

## 12.9 Band edge compliance conducted

### Description:

Measurement of the radiated band edge compliance with a conducted test setup.

### Measurement:

| Measurement parameter for measurements            |                                                                                           |
|---------------------------------------------------|-------------------------------------------------------------------------------------------|
| According to DTS clause: 13.3.2 and clause 12.2.2 |                                                                                           |
| Detector                                          | RMS                                                                                       |
| Sweep time                                        | Auto                                                                                      |
| Resolution bandwidth                              | 100 kHz                                                                                   |
| Video bandwidth                                   | 300 kHz                                                                                   |
| Span                                              | 2 MHz<br>lower band edge 2388 MHz to 2390 MHz<br>upper band edge 2483.5 MHz to 2485.5 MHz |
| Trace mode                                        | Trace average with 200 counts                                                             |
| Test setup                                        | See chapter 6.5 A                                                                         |
| Measurement uncertainty                           | See chapter 8                                                                             |

### Limits:

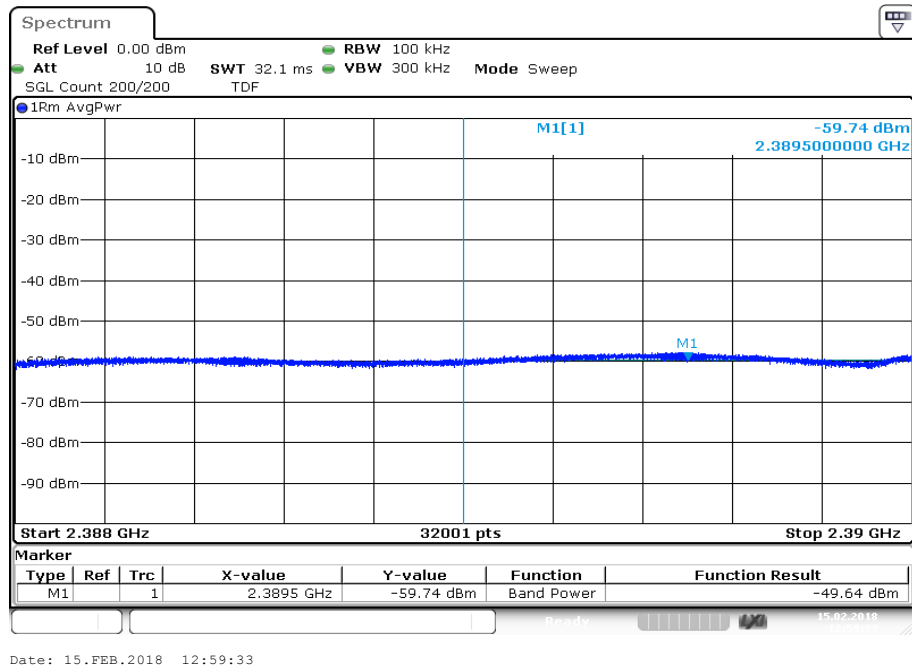
| FCC        | IC |
|------------|----|
| -41.26 dBm |    |

**Results:**

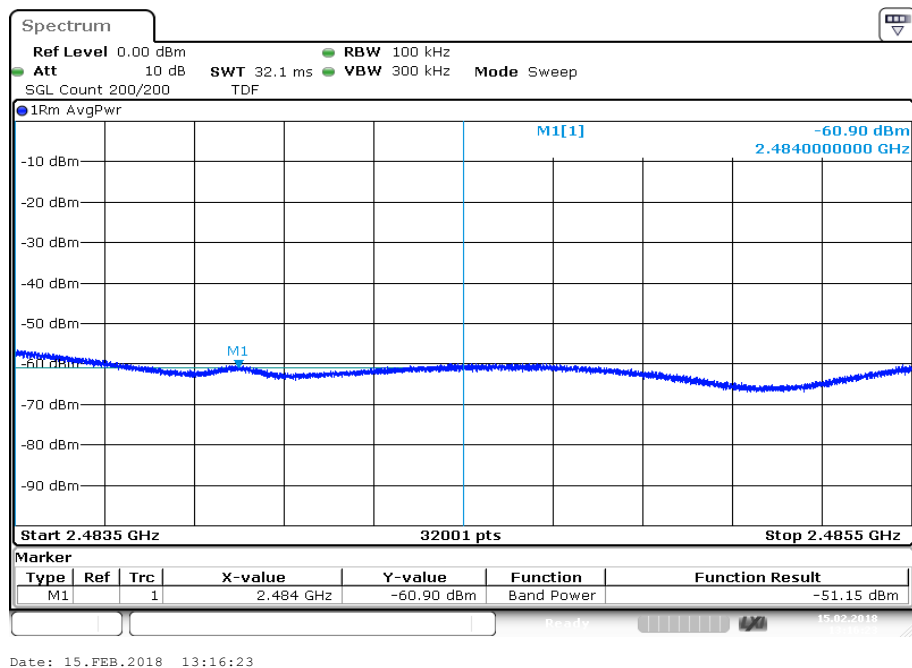
|                                         | band edge compliance / dBm |                    |                         |                         |
|-----------------------------------------|----------------------------|--------------------|-------------------------|-------------------------|
| Modulation:                             | DSSS /<br>b – mode         | OFDM /<br>g – mode | OFDM / n<br>HT20 – mode | OFDM / n<br>HT40 – mode |
| Max. lower band edge power<br>conducted | -49.6                      | -47.6              | -45.4                   | -48.8                   |
| Antenna gain / dBi                      | 2.2                        |                    |                         |                         |
| Max. lower band edge power<br>radiated  | -47.4                      | -45.4              | -43.2                   | -46.6                   |
| Max. upper band edge power<br>conducted | -51.2                      | -46.2              | -43.4                   | -42.7                   |
| Antenna gain / dBi                      | 1.2                        |                    |                         |                         |
| Max. upper band edge power<br>radiated  | -50.0                      | -45.0              | -42.2                   | -41.5                   |

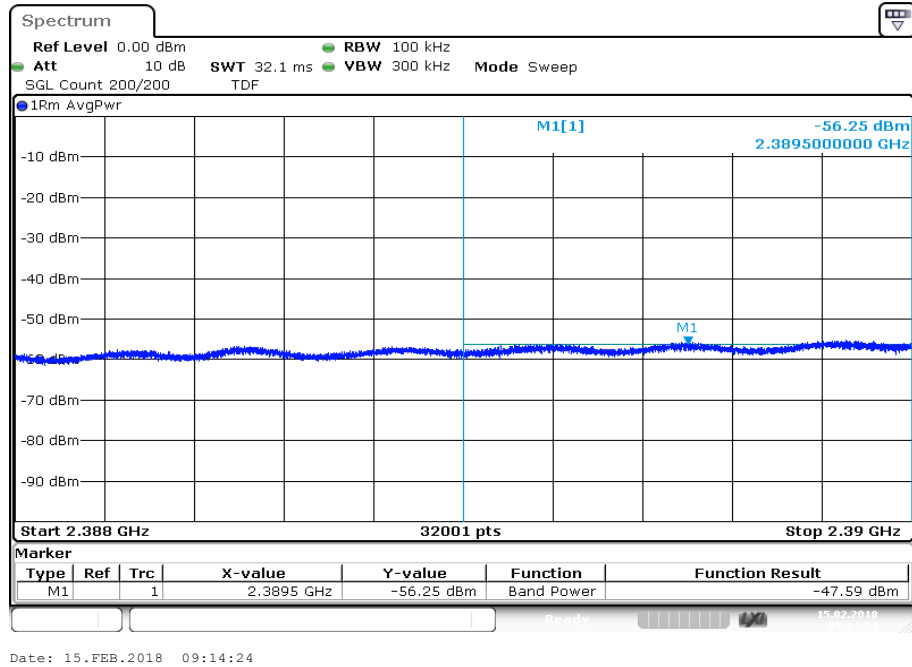
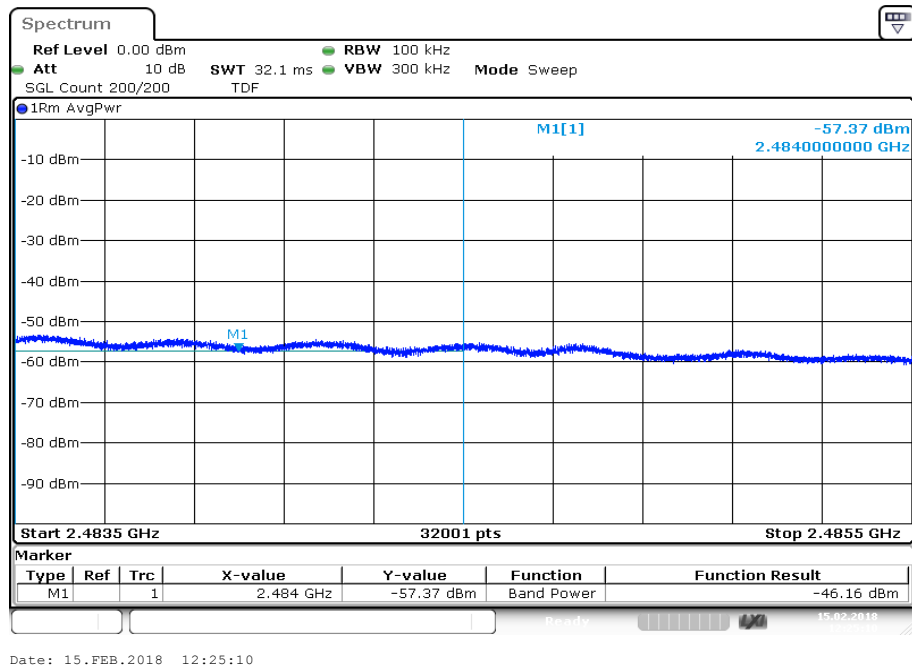
**Plots:** DSSS / b – mode

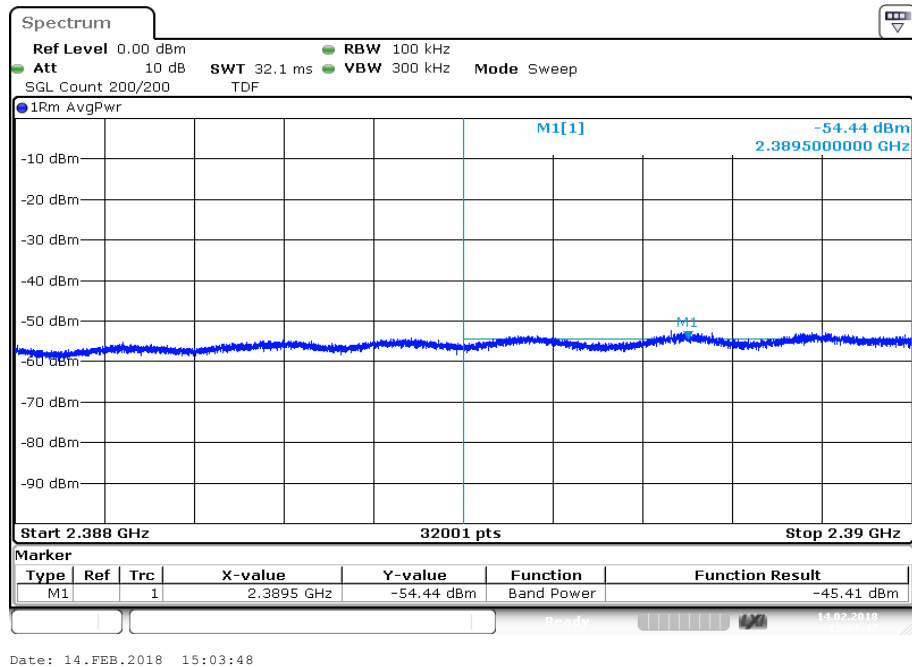
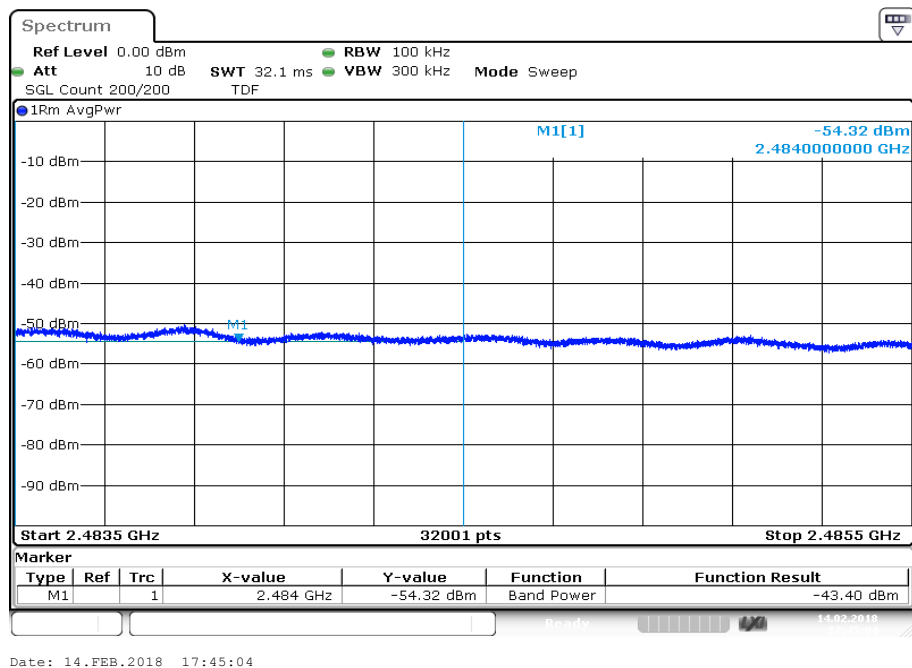
**Plot 1:** Lower band edge

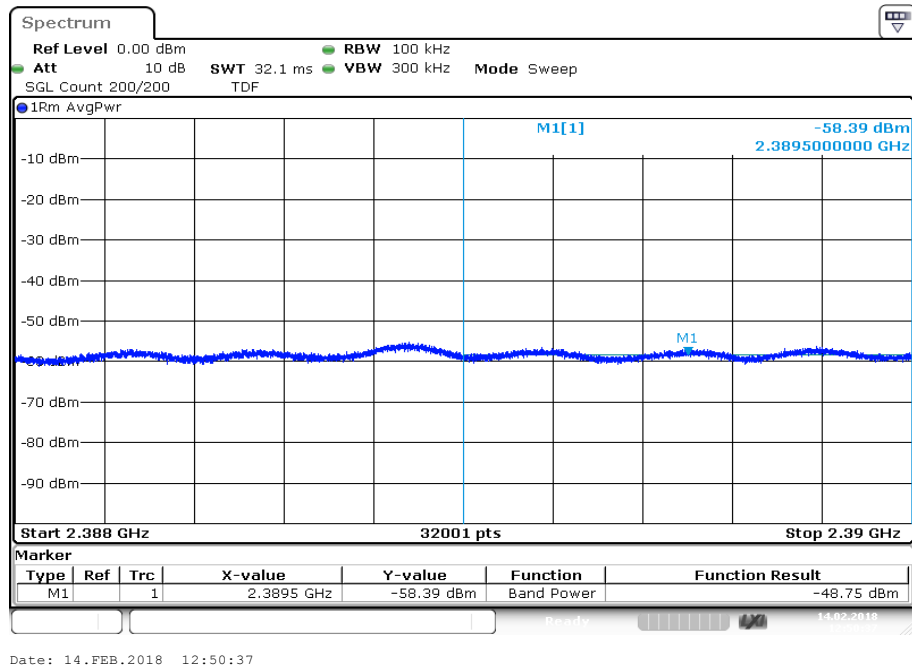
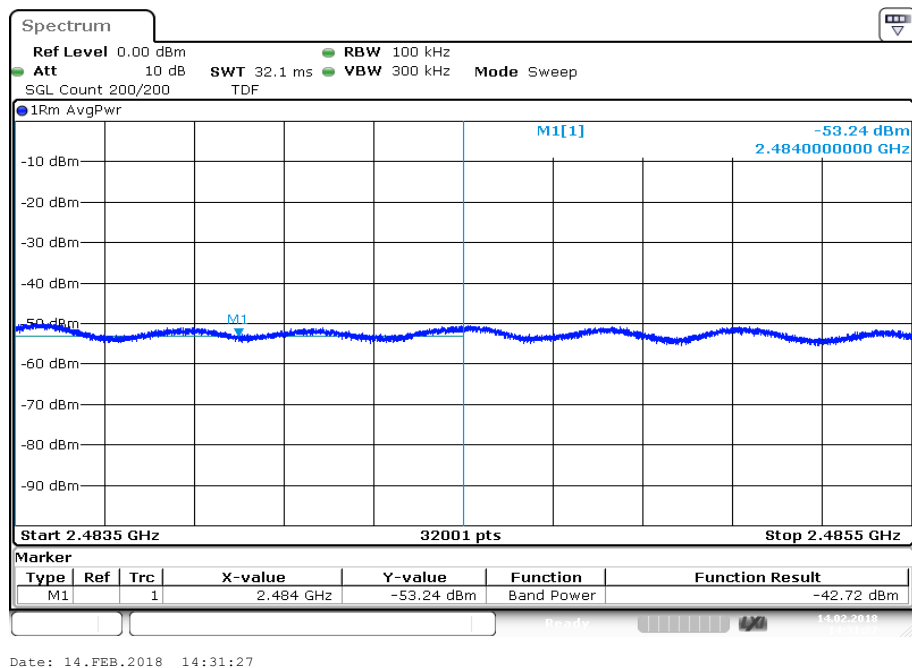


**Plot 2:** Upper band edge



**Plots:** OFDM / g – mode**Plot 1:** Lower band edge**Plot 2:** Upper band edge

**Plots:** OFDM / n HT20 – mode**Plot 1:** Lower band edge**Plot 2:** Upper band edge

**Plots:** OFDM / n HT40 – mode**Plot 1:** Lower band edge**Plot 2:** Upper band edge

## 12.10 Spurious emissions conducted

### Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at the lowest; the middle and the highest channel. The measurement is repeated for all modulations.

### Measurement:

| Measurement parameter   |                   |
|-------------------------|-------------------|
| Detector                | Peak              |
| Sweep time              | Auto              |
| Resolution bandwidth    | 100 kHz           |
| Video bandwidth         | 500 kHz           |
| Span                    | 9 kHz to 25 GHz   |
| Trace mode              | Max Hold          |
| Test setup              | See chapter 6.5 A |
| Measurement uncertainty | See chapter 8     |

### Limits:

| FCC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | IC |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 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 30 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 |    |

**Results:** DSSS / b – mode

| TX spurious emissions conducted                                  |  |                             |                                     |                                                      |                     |
|------------------------------------------------------------------|--|-----------------------------|-------------------------------------|------------------------------------------------------|---------------------|
| f [MHz]                                                          |  | amplitude of emission [dBm] | limit max. allowed emission power   | actual attenuation below frequency of operation [dB] | results             |
| Channel 1                                                        |  | 1.4                         | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 6                                                        |  | 1.2                         | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 11                                                       |  | 1.9                         | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
|                                                                  |  |                             |                                     |                                                      |                     |

**Results:** OFDM / g – mode

| TX spurious emissions conducted                                  |  |                             |                                     |                                                      |                     |
|------------------------------------------------------------------|--|-----------------------------|-------------------------------------|------------------------------------------------------|---------------------|
| f [MHz]                                                          |  | amplitude of emission [dBm] | limit max. allowed emission power   | actual attenuation below frequency of operation [dB] | results             |
| Channel 1                                                        |  | -7.3                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 2                                                        |  | -5.0                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 3                                                        |  | -5.5                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 4                                                        |  | -2.7                        |                                     |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 5                                                        |  | -2.4                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 6                                                        |  | -1.6                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 7                                                        |  | -2.7                        |                                     |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 8                                                        |  | -1.9                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 9                                                        |  | -4.5                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 10                                                       |  | -4.4                        |                                     |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 11                                                       |  | -8.1                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |

**Results:** OFDM / n HT20 – mode

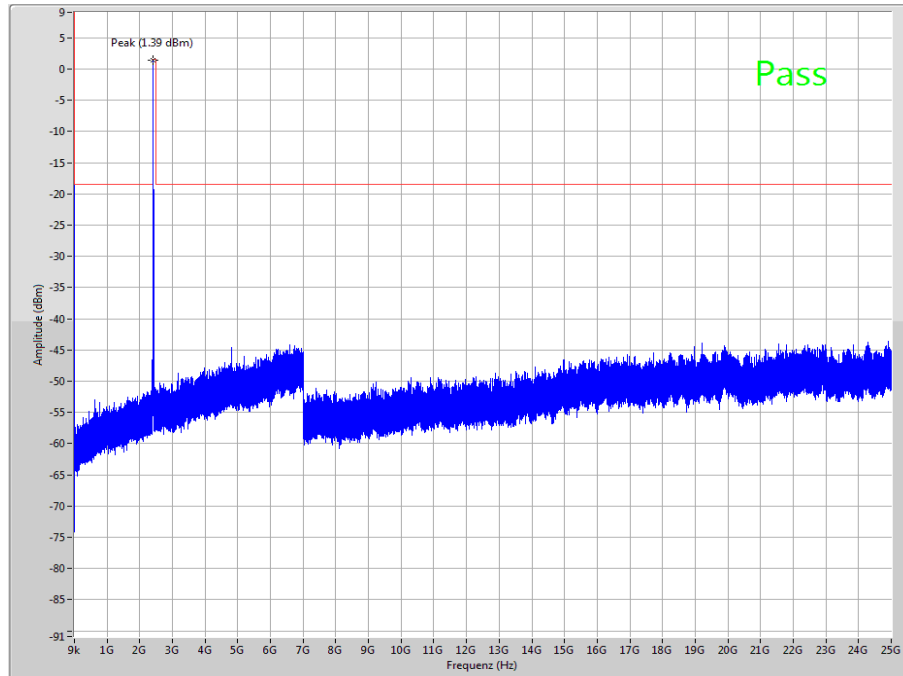
| TX spurious emissions conducted                                  |  |                             |                                     |                                                      |                     |
|------------------------------------------------------------------|--|-----------------------------|-------------------------------------|------------------------------------------------------|---------------------|
| f [MHz]                                                          |  | amplitude of emission [dBm] | limit max. allowed emission power   | actual attenuation below frequency of operation [dB] | results             |
| Channel 1                                                        |  | -7.2                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 2                                                        |  | -4.4                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 3                                                        |  | -5.4                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 4                                                        |  | -2.6                        |                                     |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 5                                                        |  | -2.2                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 6                                                        |  | -0.8                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 7                                                        |  | -2.2                        |                                     |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 8                                                        |  | -3.3                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 9                                                        |  | -4.1                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 10                                                       |  | -4.5                        |                                     |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 11                                                       |  | -7.2                        | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |

**Results:** OFDM / n HT40 – mode

| TX spurious emissions conducted                                  |  |                             |                                     |                                                      |                     |
|------------------------------------------------------------------|--|-----------------------------|-------------------------------------|------------------------------------------------------|---------------------|
| f [MHz]                                                          |  | amplitude of emission [dBm] | limit max. allowed emission power   | actual attenuation below frequency of operation [dB] | results             |
| Channel 3                                                        |  | -11.5                       | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 6                                                        |  | -11.8                       | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
| Channel 9                                                        |  | -11.8                       | 30 dBm                              |                                                      | Operating frequency |
| All detected emissions are below the -20 dBc & -30 dBc criteria. |  |                             | -20 dBc (peak)<br>-30 dBc (average) |                                                      | compliant           |
|                                                                  |  |                             |                                     |                                                      |                     |

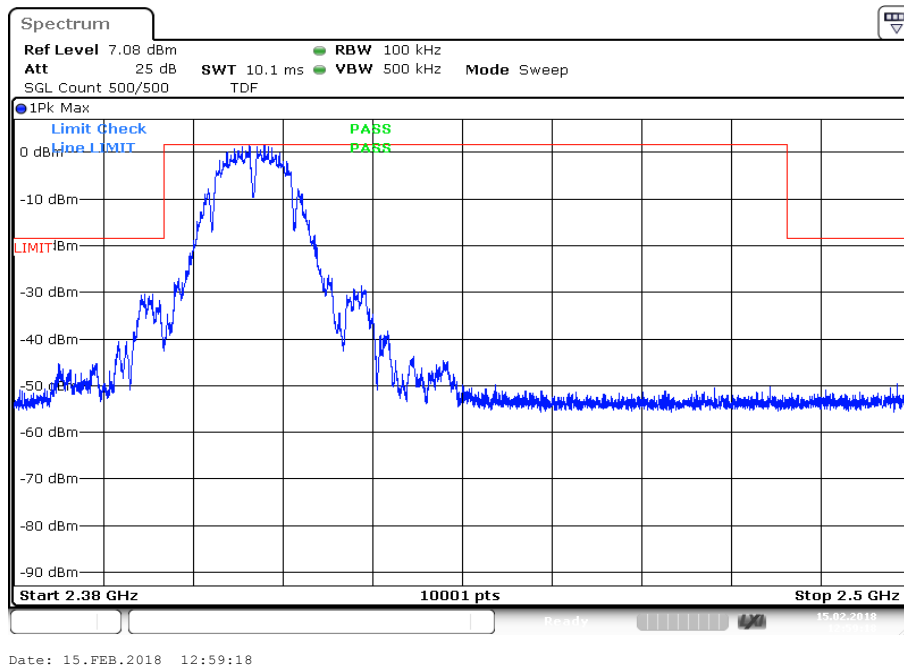
**Plots:** DSSS / b – mode

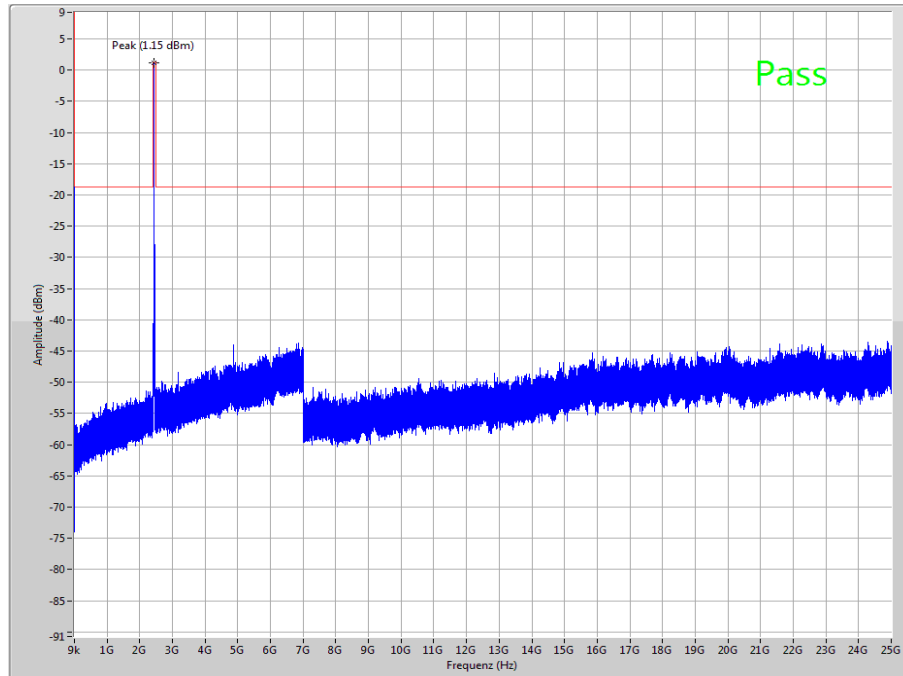
**Plot 1:** Channel 1, up to 25 GHz



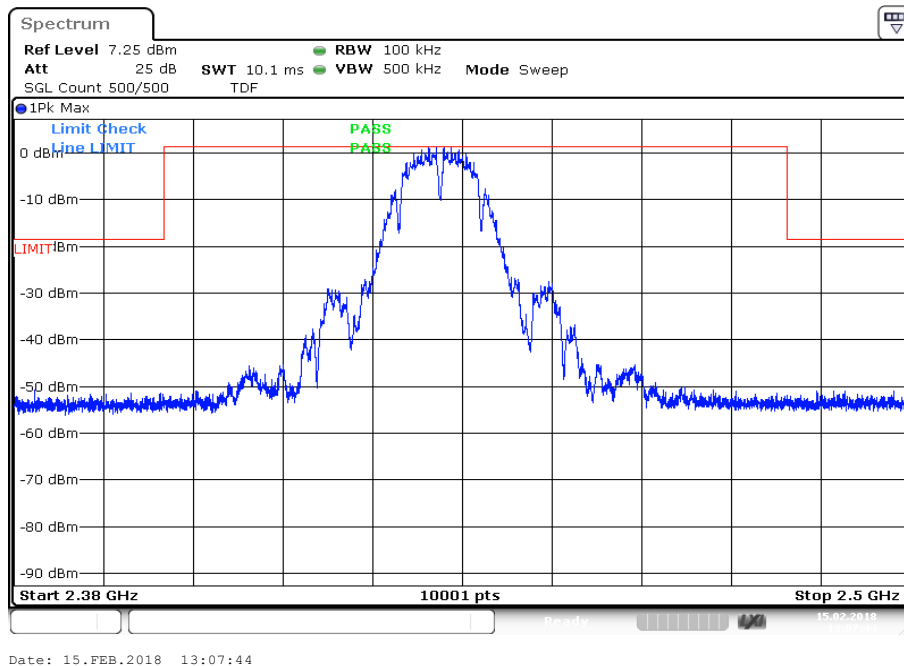
The peak at the beginning of the plot is the LO from the SA.

