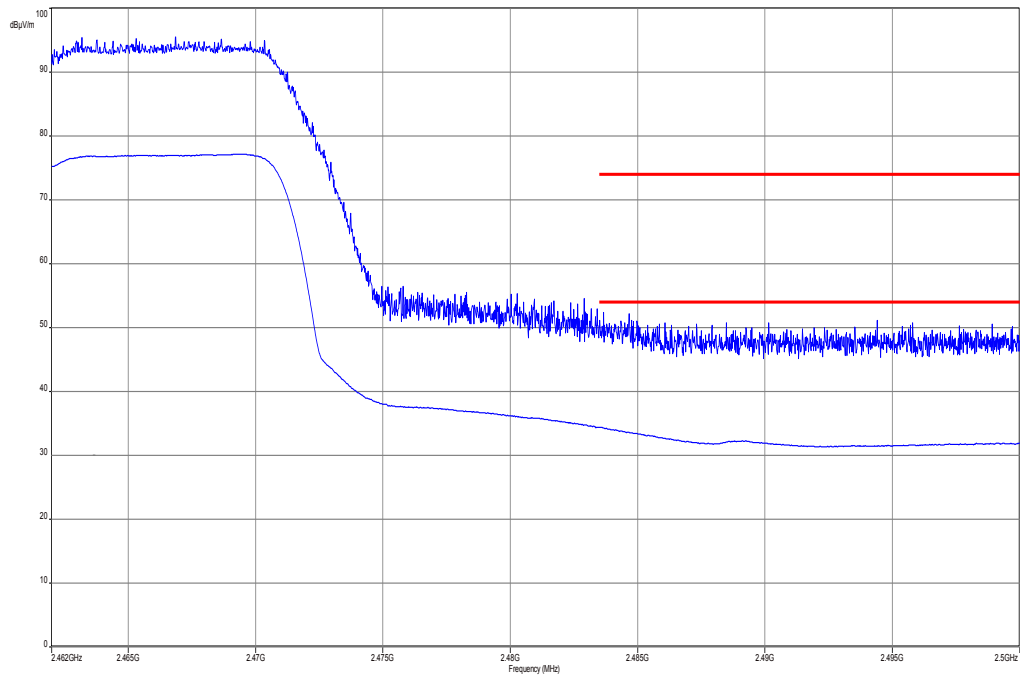
Plot 2: TX mode, upper band edge, vertical & horizontal polarization, low data rate



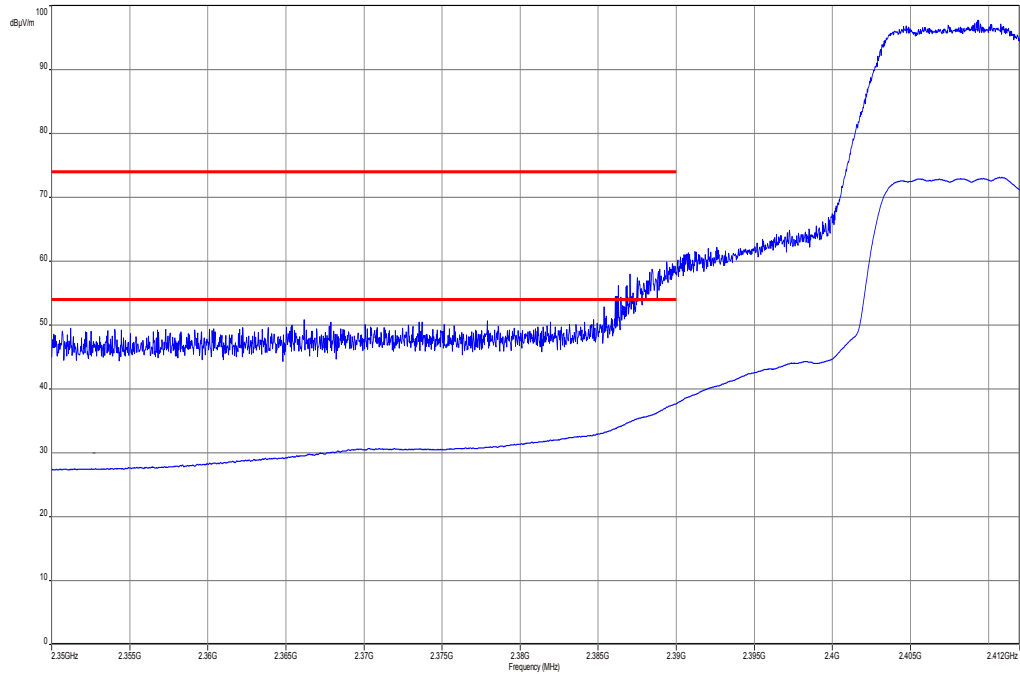
Plot 3: TX mode, lower band edge, vertical & horizontal polarization, high power data rate



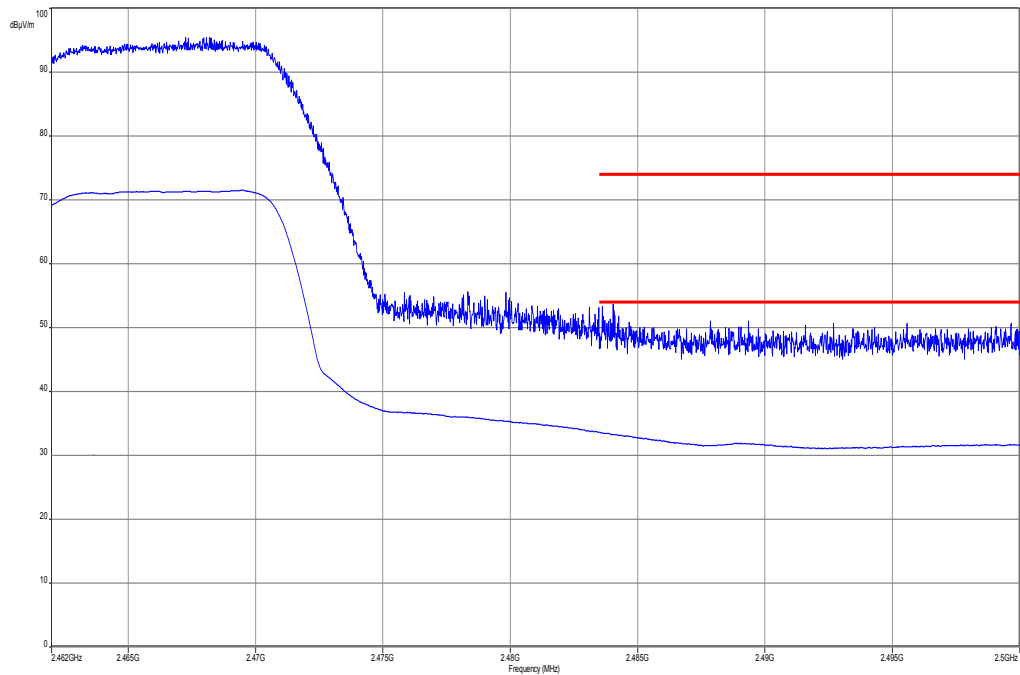
Plot 4: TX mode, upper band edge, vertical & horizontal polarization, high power data rate



Plot 5: TX mode, lower band edge, vertical & horizontal polarization, high data rate



Plot 6: TX mode, upper band edge, vertical & horizontal polarization, high data rate



11.9 TX spurious emissions conducted

Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

| Measurement parameter | |
|-----------------------|-----------------|
| According to: | |
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 100 kHz |
| Video bandwidth: | 500 kHz |
| Span: | 9 kHz to 25 GHz |
| Trace-Mode: | Max Hold |

Limits:

| FCC | IC |
|---|----|
| TX Spurious Emissions Conducted | |
| <p>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 RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required</p> | |

Results: DSSS / b – mode

| TX Spurious Emissions Conducted | | | | | |
|---|--|-----------------------------|-------------------------------------|--|---------------------|
| DSSS / b – mode | | | | | |
| f [MHz] | | amplitude of emission [dBm] | limit max. allowed emission power | actual attenuation below frequency of operation [dB] | results |
| 2412 | | 1.87 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) -30 dBc (average) | | complies |
| | | | | | |
| 2437 | | 2.43 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) -30 dBc (average) | | complies |
| | | | | | |
| 2462 | | 3.13 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) -30 dBc (average) | | complies |
| | | | | | |
| Measurement uncertainty | | ± 3 dB | | | |

Result: Passed

Results: OFDM / g – mode

| TX Spurious Emissions Conducted | | | | | |
|---|--|-----------------------------|-------------------------------------|--|---------------------|
| OFDM / g – mode | | | | | |
| f [MHz] | | amplitude of emission [dBm] | limit max. allowed emission power | actual attenuation below frequency of operation [dB] | results |
| 2412 | | -1.48 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) -30 dBc (average) | | complies |
| | | | | | |
| 2437 | | -1.15 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) -30 dBc (average) | | complies |
| | | | | | |
| 2462 | | -1.31 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) -30 dBc (average) | | complies |
| | | | | | |
| Measurement uncertainty | | ± 3 dB | | | |

Result: Passed

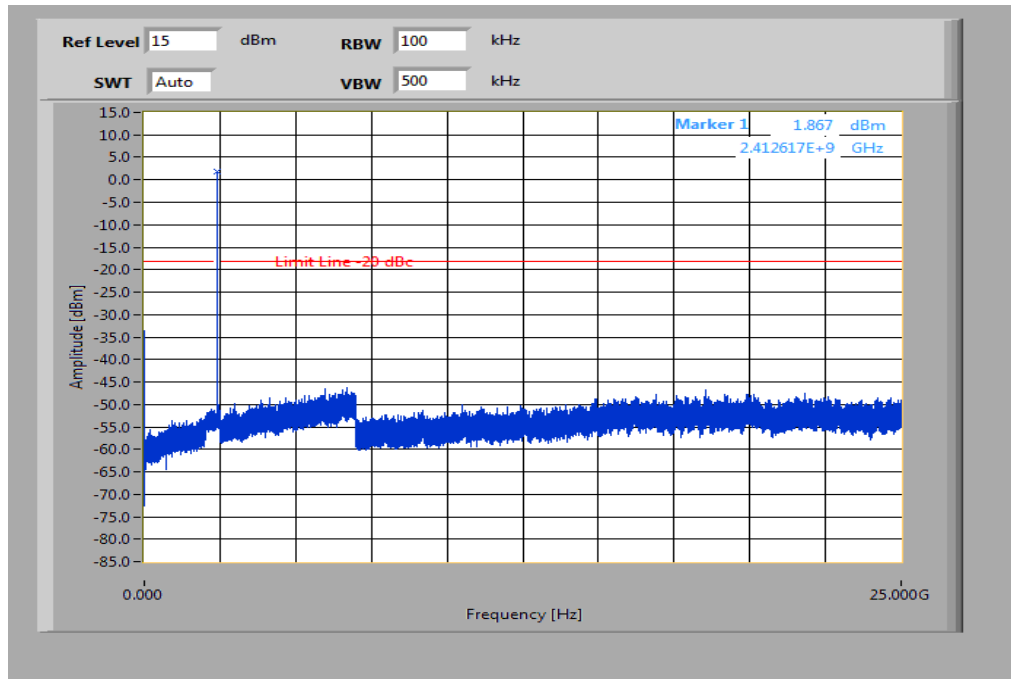
Results: OFDM / n – mode

| TX Spurious Emissions Conducted | | | | | |
|---|--|-----------------------------|-----------------------------------|--|---------------------|
| OFDM / n – mode | | | | | |
| f [MHz] | | amplitude of emission [dBm] | limit max. allowed emission power | actual attenuation below frequency of operation [dB] | results |
| 2412 | | -1.46 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) | | complies |
| | | | -30 dBc (average) | | |
| 2437 | | -1.26 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) | | complies |
| | | | -30 dBc (average) | | |
| 2462 | | -1.53 | 30 dBm | | Operating frequency |
| No peaks detected. All detected emissions are below the -20 dBc criteria. | | | -20 dBc (peak) | | complies |
| | | | -30 dBc (average) | | |
| Measurement uncertainty | | ± 3 dB | | | |

Result: Passed

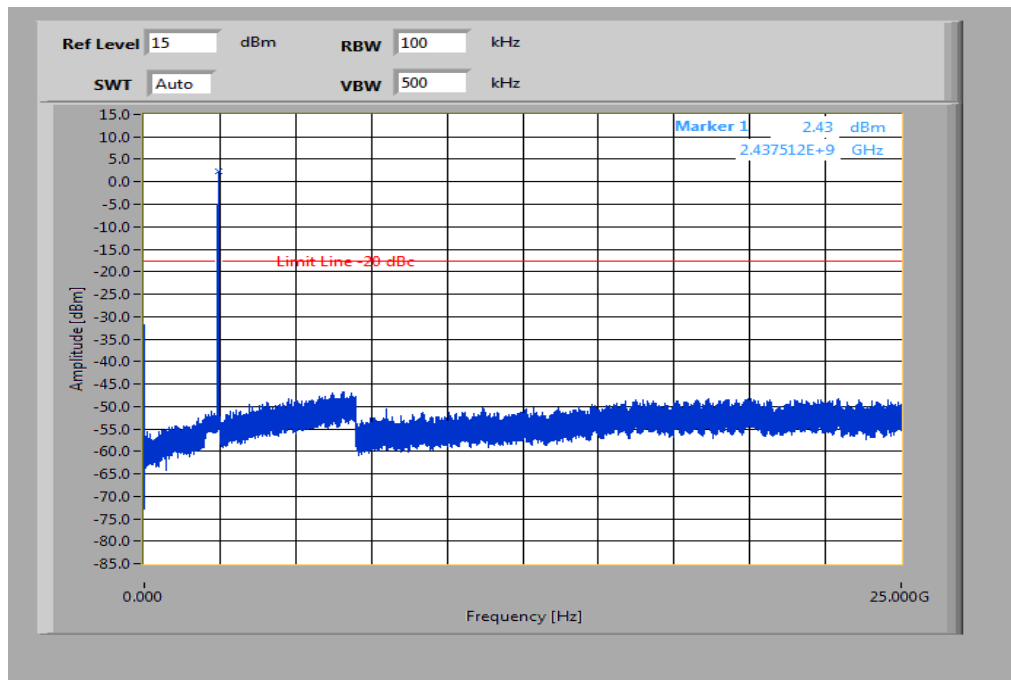
Plots: DSSS / b – mode

Plot 1: TX mode, lowest channel, up to 25 GHz



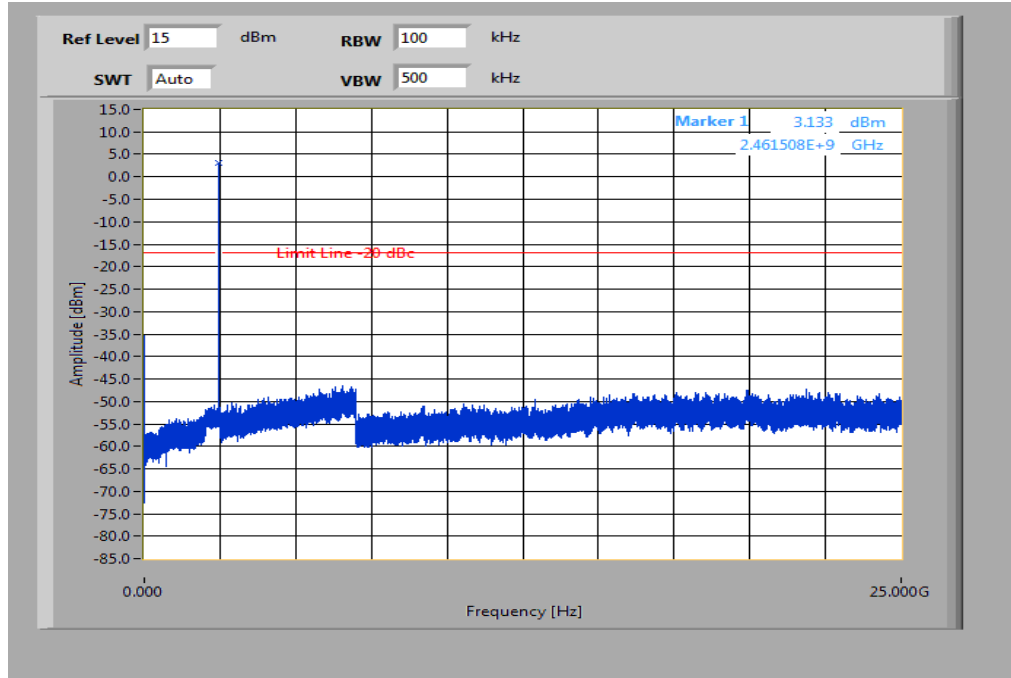
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

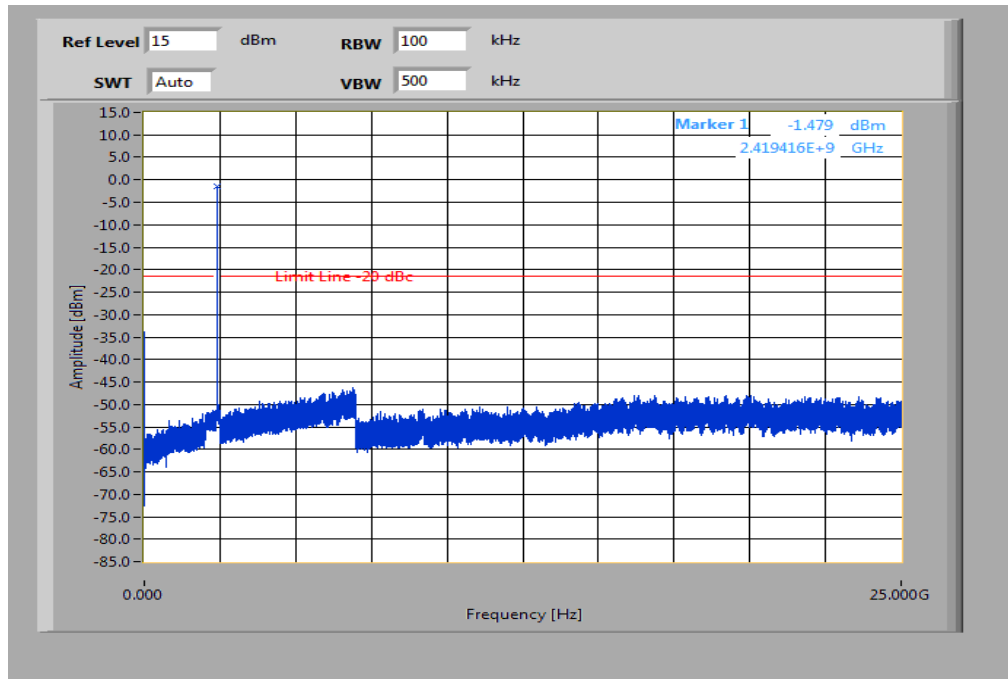
Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