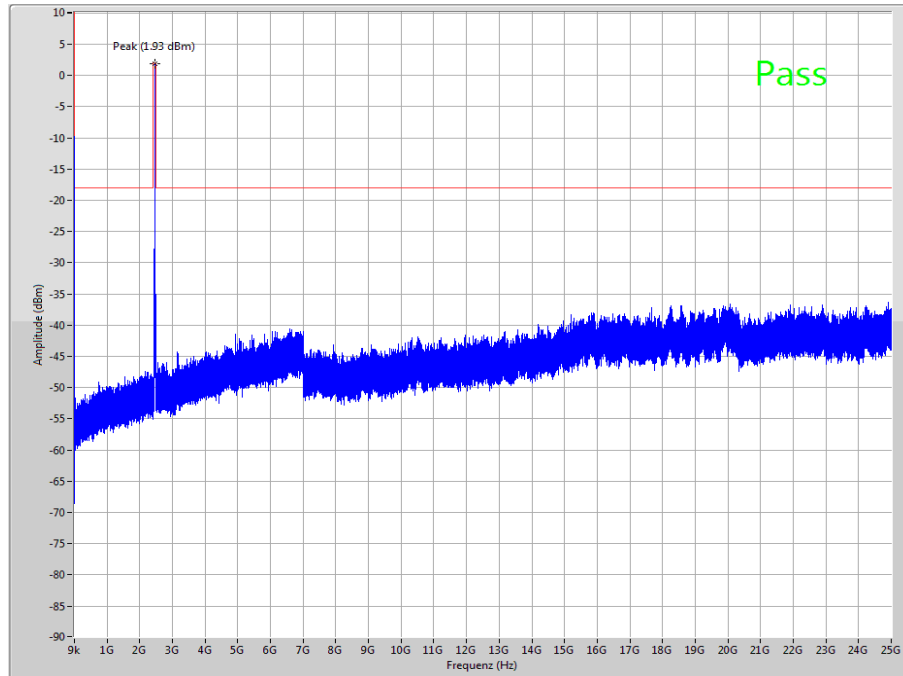
**Plot 2:** Channel 1, zoomed carrier



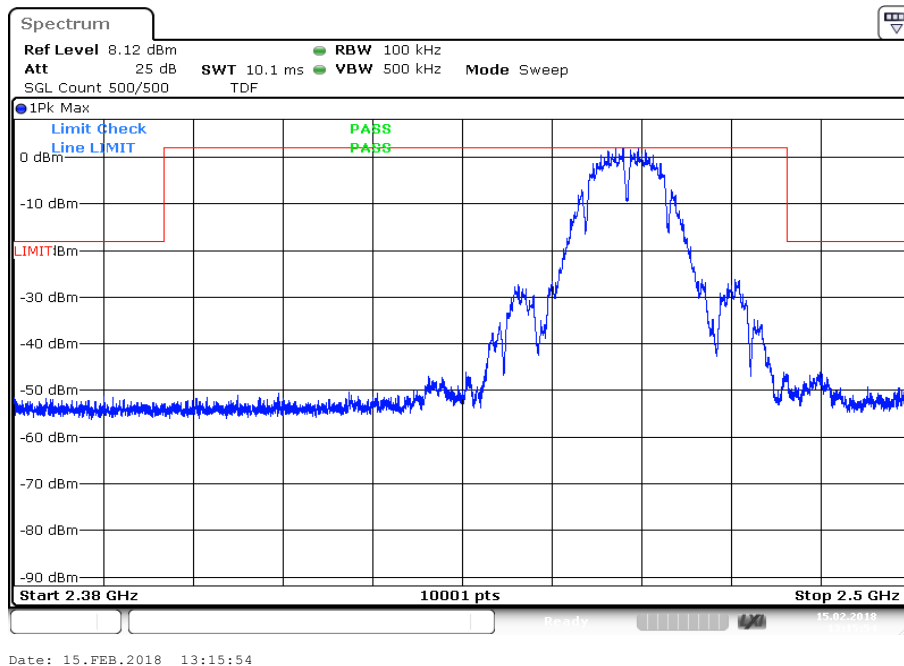
**Plot 3:** Channel 6, up to 25 GHz

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

**Plot 4:** Channel 6, zoomed carrier

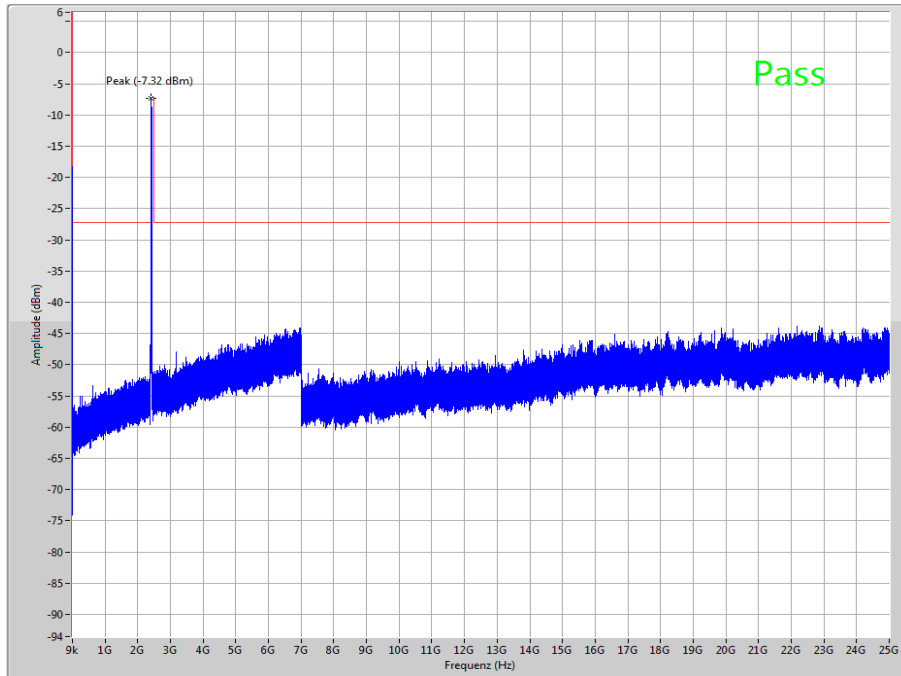
**Plot 5:** Channel 11, up to 25 GHz

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

**Plot 6:** Channel 11, zoomed carrier

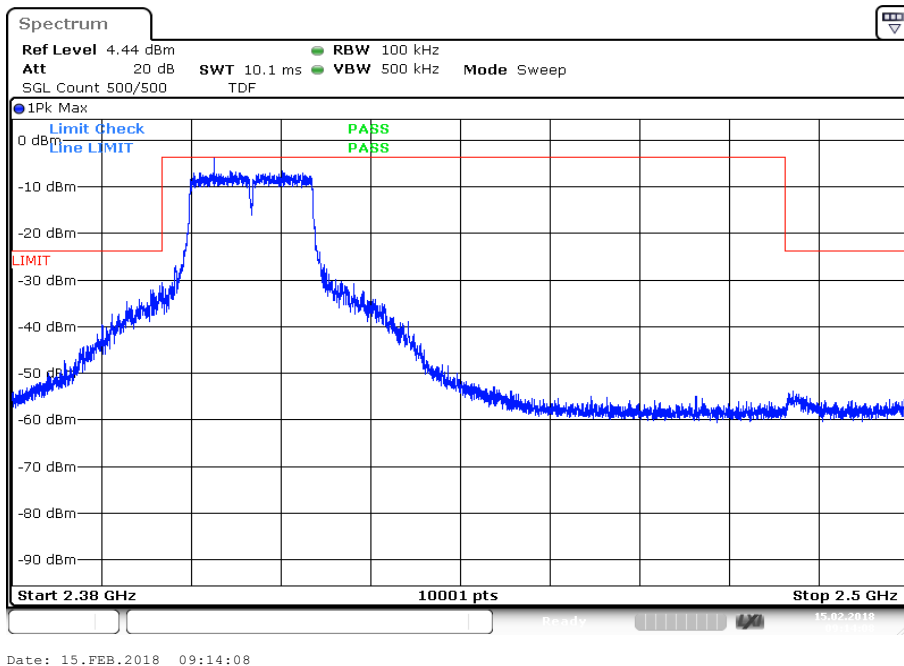
**Plots:** OFDM / g – mode

**Plot 1:** Channel 1, up to 25 GHz

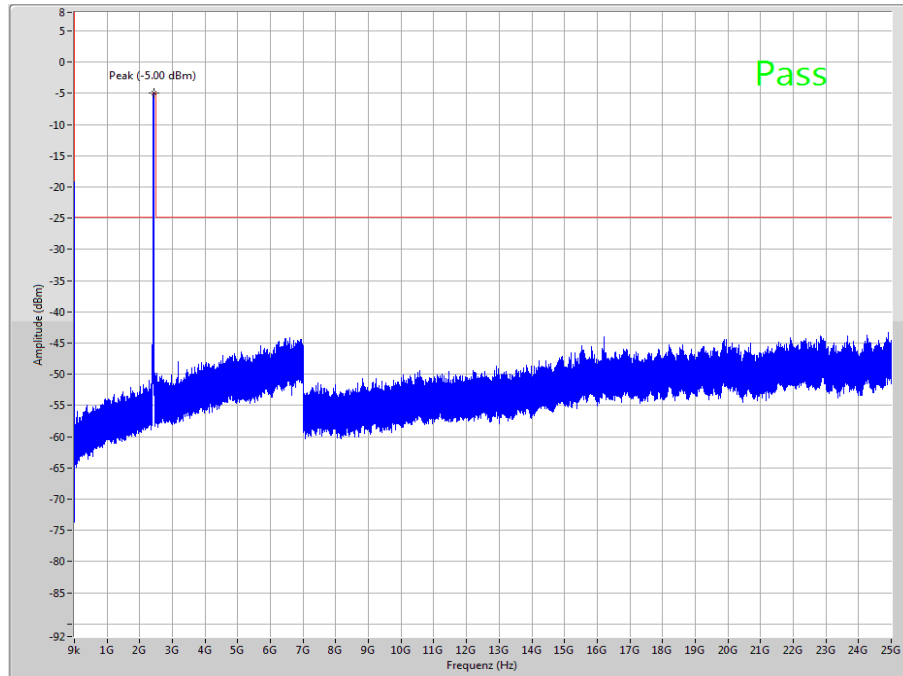


The peak at the beginning of the plot is the LO from the SA.

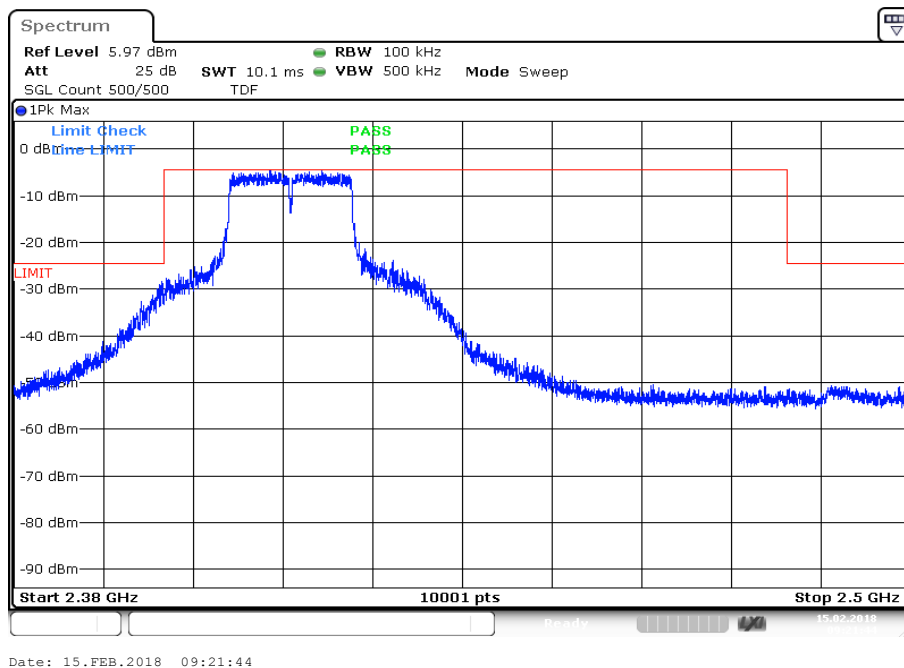
**Plot 2:** Channel 1, zoomed carrier

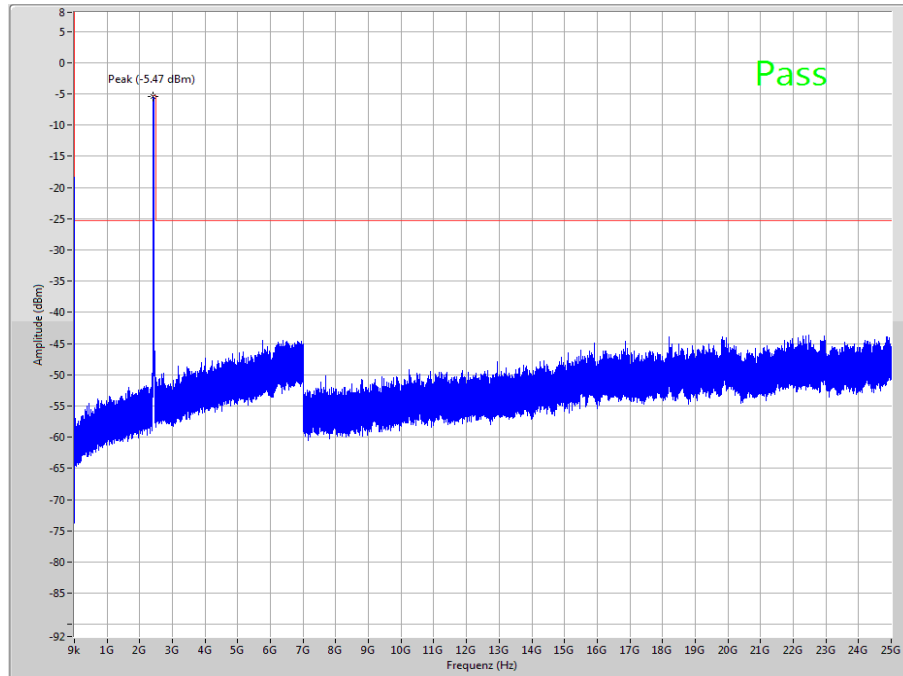


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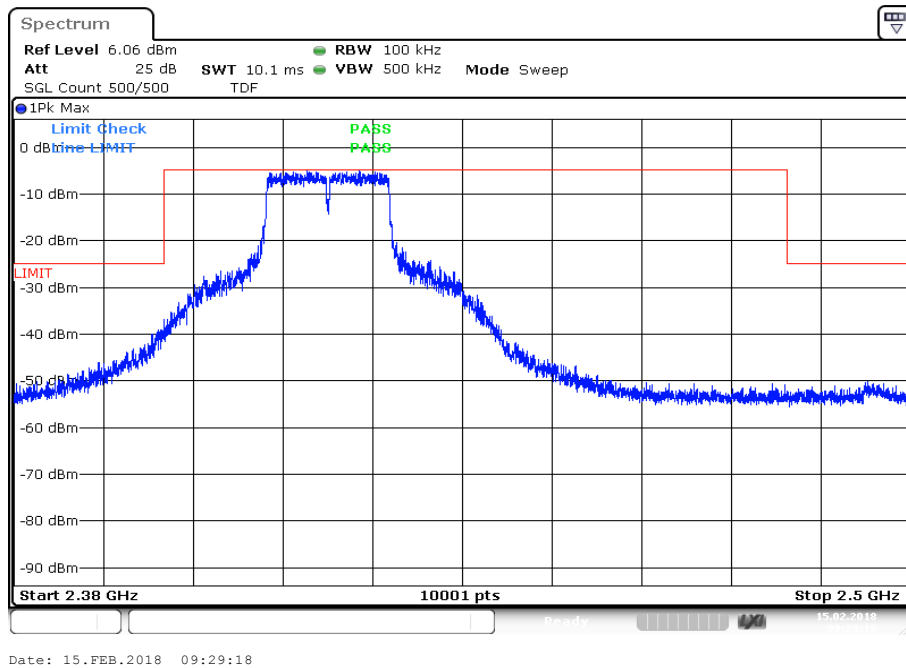
**Plot 3:** Channel 2, up to 25 GHz

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

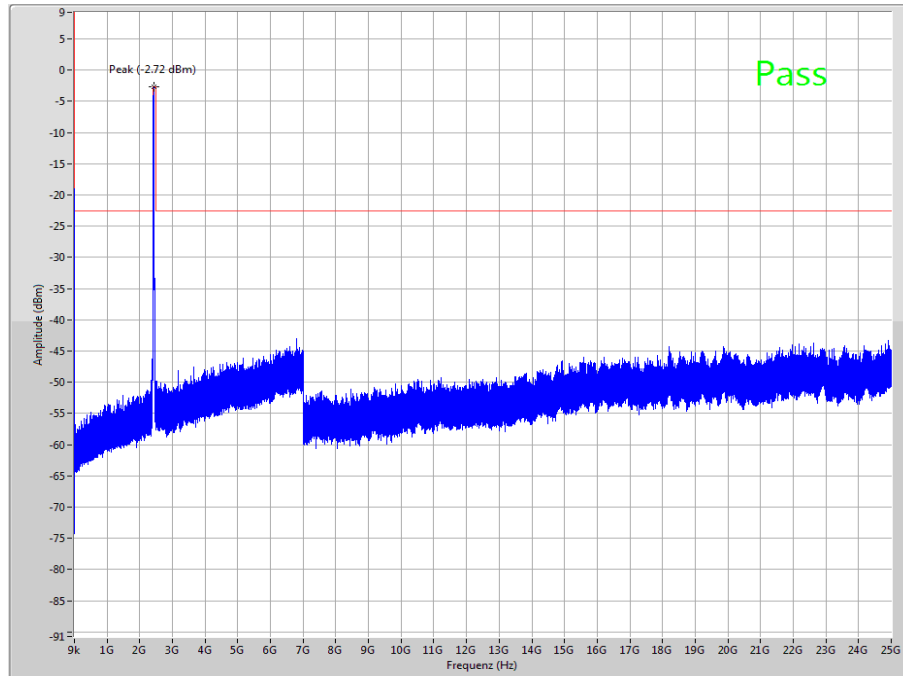
**Plot 4:** Channel 2, zoomed carrier

**Plot 5:** Channel 3, up to 25 GHz

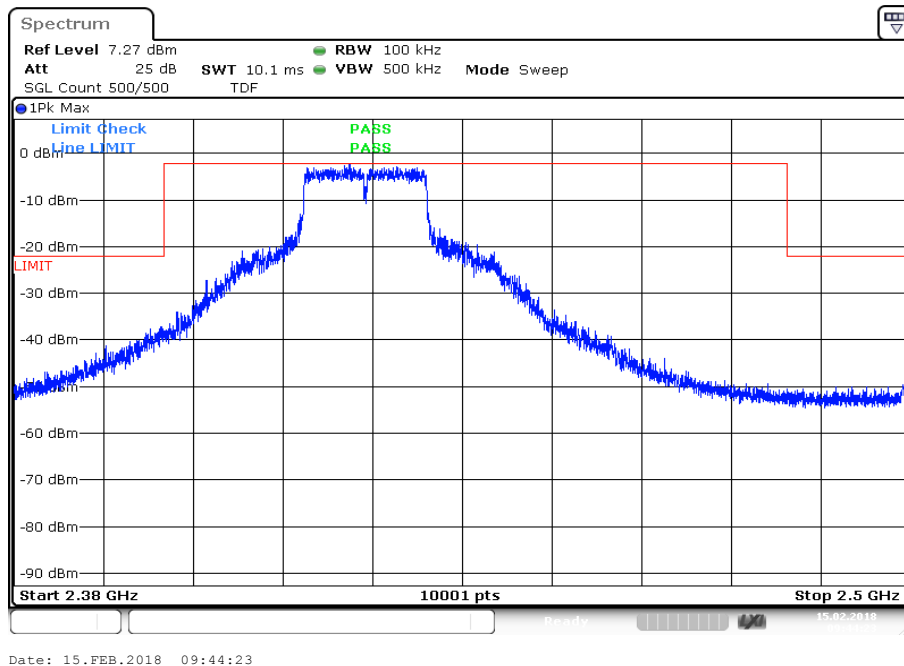
The peak at the beginning of the plot is the LO from the SA.

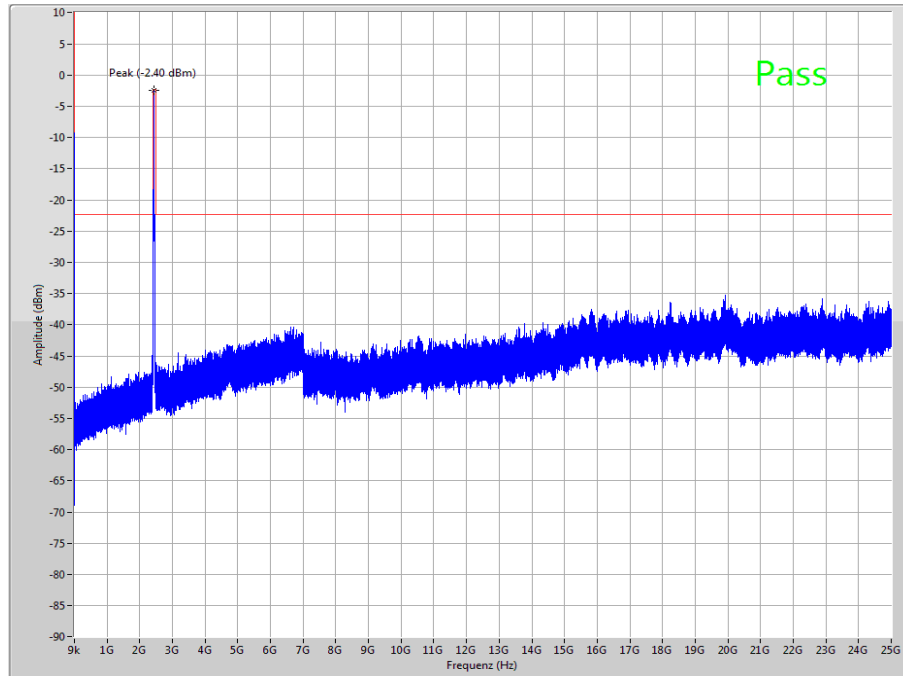
**Plot 6:** Channel 3, zoomed carrier

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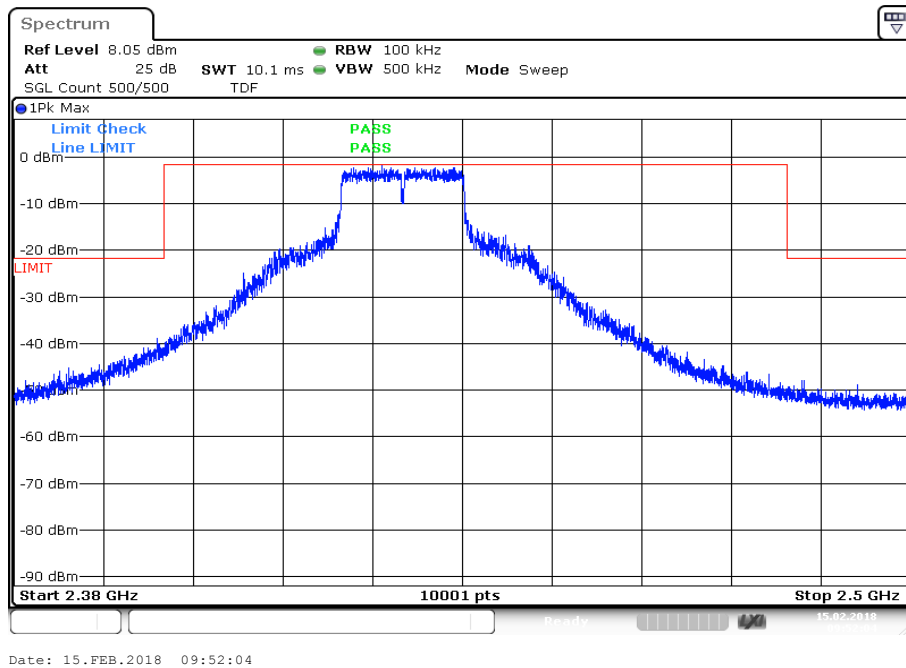
**Plot 7:** Channel 4, up to 25 GHz

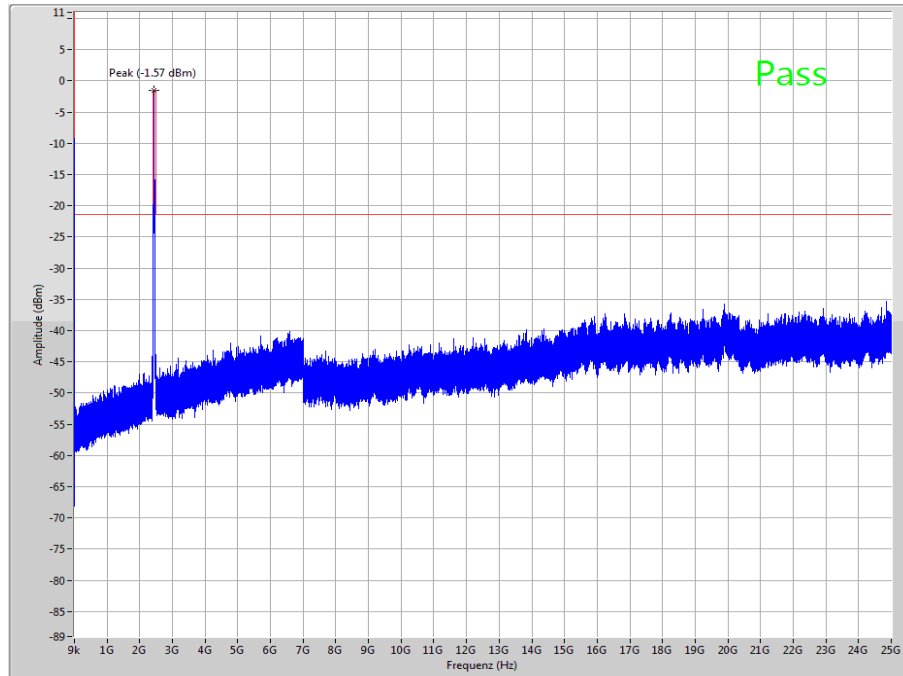
The peak at the beginning of the plot is the LO from the SA.

**Plot 8:** Channel 4, zoomed carrier

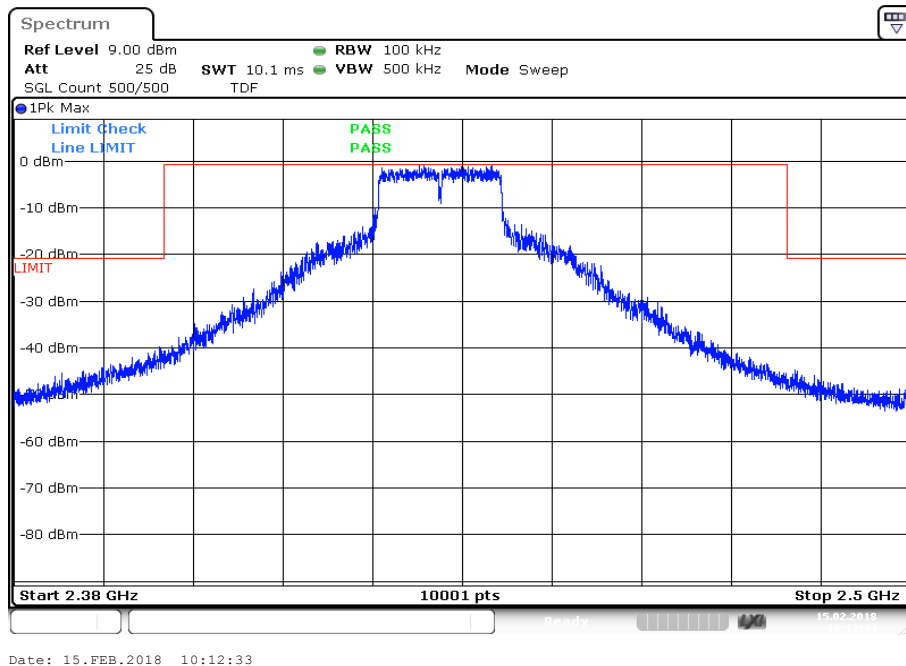
**Plot 9:** Channel 5, up to 25 GHz

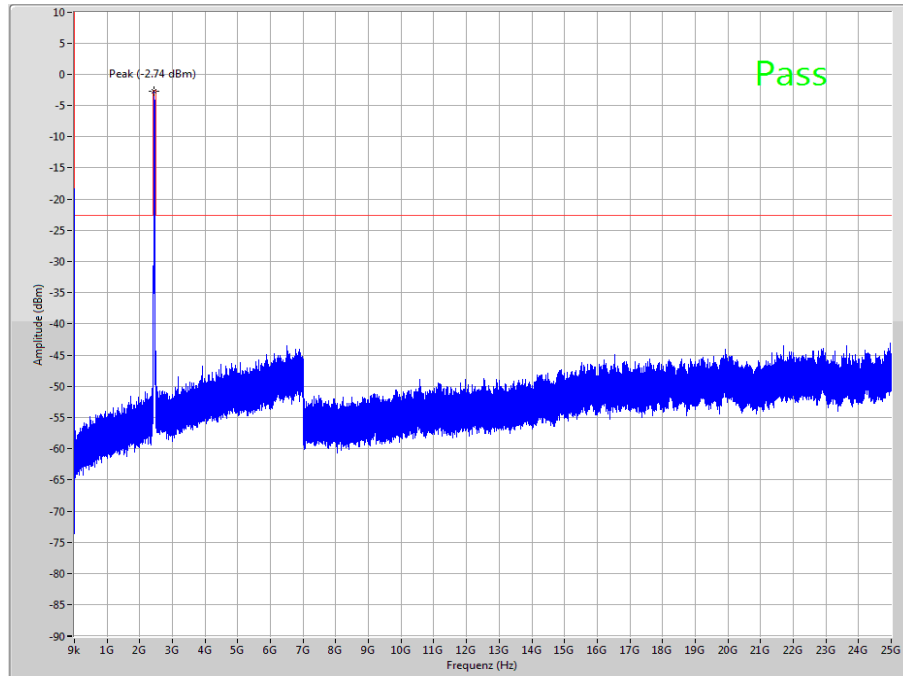
The peak at the beginning of the plot is the LO from the SA.

**Plot 10:** Channel 5, zoomed carrier

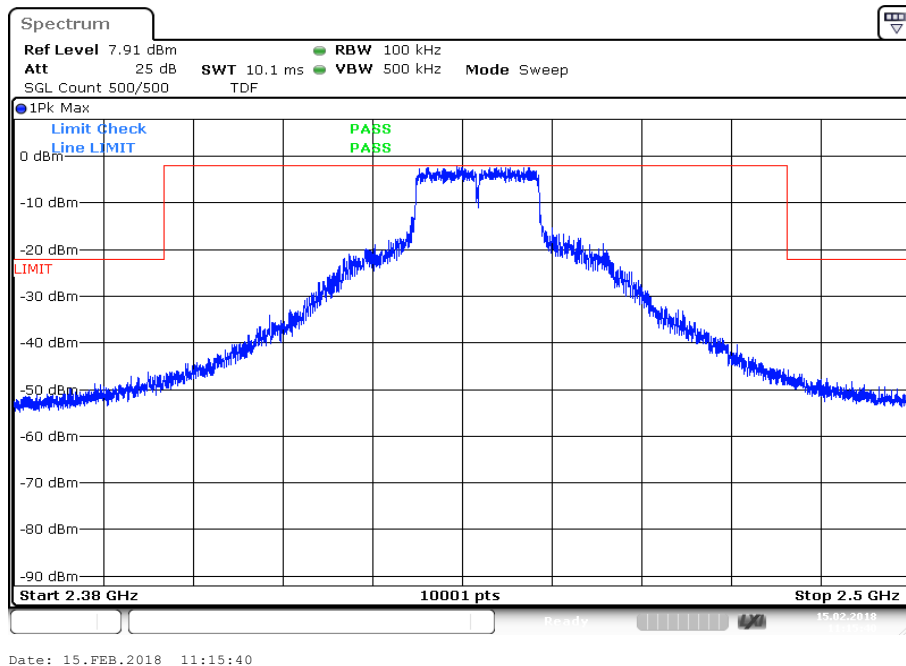
**Plot 11:** Channel 6, up to 25 GHz

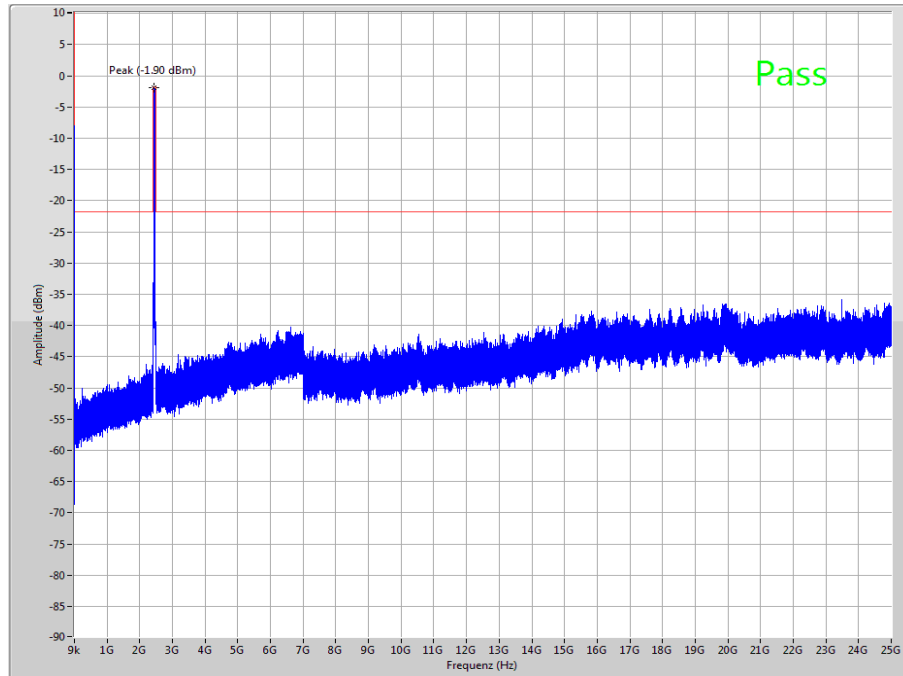
The peak at the beginning of the plot is the LO from the SA.