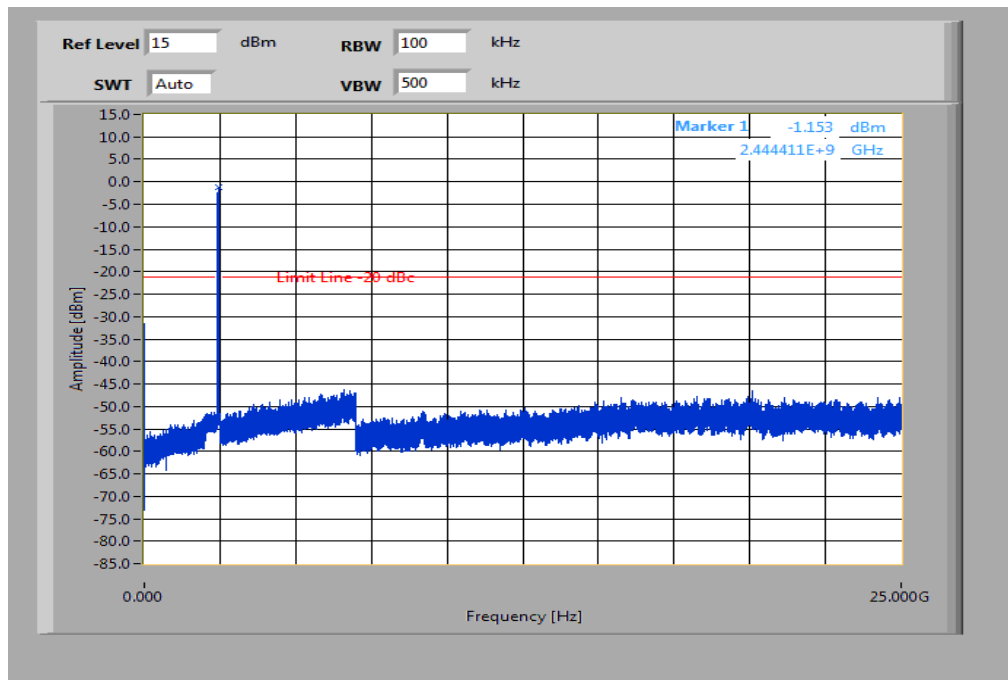
Plots: OFDM / g – mode

Plot 1: TX mode, lowest channel, up to 25 GHz



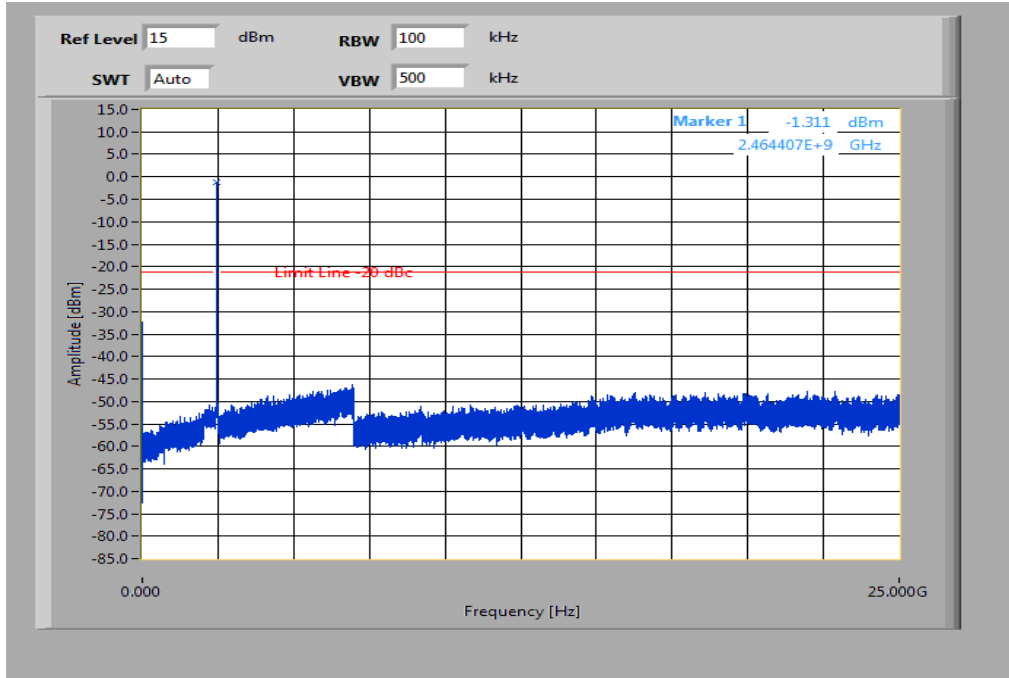
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

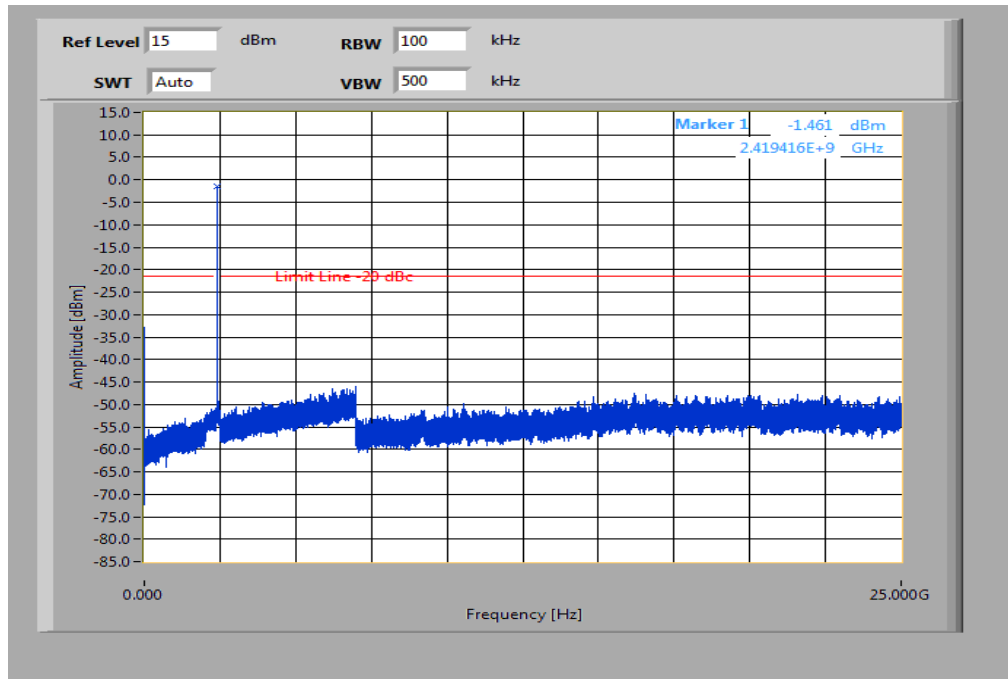
Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

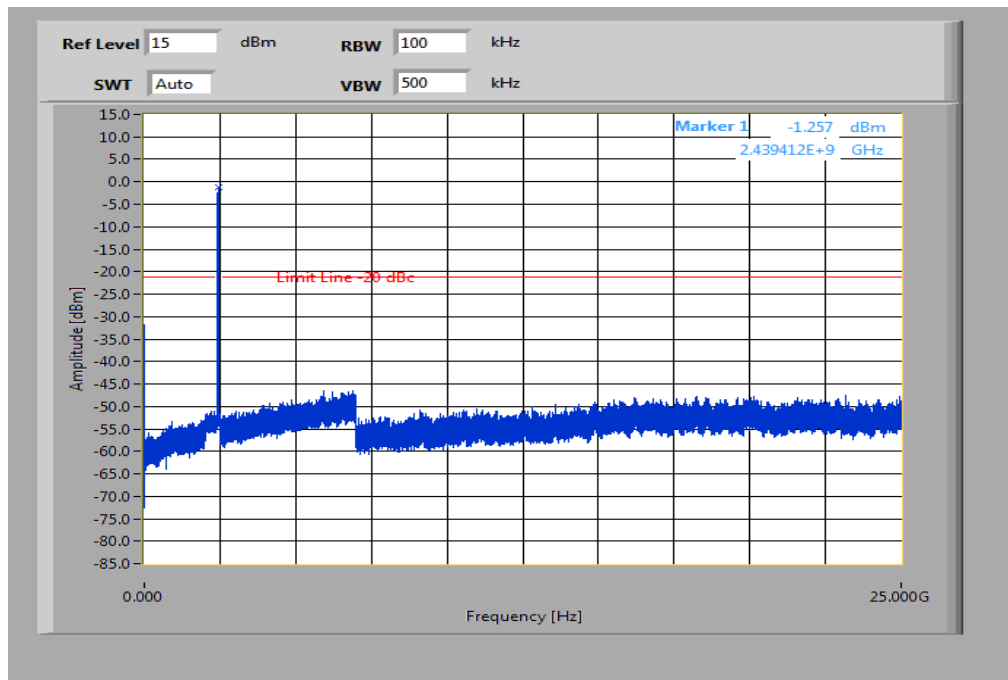
Plots: OFDM / n – mode

Plot 1: TX mode, lowest channel, up to 25 GHz



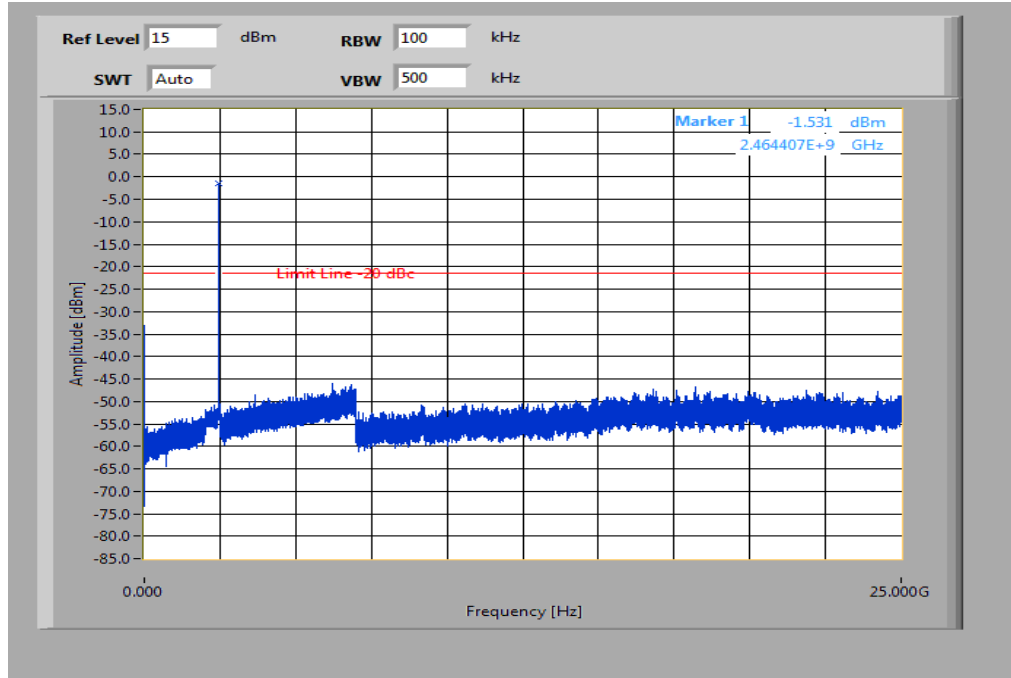
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

11.10 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

| Measurement parameter | |
|-----------------------|---|
| Detector: | Peak / Quasi Peak / RMS |
| Sweep time: | Auto |
| Resolution bandwidth: | F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz |
| Video bandwidth: | 3 x RBW Remeasurement: 10 Hz / 3 MHz |
| Span: | 30 MHz to 26 GHz |
| Trace-Mode: | Max Hold |
| Measured Modulation | <input checked="" type="checkbox"/> DSSS b – mode <input checked="" type="checkbox"/> OFDM g – mode <input checked="" type="checkbox"/> OFDM n – mode |

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

Limits:

| FCC | IC | |
|--|-------------------------|----------------------|
| TX Spurious Emissions 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 RF 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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)). | | |
| 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: DSSS / b – mode

| TX Spurious Emissions Radiated [dBµV/m] | | | | | | | | |
|--|----------|----------------|--|----------|----------------|--|----------|----------------|
| DSSS / b – mode | | | | | | | | |
| 2412 MHz | | | 2437 MHz | | | 2462 MHz | | |
| F [MHz] | Detector | Level [dBµV/m] | F [MHz] | Detector | Level [dBµV/m] | F [MHz] | Detector | Level [dBµV/m] |
| For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | | For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | | For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | |
| No emissions detected above 1 GHz. | | | No emissions detected above 1 GHz. | | | No emissions detected above 1 GHz. | | |
| Measurement uncertainty | | | ± 3 dB | | | | | |

Result: Passed

Results: OFDM / g – mode

| TX Spurious Emissions Radiated [dBµV/m] | | | | | | | | |
|--|----------|----------------|--|----------|----------------|--|----------|----------------|
| OFDM / g – mode | | | | | | | | |
| 2412 MHz | | | 2437 MHz | | | 2462 MHz | | |
| F [MHz] | Detector | Level [dBµV/m] | F [MHz] | Detector | Level [dBµV/m] | F [MHz] | Detector | Level [dBµV/m] |
| For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | | For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | | For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | |
| No emissions detected above 1 GHz. | | | No emissions detected above 1 GHz. | | | No emissions detected above 1 GHz. | | |
| Measurement uncertainty | | | ± 3 dB | | | | | |

Result: Passed

Results: OFDM / n – mode

| TX Spurious Emissions Radiated [dBµV/m] | | | | | | | | |
|--|----------|----------------|--|----------|----------------|--|----------|----------------|
| OFDM / n – mode | | | | | | | | |
| 2412 MHz | | | 2437 MHz | | | 2462 MHz | | |
| F [MHz] | Detector | Level [dBµV/m] | F [MHz] | Detector | Level [dBµV/m] | F [MHz] | Detector | Level [dBµV/m] |
| For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | | For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | | For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | |
| No emissions detected above 1 GHz. | | | No emissions detected above 1 GHz. | | | No emissions detected above 1 GHz. | | |
| Measurement uncertainty | | | ± 3 dB | | | | | |

Result: Passed

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

Plots: DSSS / b – mode

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

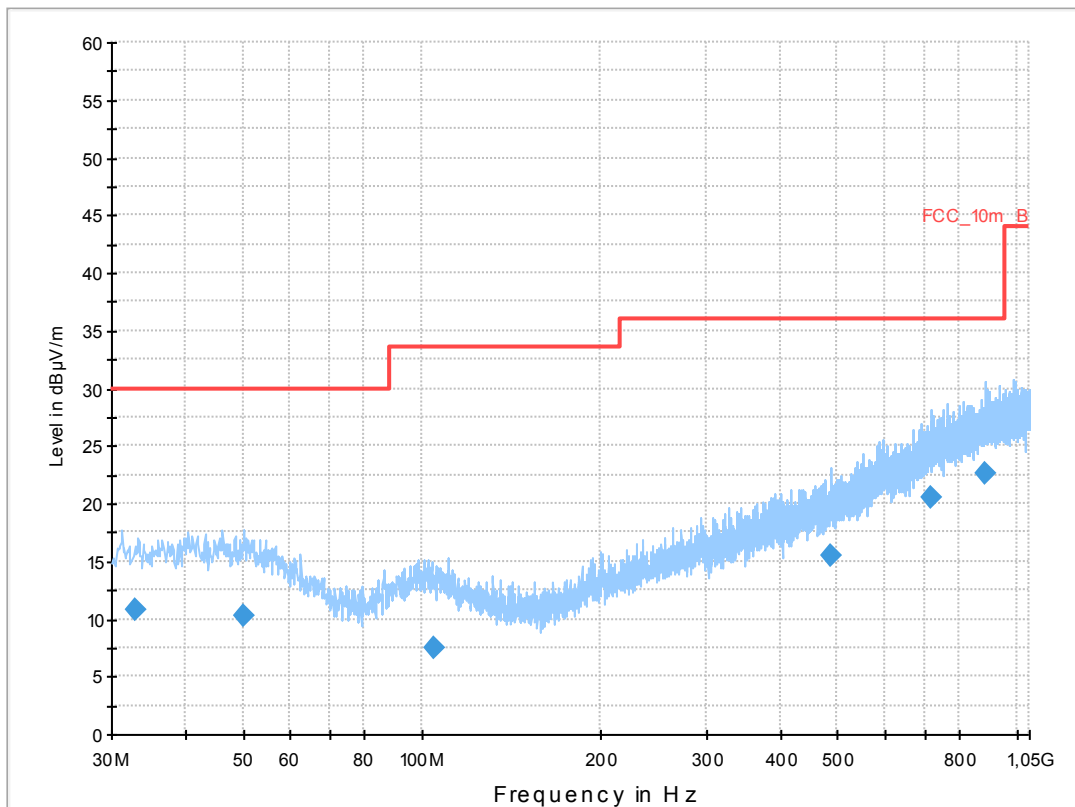
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan b-mode tx ch1
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

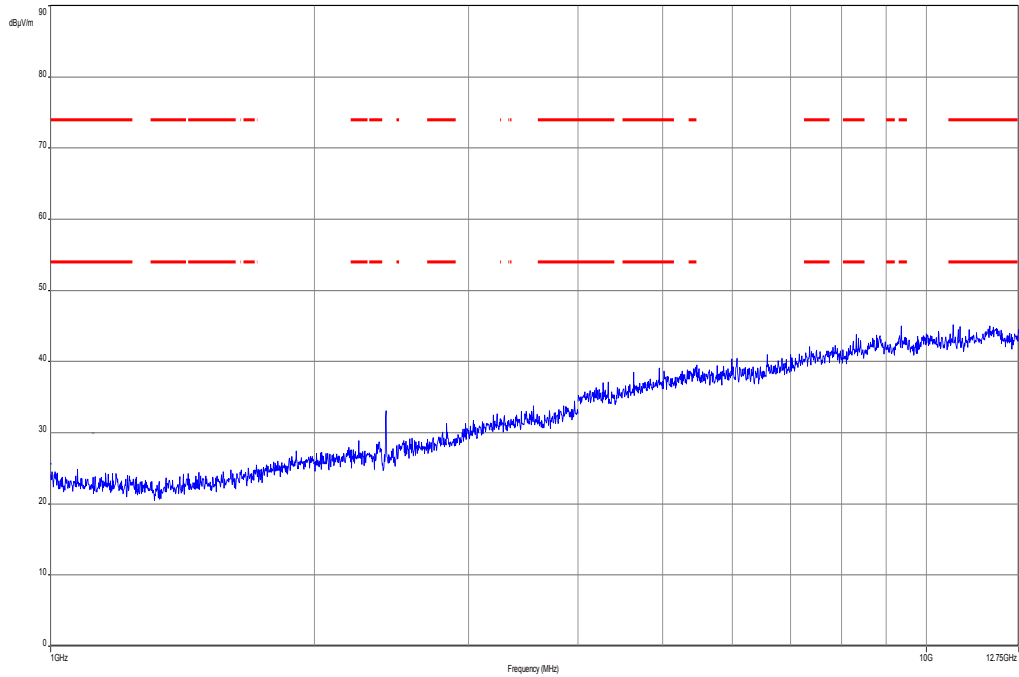
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

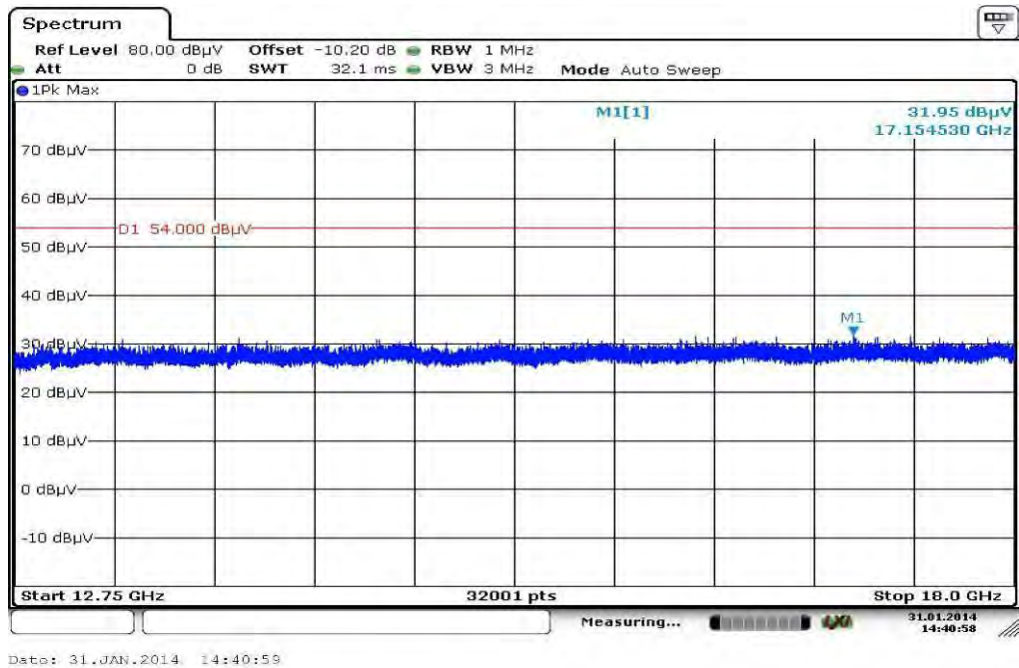
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 32.870400 | 10.8 | 1000.0 | 120.000 | 164.0 | V | 182.0 | 12.8 | 19.2 | 30.0 | |
| 49.912950 | 10.2 | 1000.0 | 120.000 | 170.0 | V | 85.0 | 13.4 | 19.8 | 30.0 | |
| 104.769900 | 7.5 | 1000.0 | 120.000 | 98.0 | V | 170.0 | 11.5 | 26.0 | 33.5 | |
| 488.310300 | 15.4 | 1000.0 | 120.000 | 170.0 | V | 268.0 | 18.5 | 20.6 | 36.0 | |
| 716.878350 | 20.5 | 1000.0 | 120.000 | 113.0 | V | 280.0 | 22.9 | 15.5 | 36.0 | |
| 882.341700 | 22.6 | 1000.0 | 120.000 | 170.0 | H | 280.0 | 25.0 | 13.4 | 36.0 | |

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

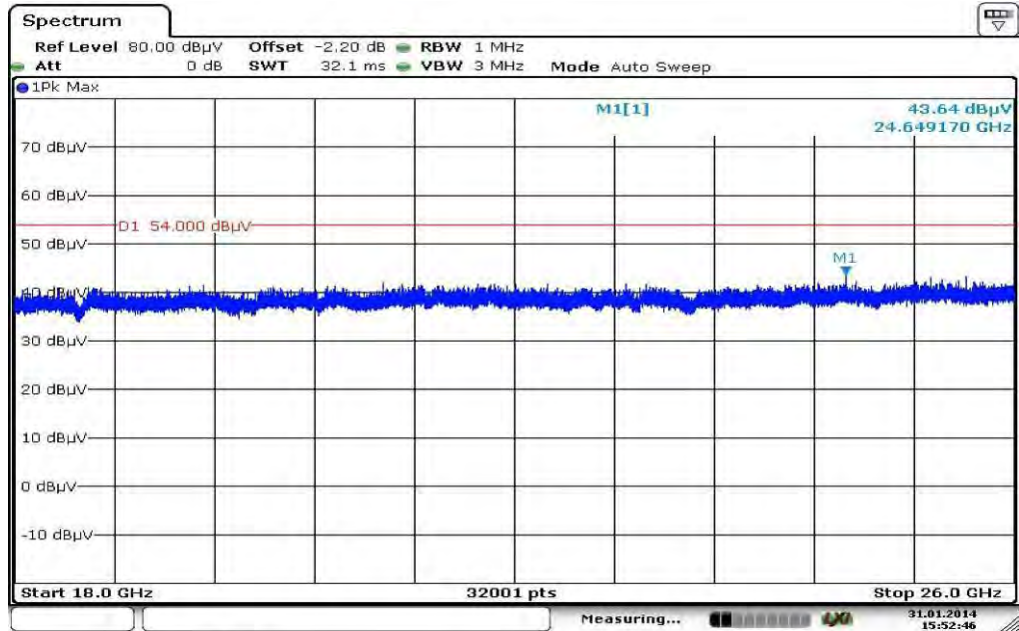


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

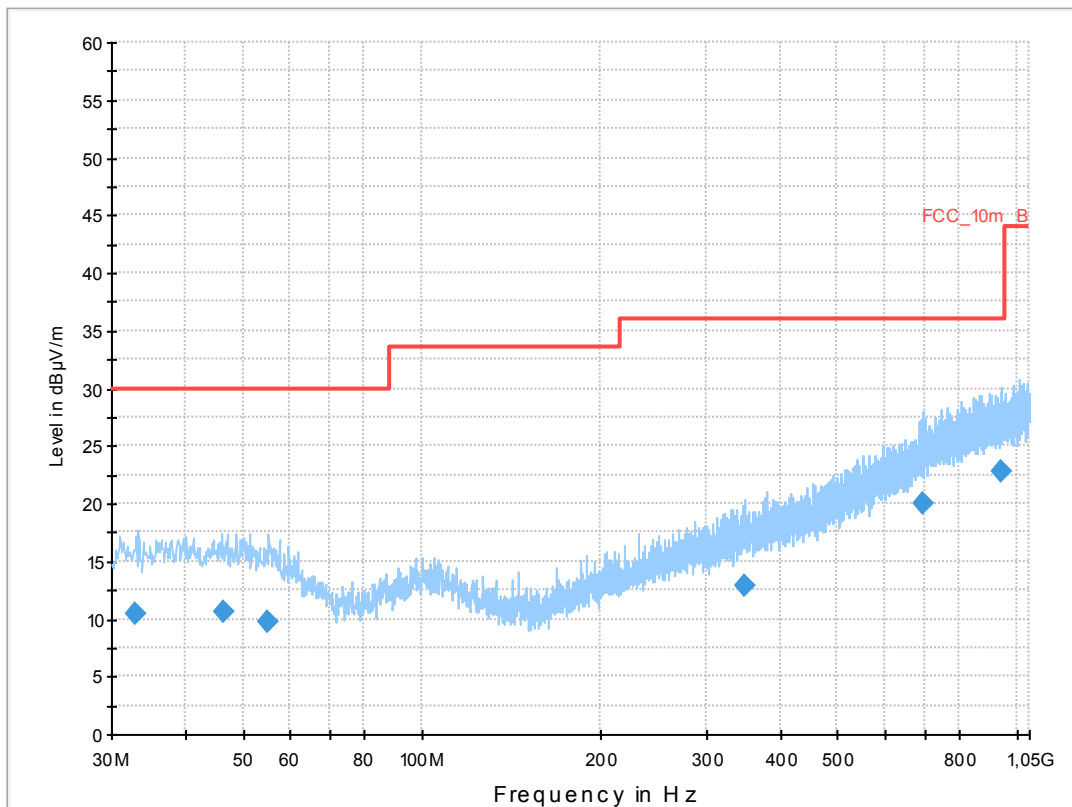
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan b-mode tx ch6
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

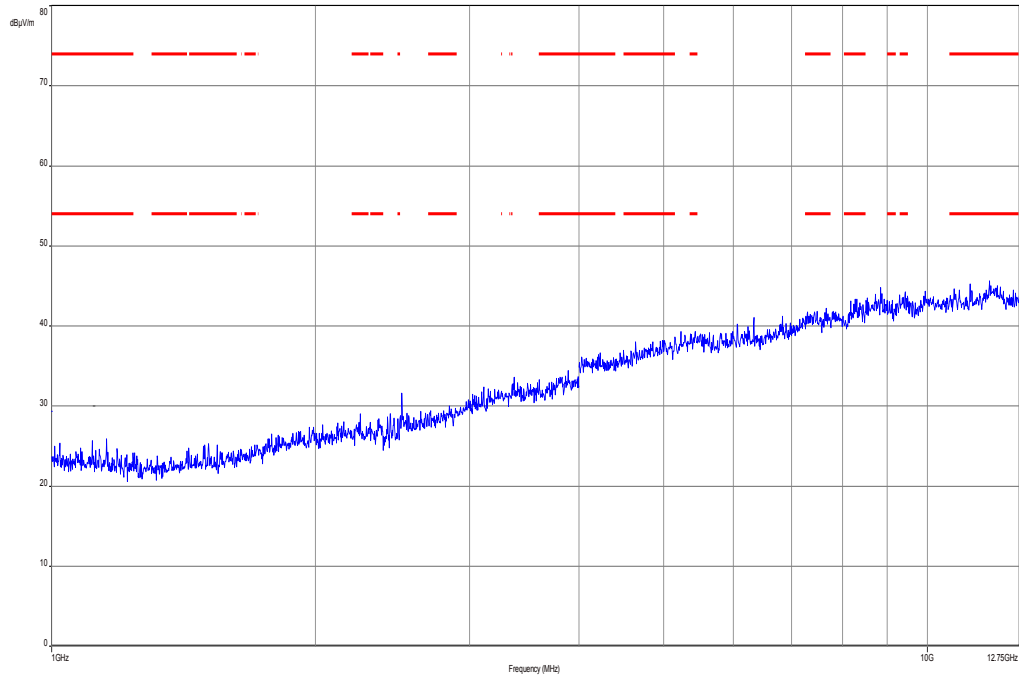
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

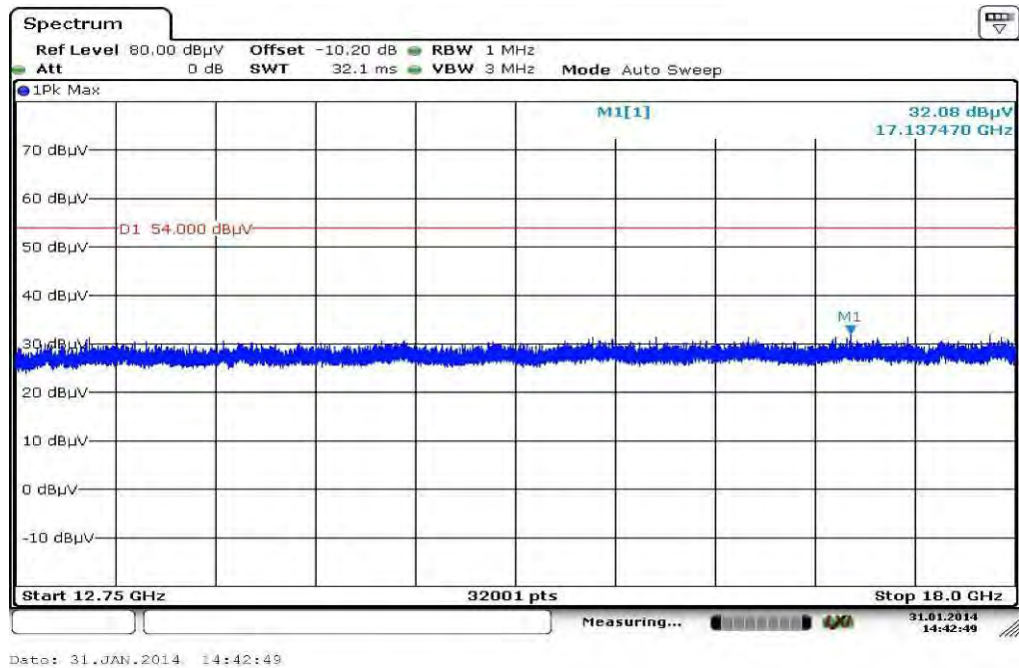
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 32.865300 | 10.5 | 1000.0 | 120.000 | 160.0 | V | 280.0 | 12.8 | 19.5 | 30.0 | |
| 46.205400 | 10.6 | 1000.0 | 120.000 | 132.0 | H | 190.0 | 13.3 | 19.4 | 30.0 | |
| 55.101300 | 9.7 | 1000.0 | 120.000 | 163.0 | V | 273.0 | 12.9 | 20.3 | 30.0 | |
| 349.498500 | 12.9 | 1000.0 | 120.000 | 98.0 | V | 182.0 | 16.0 | 23.1 | 36.0 | |
| 695.800200 | 20.0 | 1000.0 | 120.000 | 132.0 | H | 100.0 | 22.4 | 16.0 | 36.0 | |
| 941.289750 | 22.7 | 1000.0 | 120.000 | 170.0 | V | -5.0 | 25.3 | 13.3 | 36.0 | |

Plot 6: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

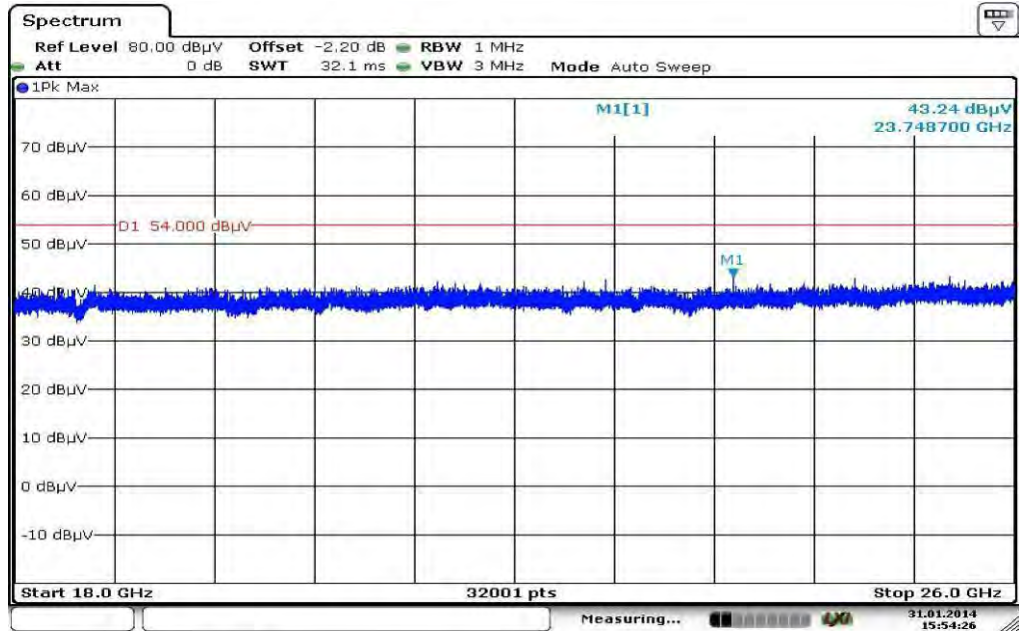


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

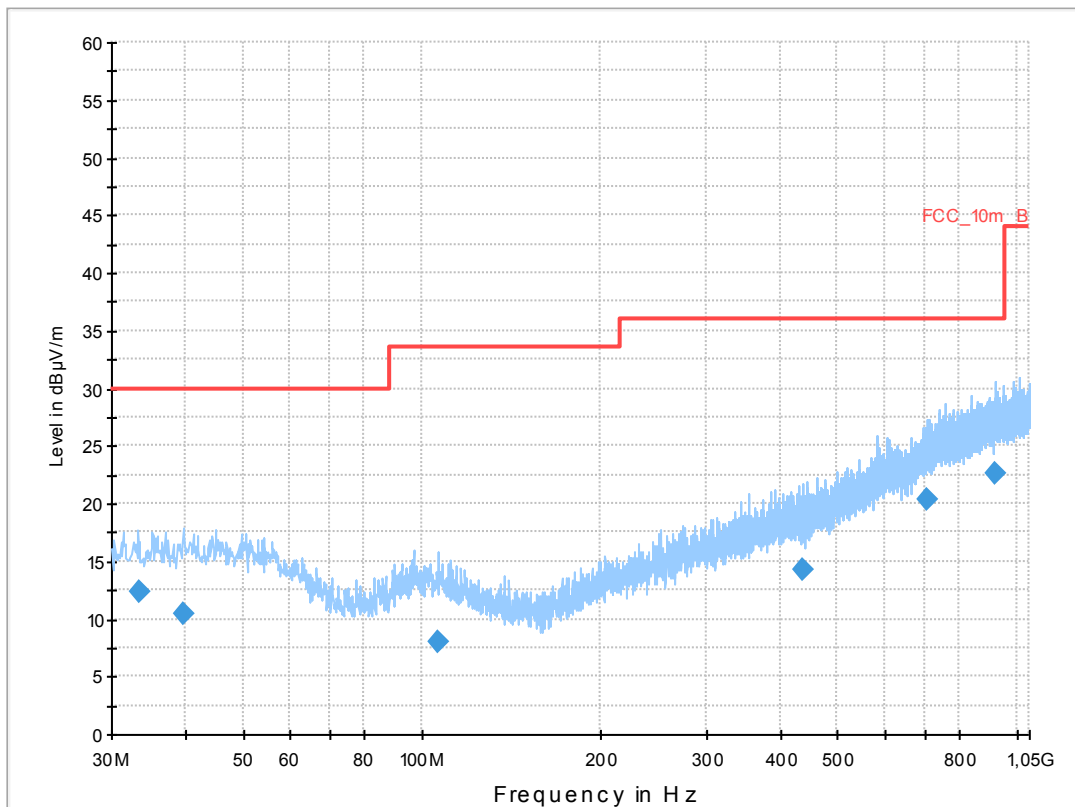
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan b-mode tx ch11
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

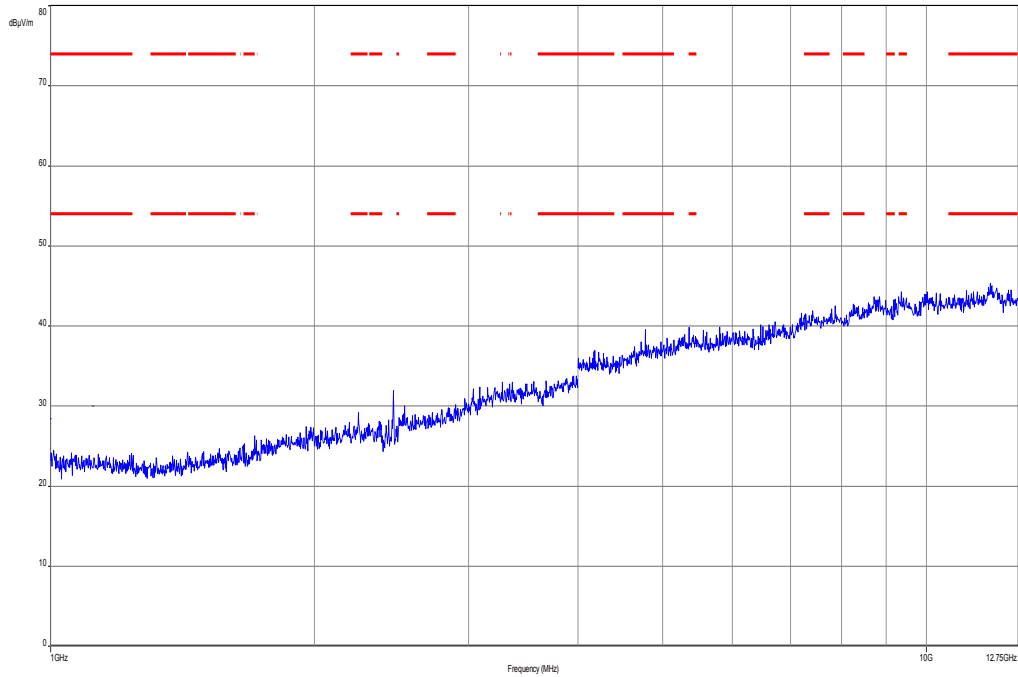
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