**Plot 12:** Channel 6, zoomed carrier

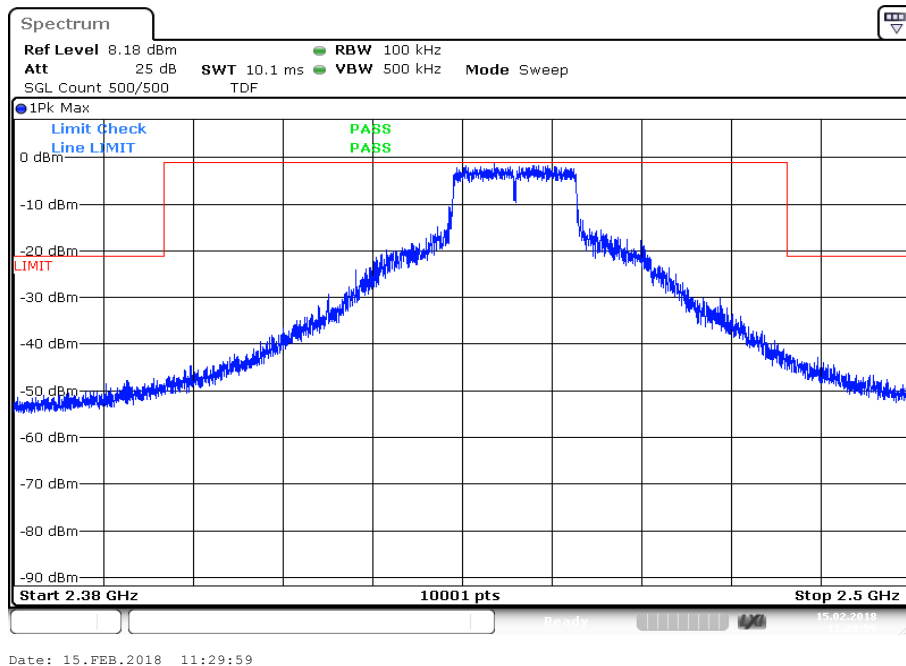
**Plot 13:** Channel 7, up to 25 GHz

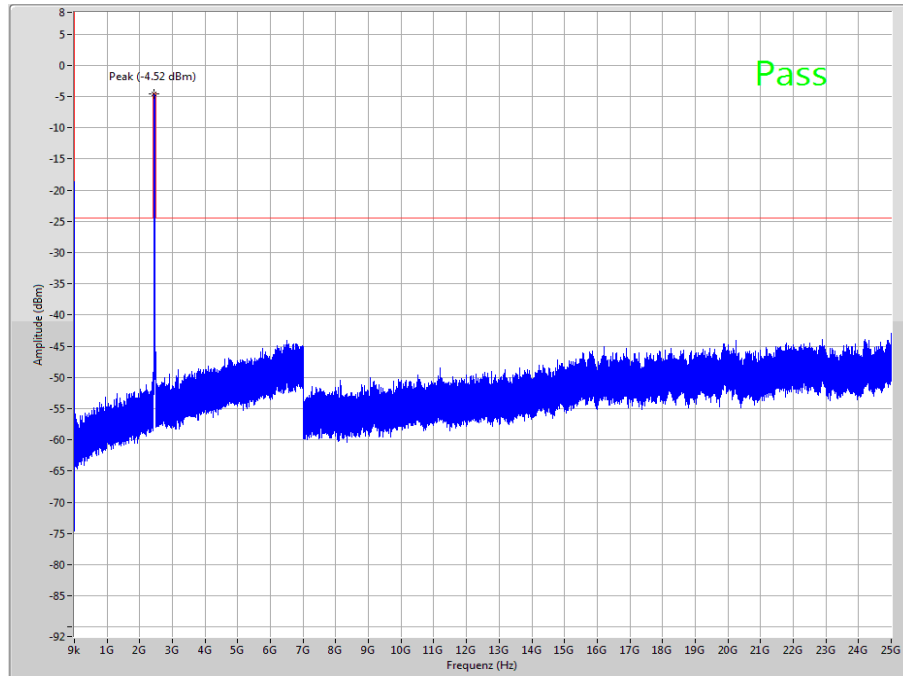
The peak at the beginning of the plot is the LO from the SA.

**Plot 14:** Channel 7, zoomed carrier

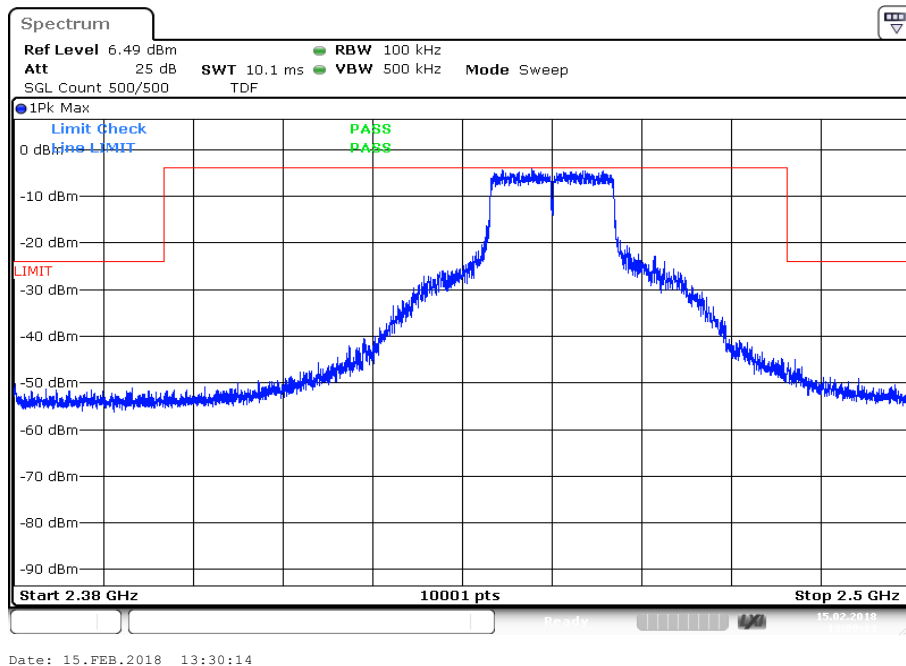
**Plot 15:** Channel 8, up to 25 GHz

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

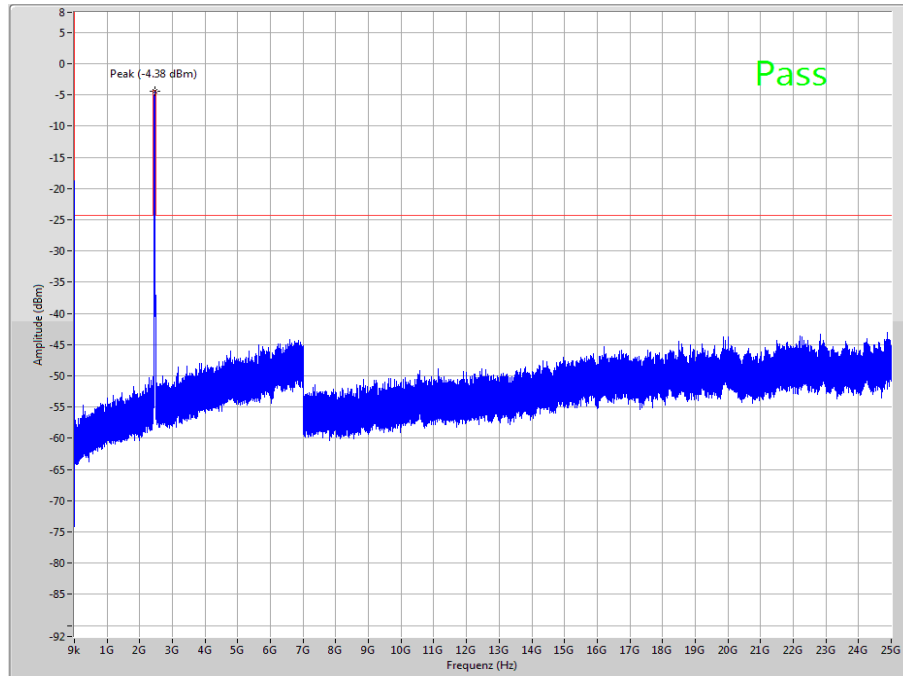
**Plot 16:** Channel 8, zoomed carrier

**Plot 17:** Channel 9, up to 25 GHz

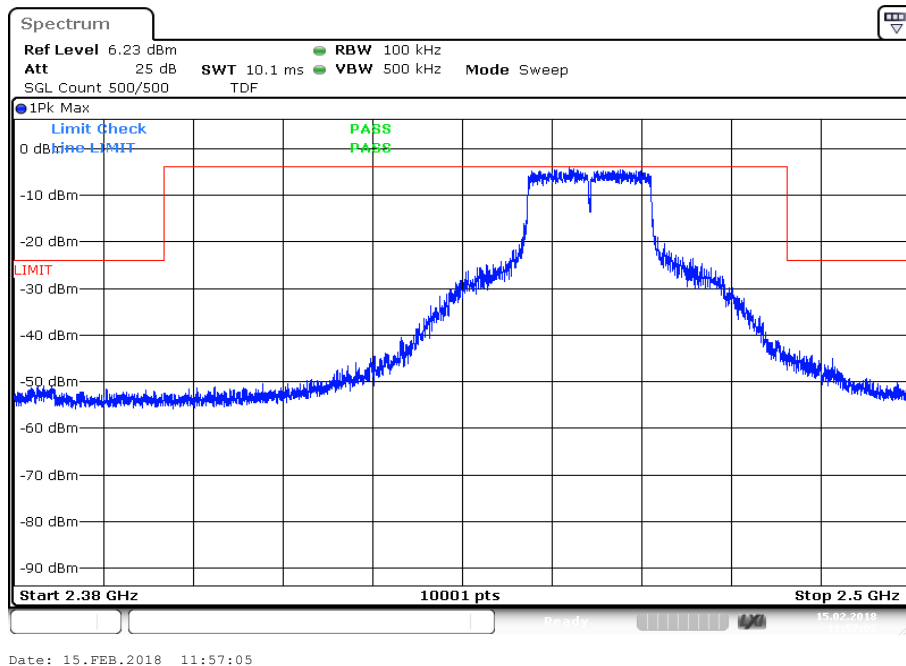
The peak at the beginning of the plot is the LO from the SA.

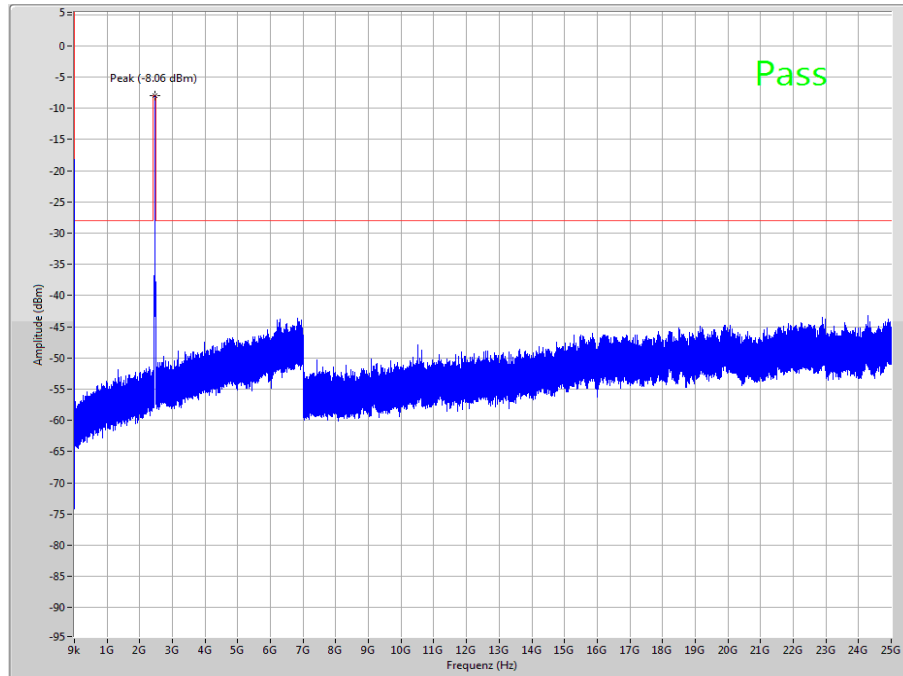
**Plot 18:** Channel 9, zoomed carrier

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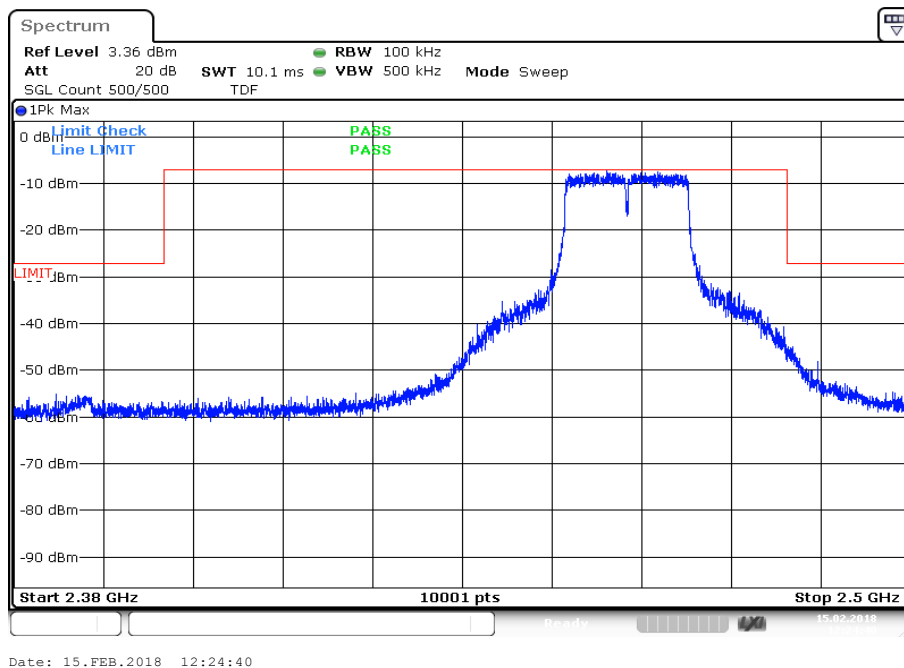
**Plot 19:** Channel 10, up to 25 GHz

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

**Plot 20:** Channel 10, zoomed carrier

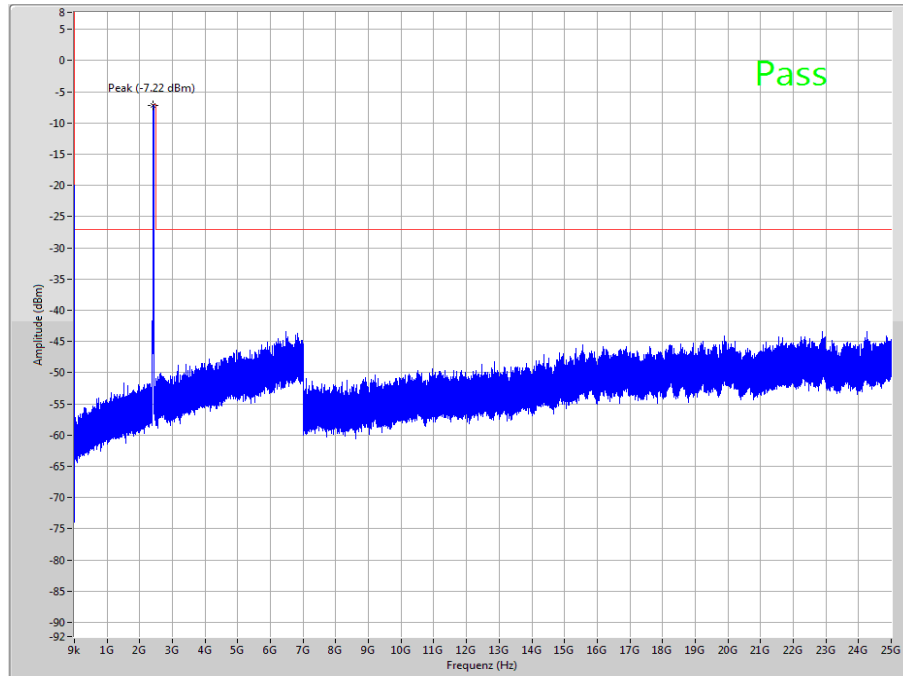
**Plot 21:** Channel 11, up to 25 GHz

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

**Plot 22:** Channel 11, zoomed carrier

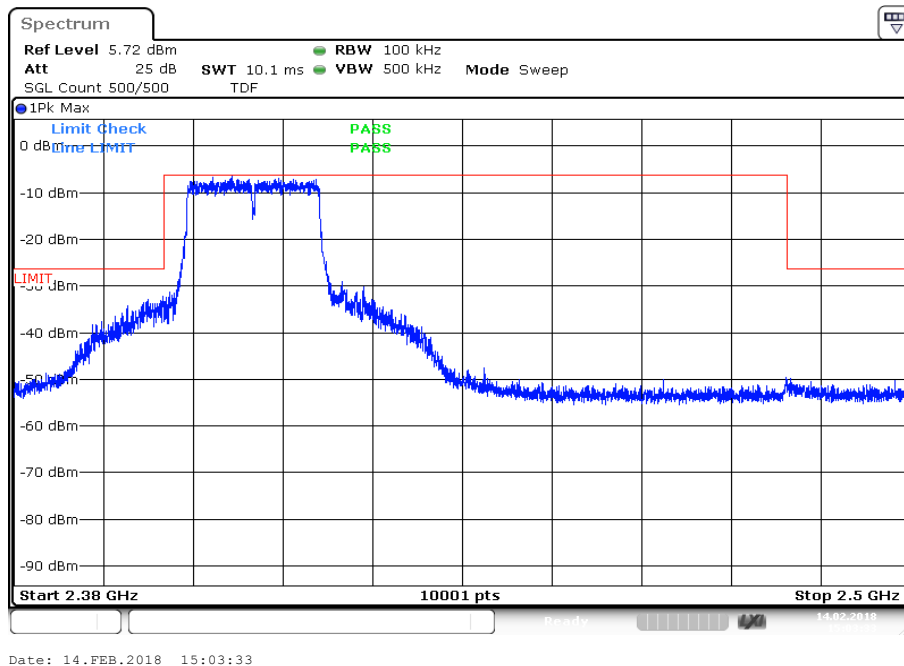
**Plots:** OFDM / n HT 20 – mode

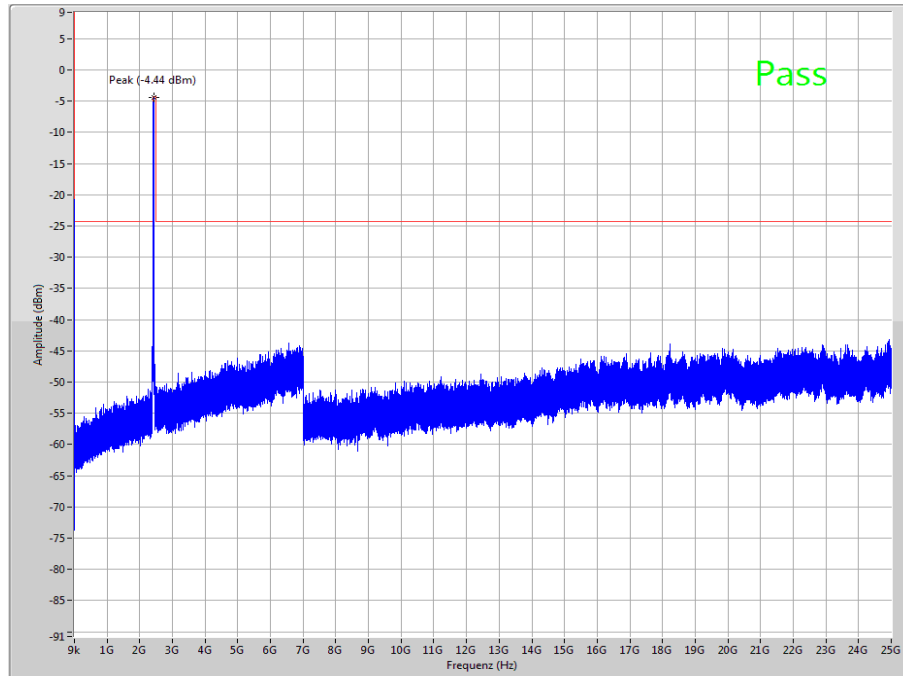
**Plot 1:** Channel 1, up to 25 GHz



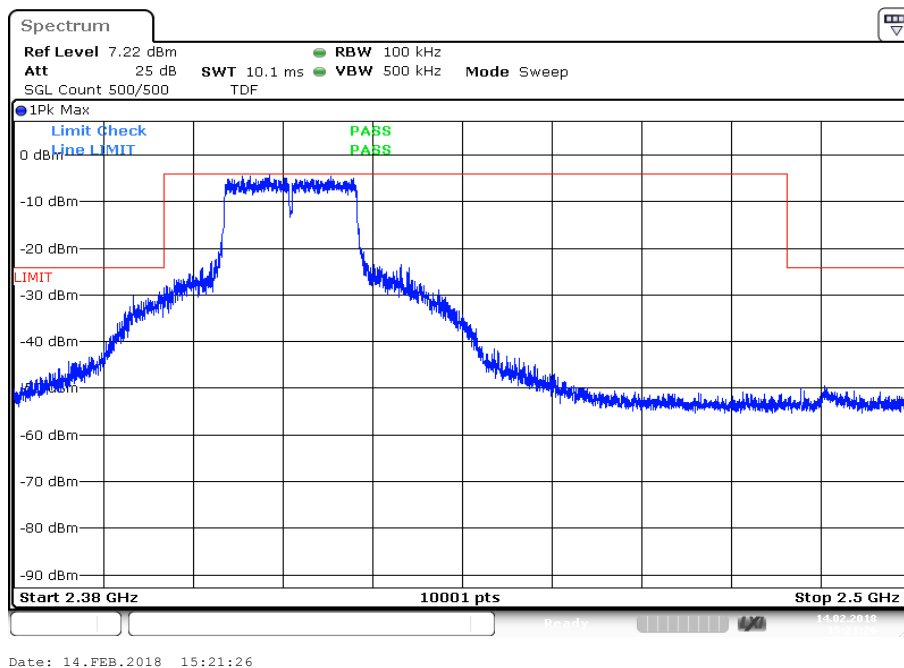
The peak at the beginning of the plot is the LO from the SA.

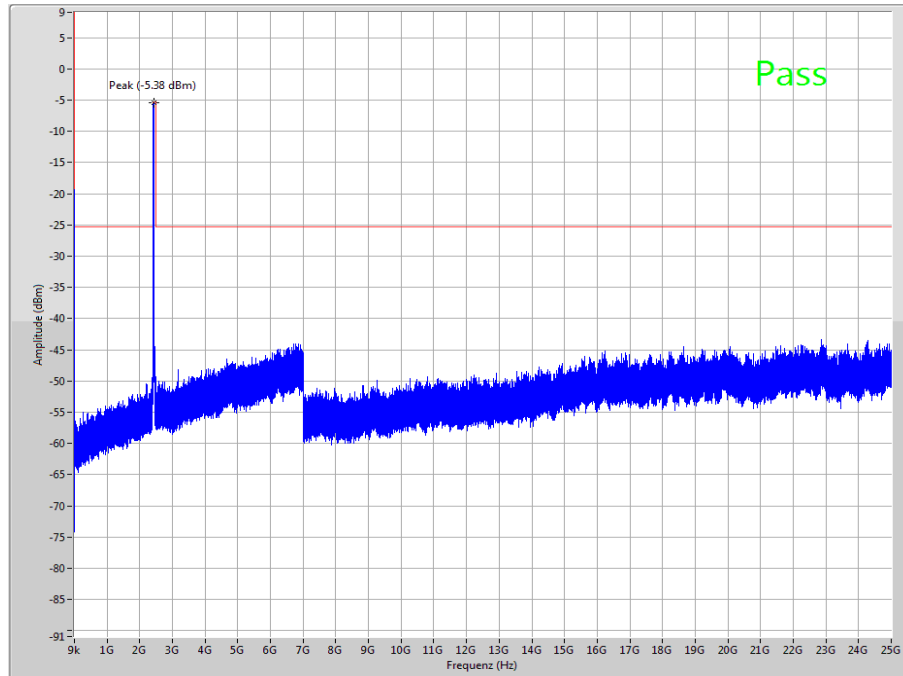
**Plot 2:** Channel 1, zoomed carrier



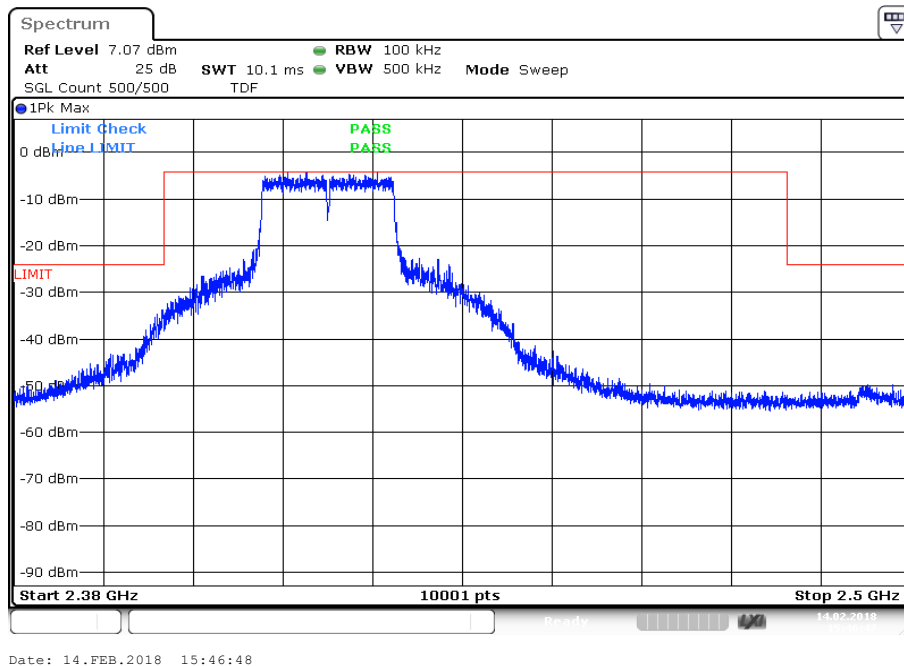
**Plot 3:** Channel 2, up to 25 GHz

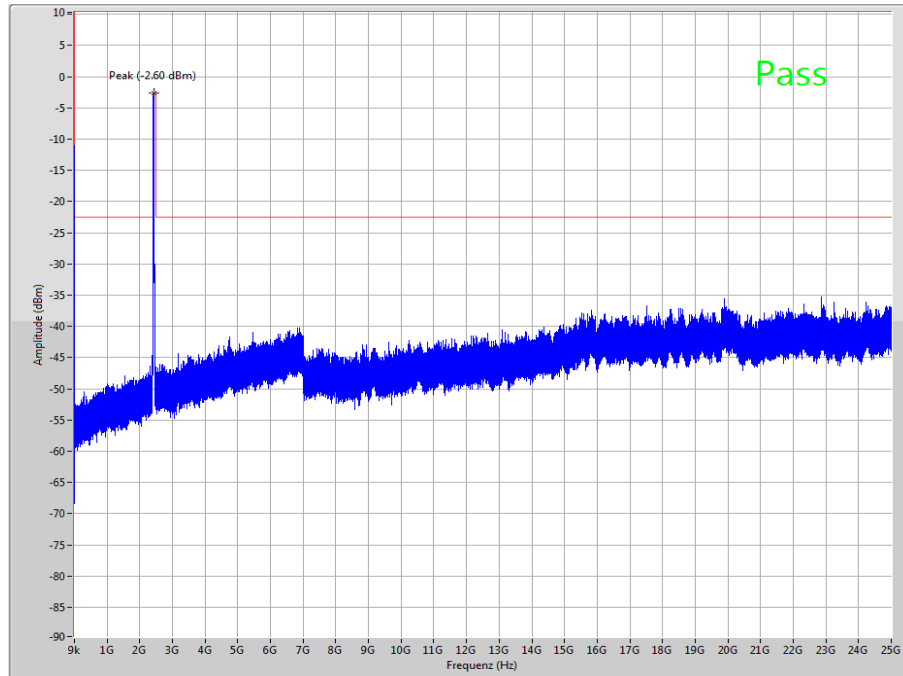
The peak at the beginning of the plot is the LO from the SA.

**Plot 4:** Channel 2, zoomed carrier

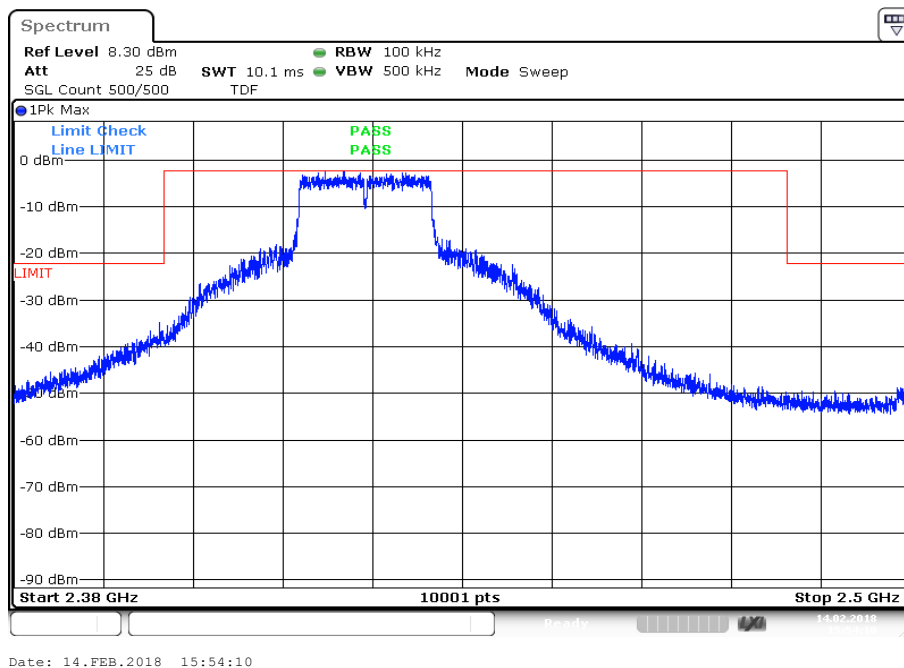
**Plot 5:** Channel 3, up to 25 GHz

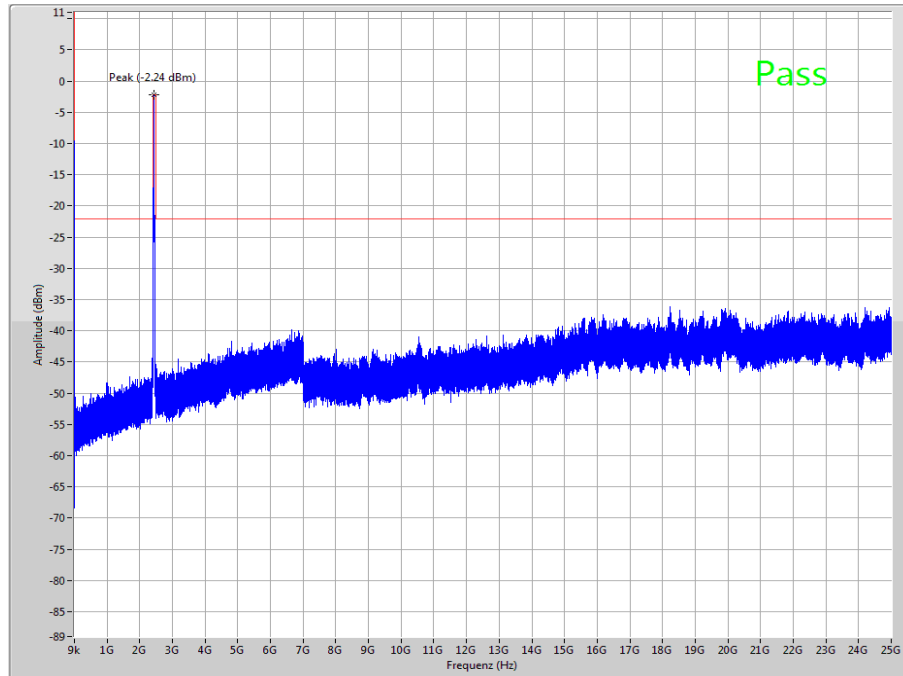
The peak at the beginning of the plot is the LO from the SA.