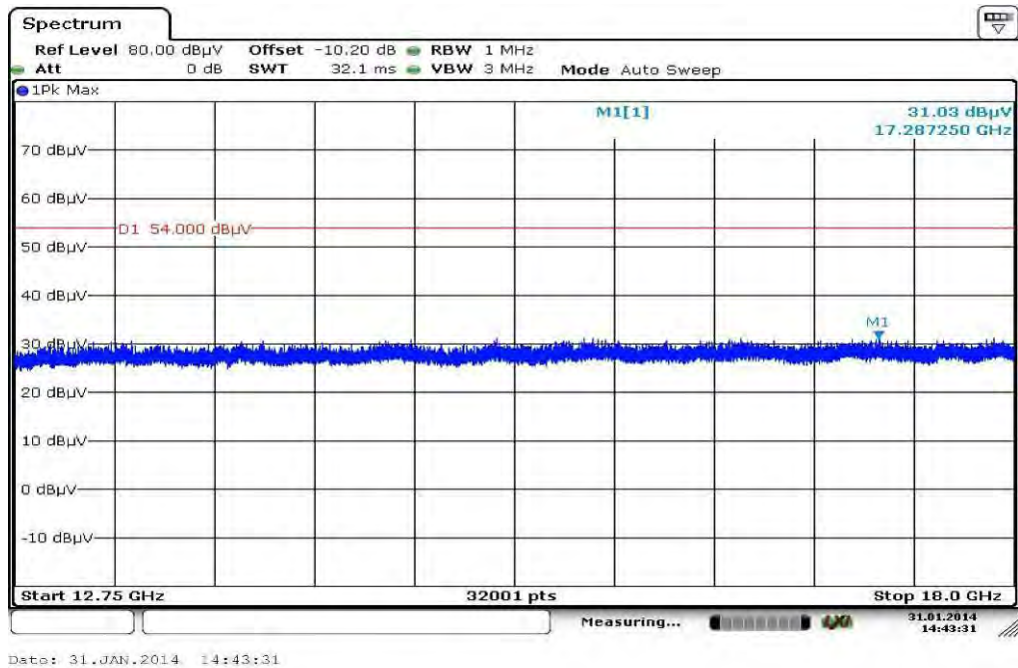
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 33.384750 | 12.4 | 1000.0 | 120.000 | 111.0 | V | 190.0 | 12.9 | 17.6 | 30.0 | |
| 39.675900 | 10.5 | 1000.0 | 120.000 | 170.0 | V | 88.0 | 13.4 | 19.5 | 30.0 | |
| 106.119600 | 8.0 | 1000.0 | 120.000 | 132.0 | H | 182.0 | 11.4 | 25.5 | 33.5 | |
| 437.767950 | 14.2 | 1000.0 | 120.000 | 111.0 | H | -10.0 | 17.5 | 21.8 | 36.0 | |
| 707.151300 | 20.3 | 1000.0 | 120.000 | 170.0 | H | 270.0 | 22.7 | 15.7 | 36.0 | |
| 922.812900 | 22.6 | 1000.0 | 120.000 | 170.0 | V | 100.0 | 25.3 | 13.4 | 36.0 | |

Plot 10: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

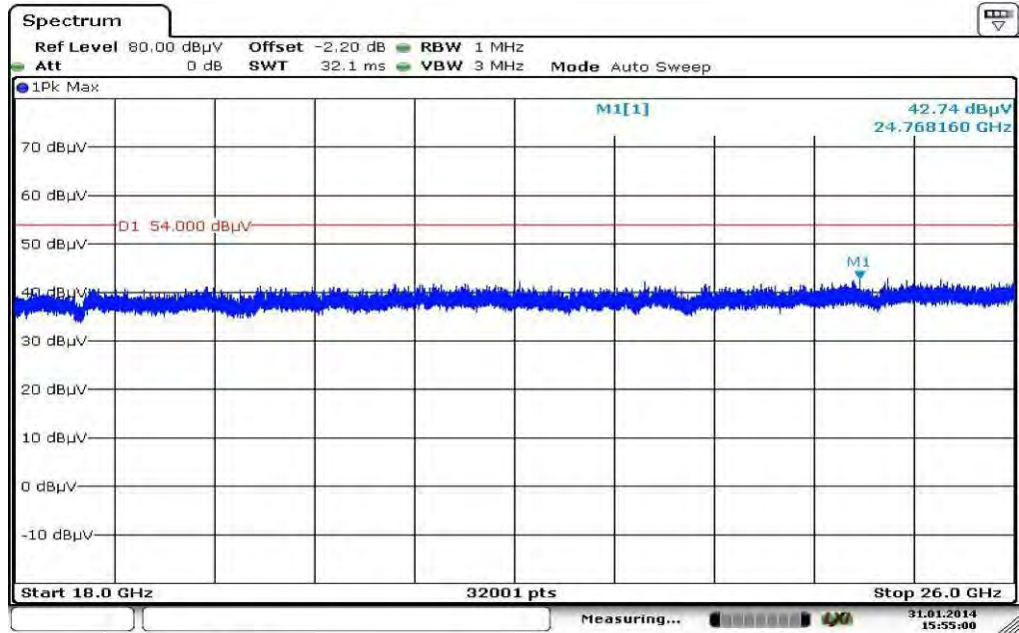


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 31.JAN.2014 15:55:00

Plots: OFDM / g – mode

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

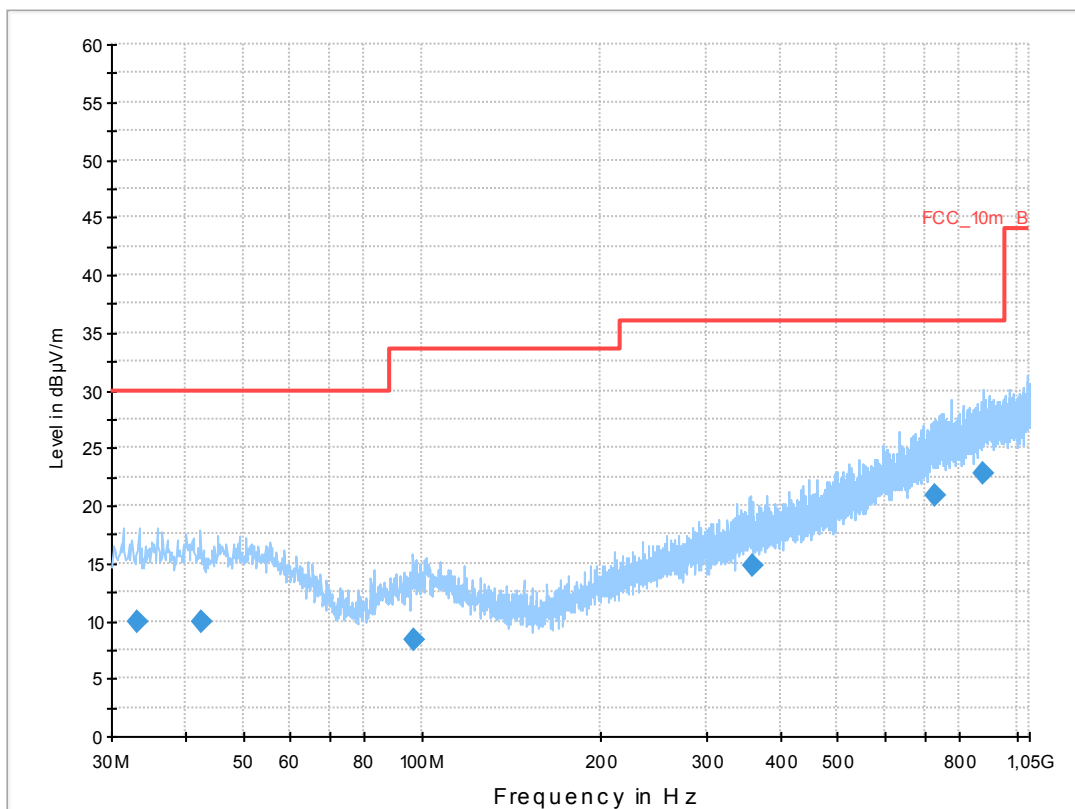
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan g-mode tx ch1
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

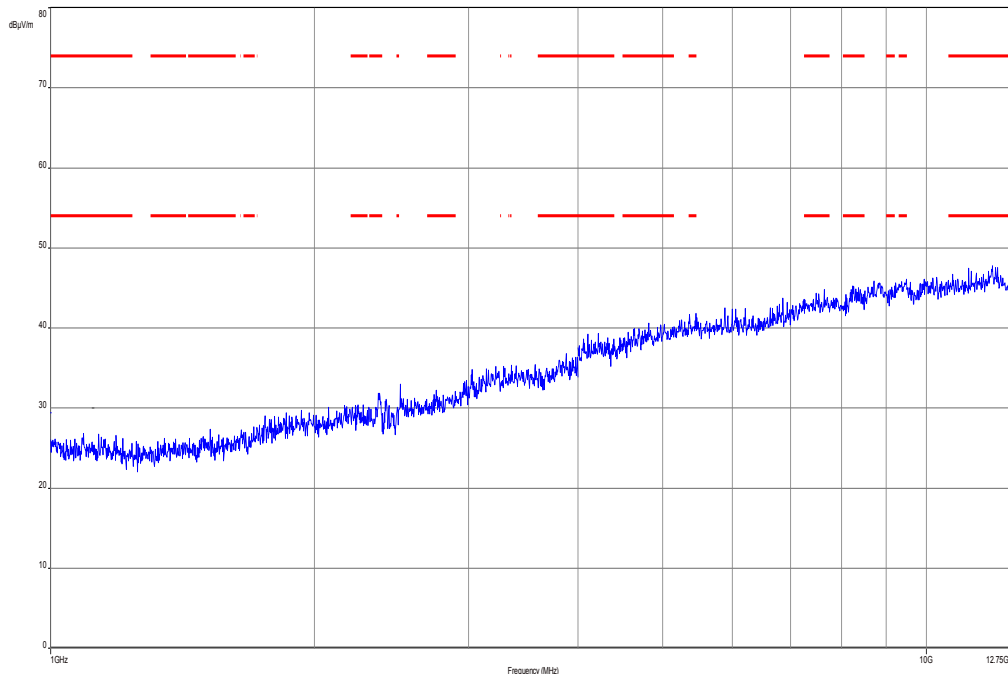
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

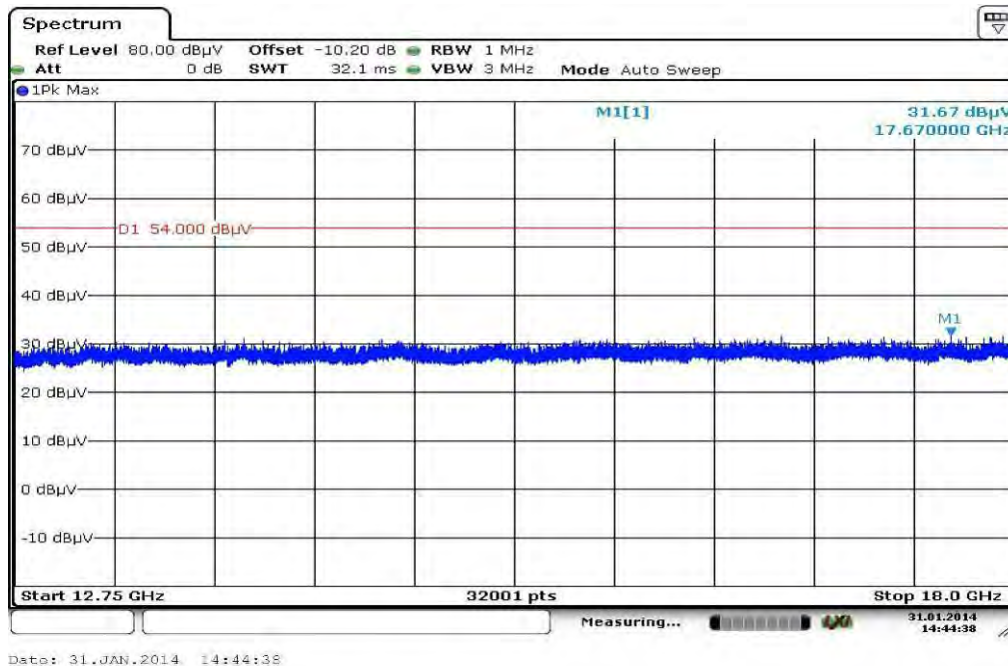
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 33.155400 | 10.0 | 1000.0 | 120.000 | 170.0 | H | 268.0 | 12.8 | 20.0 | 30.0 | |
| 42.598200 | 9.9 | 1000.0 | 120.000 | 170.0 | V | 100.0 | 13.3 | 20.1 | 30.0 | |
| 97.208400 | 8.3 | 1000.0 | 120.000 | 170.0 | H | 190.0 | 11.5 | 25.2 | 33.5 | |
| 359.955300 | 14.8 | 1000.0 | 120.000 | 105.0 | V | 3.0 | 16.2 | 21.2 | 36.0 | |
| 730.908750 | 20.8 | 1000.0 | 120.000 | 170.0 | V | 280.0 | 23.2 | 15.2 | 36.0 | |
| 875.368350 | 22.7 | 1000.0 | 120.000 | 170.0 | V | 93.0 | 24.9 | 13.3 | 36.0 | |

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

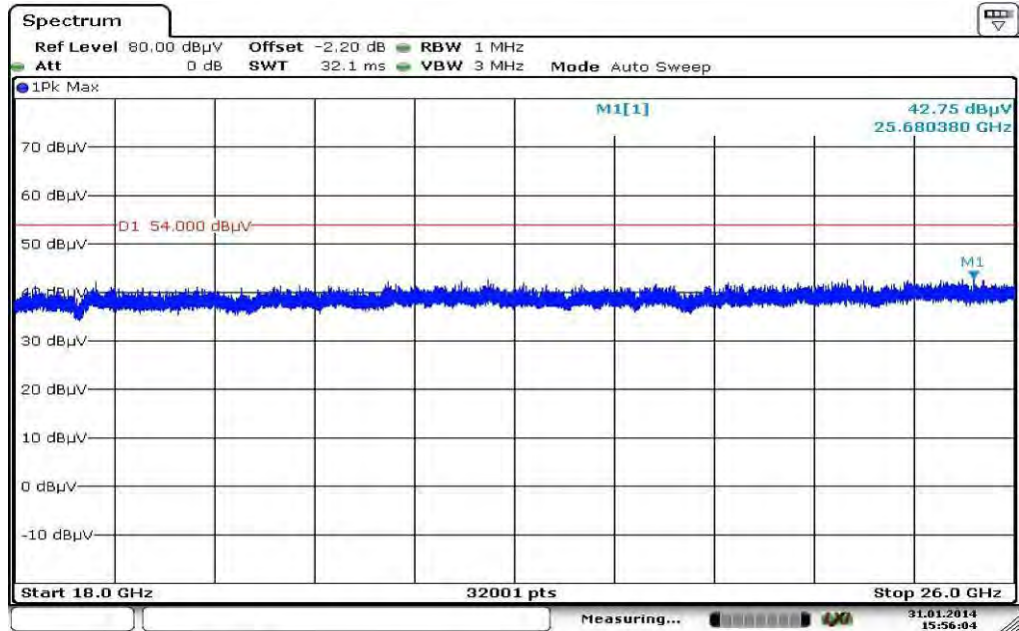


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 31.JAN.2014 15:56:04

Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

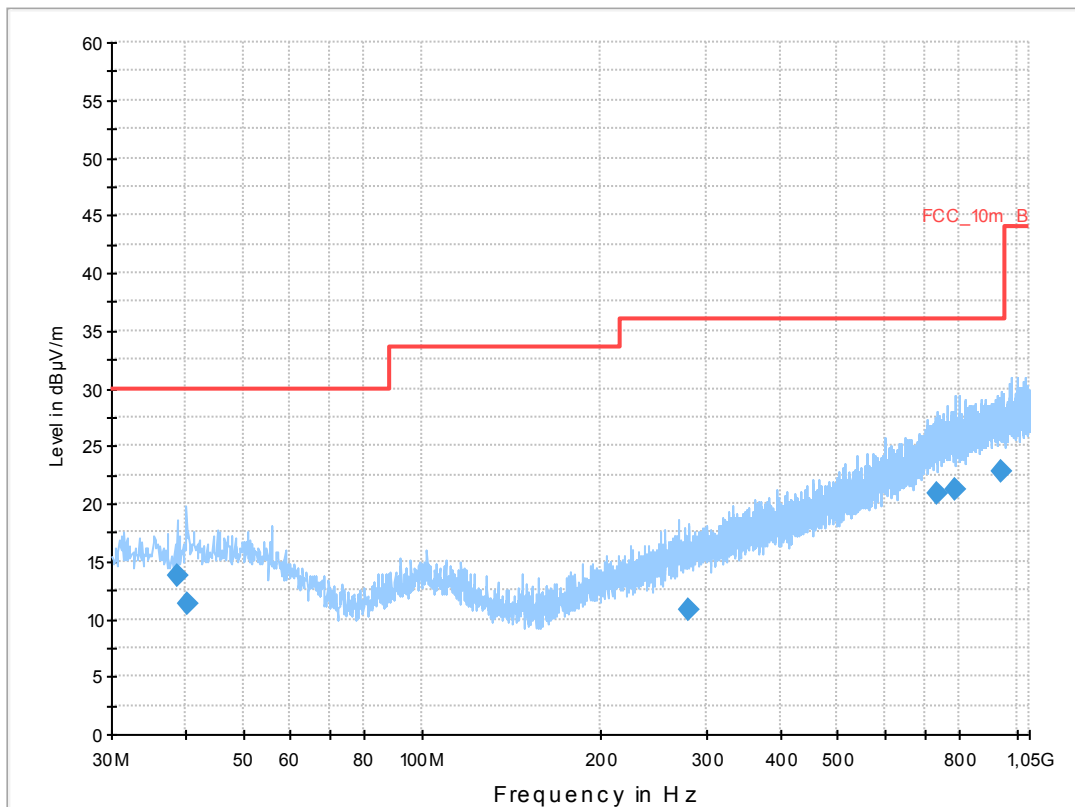
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan g-mode tx ch6
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

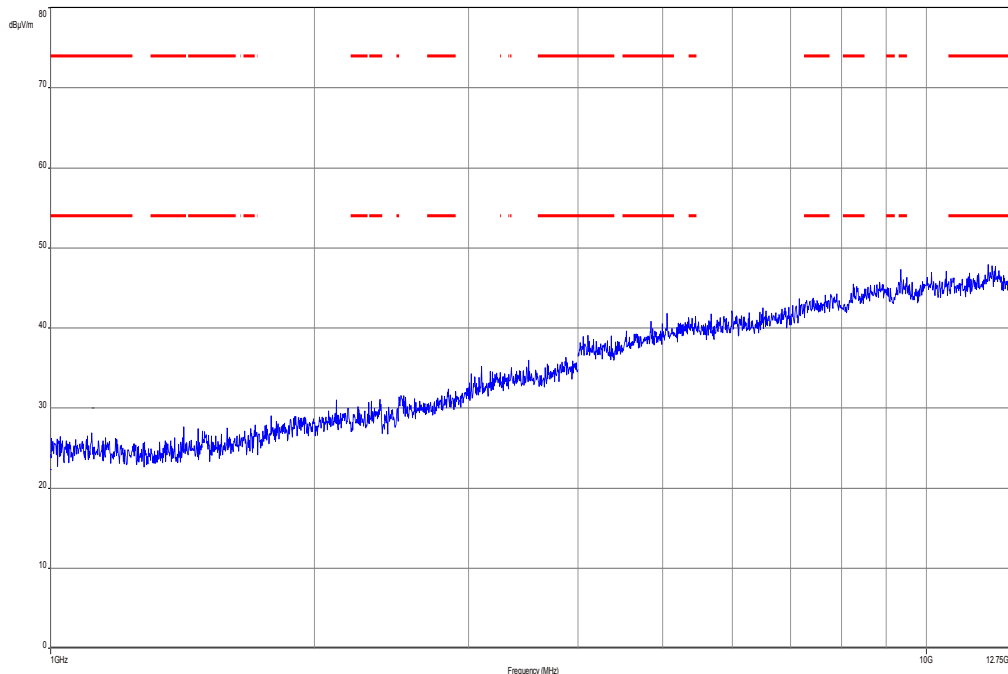
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

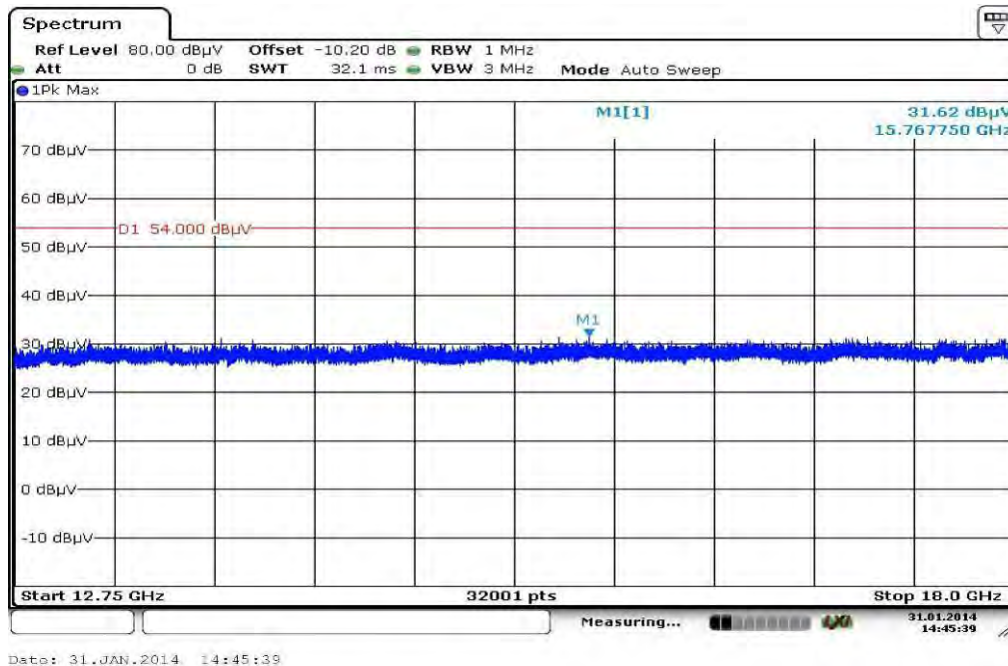
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 38.695800 | 13.8 | 1000.0 | 120.000 | 98.0 | V | 80.0 | 13.3 | 16.2 | 30.0 | |
| 40.371300 | 11.3 | 1000.0 | 120.000 | 133.0 | V | 80.0 | 13.4 | 18.7 | 30.0 | |
| 279.878850 | 10.7 | 1000.0 | 120.000 | 170.0 | V | 280.0 | 14.0 | 25.3 | 36.0 | |
| 735.970050 | 20.9 | 1000.0 | 120.000 | 170.0 | H | 100.0 | 23.3 | 15.1 | 36.0 | |
| 785.480550 | 21.2 | 1000.0 | 120.000 | 98.0 | H | 176.0 | 23.8 | 14.8 | 36.0 | |
| 941.319450 | 22.7 | 1000.0 | 120.000 | 98.0 | H | 86.0 | 25.3 | 13.3 | 36.0 | |

Plot 6: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

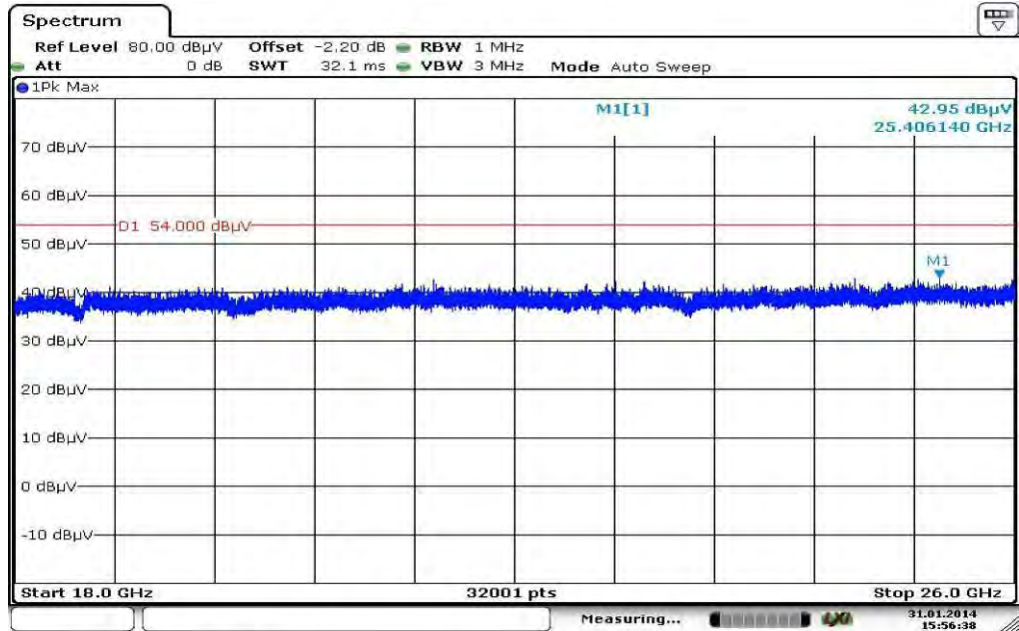


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

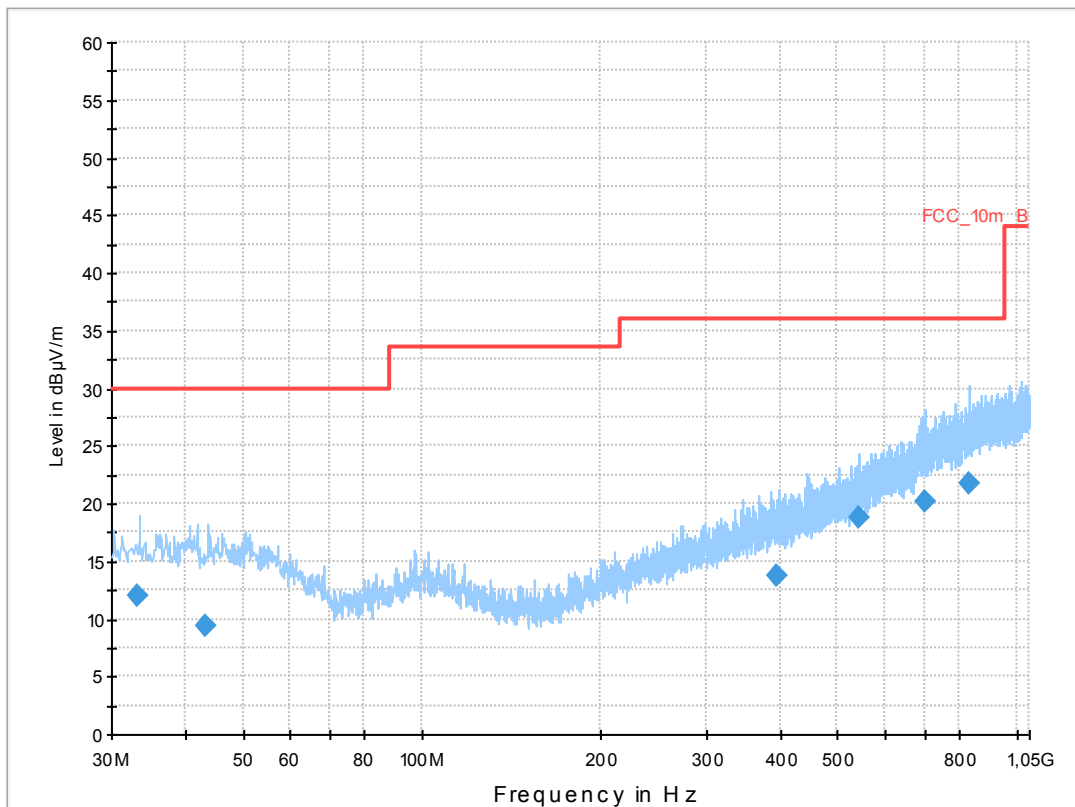
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan g-mode tx ch11
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

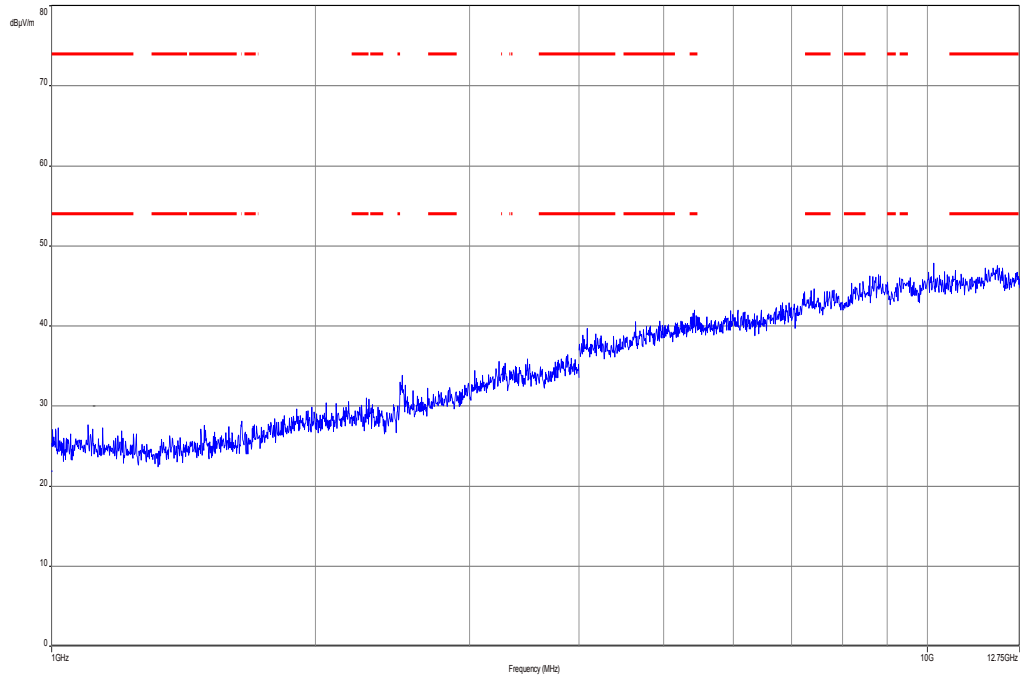
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

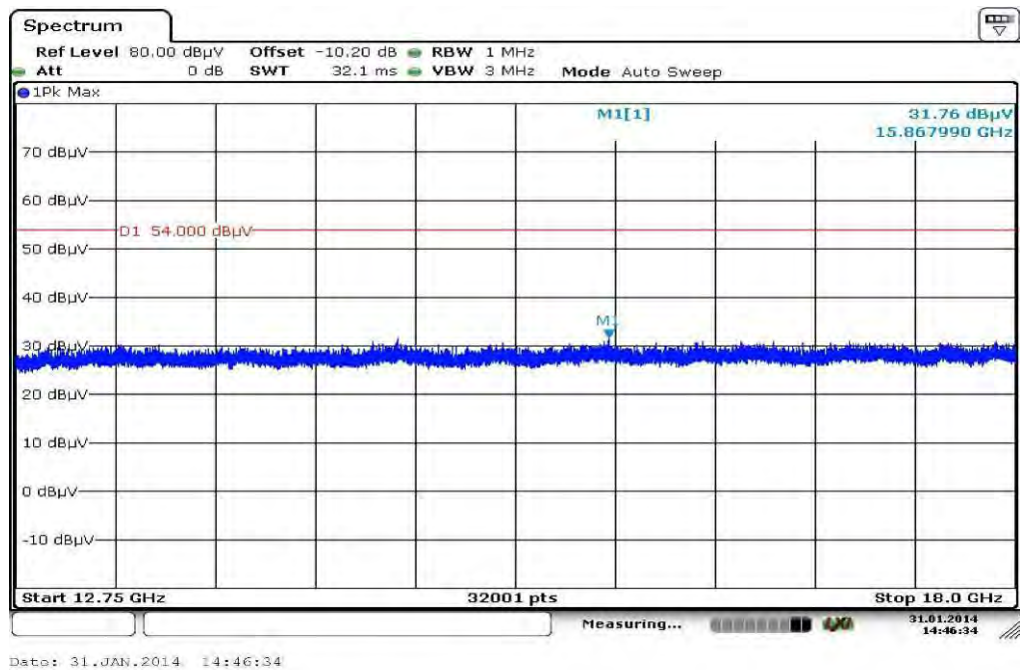
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 33.241950 | 12.0 | 1000.0 | 120.000 | 98.0 | V | 88.0 | 12.8 | 18.0 | 30.0 | |
| 43.327950 | 9.3 | 1000.0 | 120.000 | 170.0 | H | 88.0 | 13.3 | 20.7 | 30.0 | |
| 396.009750 | 13.7 | 1000.0 | 120.000 | 155.0 | V | 81.0 | 16.8 | 22.3 | 36.0 | |
| 543.985950 | 18.7 | 1000.0 | 120.000 | 170.0 | H | 260.0 | 19.3 | 17.3 | 36.0 | |
| 702.492750 | 20.1 | 1000.0 | 120.000 | 170.0 | H | 280.0 | 22.6 | 15.9 | 36.0 | |
| 830.303550 | 21.8 | 1000.0 | 120.000 | 170.0 | H | 260.0 | 24.3 | 14.2 | 36.0 | |

Plot 10: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

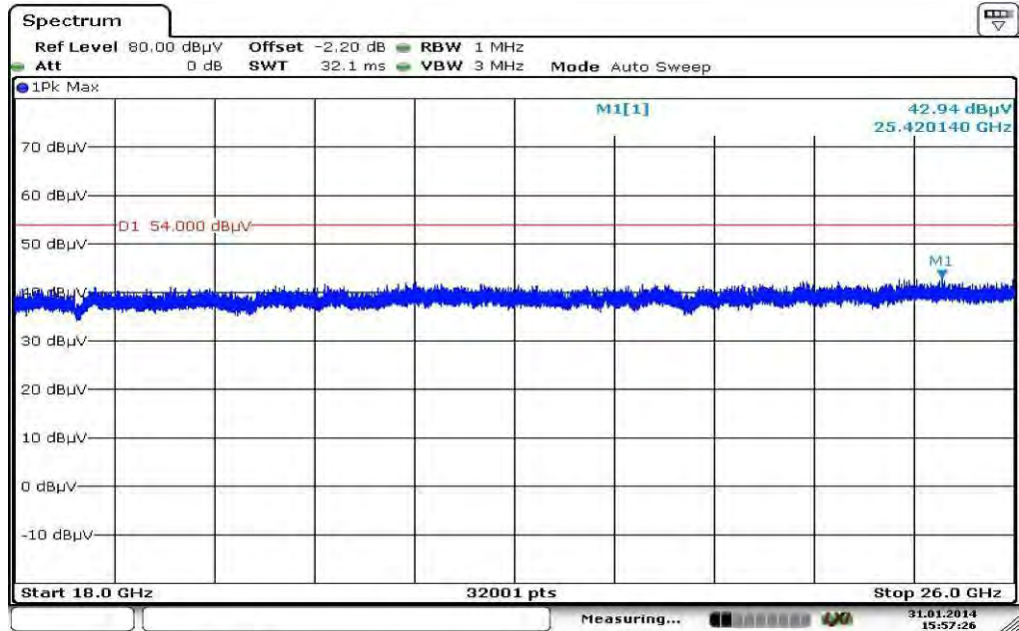


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Plots: OFDM / n – mode

Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

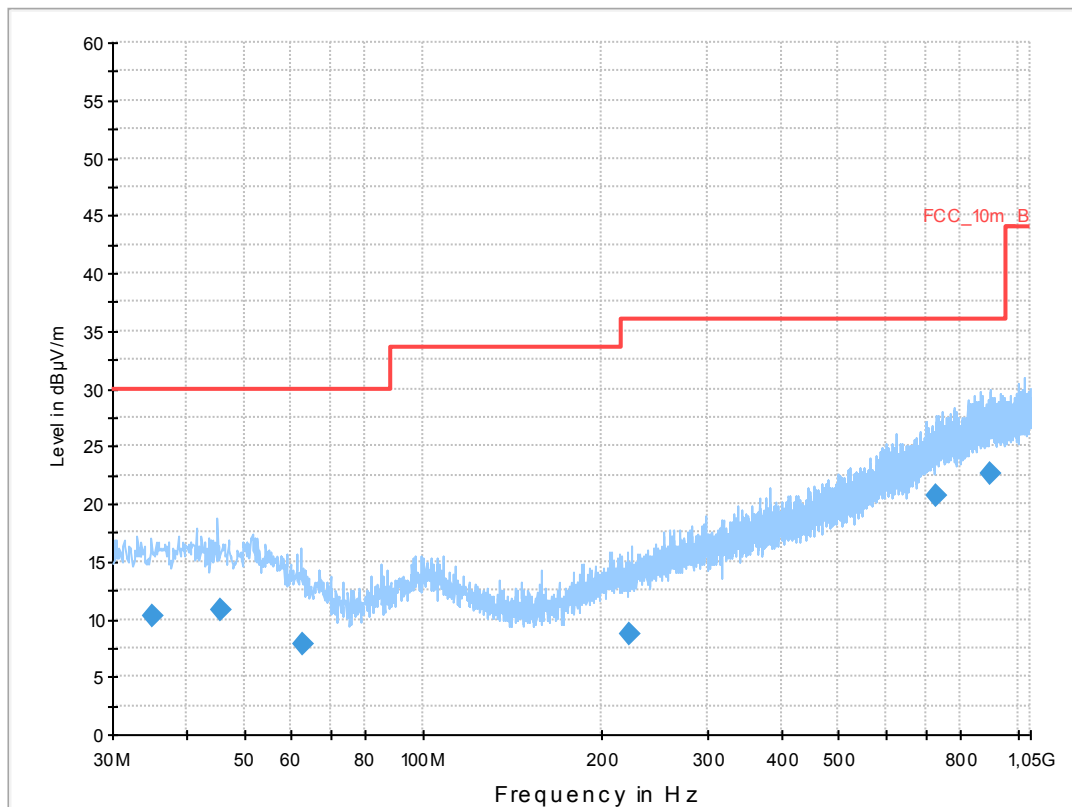
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan n-mode tx ch1
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