**Plot 6:** Channel 3, zoomed carrier

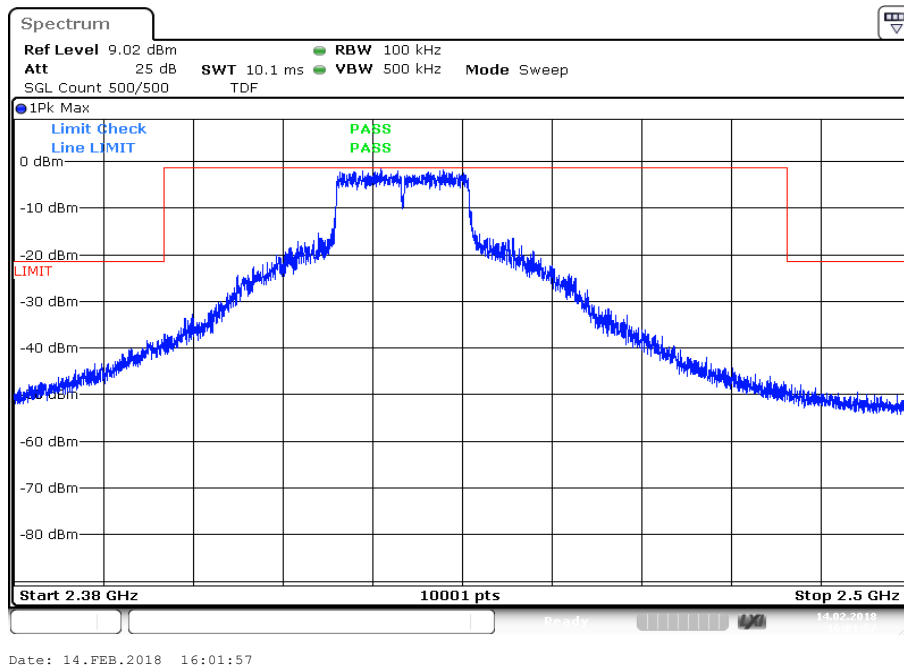
**Plot 7:** Channel 4, up to 25 GHz

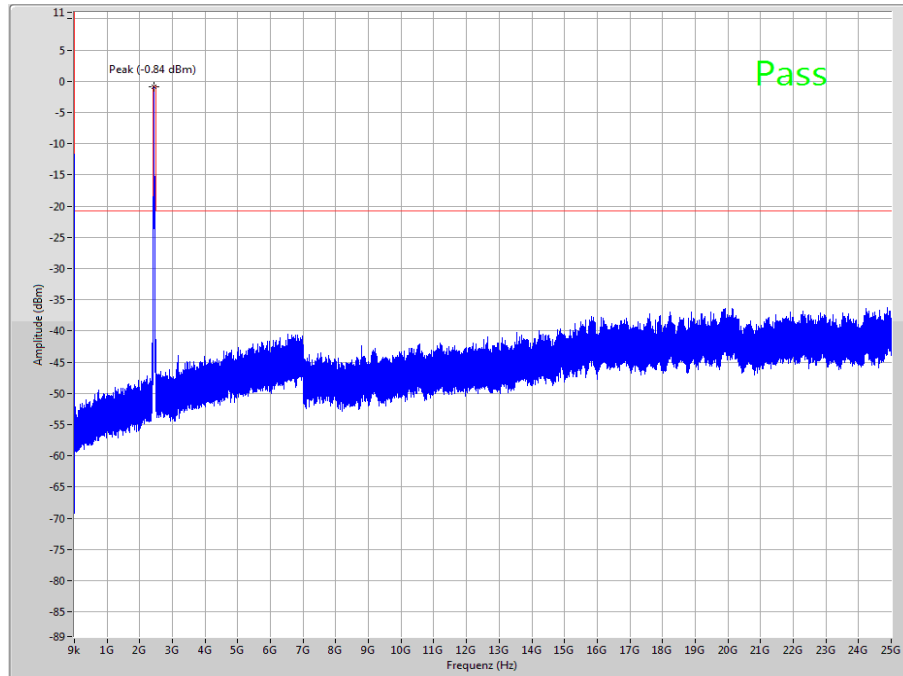
The peak at the beginning of the plot is the LO from the SA.

**Plot 8:** Channel 4, zoomed carrier

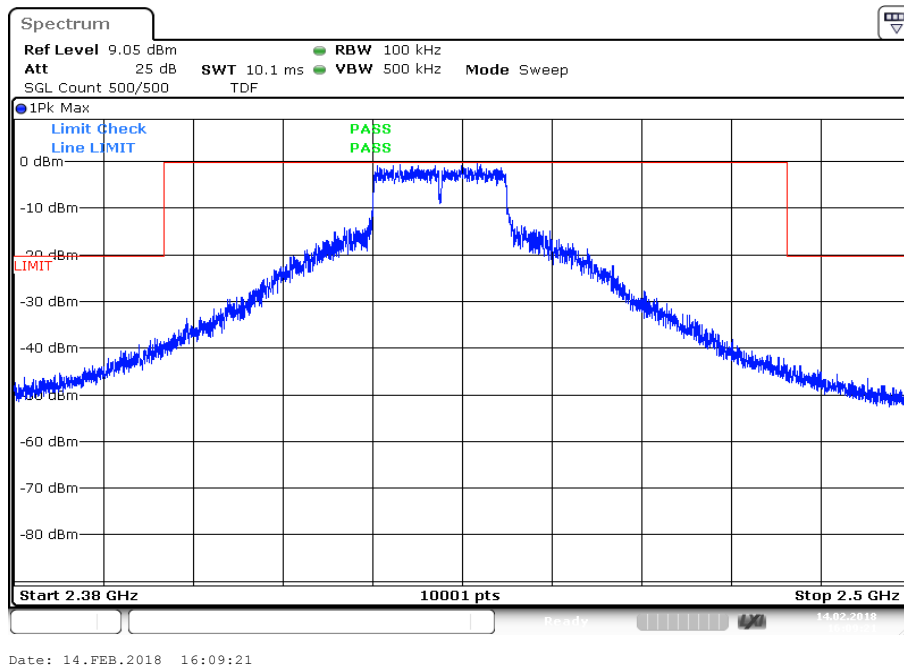
**Plot 9:** Channel 5, up to 25 GHz

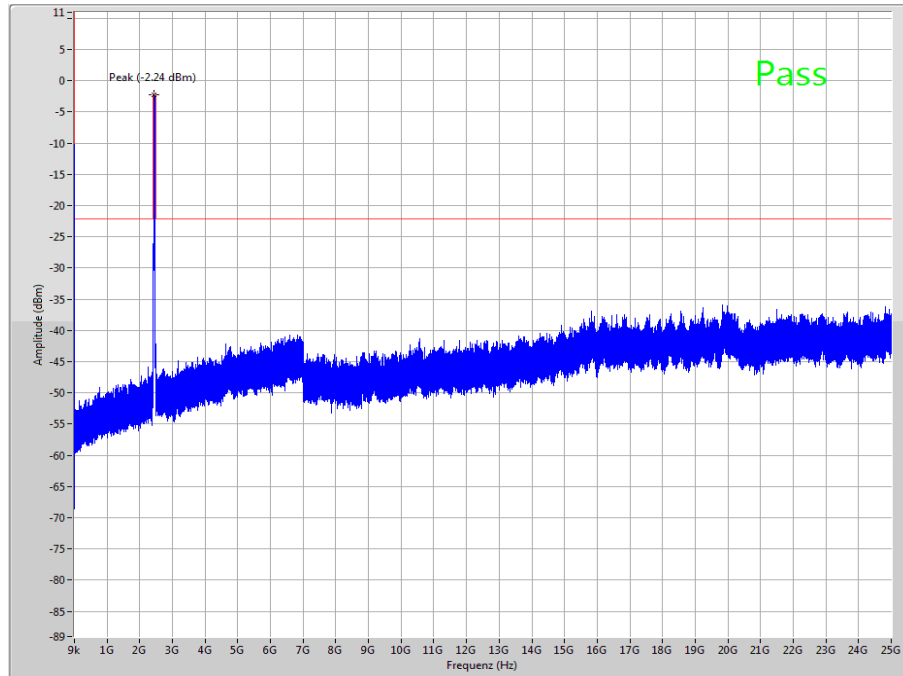
The peak at the beginning of the plot is the LO from the SA.

**Plot 10:** Channel 5, zoomed carrier

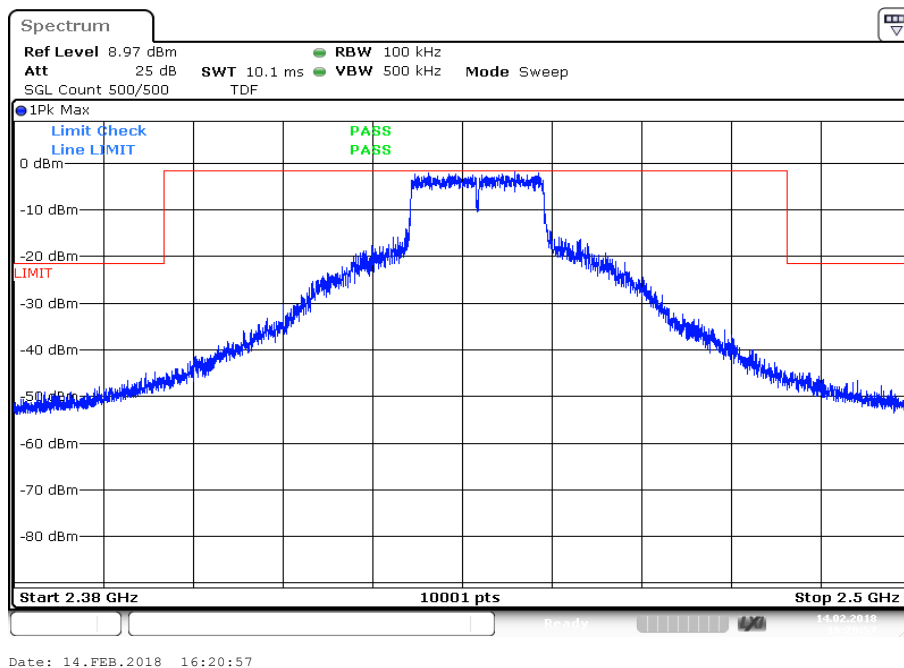
**Plot 11:** Channel 6, up to 25 GHz

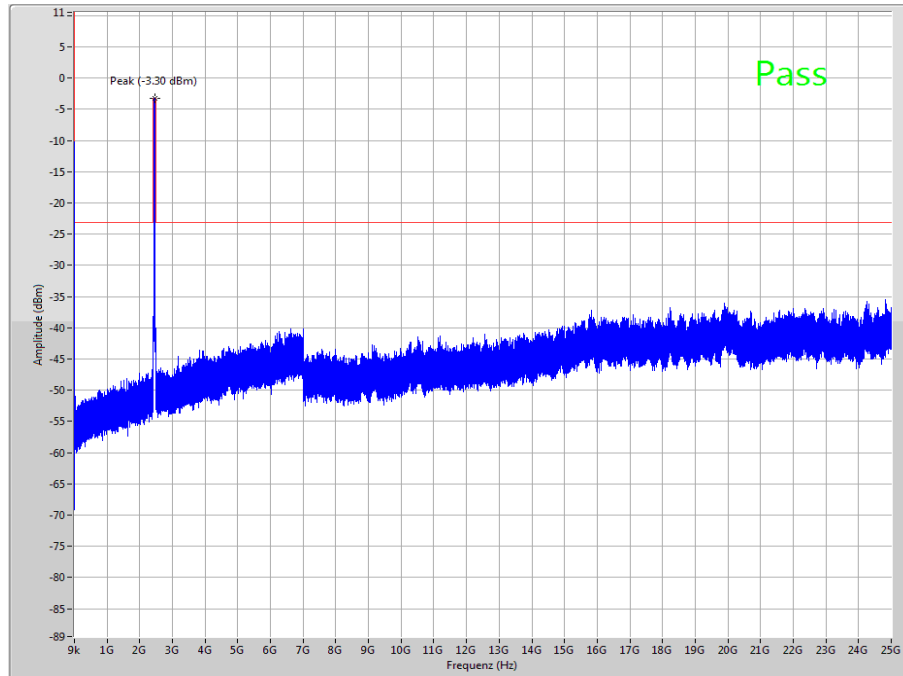
The peak at the beginning of the plot is the LO from the SA.

**Plot 12:** Channel 6, zoomed carrier

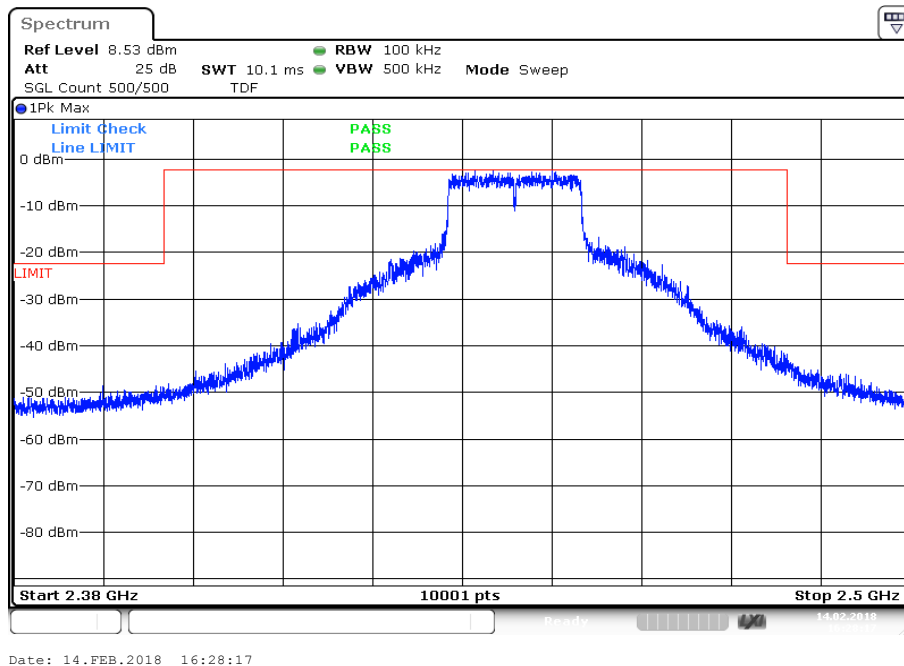
**Plot 13:** Channel 7, up to 25 GHz

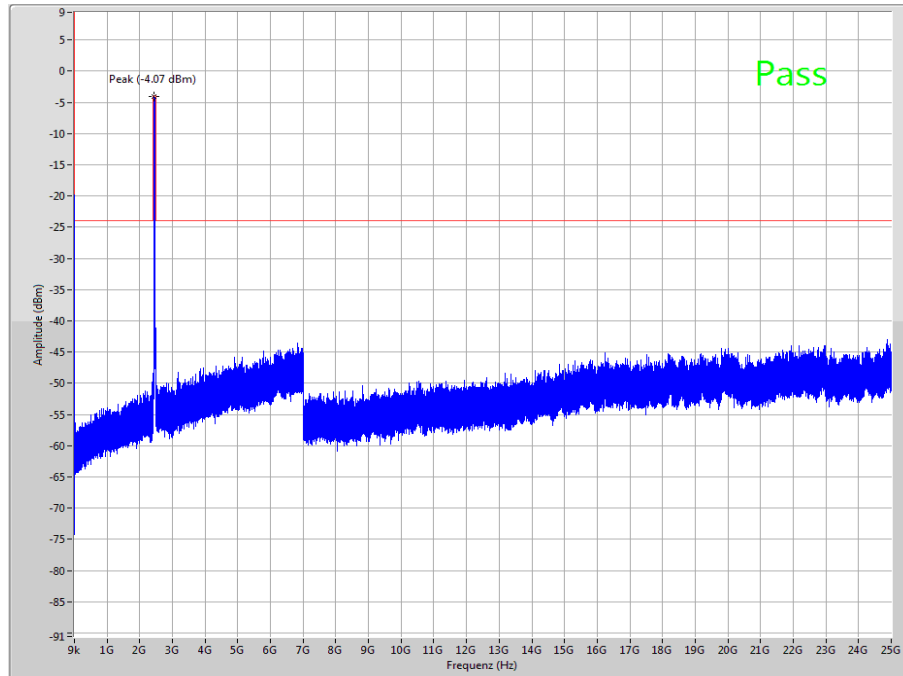
The peak at the beginning of the plot is the LO from the SA.

**Plot 14:** Channel 7, zoomed carrier

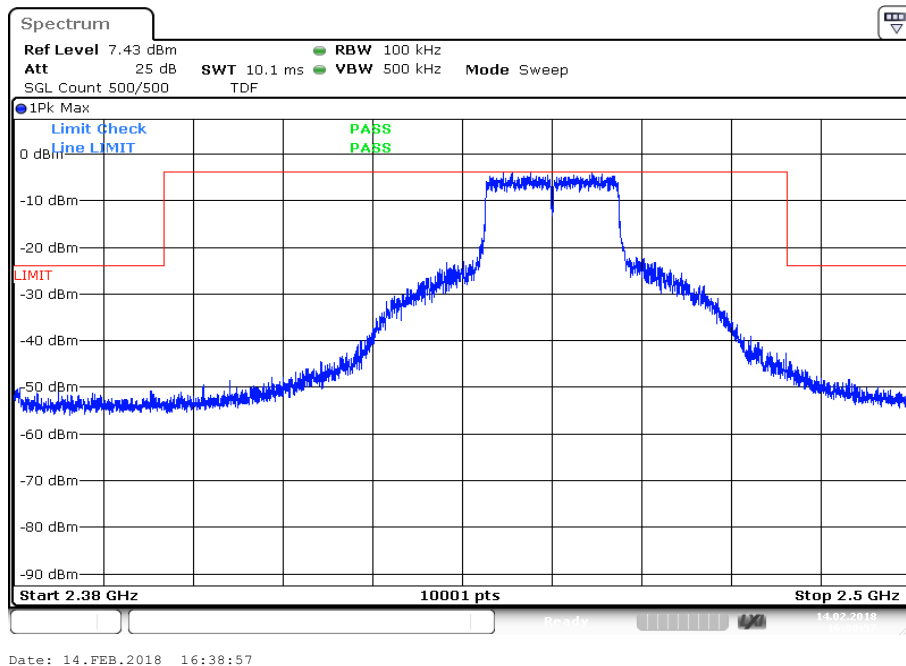
**Plot 15:** Channel 8, up to 25 GHz

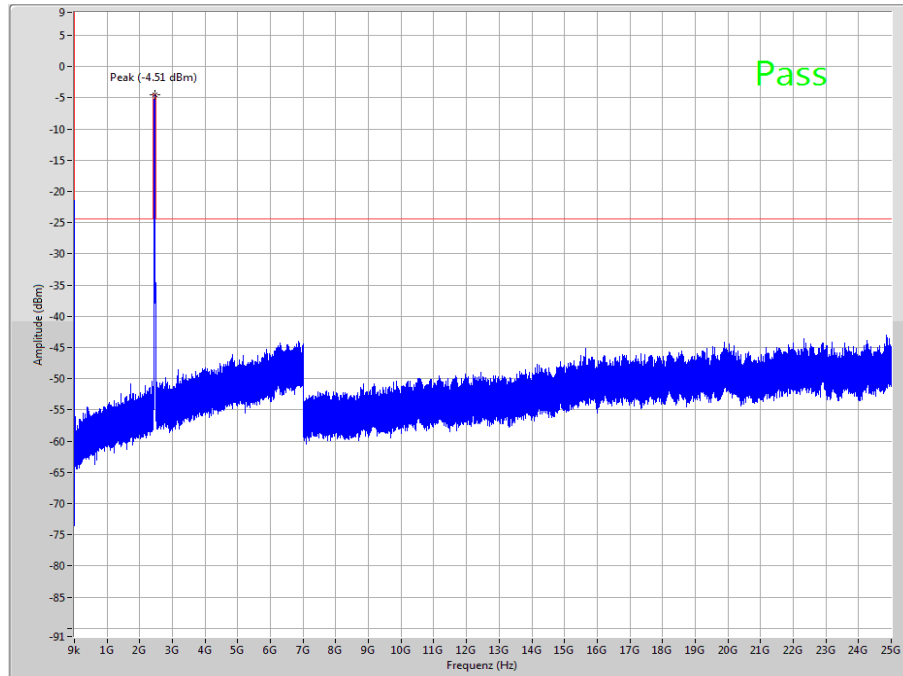
The peak at the beginning of the plot is the LO from the SA.

**Plot 16:** Channel 8, zoomed carrier

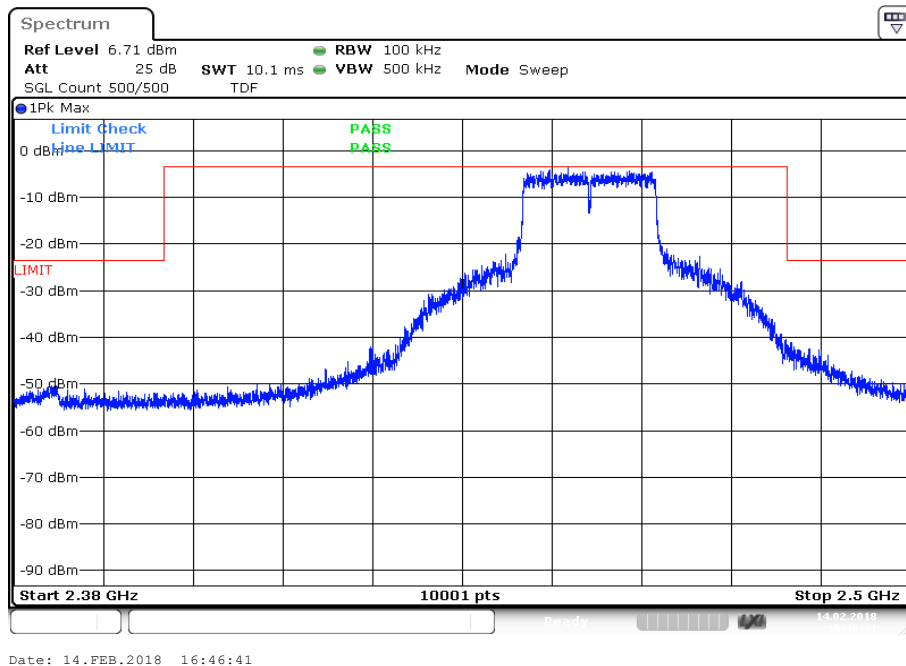
**Plot 17:** Channel 9, up to 25 GHz

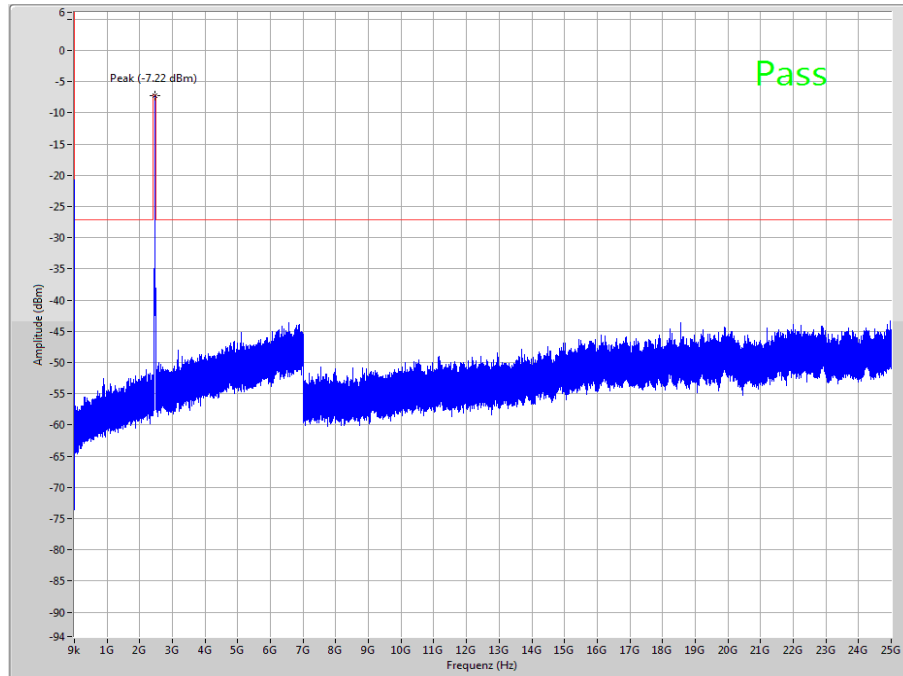
The peak at the beginning of the plot is the LO from the SA.

**Plot 18:** Channel 9, zoomed carrier

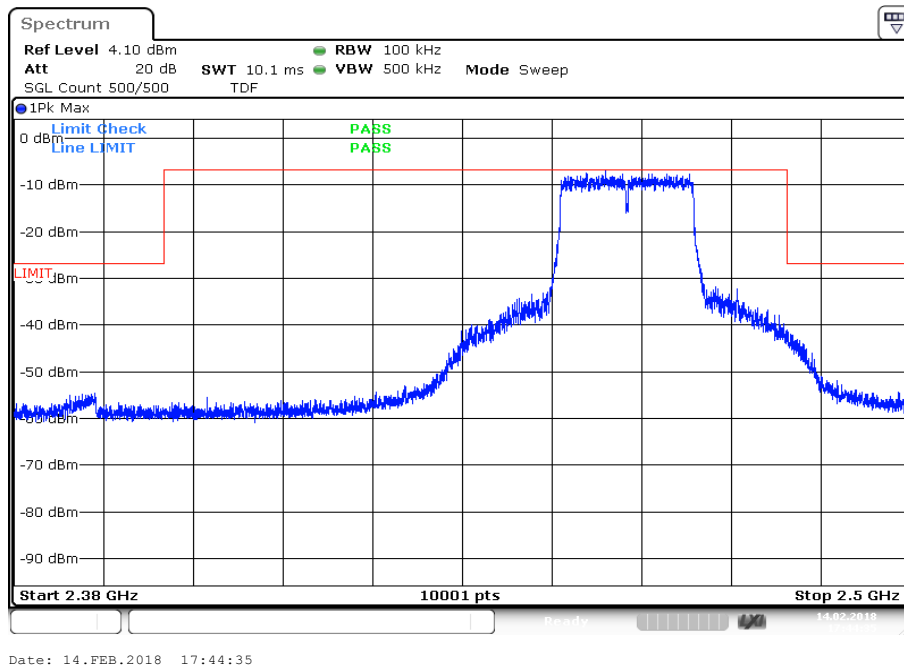
**Plot 19:** Channel 10, up to 25 GHz

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

**Plot 20:** Channel 10, zoomed carrier

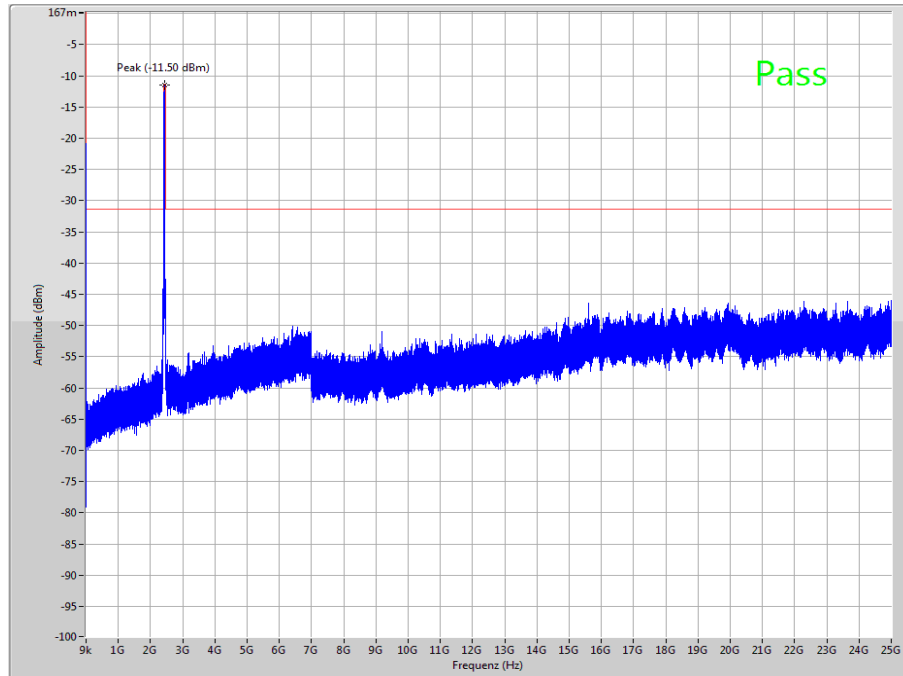
**Plot 21:** Channel 11, up to 25 GHz

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

**Plot 22:** Channel 11, zoomed carrier

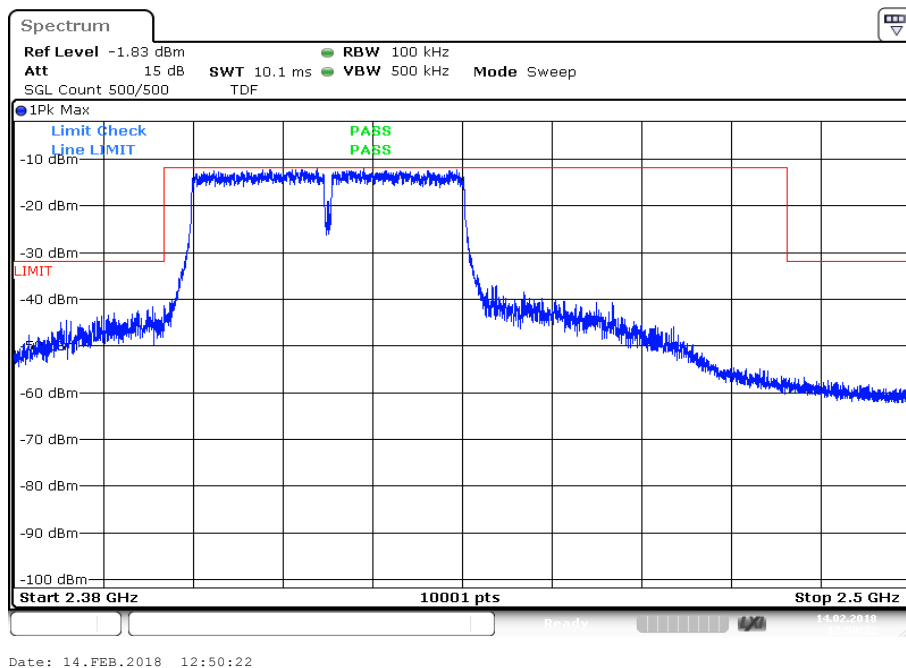
**Plots:** OFDM / n HT 40 – mode

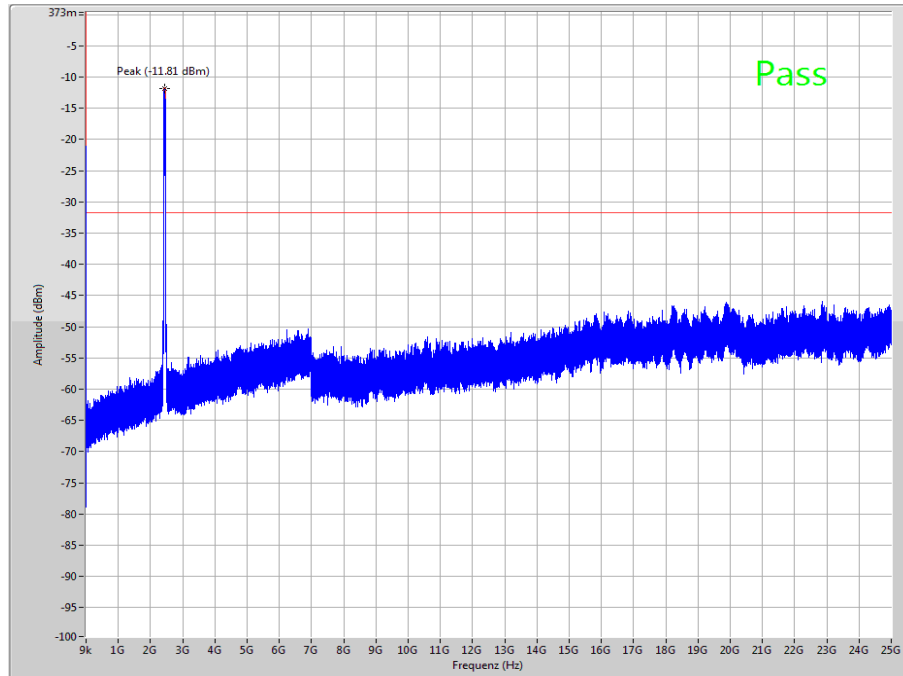
**Plot 1:** Channel 3, up to 25 GHz



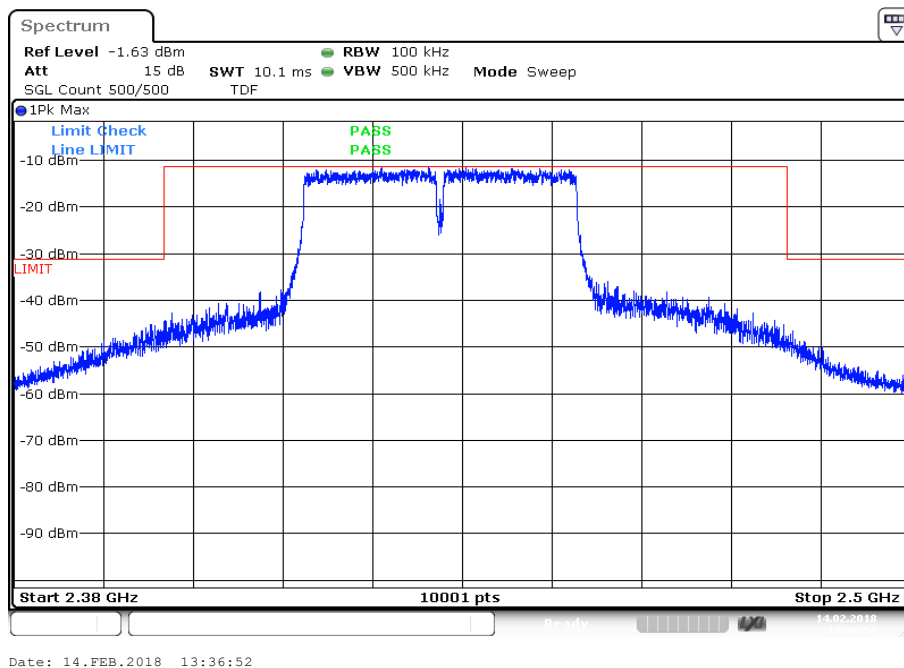
The peak at the beginning of the plot is the LO from the SA.

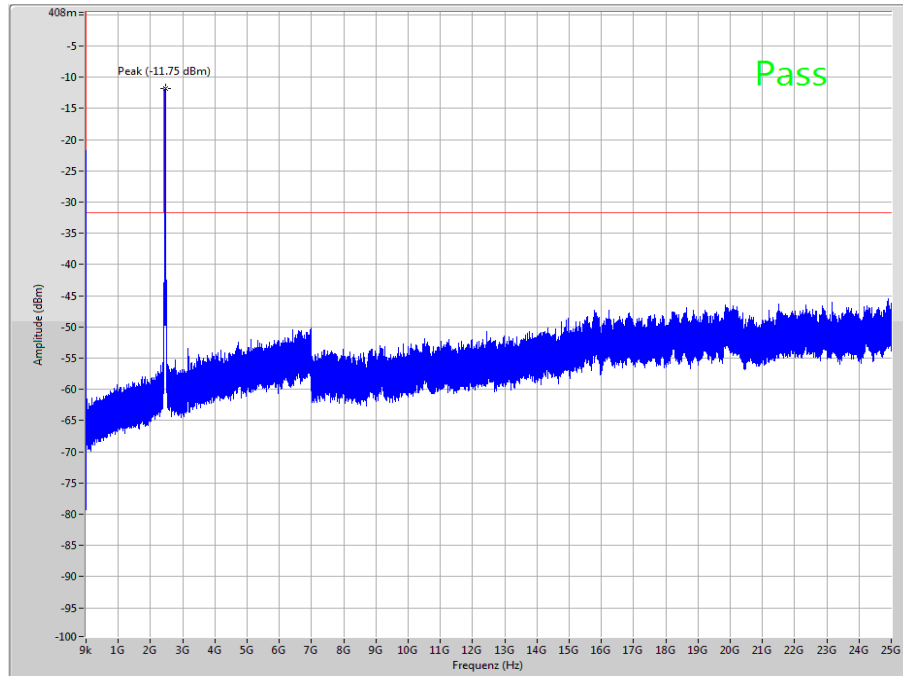
**Plot 2:** Channel 3, zoomed carrier



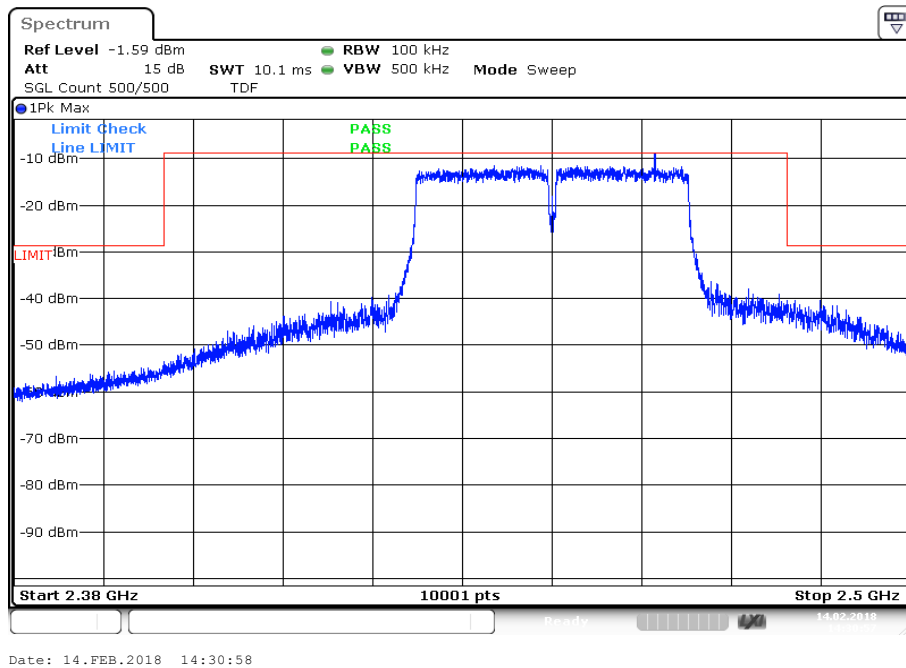
**Plot 3:** Channel 6, up to 25 GHz

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

**Plot 4:** Channel 6, zoomed carrier

**Plot 5:** Channel 9, up to 25 GHz

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

**Plot 6:** Channel 9, zoomed carrier

### 12.11 Spurious emissions radiated below 30 MHz

#### Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

#### Measurement:

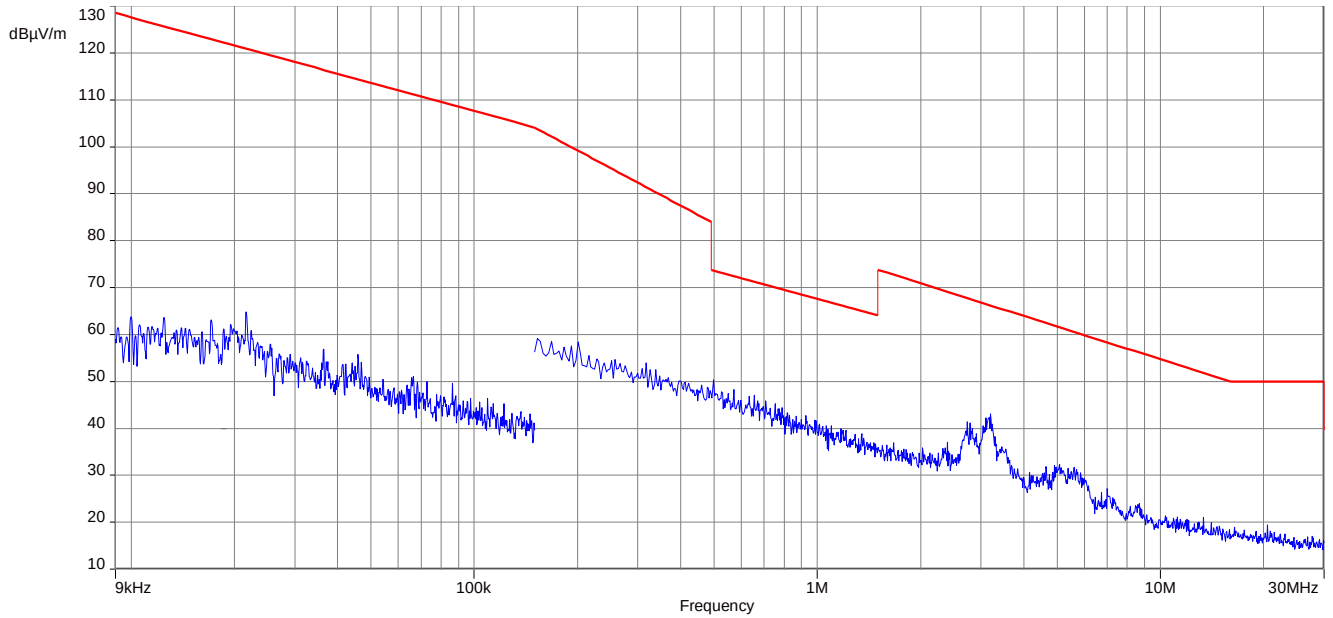
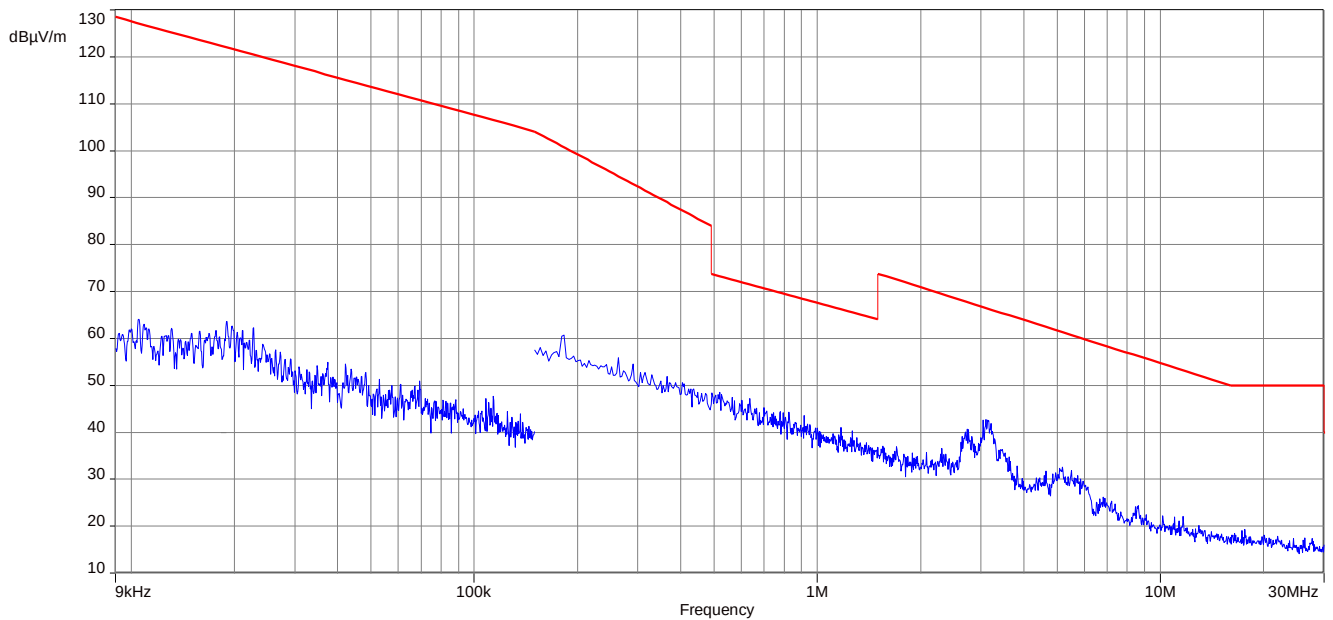
| Measurement parameter   |                                                                                                                                                                                                                 |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Detector                | Peak / Quasi Peak                                                                                                                                                                                               |
| Sweep time              | Auto                                                                                                                                                                                                            |
| Resolution bandwidth    | F < 150 kHz: 200 Hz<br>F > 150 kHz: 9 kHz                                                                                                                                                                       |
| Video bandwidth         | F < 150 kHz: 1 kHz<br>F > 150 kHz: 100 kHz                                                                                                                                                                      |
| Span                    | 9 kHz to 30 MHz                                                                                                                                                                                                 |
| Trace mode              | Max Hold                                                                                                                                                                                                        |
| Measured modulation     | <input checked="" type="checkbox"/> DSSS b – mode<br><input checked="" type="checkbox"/> OFDM g – mode<br><input type="checkbox"/> OFDM n HT20 – mode<br><input checked="" type="checkbox"/> OFDM n HT40 – mode |
| Test setup              | See chapter 6.2 A                                                                                                                                                                                               |
| Measurement uncertainty | See chapter                                                                                                                                                                                                     |

#### Limits:

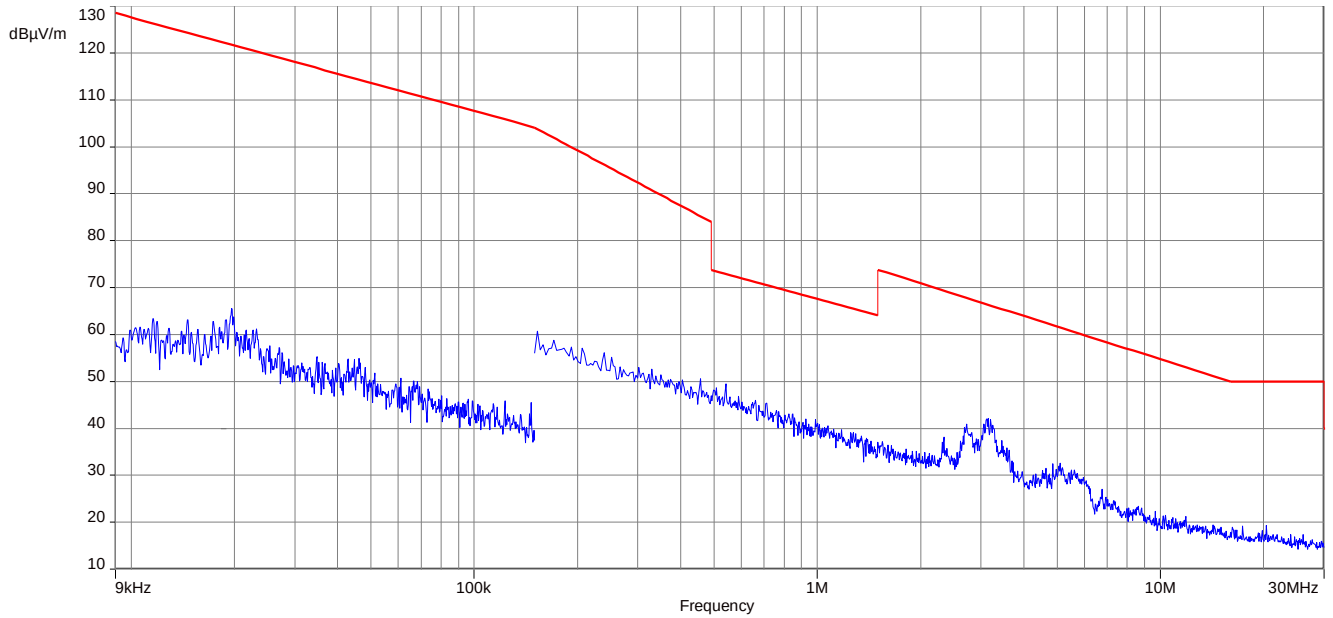
| FCC             |                             | IC                       |
|-----------------|-----------------------------|--------------------------|
| Frequency / MHz | Field Strength / (dBµV / m) | Measurement distance / m |
| 0.009 – 0.490   | 2400/F(kHz)                 | 300                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

#### Results:

| TX spurious emissions radiated < 30 MHz / (dBµV / m) @ 3 m |          |                    |
|------------------------------------------------------------|----------|--------------------|
| Frequency / MHz                                            | Detector | Level / (dBµV / m) |
| All detected peaks are more than 20 dB below the limit.    |          |                    |
|                                                            |          |                    |

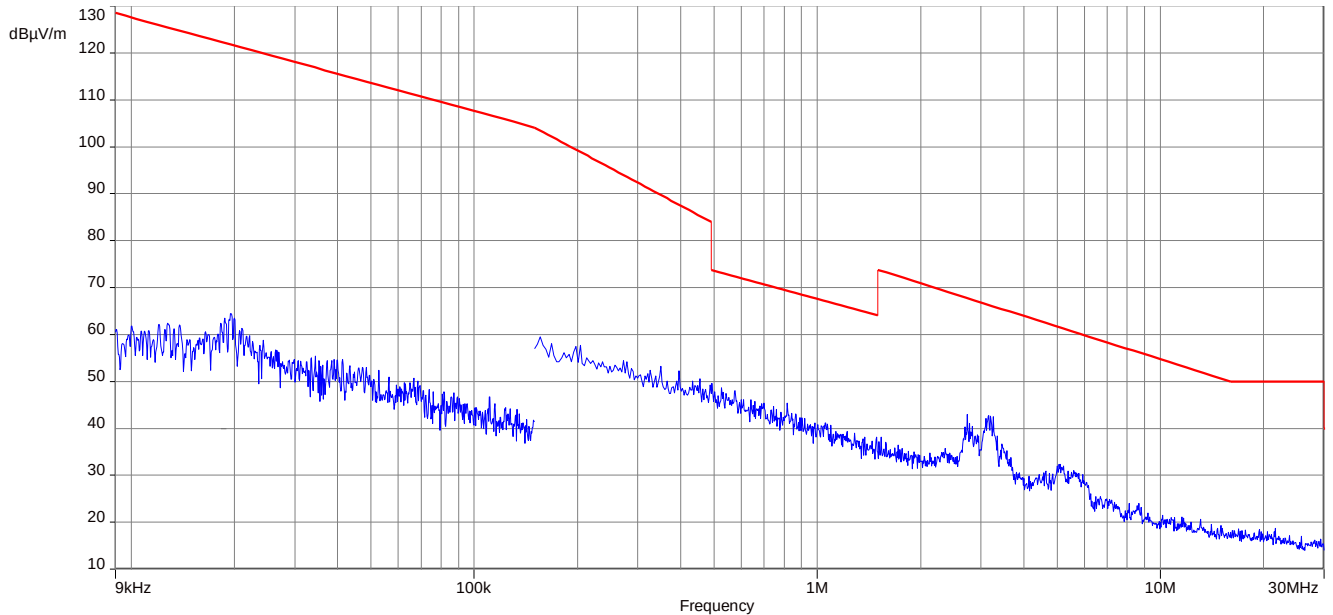
**Plots:** DSSS**Plot 1:** 9 kHz to 30 MHz, Channel 1**Plot 2:** 9 kHz to 30 MHz, Channel 6

**Plot 3:** 9 kHz to 30 MHz, Channel 11

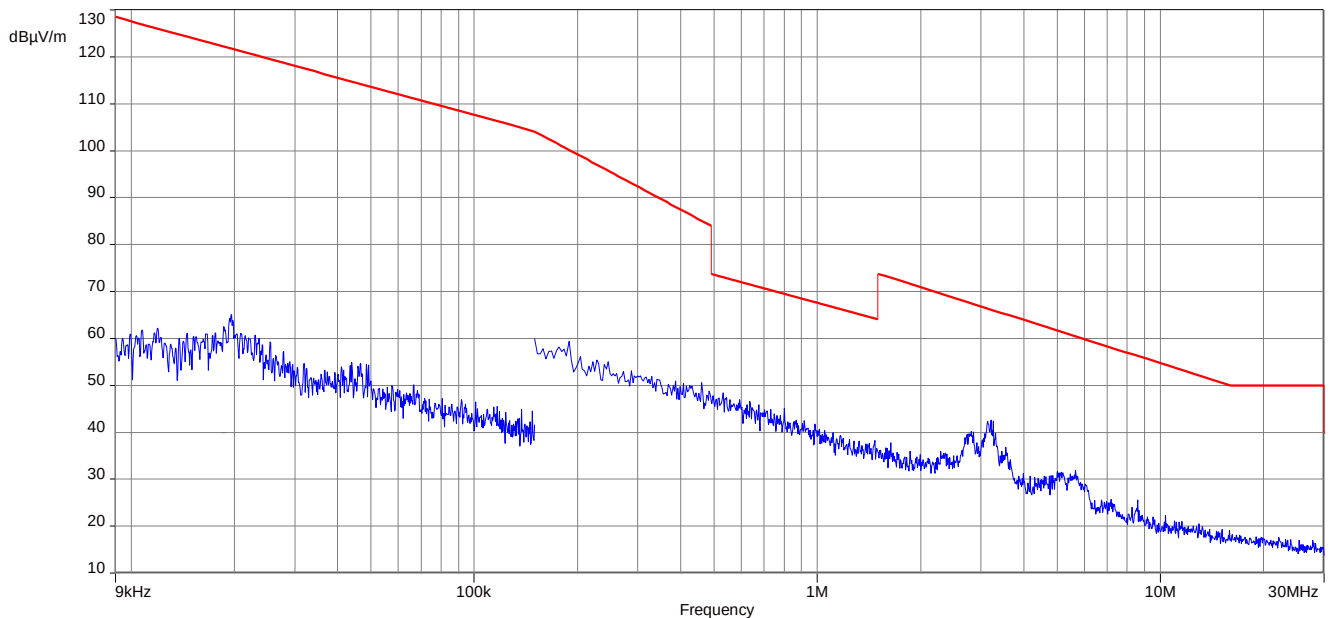


**Plots:** OFDM (20 MHz nominal channel bandwidth)

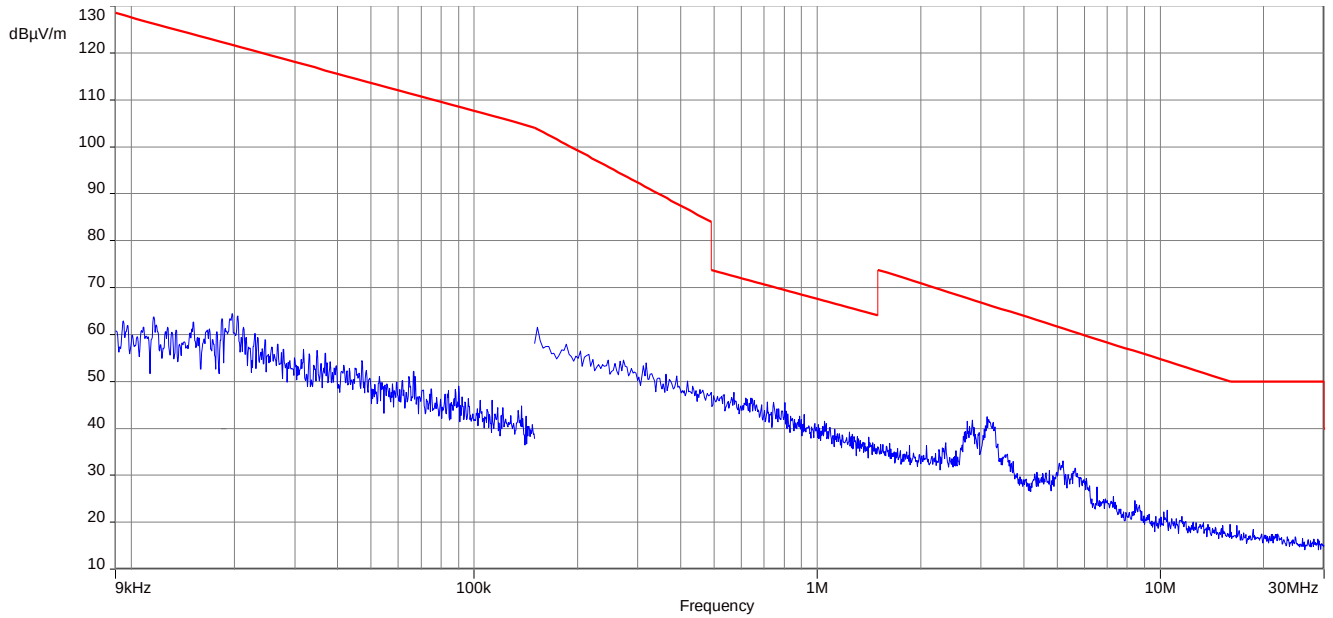
**Plot 1:** 9 kHz to 30 MHz, Channel 1



**Plot 2:** 9 kHz to 30 MHz, Channel 6

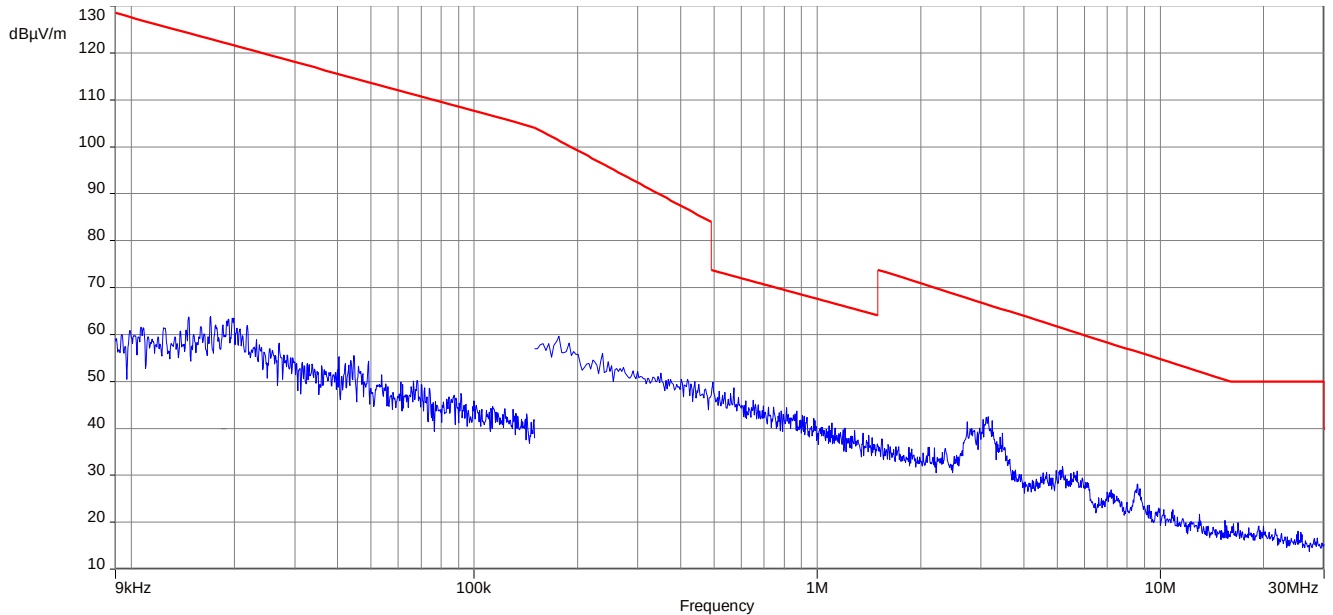


**Plot 3:** 9 kHz to 30 MHz, Channel 11

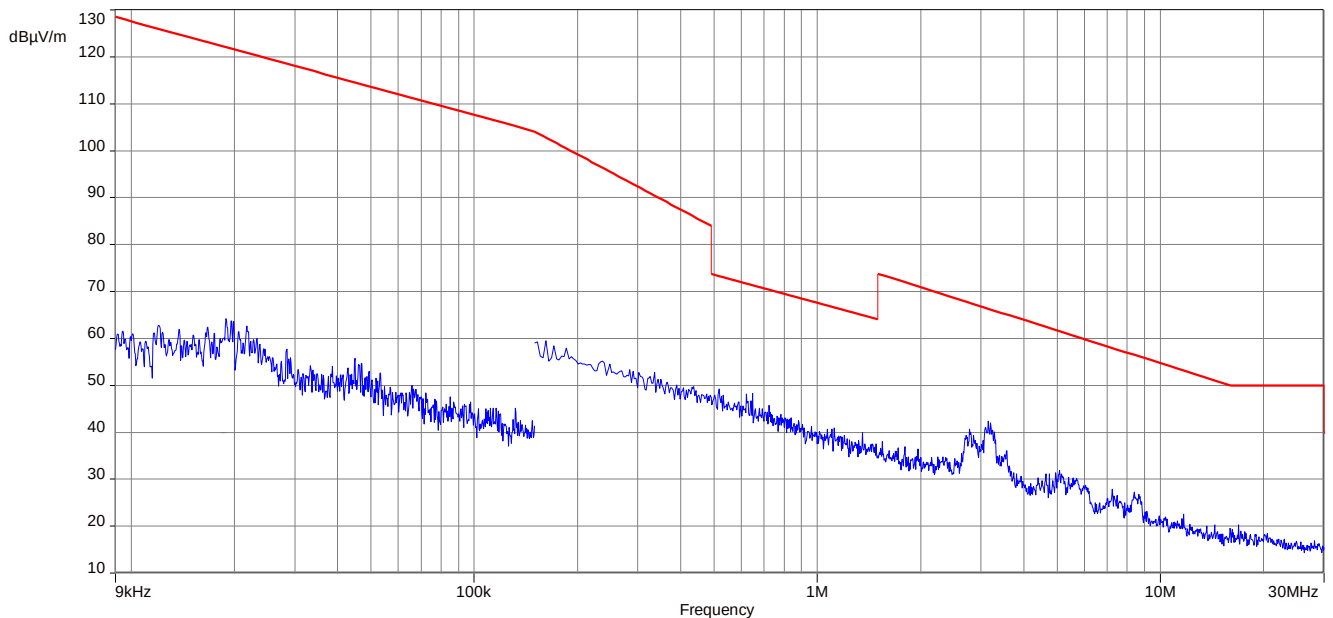


**Plots:** OFDM (40 MHz nominal channel bandwidth)

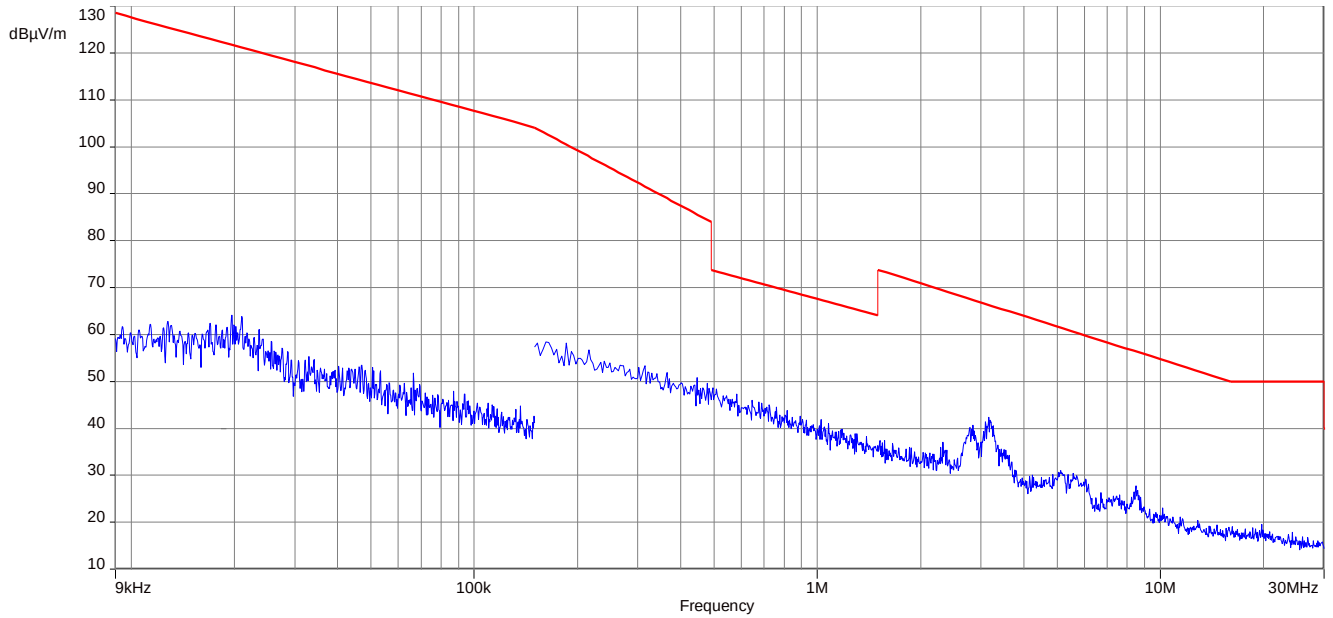
**Plot 1:** 9 kHz to 30 MHz, Channel 3



**Plot 2:** 9 kHz to 30 MHz, Channel 6



**Plot 3:** 9 kHz to 30 MHz, Channel 9



## 12.12 Spurious emissions radiated 30 MHz to 1 GHz

### Description:

Measurement of the radiated spurious emissions and cabinet radiations below 1 GHz.