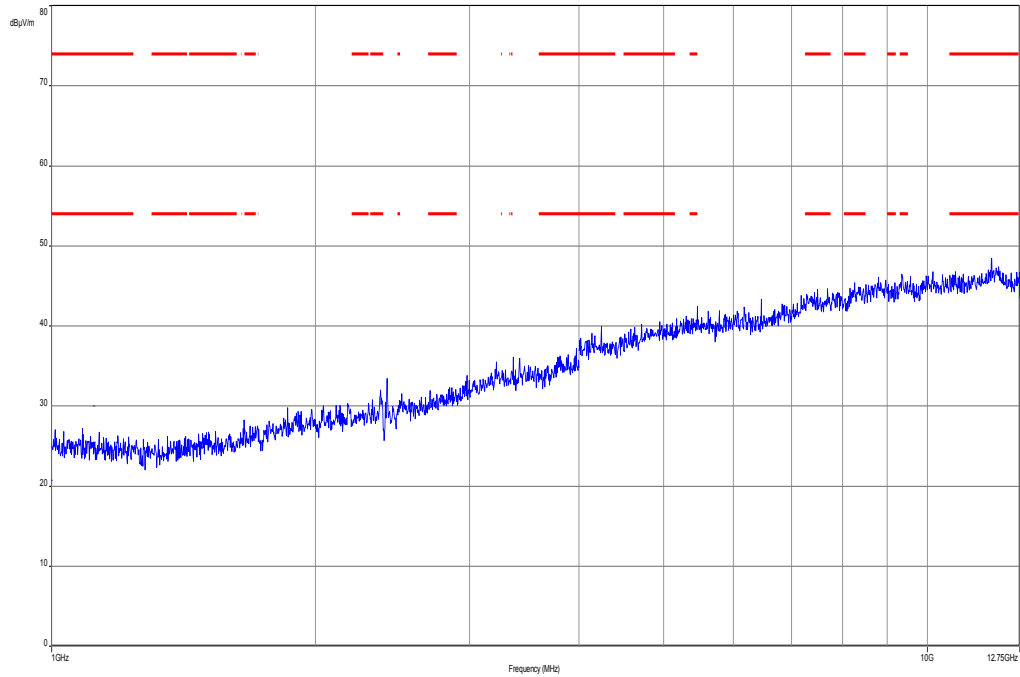
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

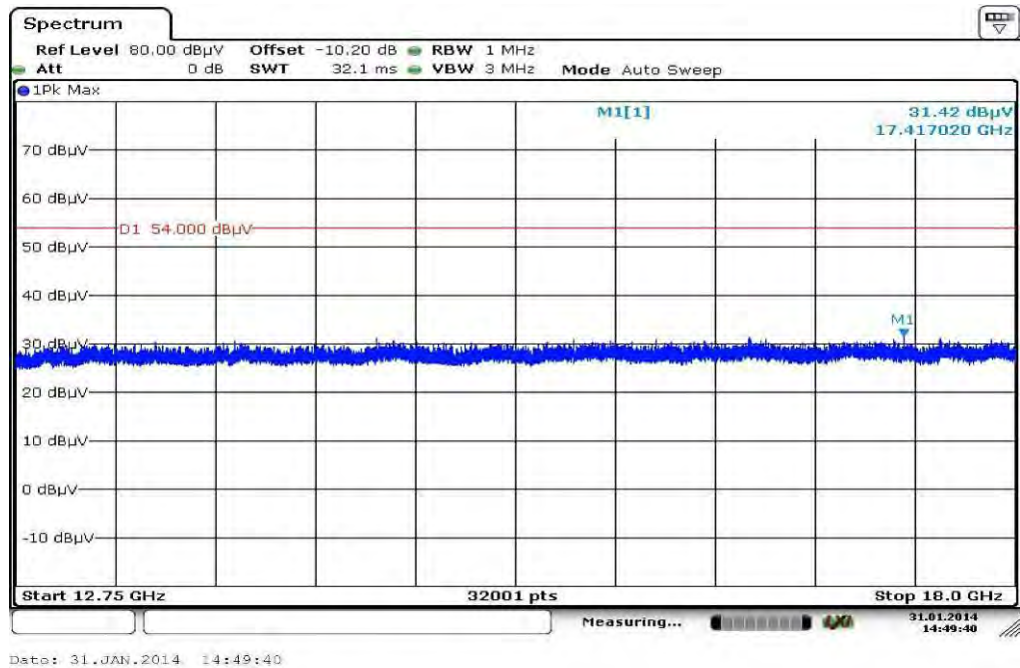
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 35.034600 | 10.3 | 1000.0 | 120.000 | 170.0 | H | 93.0 | 13.0 | 19.7 | 30.0 | |
| 45.623850 | 10.7 | 1000.0 | 120.000 | 170.0 | V | 190.0 | 13.3 | 19.3 | 30.0 | |
| 62.772900 | 7.9 | 1000.0 | 120.000 | 170.0 | H | 2.0 | 10.9 | 22.1 | 30.0 | |
| 223.137300 | 8.8 | 1000.0 | 120.000 | 170.0 | V | 280.0 | 12.5 | 27.2 | 36.0 | |
| 729.173850 | 20.7 | 1000.0 | 120.000 | 170.0 | V | 100.0 | 23.2 | 15.3 | 36.0 | |
| 897.451650 | 22.7 | 1000.0 | 120.000 | 98.0 | H | 265.0 | 25.2 | 13.3 | 36.0 | |

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

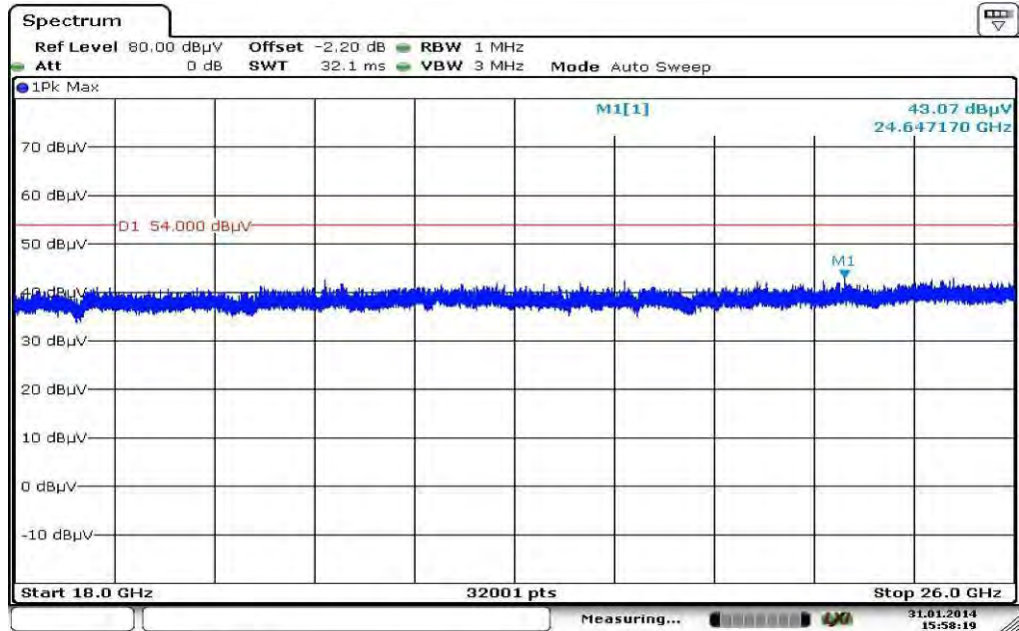


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

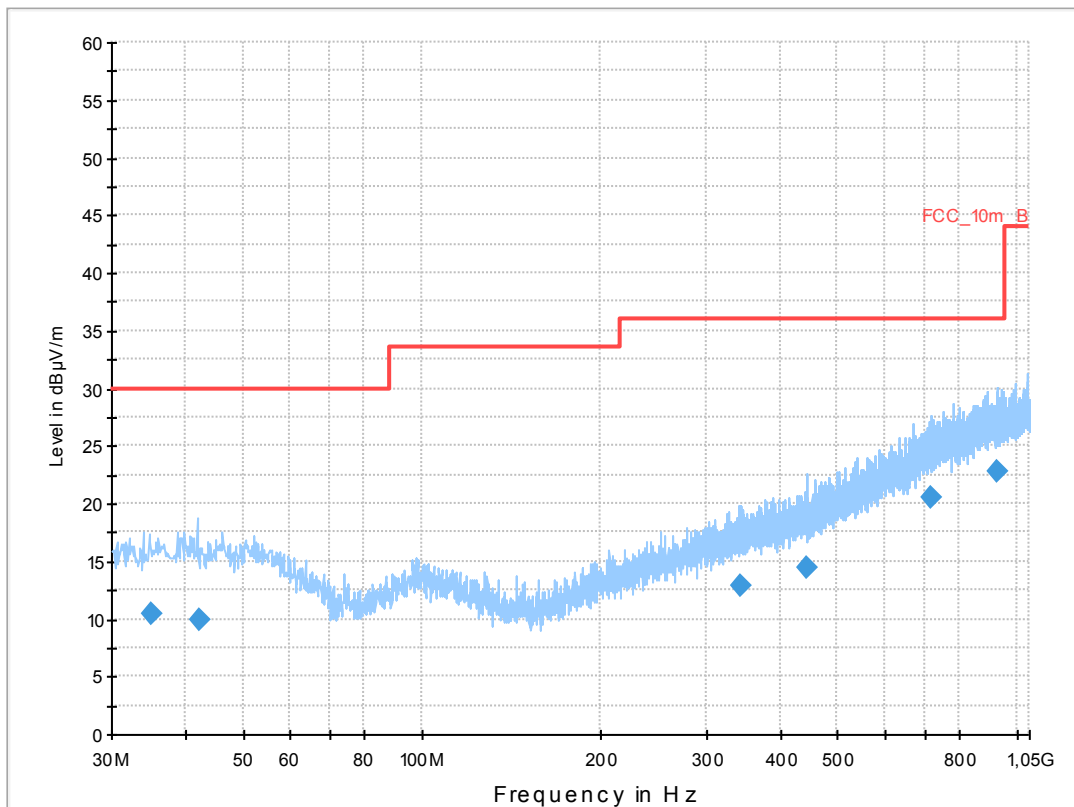
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan n-mode tx ch6
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

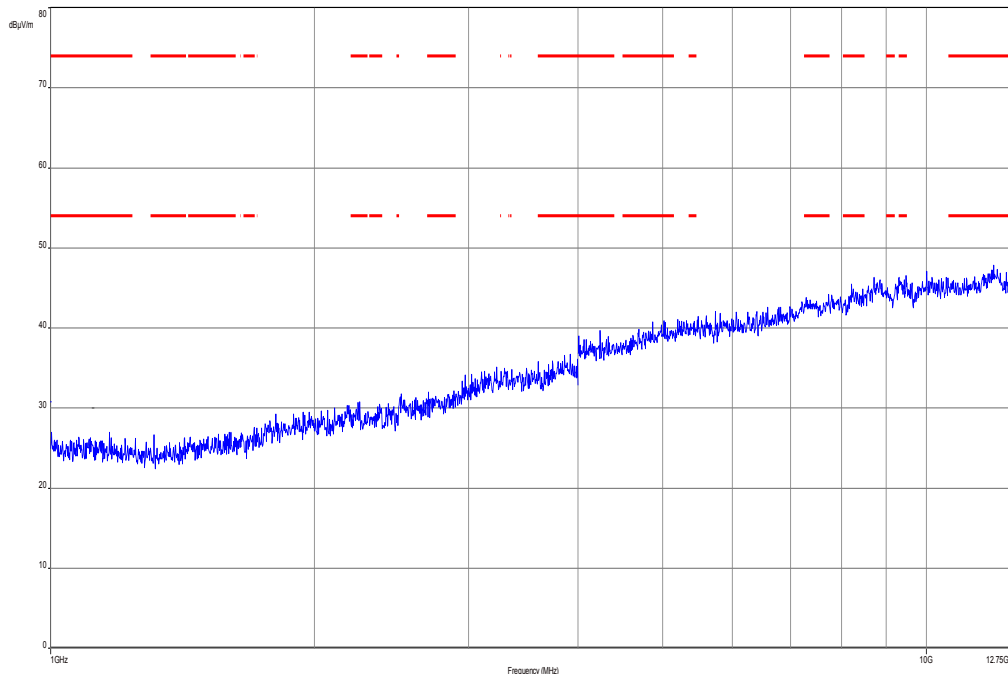
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

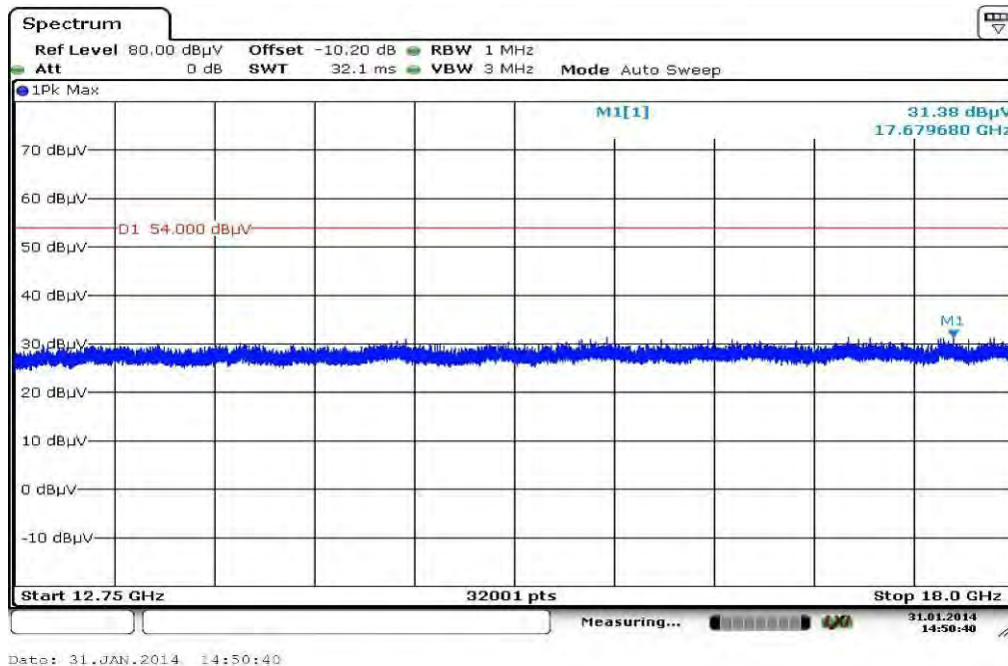
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 35.119350 | 10.4 | 1000.0 | 120.000 | 132.0 | V | 81.0 | 13.0 | 19.6 | 30.0 | |
| 42.124200 | 9.9 | 1000.0 | 120.000 | 145.0 | H | 10.0 | 13.4 | 20.1 | 30.0 | |
| 343.184550 | 12.8 | 1000.0 | 120.000 | 170.0 | V | -9.0 | 15.9 | 23.2 | 36.0 | |
| 445.126950 | 14.4 | 1000.0 | 120.000 | 98.0 | H | 261.0 | 17.6 | 21.6 | 36.0 | |
| 716.260200 | 20.4 | 1000.0 | 120.000 | 170.0 | V | -2.0 | 22.9 | 15.6 | 36.0 | |
| 925.148100 | 22.7 | 1000.0 | 120.000 | 170.0 | H | 10.0 | 25.3 | 13.3 | 36.0 | |

Plot 6: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

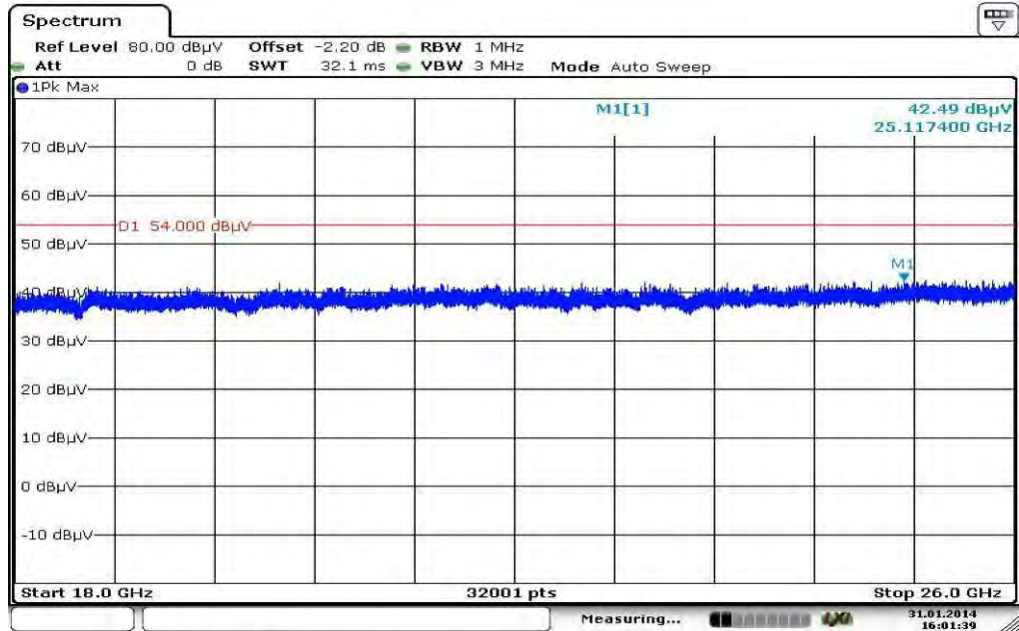


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

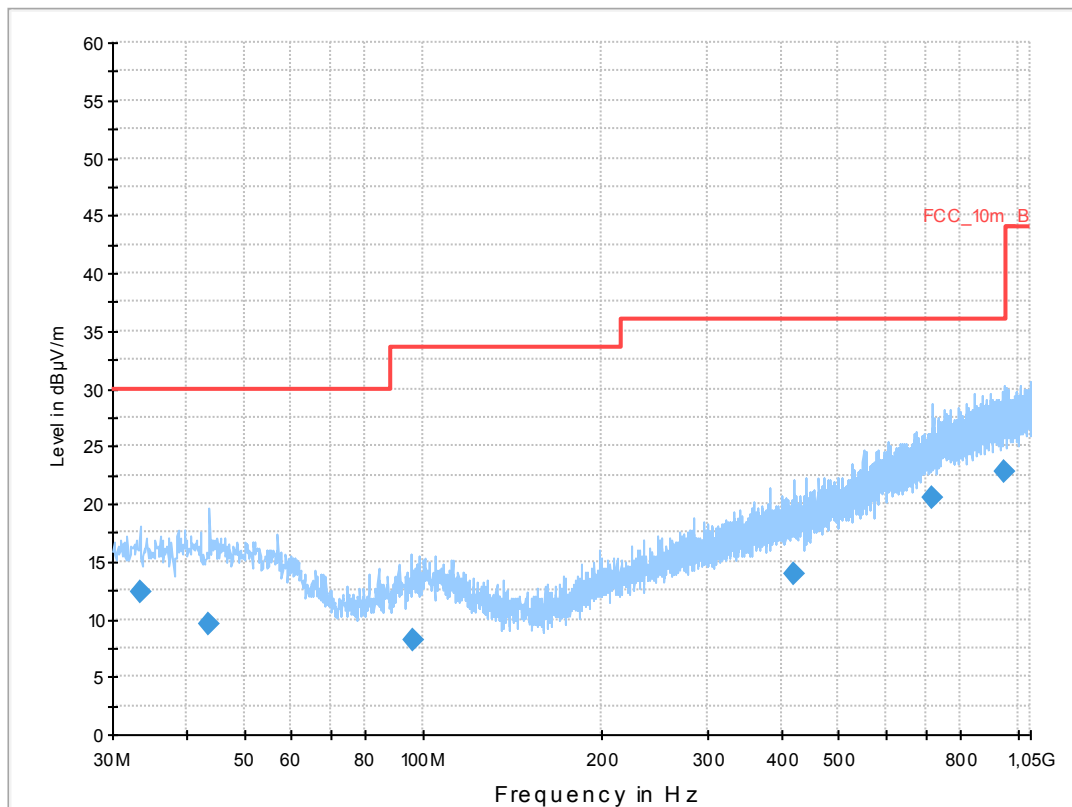
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: wlan n-mode tx ch11
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