### Measurement:

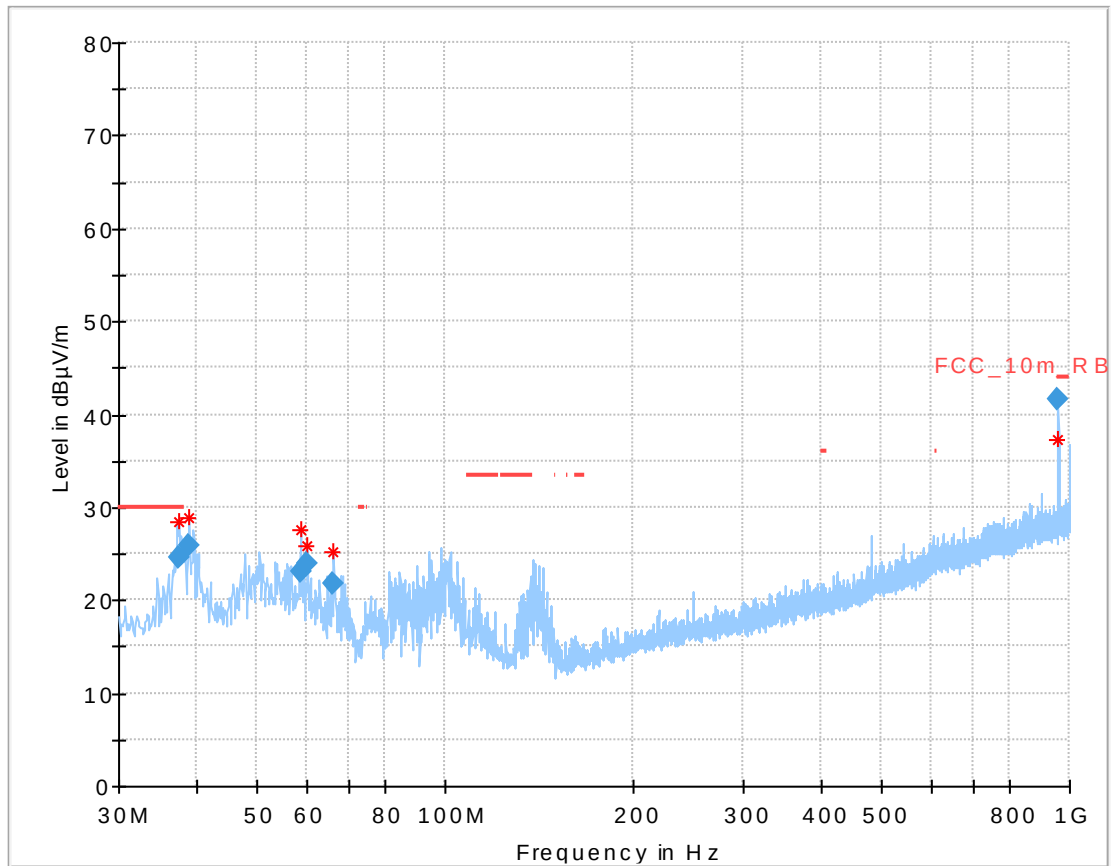
| Measurement parameter   |                                                                                                                                                                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Detector                | Peak / Quasi Peak                                                                                                                                                                                                                                                       |
| Sweep time              | Auto                                                                                                                                                                                                                                                                    |
| Resolution bandwidth    | 120 kHz                                                                                                                                                                                                                                                                 |
| Video bandwidth         | 3 x RBW                                                                                                                                                                                                                                                                 |
| Span                    | 30 MHz to 1 GHz                                                                                                                                                                                                                                                         |
| Trace mode              | Max Hold                                                                                                                                                                                                                                                                |
| Measured modulation     | <input checked="" type="checkbox"/> DSSS b – mode<br><input checked="" type="checkbox"/> OFDM g – mode<br><input type="checkbox"/> OFDM n HT20 – mode<br><input checked="" type="checkbox"/> OFDM n HT40 – mode<br><input checked="" type="checkbox"/> RX / Idle – mode |
| Test setup              | See chapter 6.1 A                                                                                                                                                                                                                                                       |
| Measurement uncertainty | See chapter                                                                                                                                                                                                                                                             |

### Limits:

| FCC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             | IC                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------|
| 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 / m |
| 30 – 88                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 30.0                        | 10                       |
| 88 – 216                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 33.5                        | 10                       |
| 216 – 960                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 36.0                        | 10                       |

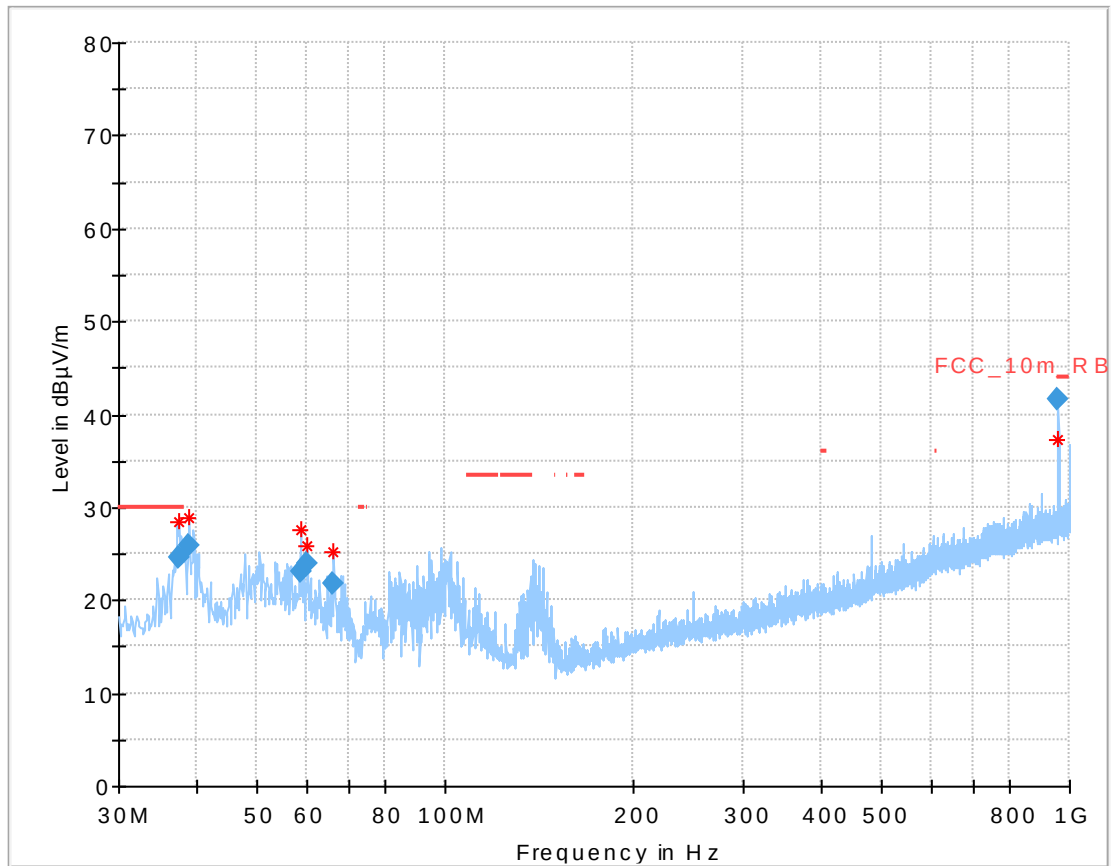
**Plot:** DSSS

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

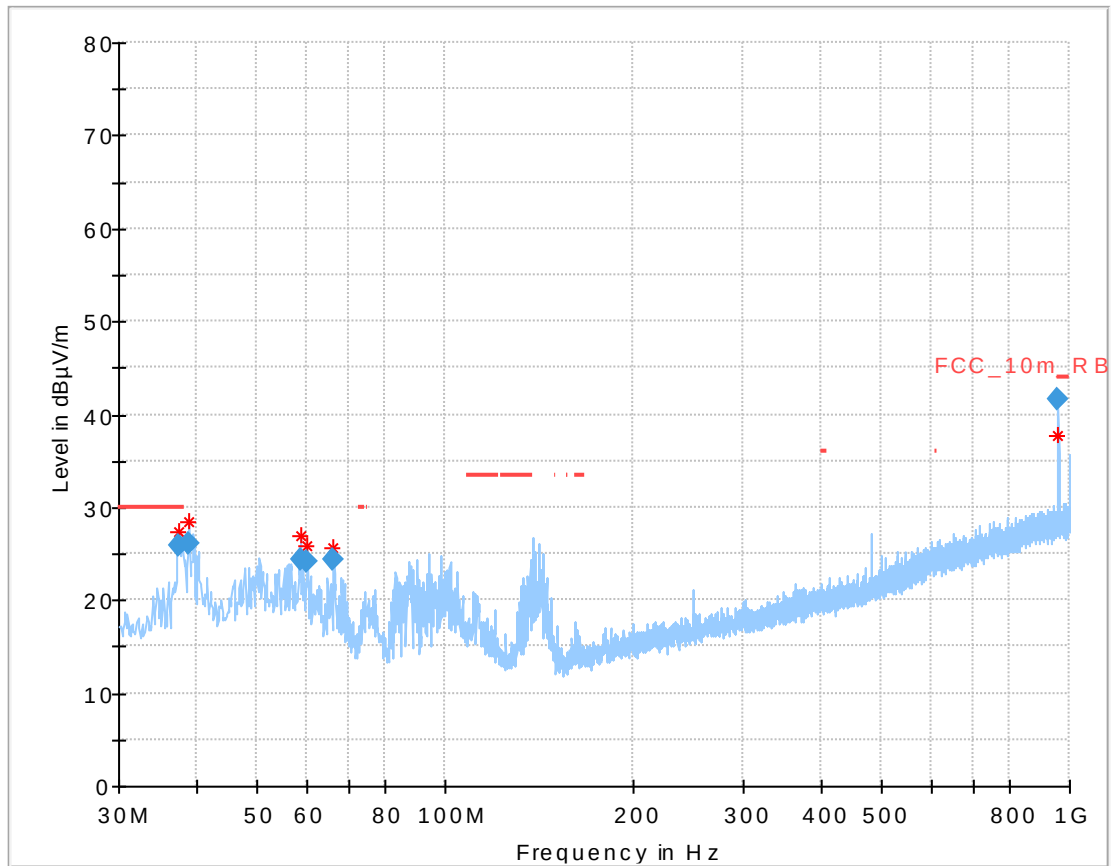


**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 37.538          | 24.65              | 30.0           | 5.35        | 1000            | 120             | 101.0       | V   | 329.0         | 12.9       |
| 38.961          | 25.87              | 30.0           | 4.13        | 1000            | 120             | 101.0       | V   | 60.0          | 13.1       |
| 58.736          | 23.15              | 30.0           | 6.85        | 1000            | 120             | 104.0       | V   | 160.0         | 12.2       |
| 60.210          | 23.94              | 30.0           | 6.06        | 1000            | 120             | 98.0        | V   | 242.0         | 11.8       |
| 66.301          | 21.74              | 30.0           | 8.26        | 1000            | 120             | 101.0       | V   | 171.0         | 10.5       |
| 960.006         | 41.67              | 44.0           | 2.33        | 1000            | 120             | 98.0        | H   | 182.0         | 24.5       |

**Plot 2:** 30 MHz to 1 GHz, vertical & horizontal polarization, Channel 6**Final results:**

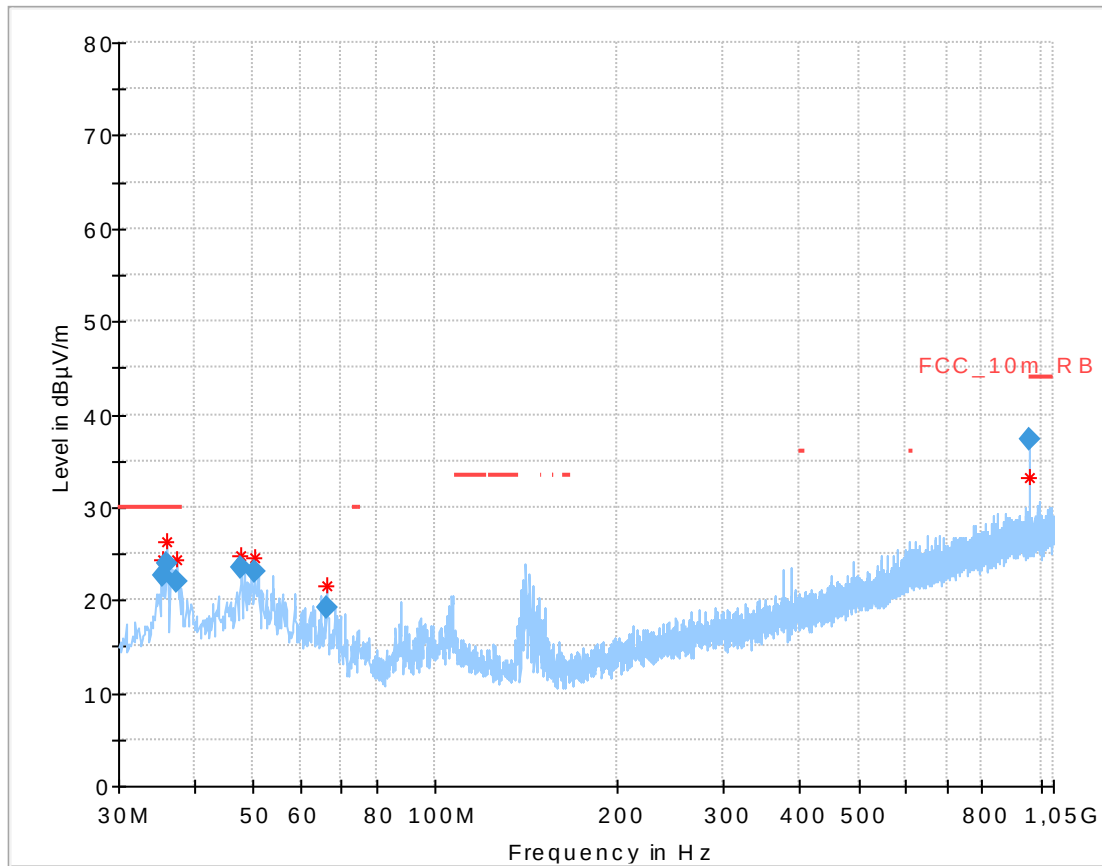
| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 37.538          | 24.65              | 30.0           | 5.35        | 1000            | 120             | 101.0       | V   | 329.0         | 12.9       |
| 38.961          | 25.87              | 30.0           | 4.13        | 1000            | 120             | 101.0       | V   | 60.0          | 13.1       |
| 58.736          | 23.15              | 30.0           | 6.85        | 1000            | 120             | 104.0       | V   | 160.0         | 12.2       |
| 60.210          | 23.94              | 30.0           | 6.06        | 1000            | 120             | 98.0        | V   | 242.0         | 11.8       |
| 66.301          | 21.74              | 30.0           | 8.26        | 1000            | 120             | 101.0       | V   | 171.0         | 10.5       |
| 960.006         | 41.67              | 44.0           | 2.33        | 1000            | 120             | 98.0        | H   | 182.0         | 24.5       |

**Plot 3:** 30 MHz to 1 GHz, vertical & horizontal polarization, Channel 11**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 37.522          | 25.88              | 30.0           | 4.12        | 1000            | 120             | 98.0        | V   | 242.0         | 12.9       |
| 38.949          | 26.19              | 30.0           | 3.81        | 1000            | 120             | 101.0       | V   | 44.0          | 13.1       |
| 58.736          | 24.36              | 30.0           | 5.64        | 1000            | 120             | 101.0       | V   | -10.0         | 12.2       |
| 60.230          | 24.16              | 30.0           | 5.84        | 1000            | 120             | 101.0       | V   | 11.0          | 11.8       |
| 66.282          | 24.40              | 30.0           | 5.60        | 1000            | 120             | 101.0       | V   | 10.0          | 10.5       |
| 959.987         | 41.71              | 36.0           | -5.71       | 1000            | 120             | 98.0        | H   | 183.0         | 24.5       |

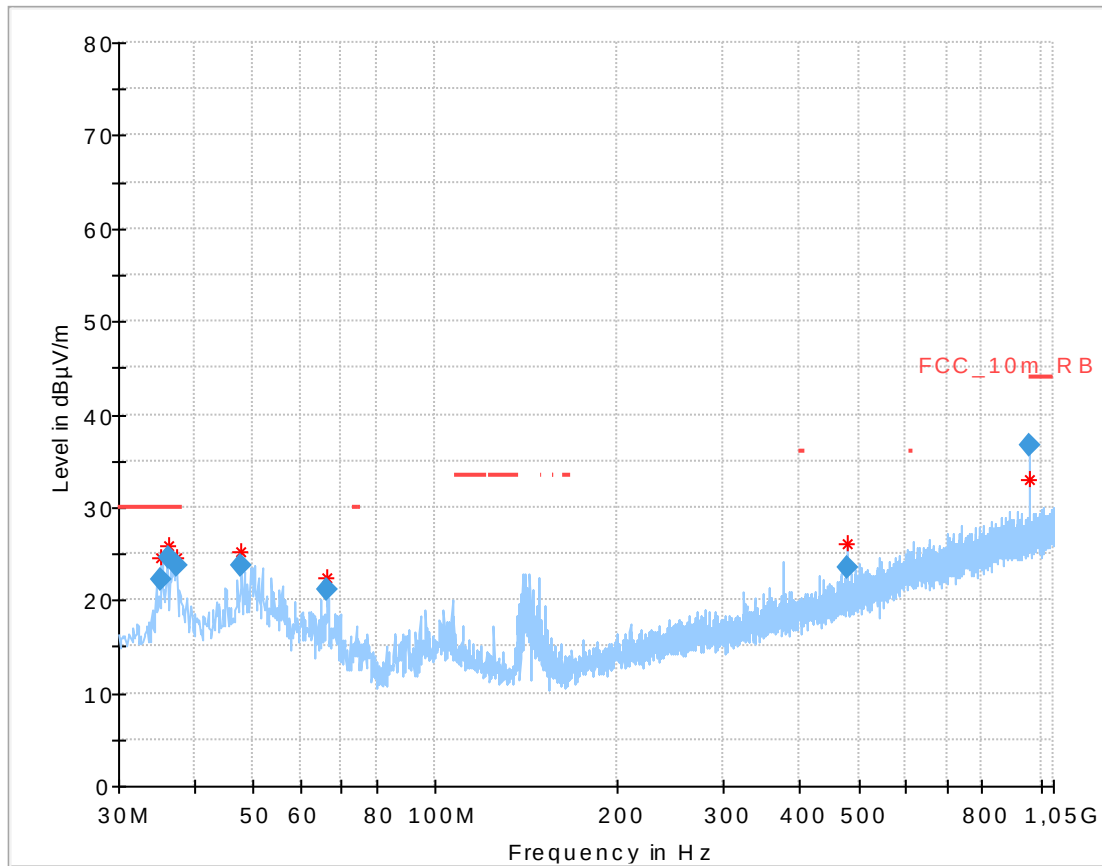
**Plot:** OFDM (20 MHz nominal channel bandwidth)

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

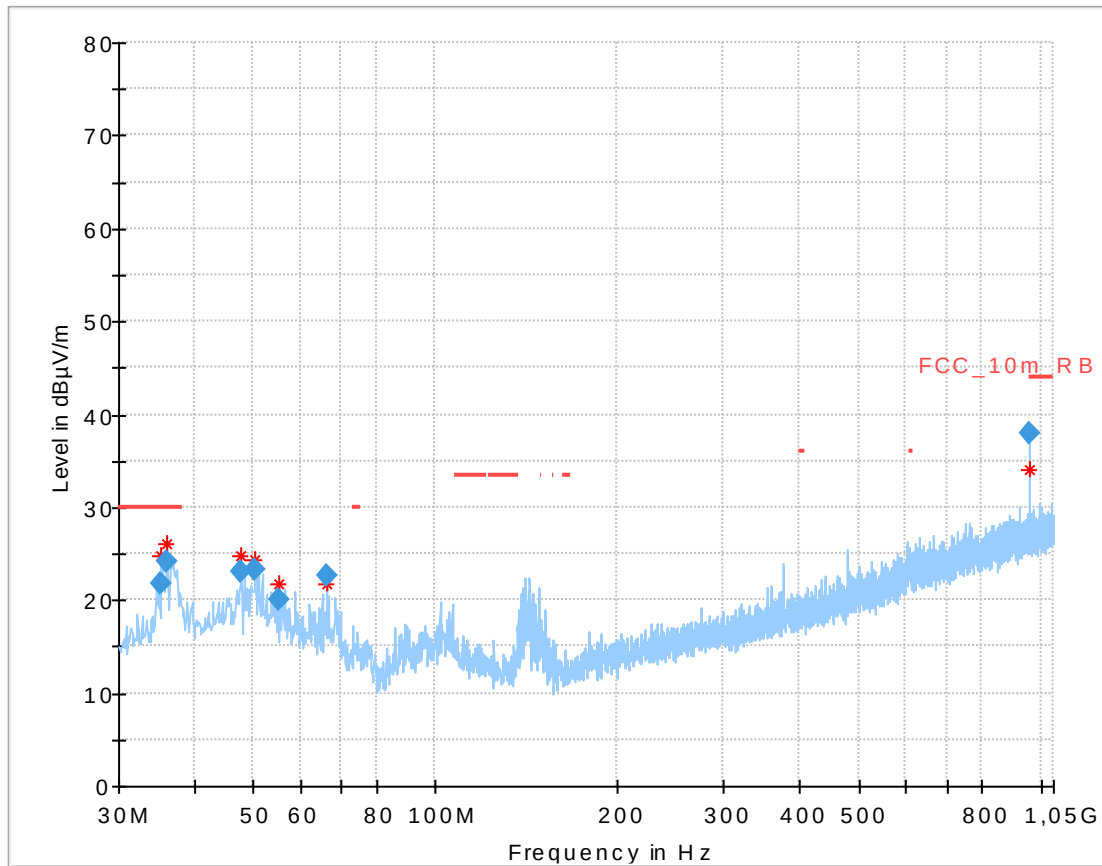


**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 35.347          | 22.61              | 30.0           | 7.39        | 1000            | 120             | 170.0       | V   | 90.0          | 12.7       |
| 36.151          | 23.99              | 30.0           | 6.01        | 1000            | 120             | 98.0        | V   | 270.0         | 12.8       |
| 37.533          | 21.91              | 30.0           | 8.09        | 1000            | 120             | 101.0       | V   | 270.0         | 12.9       |
| 47.815          | 23.52              | 30.0           | 6.48        | 1000            | 120             | 98.0        | V   | 90.0          | 13.7       |
| 50.436          | 23.09              | 30.0           | 6.91        | 1000            | 120             | 98.0        | V   | 270.0         | 13.7       |
| 66.231          | 19.09              | 30.0           | 10.91       | 1000            | 120             | 170.0       | V   | 270.0         | 10.5       |
| 959.989         | 37.33              | 36.0           | -1.33       | 1000            | 120             | 100.0       | H   | 180.0         | 24.5       |

**Plot 2:** 30 MHz to 1 GHz, vertical & horizontal polarization, Channel 6**Final results:**

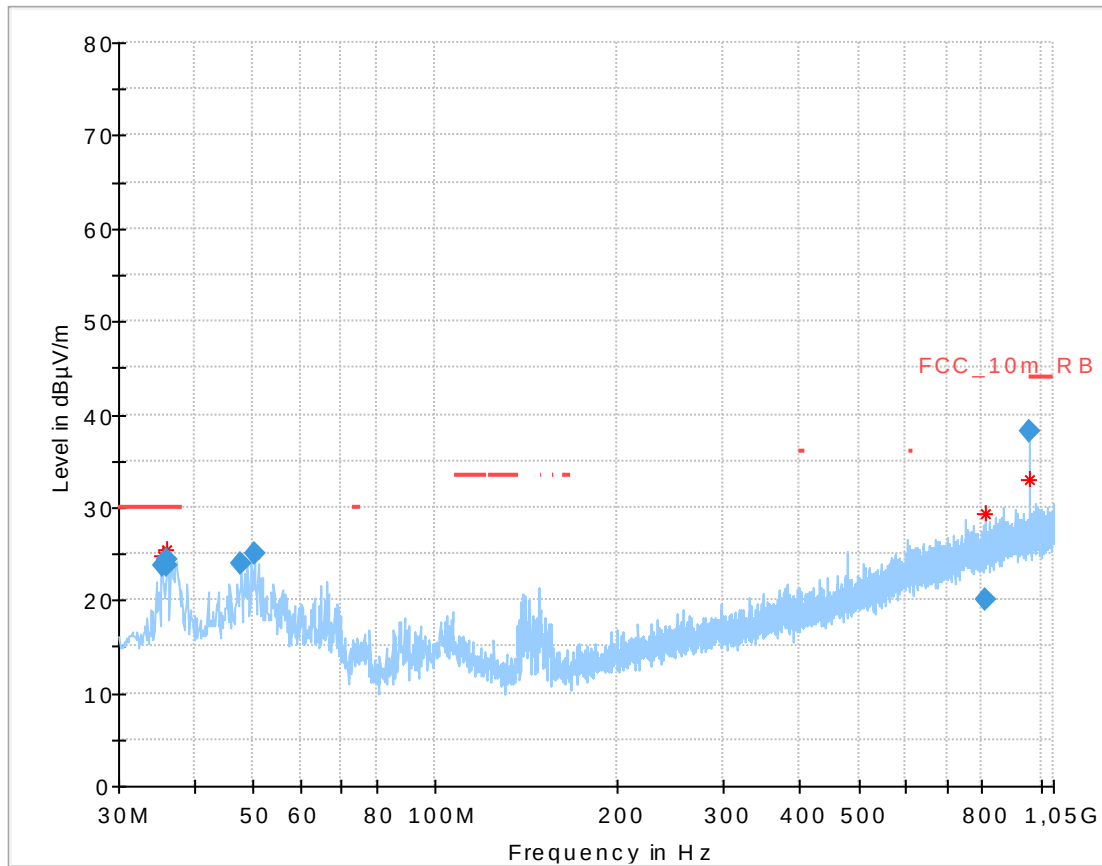
| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 35.326          | 22.25              | 30.0           | 7.75        | 1000            | 120             | 170.0       | V   | 90.0          | 12.7       |
| 36.159          | 24.67              | 30.0           | 5.33        | 1000            | 120             | 101.0       | V   | 90.0          | 12.8       |
| 37.355          | 23.82              | 30.0           | 6.18        | 1000            | 120             | 101.0       | V   | 270.0         | 12.9       |
| 47.792          | 23.76              | 30.0           | 6.24        | 1000            | 120             | 98.0        | V   | 90.0          | 13.7       |
| 66.251          | 21.05              | 30.0           | 8.95        | 1000            | 120             | 170.0       | V   | 270.0         | 10.5       |
| 480.004         | 23.52              | 36.0           | 12.48       | 1000            | 120             | 101.0       | H   | 270.0         | 18.3       |
| 960.000         | 36.60              | 36.0           | -0.60       | 1000            | 120             | 101.0       | H   | 270.0         | 24.5       |

**Plot 3:** 30 MHz to 1 GHz, vertical & horizontal polarization, Channel 11**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 35.316          | 21.72              | 30.0           | 8.28        | 1000            | 120             | 170.0       | V   | 90.0          | 12.7       |
| 36.128          | 24.07              | 30.0           | 5.93        | 1000            | 120             | 170.0       | V   | 90.0          | 12.8       |
| 47.791          | 23.17              | 30.0           | 6.83        | 1000            | 120             | 98.0        | V   | 180.0         | 13.7       |
| 50.453          | 23.33              | 30.0           | 6.67        | 1000            | 120             | 98.0        | V   | 180.0         | 13.7       |
| 55.277          | 20.07              | 30.0           | 9.93        | 1000            | 120             | 170.0       | V   | 270.0         | 13.0       |
| 66.288          | 22.54              | 30.0           | 7.46        | 1000            | 120             | 170.0       | V   | 270.0         | 10.5       |
| 959.999         | 38.02              | 36.0           | -2.02       | 1000            | 120             | 98.0        | H   | 180.0         | 24.5       |

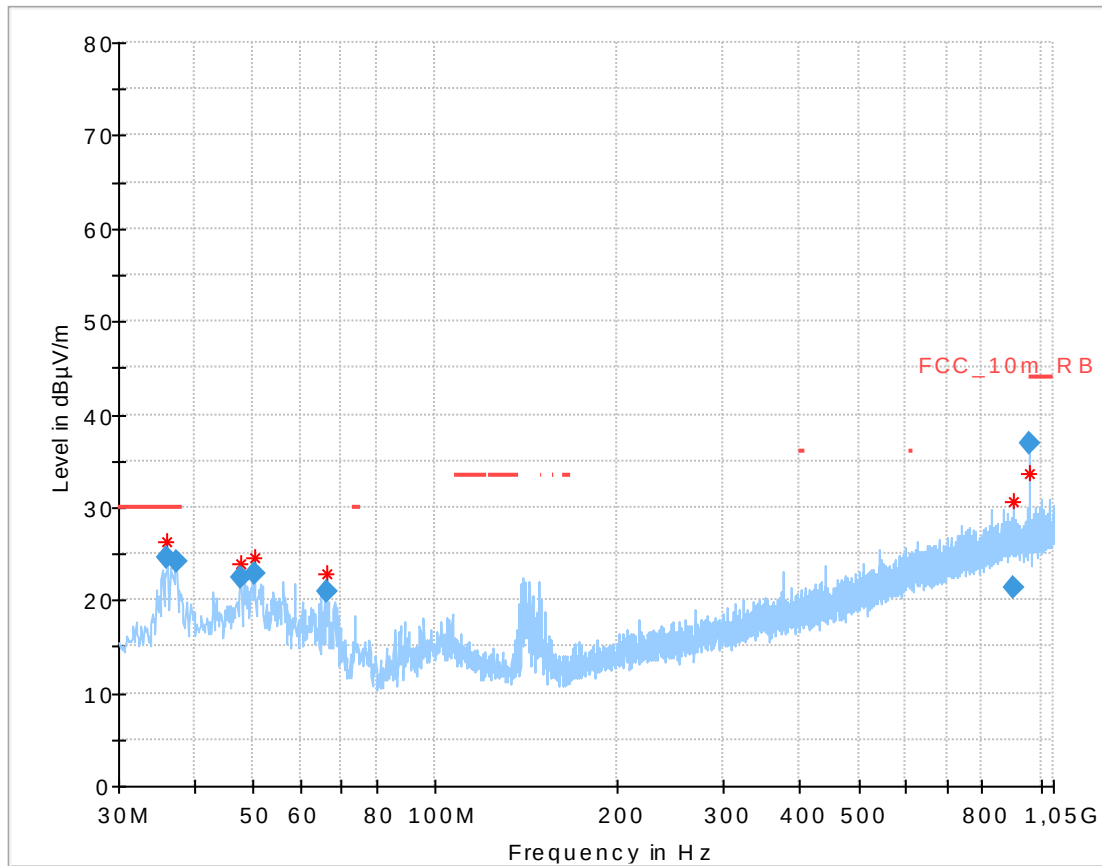
**Plot:** OFDM (40 MHz nominal channel bandwidth)

**Plot 1:** 30 MHz to 1 GHz, vertical & horizontal polarization, Channel 3

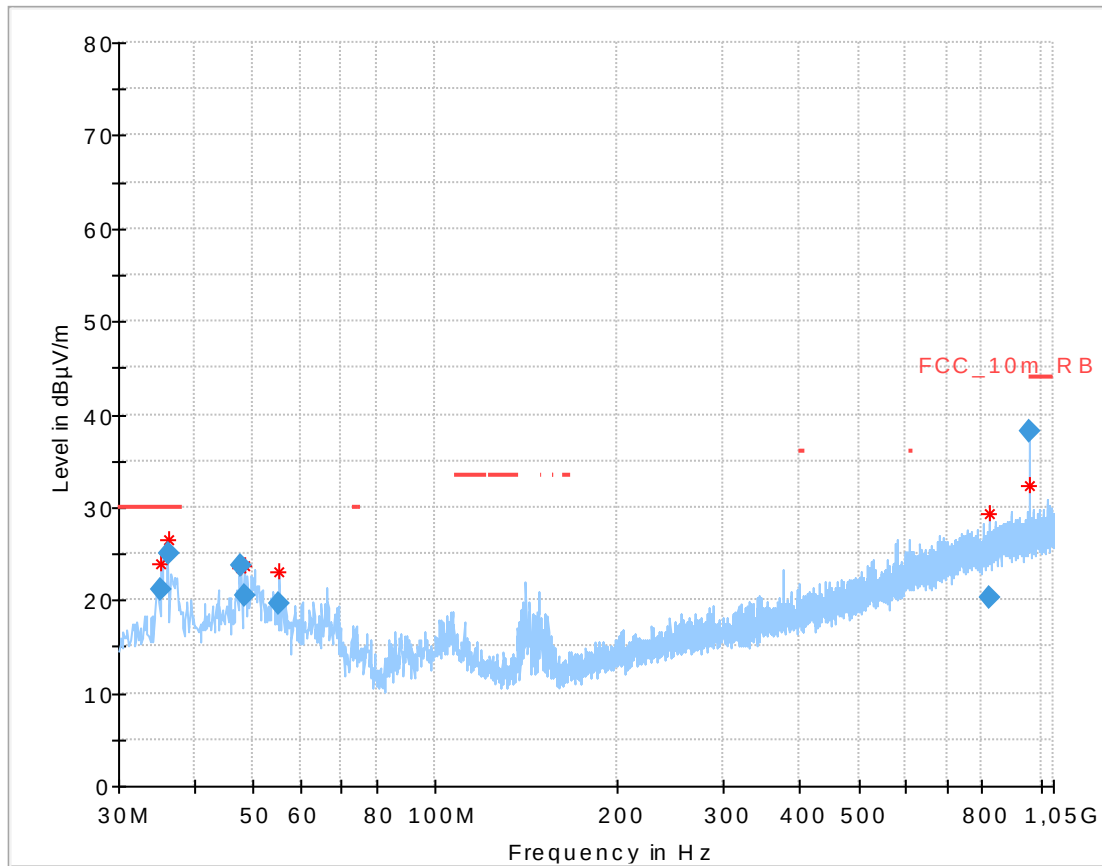


#### Final results:

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 35.351          | 23.76              | 30.0           | 6.24        | 1000            | 120             | 100.0       | V   | 0.0           | 12.7       |
| 36.136          | 24.45              | 30.0           | 5.55        | 1000            | 120             | 170.0       | V   | 90.0          | 12.8       |
| 36.139          | 23.63              | 30.0           | 6.37        | 1000            | 120             | 98.0        | V   | 270.0         | 12.8       |
| 47.802          | 23.95              | 30.0           | 6.05        | 1000            | 120             | 98.0        | V   | 180.0         | 13.7       |
| 50.433          | 25.10              | 30.0           | 4.90        | 1000            | 120             | 98.0        | V   | 270.0         | 13.7       |
| 812.931         | 20.08              | 36.0           | 15.92       | 1000            | 120             | 170.0       | H   | 0.0           | 23.0       |
| 960.003         | 38.17              | 44.0           | 5.83        | 1000            | 120             | 98.0        | H   | 180.0         | 24.5       |

**Plot 2:** 30 MHz to 1 GHz, vertical & horizontal polarization, Channel 6**Final results:**

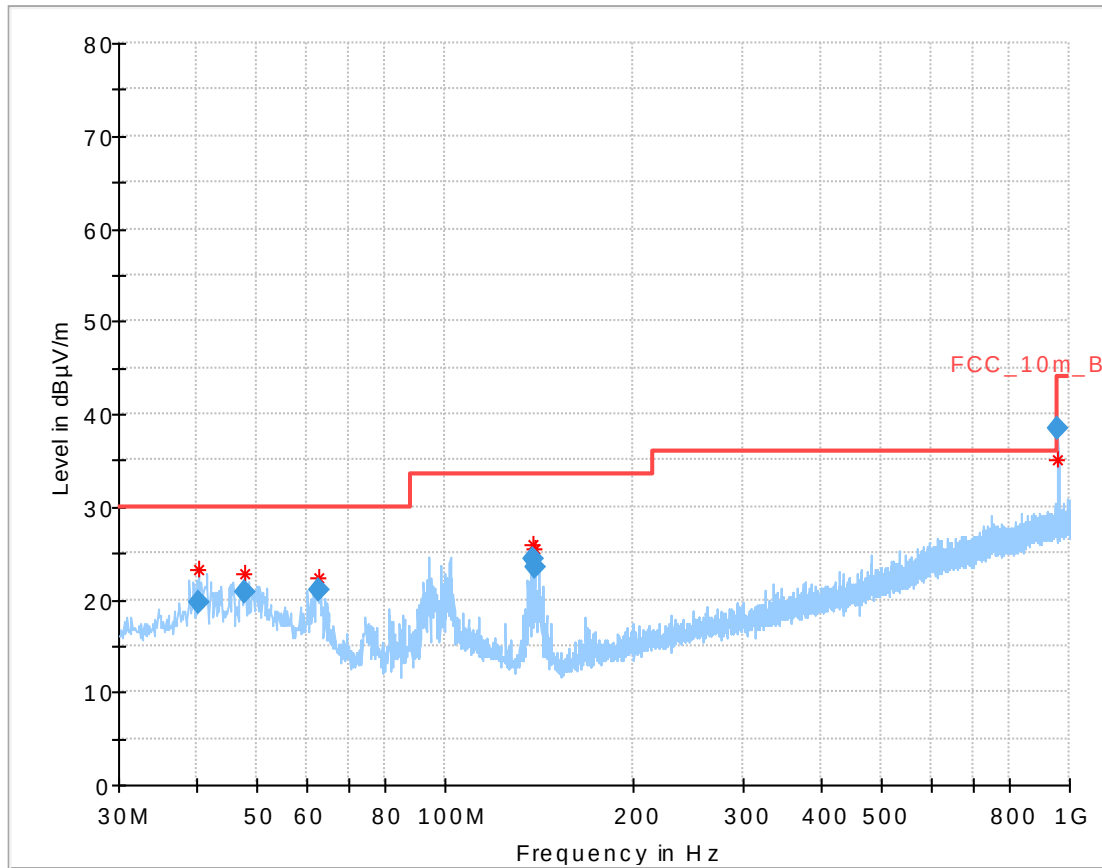
| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 36.129          | 24.51              | 30.0           | 5.49        | 1000            | 120             | 101.0       | V   | 270.0         | 12.8       |
| 37.358          | 24.05              | 30.0           | 5.95        | 1000            | 120             | 101.0       | V   | 270.0         | 12.9       |
| 47.795          | 22.42              | 30.0           | 7.58        | 1000            | 120             | 170.0       | V   | 180.0         | 13.7       |
| 50.412          | 22.76              | 30.0           | 7.24        | 1000            | 120             | 98.0        | V   | 90.0          | 13.7       |
| 66.259          | 20.82              | 30.0           | 9.18        | 1000            | 120             | 170.0       | V   | 180.0         | 10.5       |
| 899.246         | 21.26              | 36.0           | 14.74       | 1000            | 120             | 170.0       | V   | 0.0           | 24.2       |
| 960.008         | 36.78              | 44.0           | 7.22        | 1000            | 120             | 98.0        | H   | 270.0         | 24.5       |

**Plot 3:** 30 MHz to 1 GHz, vertical & horizontal polarization, Channel 9**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 35.298          | 21.21              | 30.0           | 8.79        | 1000            | 120             | 101.0       | V   | 90.0          | 12.7       |
| 36.154          | 25.12              | 30.0           | 4.88        | 1000            | 120             | 98.0        | V   | 90.0          | 12.8       |
| 47.797          | 23.80              | 30.0           | 6.20        | 1000            | 120             | 98.0        | V   | 180.0         | 13.7       |
| 48.427          | 20.48              | 30.0           | 9.52        | 1000            | 120             | 98.0        | V   | 270.0         | 13.7       |
| 55.279          | 19.62              | 30.0           | 10.38       | 1000            | 120             | 170.0       | V   | 180.0         | 13.0       |
| 825.407         | 20.25              | 36.0           | 15.75       | 1000            | 120             | 170.0       | H   | 270.0         | 23.2       |
| 960.002         | 38.06              | 44.0           | 5.94        | 1000            | 120             | 98.0        | H   | 180.0         | 24.5       |

**Plot:** RX / Idle mode

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



**Final results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 40.322          | 19.77              | 30.0           | 10.23       | 1000            | 120             | 101.0       | V   | 20.0          | 13.2       |
| 47.820          | 20.85              | 30.0           | 9.15        | 1000            | 120             | 101.0       | V   | 31.0          | 13.7       |
| 62.772          | 21.01              | 30.0           | 8.99        | 1000            | 120             | 98.0        | V   | 92.0          | 11.2       |
| 138.402         | 24.37              | 33.5           | 9.13        | 1000            | 120             | 170.0       | V   | 195.0         | 9.0        |
| 139.199         | 23.53              | 33.5           | 9.97        | 1000            | 120             | 170.0       | V   | 172.0         | 8.9        |
| 960.025         | 38.54              | 44.0           | 5.46        | 1000            | 120             | 101.0       | H   | 327.0         | 24.5       |

### 12.13 Spurious emissions radiated above 1 GHz

#### Description:

Measurement of the radiated spurious emissions above 1 GHz in transmit mode and receiver / idle mode.

#### Measurement:

| Measurement parameter   |                                                                                                                                                                                                                             |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Detector                | Peak / RMS                                                                                                                                                                                                                  |
| Sweep time              | Auto                                                                                                                                                                                                                        |
| Resolution bandwidth    | 1 MHz                                                                                                                                                                                                                       |
| Video bandwidth         | 3 x RBW                                                                                                                                                                                                                     |
| Span                    | 1 GHz to 26 GHz                                                                                                                                                                                                             |
| Trace mode              | Max Hold                                                                                                                                                                                                                    |
| Measured modulation     | <input type="checkbox"/> DSSS b – mode<br><input type="checkbox"/> OFDM g – mode<br><input type="checkbox"/> OFDM n HT20 – mode<br><input type="checkbox"/> OFDM n HT40 – mode<br><input type="checkbox"/> RX / Idle – mode |
| Test setup              | See chapter 6.2 C<br>See chapter 6.2 A                                                                                                                                                                                      |
| Measurement uncertainty | See chapter 8                                                                                                                                                                                                               |

#### Limits:

| FCC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   | IC                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------|
| 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 30 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 / (dB $\mu$ V / m) | Measurement distance / m |
| Above 960                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 54.0 (AVG)                        | 3                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 74.0 (peak)                       |                          |

**Results:** DSSS

| TX spurious emissions radiated / dBµV/m @ 3 m |          |                |           |          |                |            |          |                |
|-----------------------------------------------|----------|----------------|-----------|----------|----------------|------------|----------|----------------|
| Channel 1                                     |          |                | Channel 6 |          |                | Channel 11 |          |                |
| f / MHz                                       | Detector | Level / dBµV/m | f / MHz   | Detector | Level / dBµV/m | f / MHz    | Detector | Level / dBµV/m |
| 1440                                          | Peak     | 43.1           | 1440      | Peak     | 43.1           | 1440       | Peak     | 43.1           |
|                                               | AVG      | 42.1           |           | AVG      | 42.1           |            | AVG      | 42.1           |
| 4824                                          | Peak     | 54.9           | 4874      | Peak     | 56.9           | 4924       | Peak     | 57.2           |
|                                               | AVG      | 49.5           |           | AVG      | 52.6           |            | AVG      | 53.7           |

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

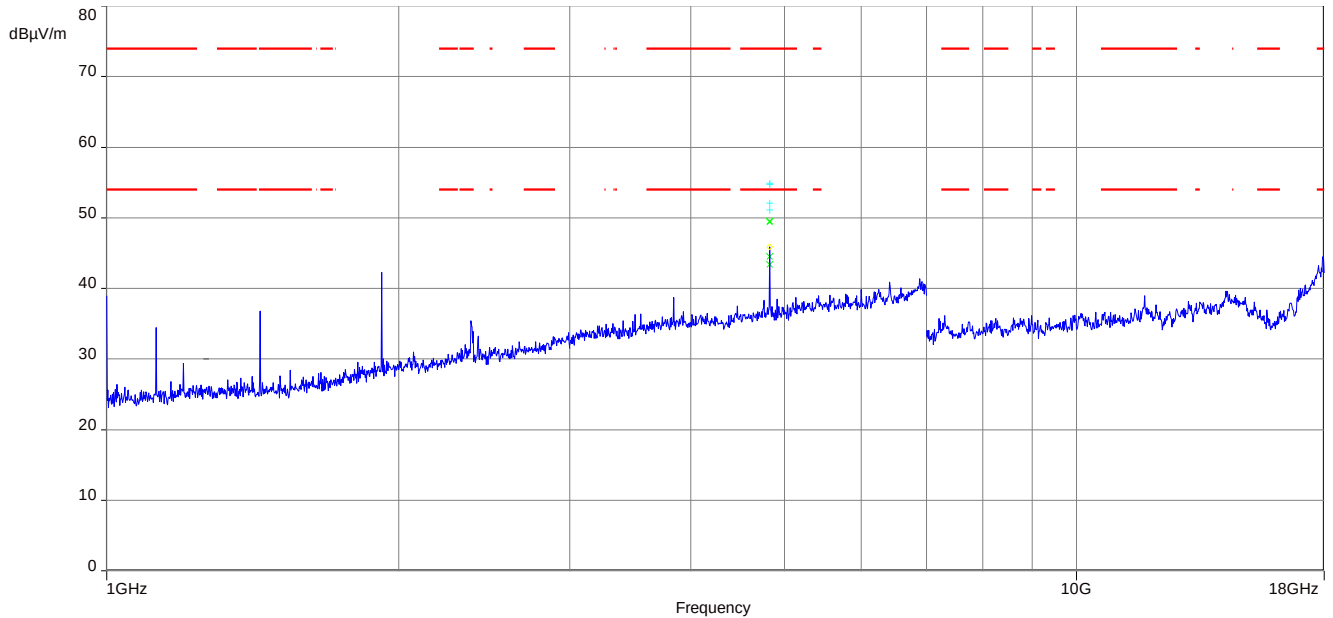
| TX spurious emissions radiated / dBµV/m @ 3 m |          |                |           |          |                |            |          |                |
|-----------------------------------------------|----------|----------------|-----------|----------|----------------|------------|----------|----------------|
| Channel 1                                     |          |                | Channel 6 |          |                | Channel 11 |          |                |
| f / MHz                                       | Detector | Level / dBµV/m | f / MHz   | Detector | Level / dBµV/m | f / MHz    | Detector | Level / dBµV/m |
| 1440                                          | Peak     | 43.1           | 1440      | Peak     | 43.1           | 1440       | Peak     | 43.1           |
|                                               | AVG      | 42.1           |           | AVG      | 42.1           |            | AVG      | 42.1           |
| 4826                                          | Peak     | 54.8           | 4876      | Peak     | 55.9           | 4924       | Peak     | 55.1           |
|                                               | AVG      | 43.8           |           | AVG      | 44.7           |            | AVG      | 44.9           |

**Results:** OFDM (40 MHz nominal channel bandwidth)

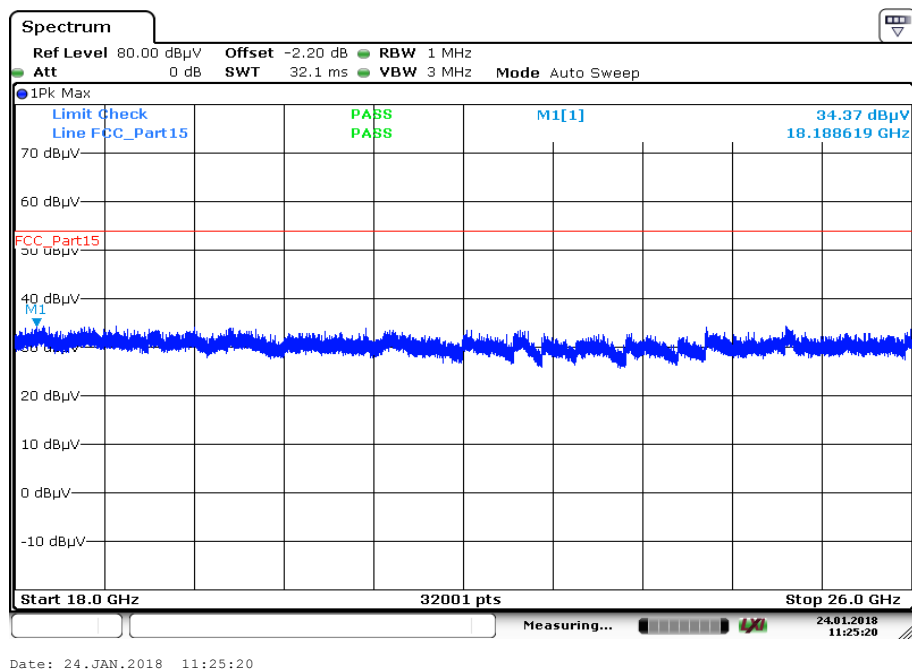
| TX spurious emissions radiated / dBµV/m @ 3 m |          |                |           |          |                |           |          |                |
|-----------------------------------------------|----------|----------------|-----------|----------|----------------|-----------|----------|----------------|
| Channel 6                                     |          |                | Channel 6 |          |                | Channel 9 |          |                |
| f / MHz                                       | Detector | Level / dBµV/m | f / MHz   | Detector | Level / dBµV/m | f / MHz   | Detector | Level / dBµV/m |
| 1440                                          | Peak     | 43.1           | 1440      | Peak     | 43.1           | 1440      | Peak     | 43.1           |
|                                               | AVG      | 42.1           |           | AVG      | 42.1           |           | AVG      | 42.1           |
|                                               | Peak     |                |           | Peak     |                |           | Peak     |                |
|                                               | AVG      |                |           | AVG      |                |           | AVG      |                |

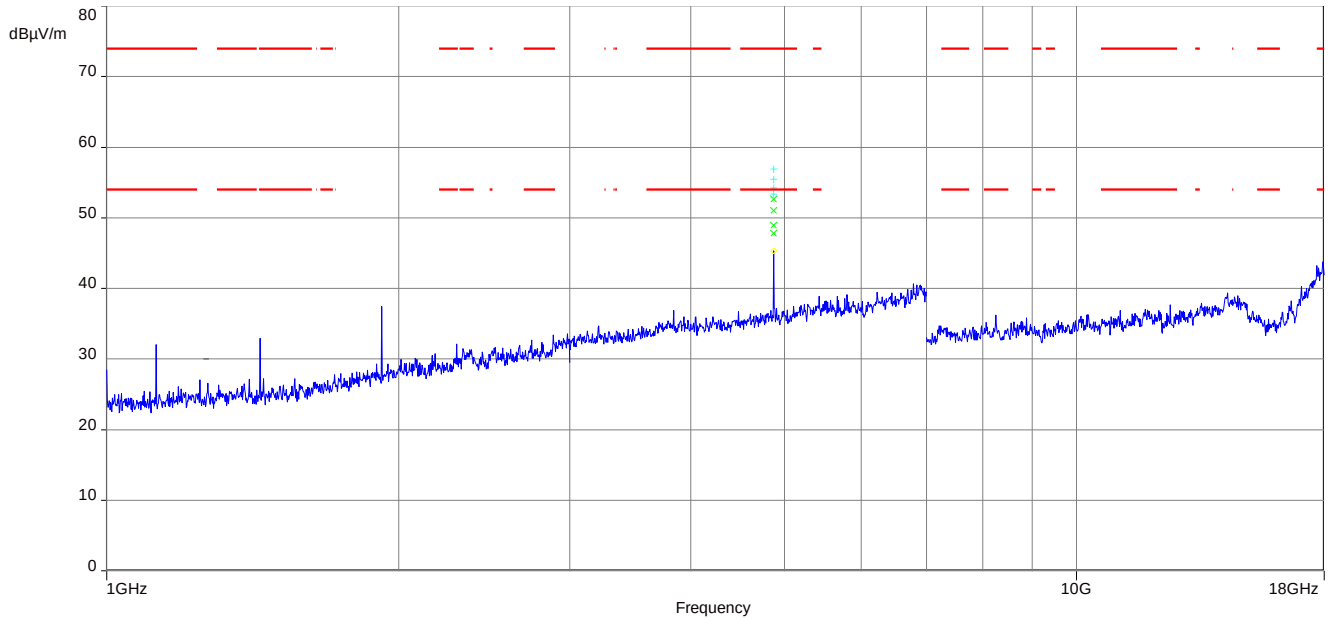
**Results:** RX / idle – mode

| RX Spurious Emissions Radiated [dBµV/m] |          |                |
|-----------------------------------------|----------|----------------|
| F [MHz]                                 | Detector | Level [dBµV/m] |
| 1440                                    | Peak     | 43.1           |
| 1440                                    | RMS      | 42.1           |
| 1920                                    | Peak     | 45.8           |
| 1920                                    | RMS      | 44.7           |

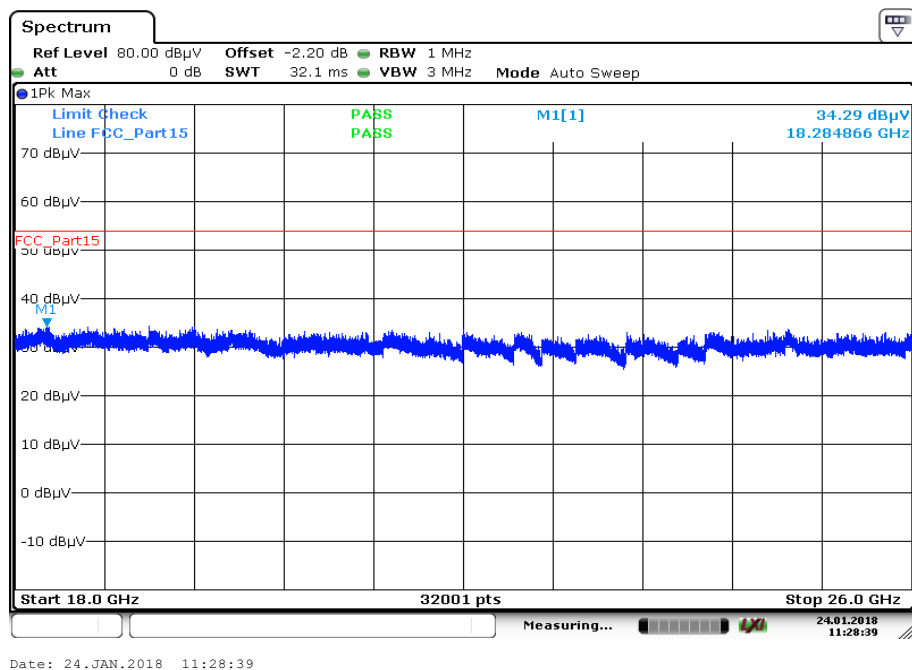
**Plots:** DSSS**Plot 1:** Channel 1, 1 GHz to 18 GHz, vertical & horizontal polarization

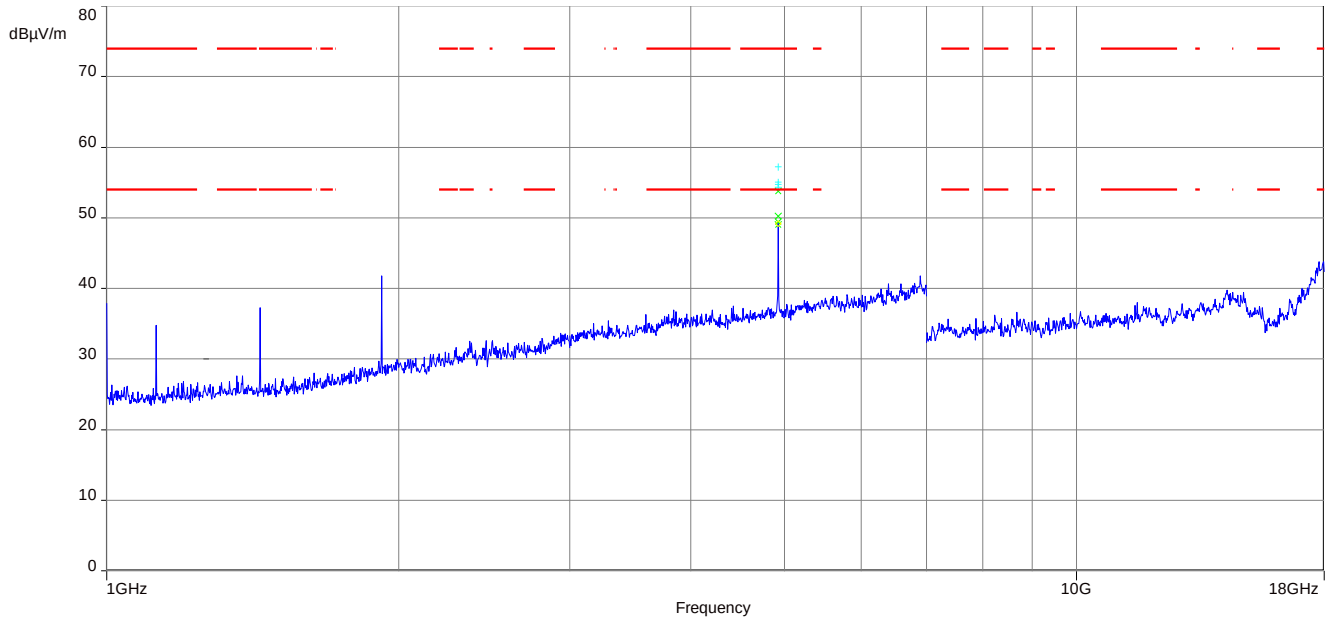
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 2:** Channel 1, 18 GHz to 26 GHz, vertical & horizontal polarization

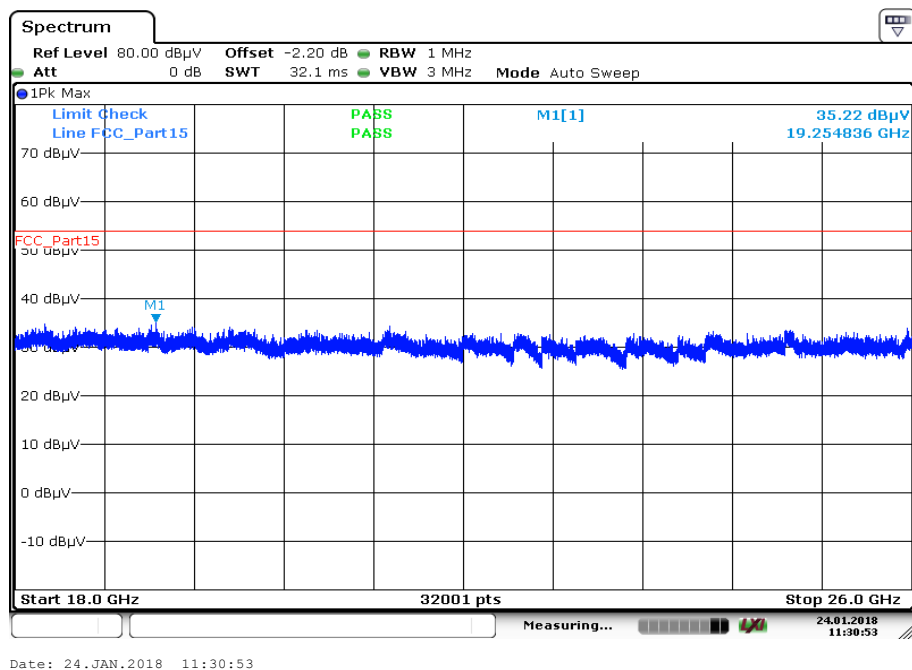
**Plot 3:** Channel 6, 1 GHz to 18 GHz, vertical & horizontal polarization

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

**Plot 4:** Channel 6, 18 GHz to 26 GHz, vertical & horizontal polarization

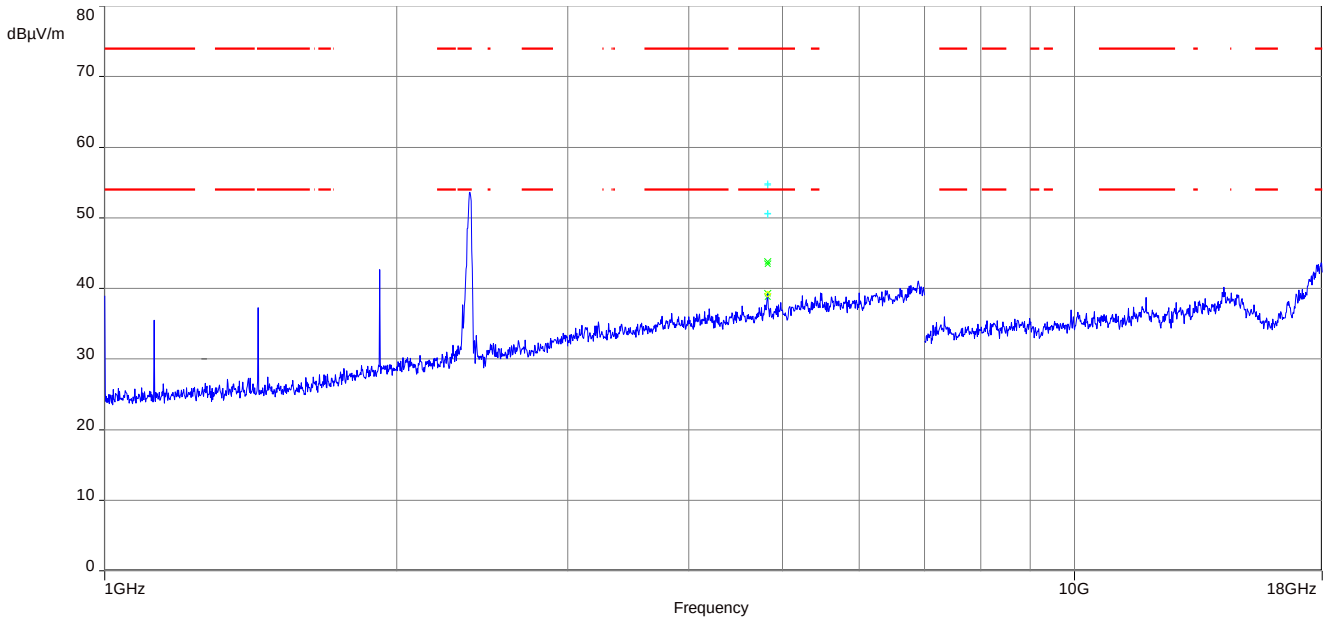
**Plot 5:** Channel 11, 1 GHz to 18 GHz, vertical & horizontal polarization

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

**Plot 6:** Channel 11, 18 GHz to 26 GHz, vertical & horizontal polarization

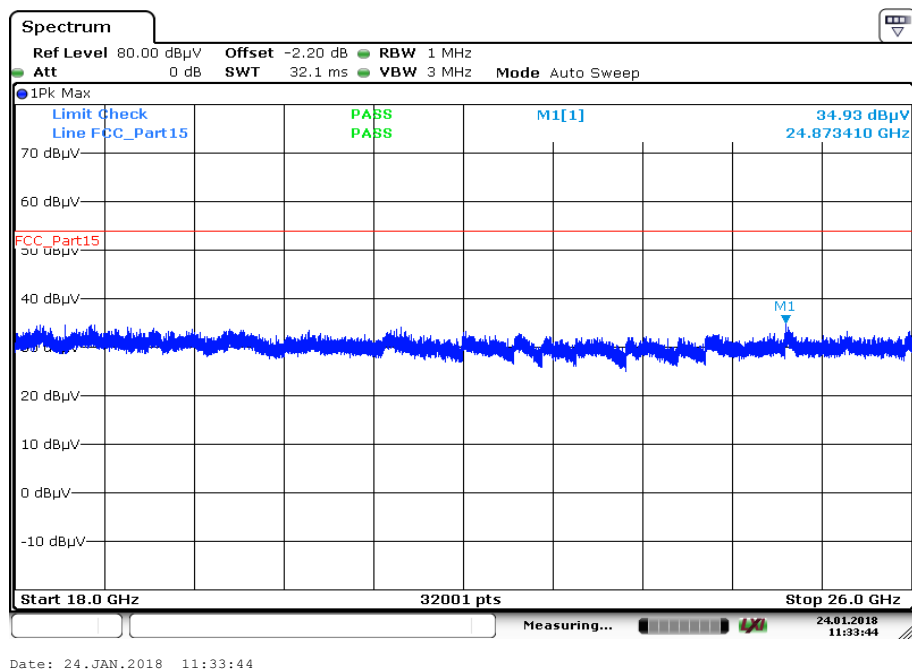
**Plots:** OFDM (20 MHz bandwidth)

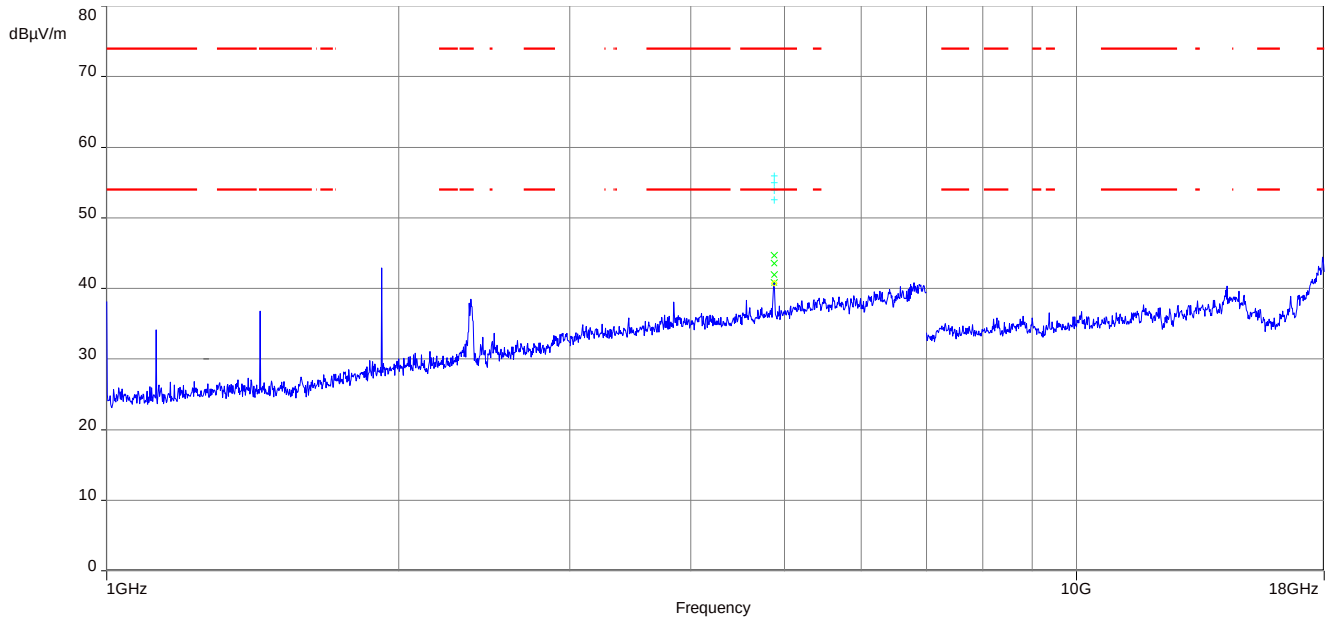
**Plot 1:** Channel 1, 1 GHz to 18 GHz, vertical & horizontal polarization



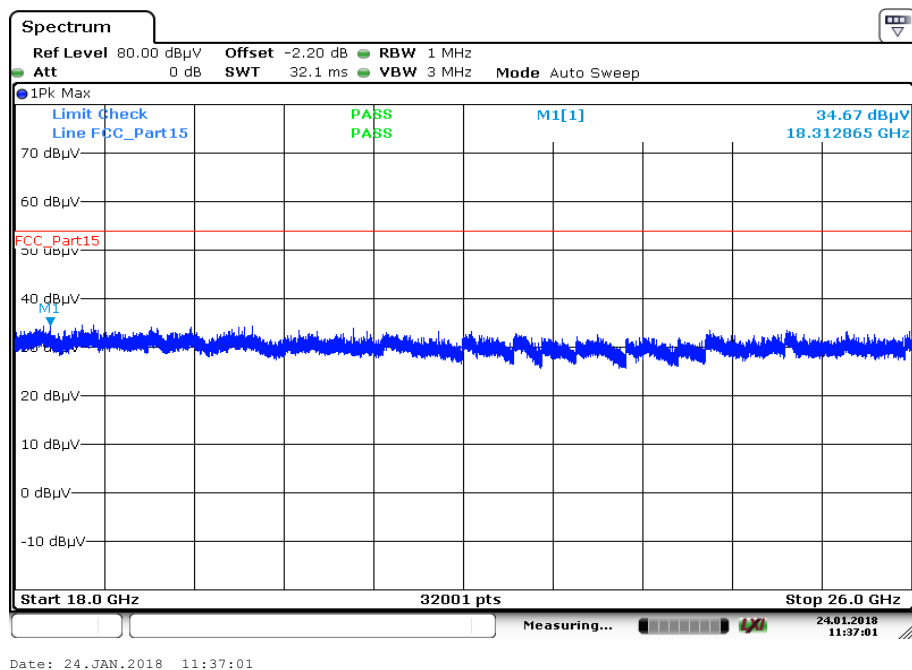
The carrier signal is notched with a 2.4 GHz band rejection filter.