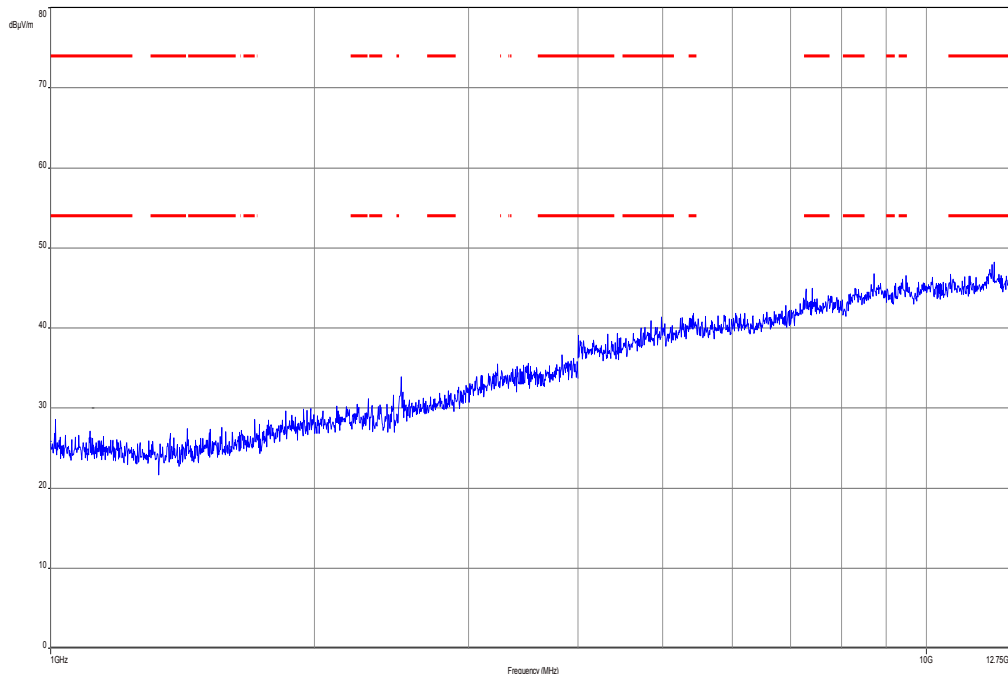
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



Final Result 1

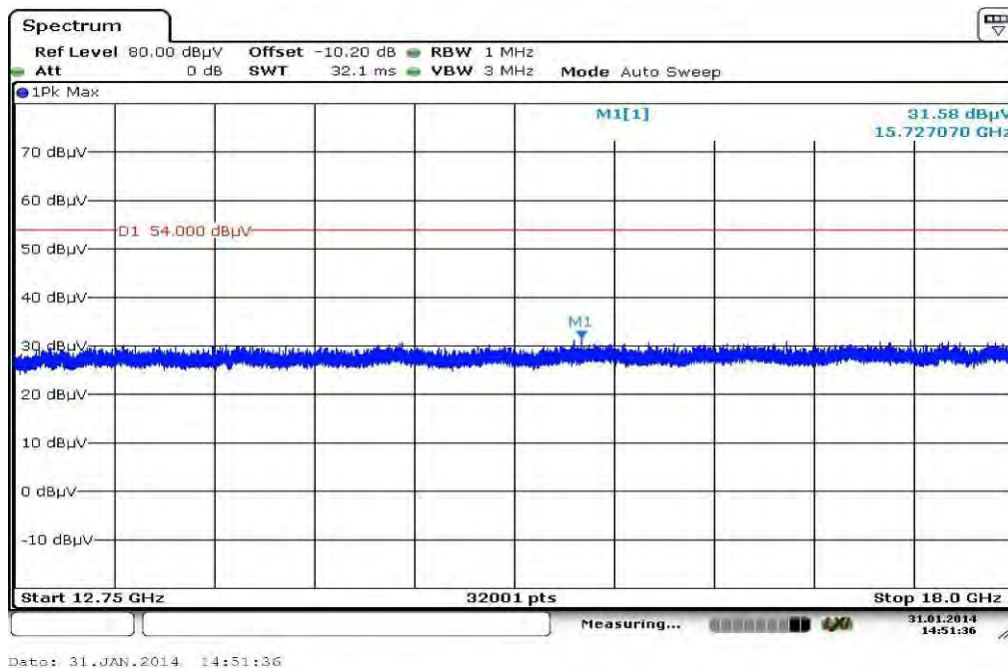
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 33.338550 | 12.3 | 1000.0 | 120.000 | 98.0 | V | 268.0 | 12.9 | 17.7 | 30.0 | |
| 43.473900 | 9.5 | 1000.0 | 120.000 | 170.0 | V | 85.0 | 13.3 | 20.5 | 30.0 | |
| 95.791200 | 8.1 | 1000.0 | 120.000 | 132.0 | H | 100.0 | 11.3 | 25.4 | 33.5 | |
| 420.765750 | 13.9 | 1000.0 | 120.000 | 170.0 | H | 85.0 | 17.2 | 22.1 | 36.0 | |
| 717.442650 | 20.5 | 1000.0 | 120.000 | 170.0 | H | 100.0 | 22.9 | 15.5 | 36.0 | |
| 949.426650 | 22.7 | 1000.0 | 120.000 | 170.0 | H | 90.0 | 25.3 | 13.3 | 36.0 | |

Plot 10: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization

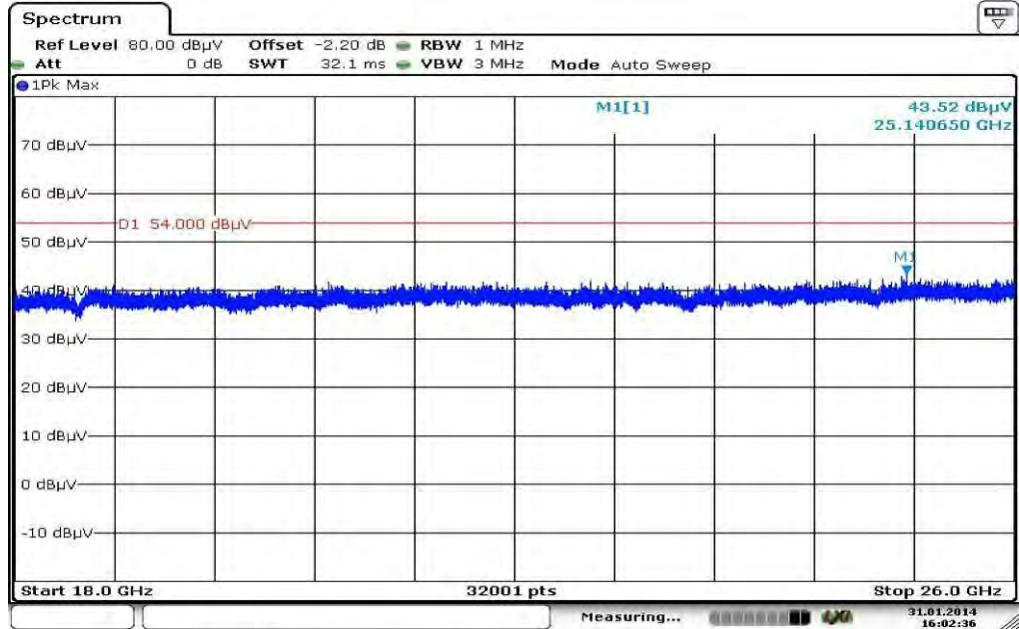


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



11.11 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode. The results are valid for both modes.

Measurement:

| Measurement parameter | |
|-----------------------|---|
| Detector: | Peak / Quasi Peak / RMS |
| Sweep time: | Auto |
| Resolution bandwidth: | F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz |
| Video bandwidth: | 3 x RBW Remeasurement: 10 Hz / 3 MHz |
| Span: | 30 MHz to 26 GHz |
| Trace-Mode: | Max Hold |

Limits:

| FCC | | IC |
|--------------------------------|-------------------------------|----------------------|
| RX Spurious Emissions Radiated | | |
| Frequency (MHz) | Field Strength (dB μ V/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 [dB μ V/m] | | |
|--|----------|----------------------|
| F [MHz] | Detector | Level [dB μ V/m] |
| For emissions below 1 GHz, please take a look at the table below the 1 GHz plot. | | |
| No emissions detected above 1 GHz. | | |
| Measurement uncertainty | ± 3 dB | |

Result: Passed.

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

Plots: RX / Idle – mode

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

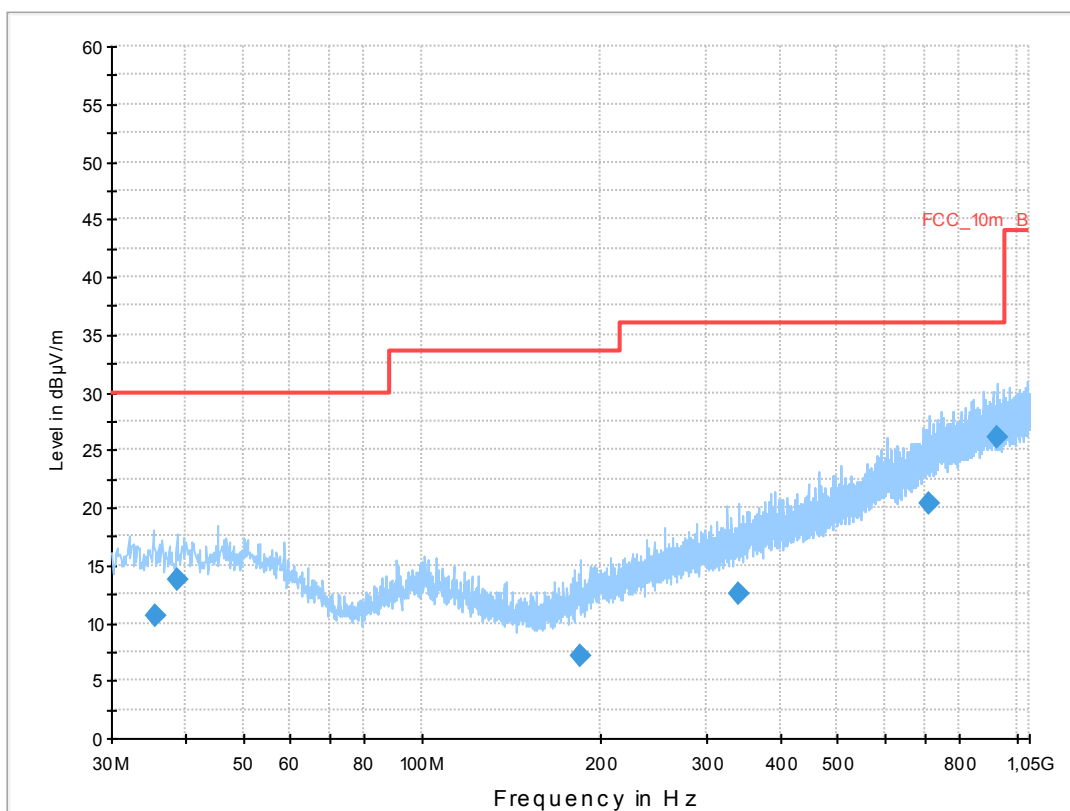
Common Information

EUT: TS-0020-BV
 Serial Number: CB51268FN3
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: WLAN Idle
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dBµV/m

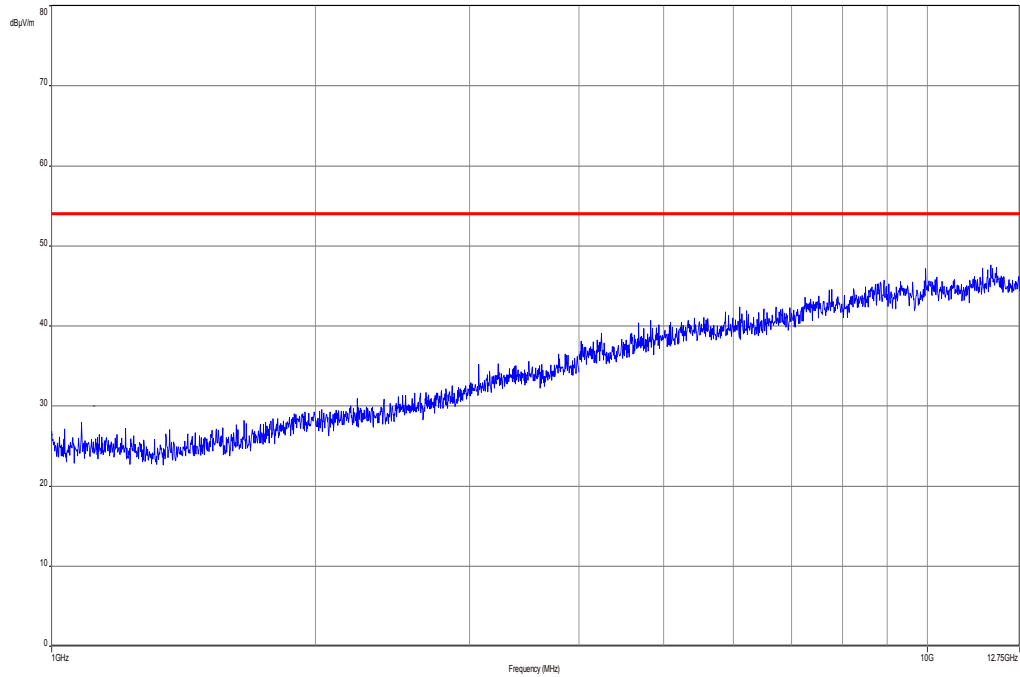
| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|----------------|-----------|-----------|---------|------------|--------|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |



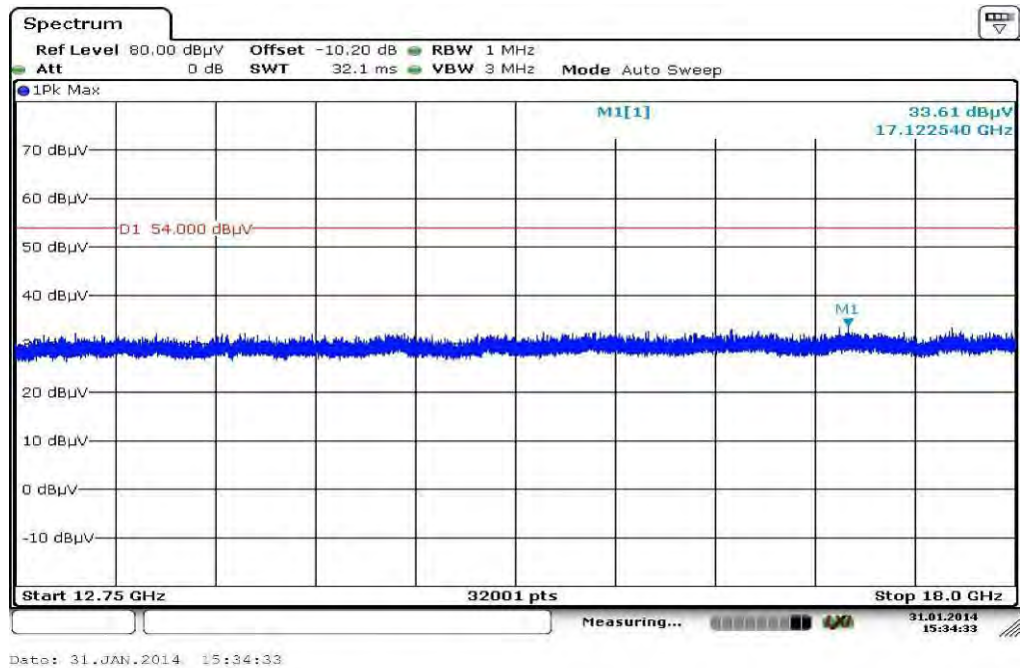
Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|---------|
| 35.511750 | 10.6 | 1000.0 | 120.000 | 132.0 | H | 190.0 | 13.1 | 19.4 | 30.0 | |
| 38.696250 | 13.7 | 1000.0 | 120.000 | 98.0 | V | 268.0 | 13.3 | 16.3 | 30.0 | |
| 183.855600 | 7.2 | 1000.0 | 120.000 | 170.0 | H | 190.0 | 10.7 | 26.3 | 33.5 | |
| 340.353600 | 12.6 | 1000.0 | 120.000 | 98.0 | V | 180.0 | 15.8 | 23.4 | 36.0 | |
| 714.690600 | 20.4 | 1000.0 | 120.000 | 121.0 | H | 0.0 | 22.8 | 15.6 | 36.0 | |
| 927.418500 | 26.0 | 1000.0 | 120.000 | 98.0 | V | 260.0 | 25.3 | 10.0 | 36.0 | |

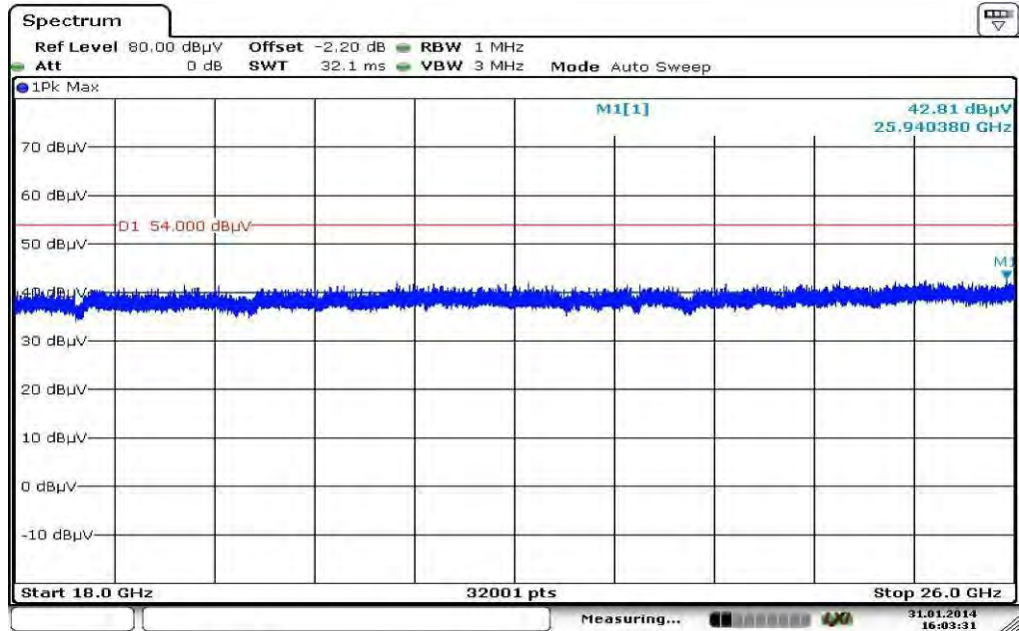
Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 31.JAN.2014 16:03:31

11.12 Spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is representative for all channels and modes. If peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. 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 F > 150 kHz: 9 kHz |
| Resolution bandwidth: | F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz |
| Span: | 9 kHz to 30 MHz |
| Trace-Mode: | Max Hold |

Limits:

| FCC | | IC |
|---|-------------------------|----------------------|
| TX 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 |

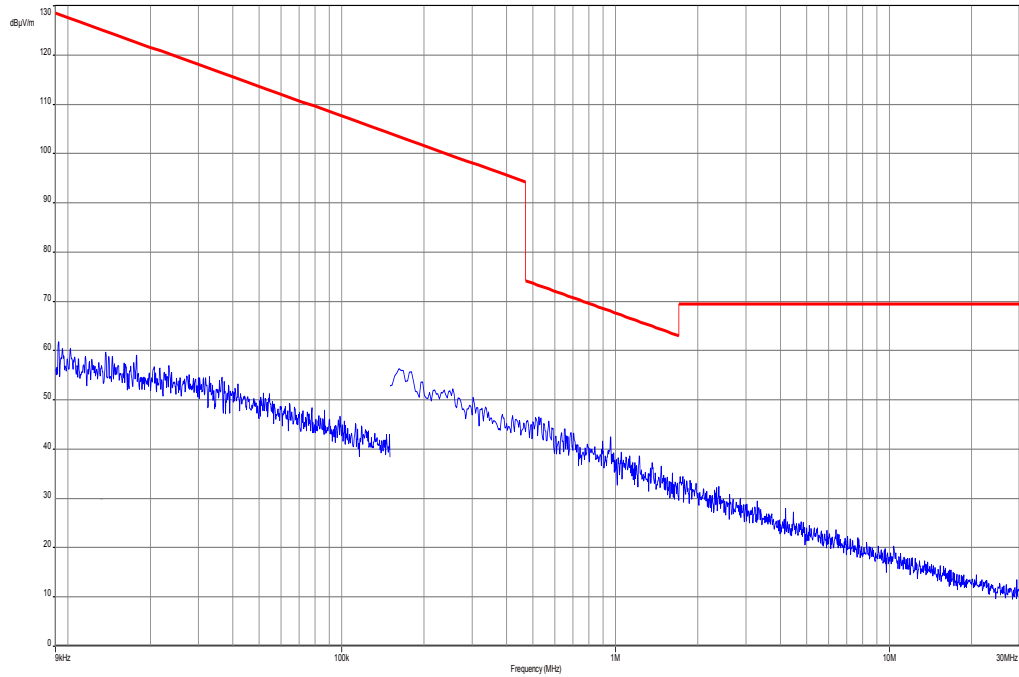
Results:

| TX Spurious Emissions Radiated < 30 MHz [dBµV/m] | | |
|--|----------|----------------|
| F [MHz] | Detector | Level [dBµV/m] |
| No peaks detected. | | |
| Measurement uncertainty | ± 3 dB | |

Result: Passed

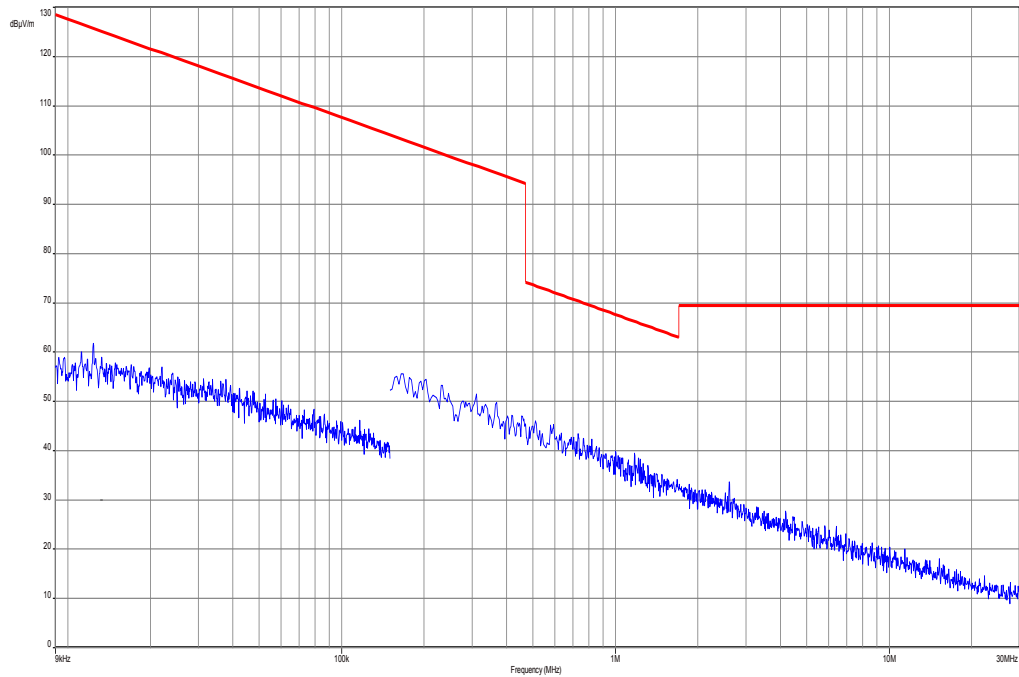
Plots: TX mode

Plot 1: 9 kHz to 30 MHz



Plots: RX / Idle – mode

Plot 1: 9 kHz to 30 MHz



11.13 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is repeated for DSSS and OFDM modulation. If peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

| Measurement parameter | |
|-----------------------|--|
| Detector: | Peak - Quasi Peak / Average |
| Sweep time: | Auto |
| Video bandwidth: | F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz |
| Resolution bandwidth: | F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz |
| Span: | 9 kHz to 30 MHz |
| Trace-Mode: | Max Hold |

Limits:

| FCC | IC | |
|--|---------------------|------------------|
| TX Spurious Emissions Conducted < 30 MHz | | |
| Frequency (MHz) | Quasi-Peak (dBµV/m) | Average (dBµV/m) |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* |
| 0.5 – 5 | 56 | 46 |
| 5 – 30.0 | 60 | 50 |

*Decreases with the logarithm of the frequency

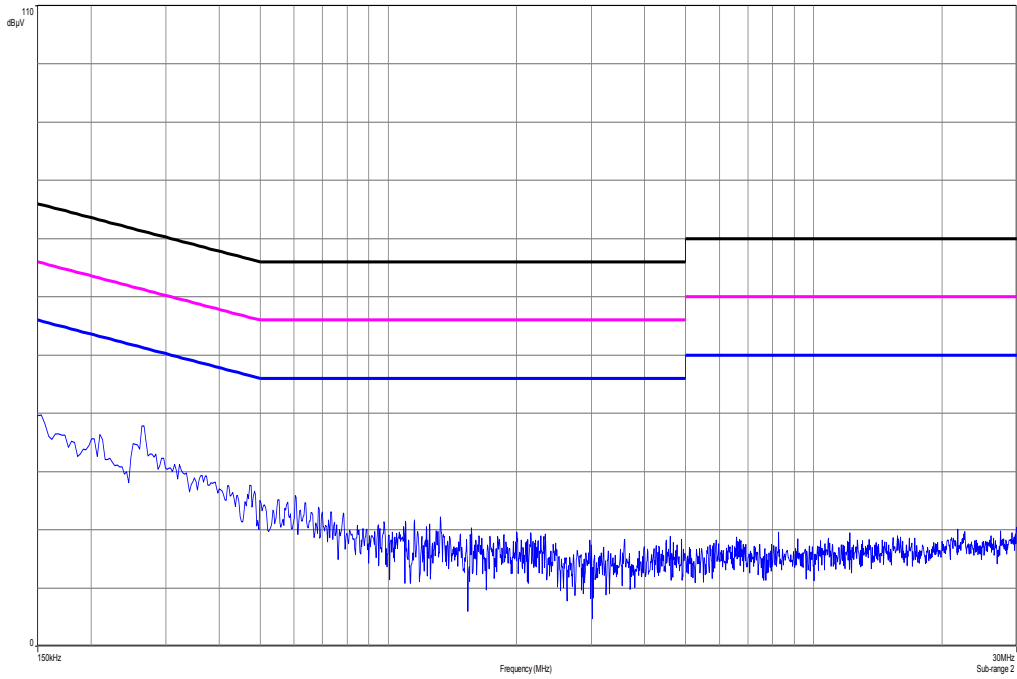
Results:

| TX Spurious Emissions Conducted < 30 MHz [dBµV/m] | | |
|---|----------|----------------|
| F [MHz] | Detector | Level [dBµV/m] |
| No peaks detected. | | |
| Measurement uncertainty | ± 3 dB | |

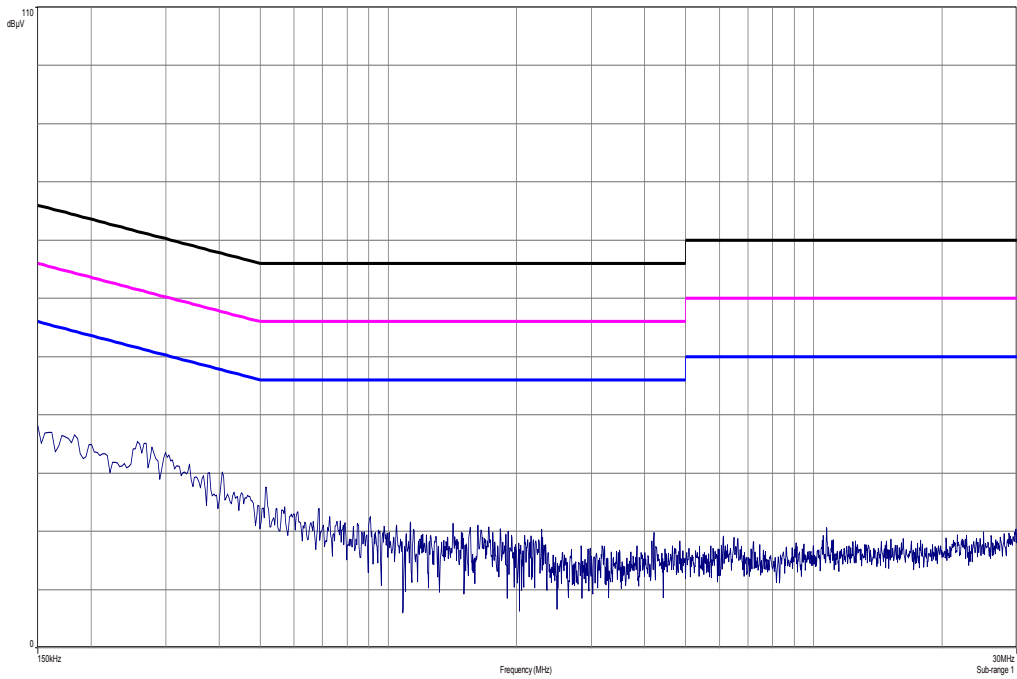
Result: Passed

Plots:

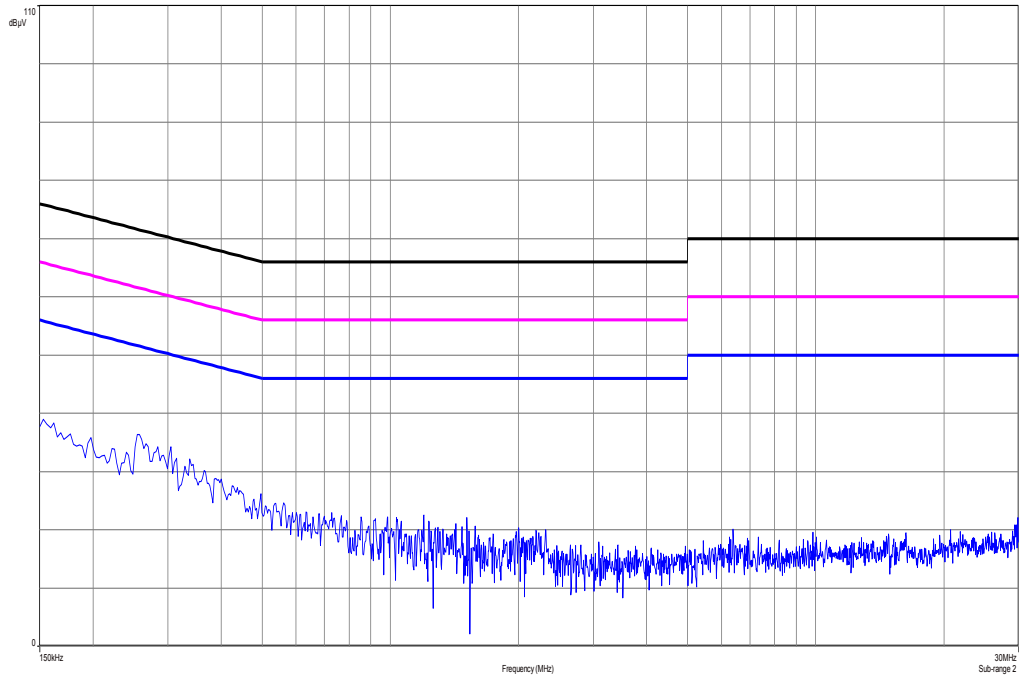
Plot 1: TX mode, 150 kHz to 30 MHz, phase line



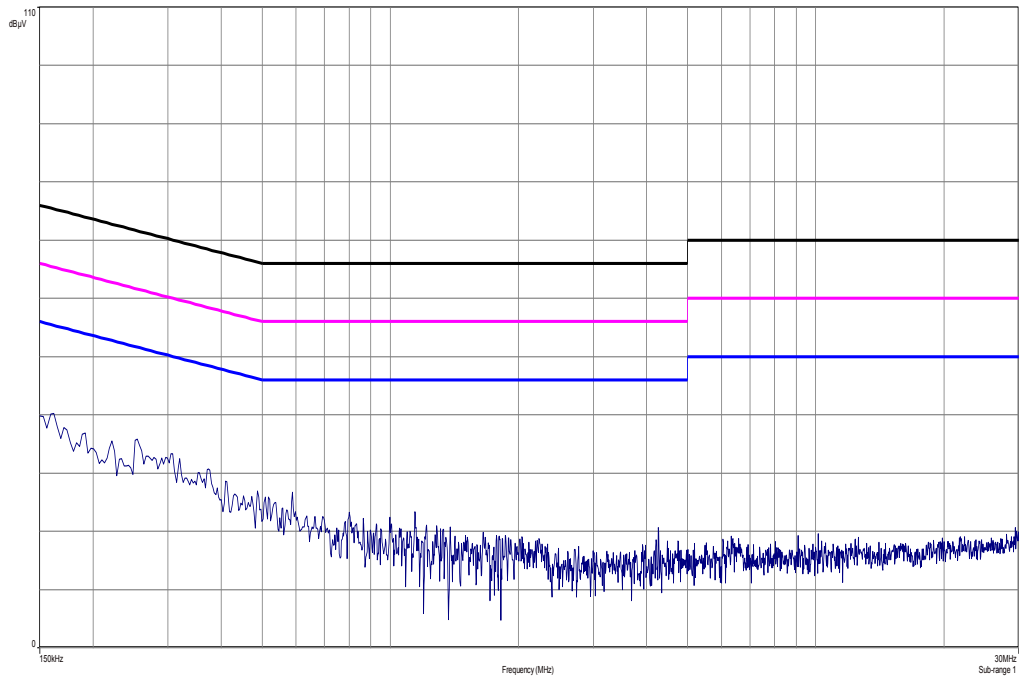
Plot 2: TX mode, 150 kHz to 30 MHz, neutral line



Plot 3: RX / Idle – mode, 150 kHz to 30 MHz, phase line



Plot 4: RX / Idle – mode, 150 kHz to 30 MHz, neutral line



12 Test equipment and ancillaries used for tests

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 signalling 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 (Labor/Item).

| No. | Lab / Item | Equipment | Type | Manufact. | Serial No. | INV. No Cetecom | Kind of Calibration | Last Calibration | Next Calibration |
|-----|------------|---|---|-----------------------------|------------|--------------------|------------------------|---------------------|---------------------|
| 1 | 45 | Switch-Unit | 3488A | HP Meßtechnik | 2719A14505 | 300000368 | g | | |
| 2 | 50 | DC power supply, 60Vdc, 50A, 1200 W | 6032A | HP Meßtechnik | 2920A04466 | 300000580 | ne | | |
| 3 | n. a. | Antenna Tower | Model 2175 | ETS- LINDGREN | 64762 | 300003745 | izw | | |
| 4 | n. a. | Positioning Controller | Model 2090 | ETS- LINDGREN | 64672 | 300003746 | izw | | |
| 5 | n. a. | Turntable Interface-Box | Model 105637 | ETS- LINDGREN | 44583 | 300003747 | izw | | |
| 6 | n. a. | TRILOG Broadband Test-Antenna 30 MHz - 3 GHz | VULB9163 | Schwarzbe ck | 295 | 300003787 | k | 12.04.2012 | 12.04.2014 |
| 7 | n. a. | Double-Ridged Waveguide Horn Antenna 1-18.0GHz | 3115 | EMCO | 8812-3088 | 300001032 | vIKI! | 08.05.2013 | 08.05.2015 |
| 8 | n. a. | Anechoic chamber | FAC 3/5m | MWB / TDK | 87400/02 | 300000996 | ev | | |
| 9 | n. a. | Switch / Control Unit | 3488A | HP Meßtechnik | * | 300000199 | ne | | |
| 10 | n. a. | Switch / Control Unit | 3488A | HP Meßtechnik | 2719A15013 | 300001156 | ne | | |
| 11 | 9 | Isolating Transformer | MPL IEC625 Bus Regeltrennt ravo | Erfi | 91350 | 300001155 | ne | | |
| 12 | n. a. | Three-Way Power Splitter, 50 Ohm | 11850C | HP Meßtechnik | | 300000997 | ne | | |
| 13 | 90 | Active Loop Antenna 10 kHz to 30 MHz | 6502 | Kontron Psychotech | 8905-2342 | 300000256 | k | 13.06.2013 | 13.06.2015 |
| 14 | n. a. | Amplifier | js42- 00502650- 28-5a | Parzich GMBH | 928979 | 300003143 | ne | | |
| 15 | n. a. | Band Reject filter | WRCG240 0/2483- 2375/2505- 50/10SS | Wainwright | 11 | 300003351 | ev | | |
| 16 | n. a. | TRILOG Broadband Test-Antenna 30 MHz - 3 GHz | VULB9163 | Schwarzbe ck | 371 | 300003854 | vIKI! | 14.10.2011 | 14.10.2014 |
| 17 | n. a. | MXE EMI Receiver 20 Hz bis 26,5 GHz | N9038A | Agilent Technologi es | MY51210197 | 300004405 | k | 21.02.2013 | 21.02.2014 |
| 18 | 11b | Microwave System Amplifier, 0.5- 26.5 GHz | 83017A | HP Meßtechnik | 00419 | 300002268 | ev | | |
| 19 | A026 | Std. Gain Horn Antenna 12.4 to 18.0 GHz | 639 | Narda | 8402 | 300000787 | k | 22.07.2013 | 22.07.2015 |
| 20 | A029 | Std. Gain Horn Antenna 18.0 to 26.5 GHz | 638 | Narda | 8205 | 300002442 | k | 19.07.2013 | 19.07.2015 |
| 21 | n. a. | Signal Analyzer 40 GHz | FSV40 | R&S | 101042 | 300004517 | k | 21.01.2014 | 21.01.2015 |
| 22 | n. a. | Power Supply | 6632B | Agilent | GB42110541 | 400000562 | vIKI! | 10.01.2013 | 10.01.2016 |

| | | | | | | | | | |
|----|-------|-------------------|--------|--------------|--------|-----------|---|------------|------------|
| | | 0-20V, 0-5A | | Technologies | | | | | |
| 23 | n. a. | EMI Test Receiver | ESCI 3 | R&S | 100083 | 300003312 | k | 27.01.2014 | 27.01.2015 |

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

13 Observations

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

Annex A Document history

| Version | Applied changes | Date of release |
|---------|-----------------|-----------------|
| | Initial release | 2014-02-05 |

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 |

Annex C Accreditation Certificate

Front side of certificate



Back side of certificate



Note:

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

<http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html>