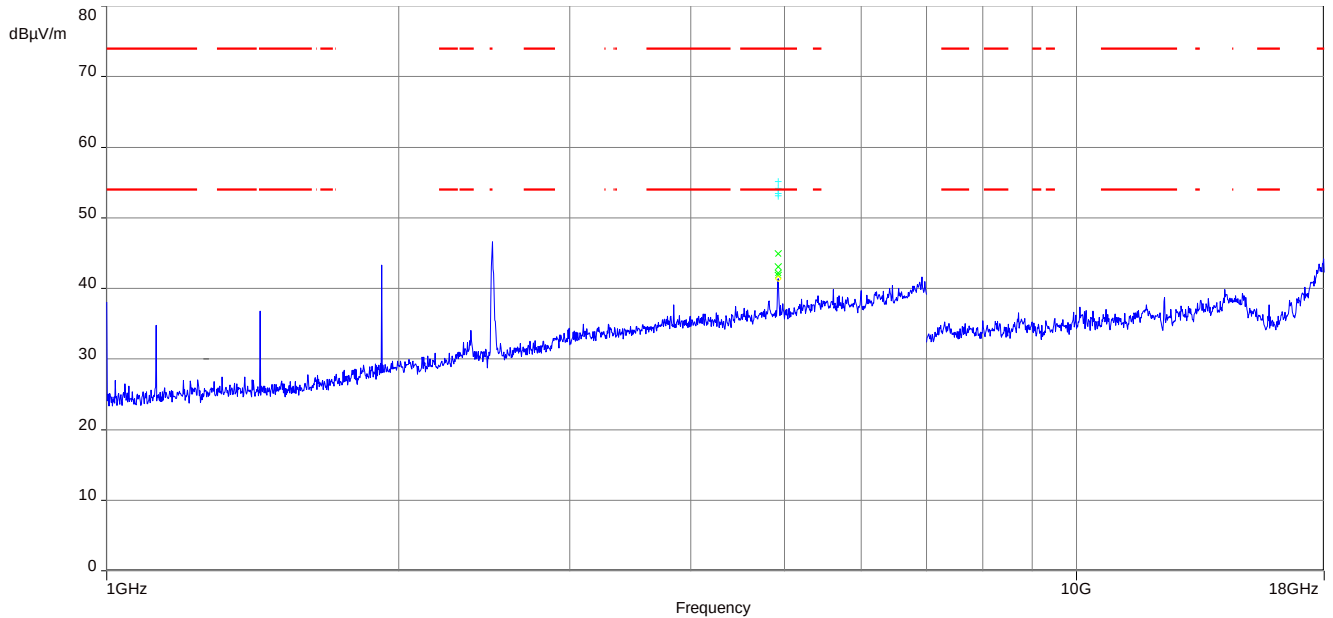
**Plot 2:** Channel 1, 18 GHz to 26 GHz, vertical & horizontal polarization



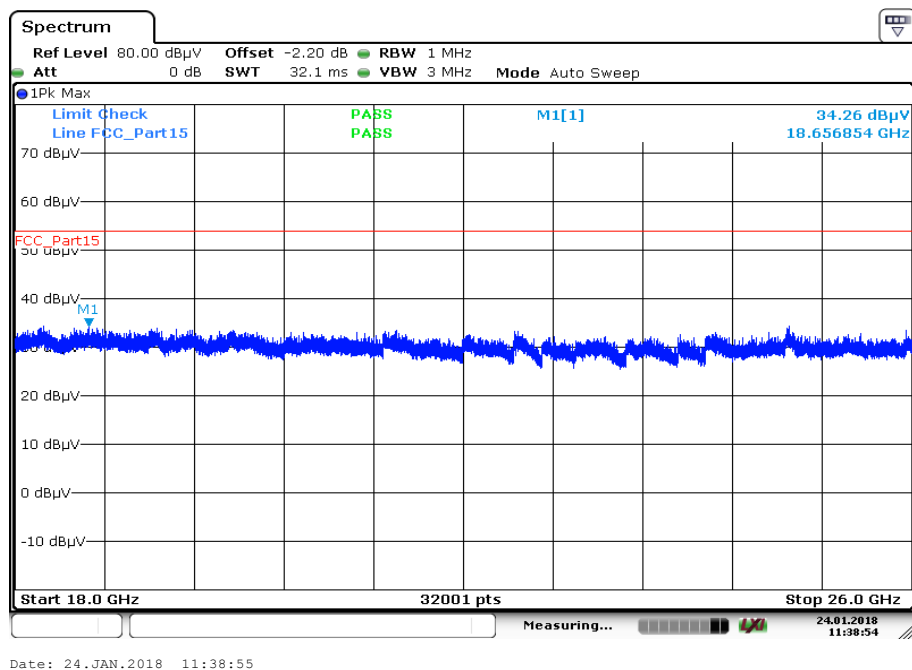
**Plot 3:** Channel 6, 1 GHz to 18 GHz, vertical & horizontal polarization

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

**Plot 4:** Channel 6, 18 GHz to 26 GHz, vertical & horizontal polarization

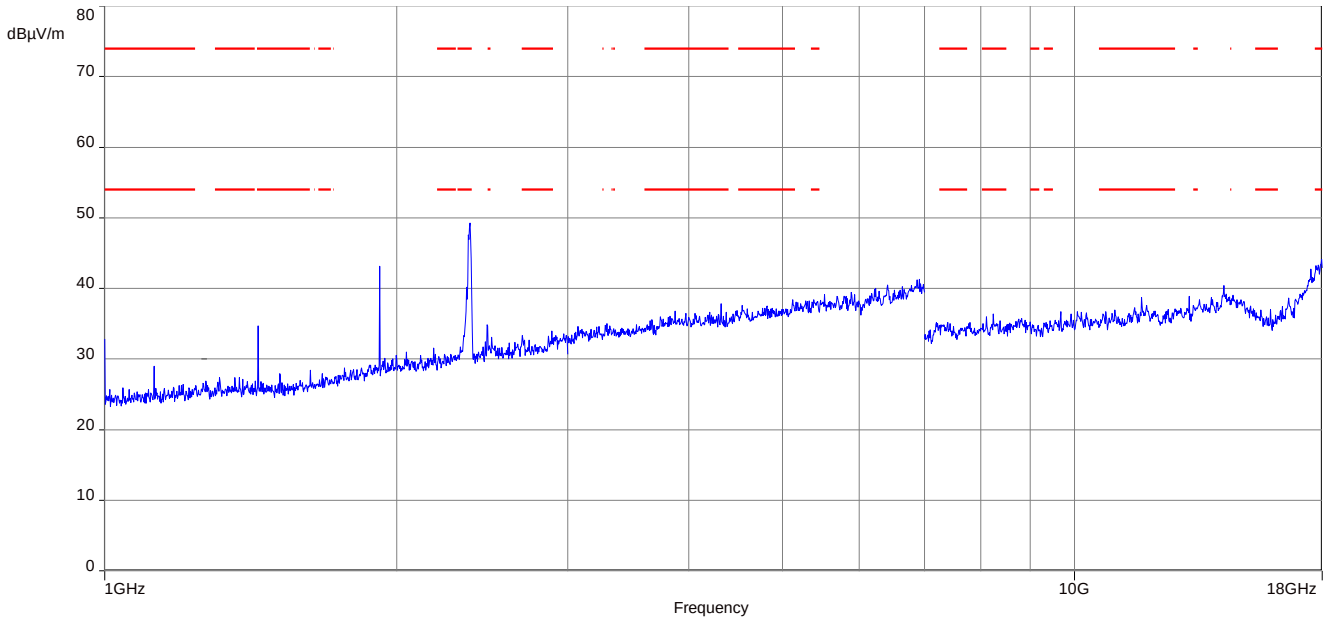
**Plot 5:** Channel 11, 1 GHz to 18 GHz, vertical & horizontal polarization

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

**Plot 6:** Channel 11, 18 GHz to 26 GHz, vertical & horizontal polarization

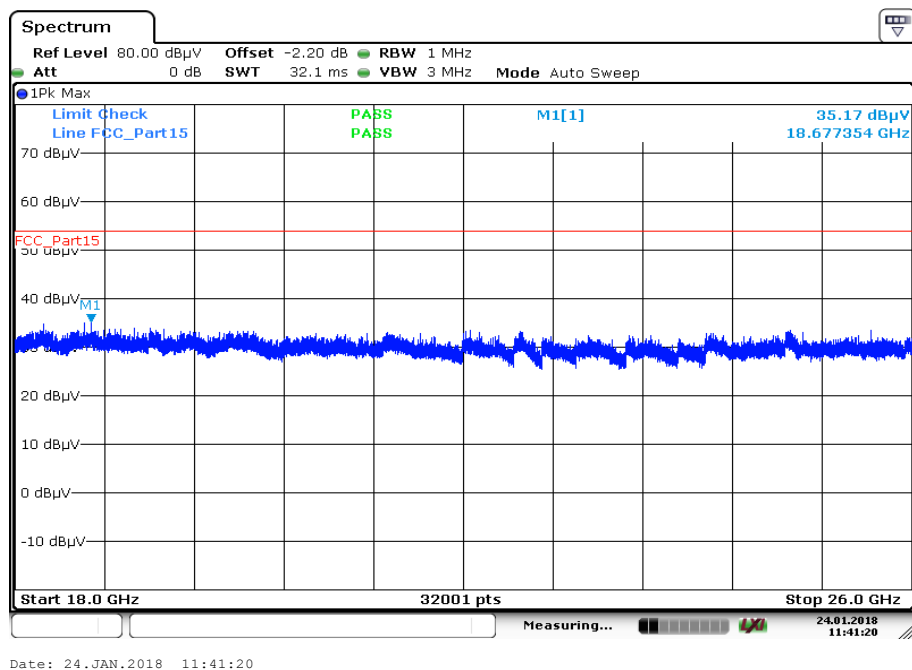
**Plots:** OFDM (40 MHz bandwidth)

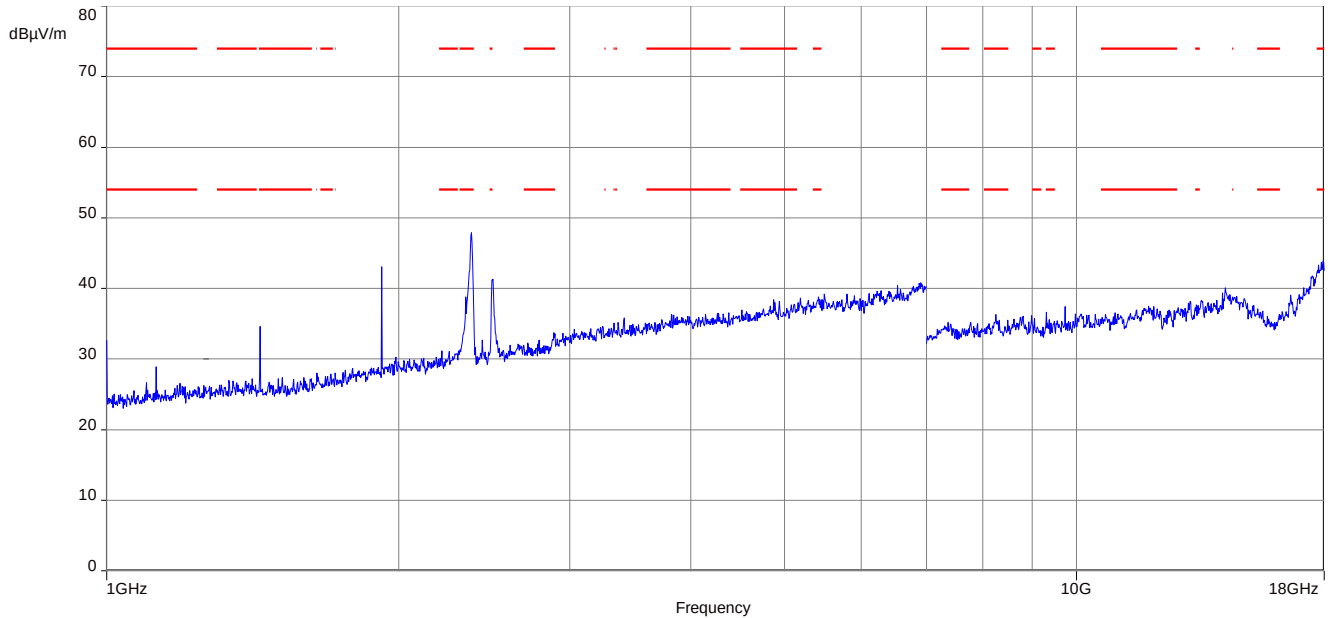
**Plot 1:** Channel 3, 1 GHz to 18 GHz, vertical & horizontal polarization



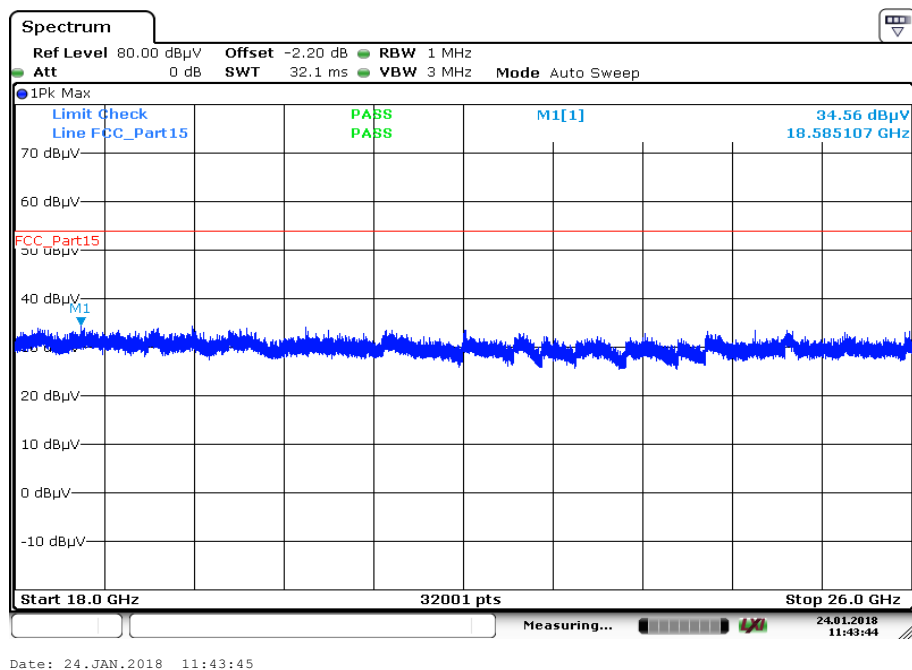
The carrier signal is notched with a 2.4 GHz band rejection filter.

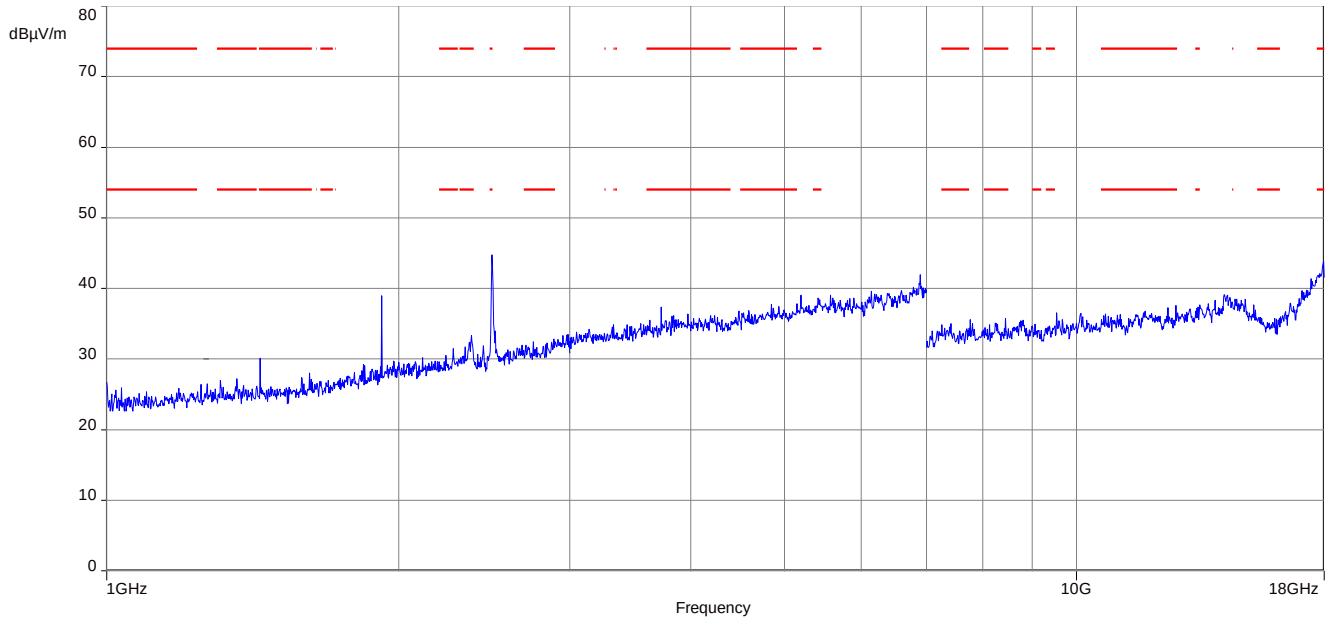
**Plot 2:** Channel 3, 18 GHz to 26 GHz, vertical & horizontal polarization



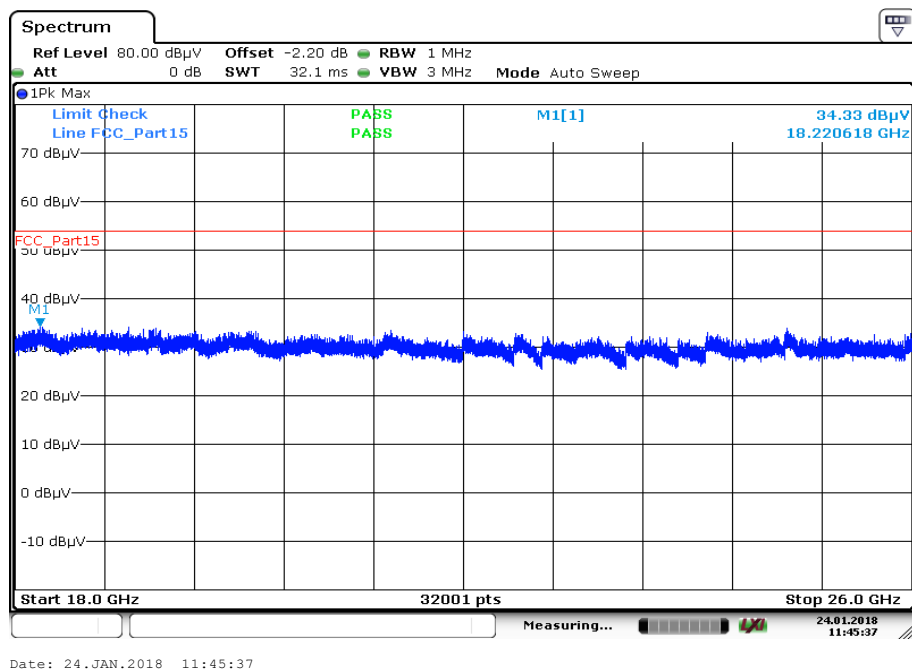
**Plot 3:** Channel 6, 1 GHz to 18 GHz, vertical & horizontal polarization

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

**Plot 4:** Channel 6, 18 GHz to 26 GHz, vertical & horizontal polarization

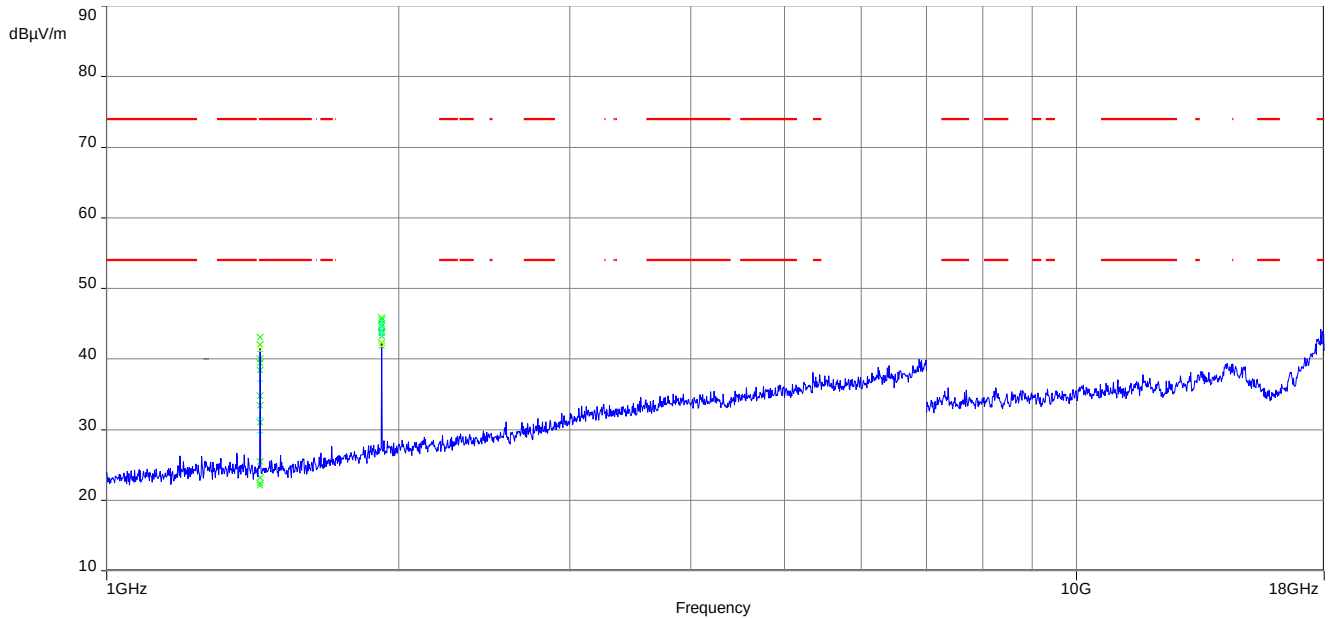
**Plot 5:** Channel 9, 1 GHz to 18 GHz, vertical & horizontal polarization

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

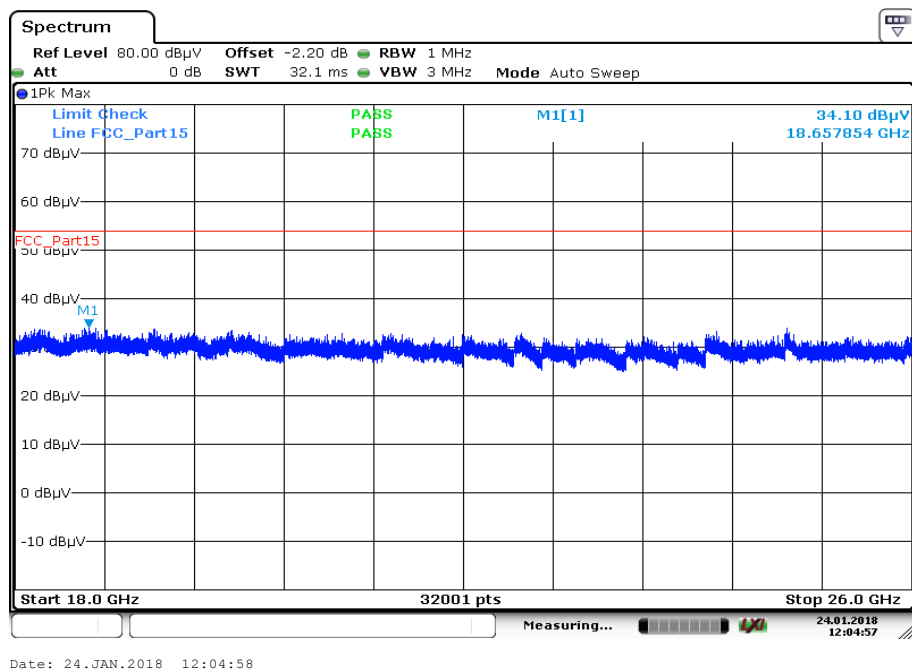
**Plot 6:** Channel 9, 18 GHz to 26 GHz, vertical & horizontal polarization

**Plots:** RX / idle mode

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



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



## 12.14 Spurious emissions conducted below 30 MHz (AC conducted)

### Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. 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                                       |
| Resolution bandwidth    | F < 150 kHz: 200 Hz<br>F > 150 kHz: 9 kHz  |
| Video bandwidth         | F < 150 kHz: 1 kHz<br>F > 150 kHz: 100 kHz |
| Span                    | 9 kHz to 30 MHz                            |
| Trace mode              | Max. hold                                  |
| Test setup              | See chapter 6.4 A                          |
| Measurement uncertainty | See chapter 8                              |

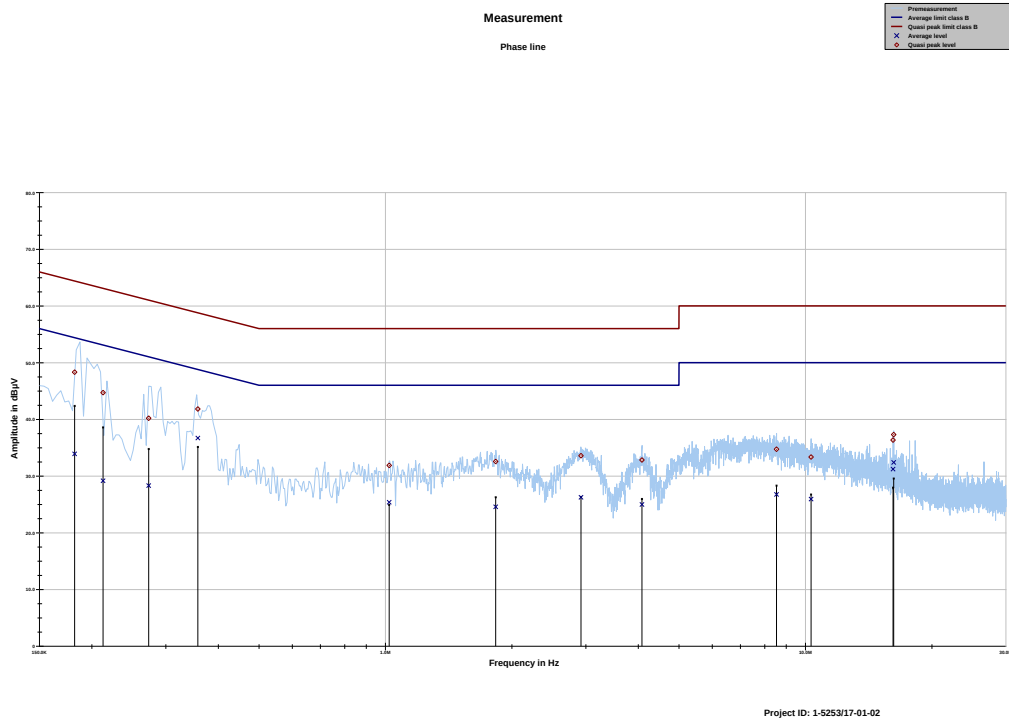
### Limits:

| FCC              |                               | IC                         |
|------------------|-------------------------------|----------------------------|
| Frequency / MHz) | Quasi-Peak / (dB $\mu$ V / m) | Average / (dB $\mu$ V / m) |
| 0.15 – 0.5       | 66 to 56*                     | 56 to 46*                  |
| 0.5 – 5          | 56                            | 46                         |
| 5 – 30.0         | 60                            | 50                         |

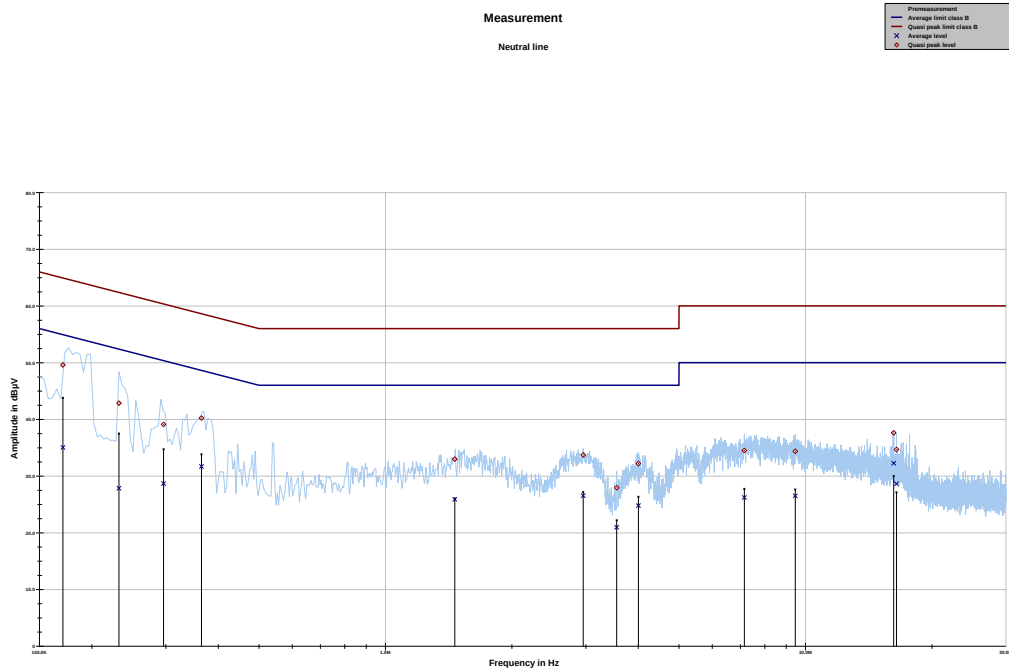
\*Decreases with the logarithm of the frequency

### Results:

| TX spurious emissions conducted < 30 MHz / (dB $\mu$ V / m) @ 3m |          |                      |
|------------------------------------------------------------------|----------|----------------------|
| f / MHz                                                          | Detector | Level / dB $\mu$ V/m |
| All detected peaks are more than 20 dB below the limit.          |          |                      |
|                                                                  |          |                      |

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

| Frequency | Quasi peak level | Margin quasi peak | Limit QP | Average level | Margin average | Limit AV |
|-----------|------------------|-------------------|----------|---------------|----------------|----------|
| MHz       | dBµV             | dB                | dBµV     | dBµV          | dB             | dBµV     |
| 0.181970  | 48.32            | 16.08             | 64.395   | 33.92         | 21.17          | 55.087   |
| 0.212688  | 44.71            | 18.39             | 63.100   | 29.16         | 25.05          | 54.209   |
| 0.273207  | 40.20            | 20.82             | 61.020   | 28.32         | 24.16          | 52.480   |
| 0.357648  | 41.83            | 16.96             | 58.783   | 36.69         | 13.37          | 50.067   |
| 1.020806  | 31.88            | 24.12             | 56.000   | 25.38         | 20.62          | 46.000   |
| 1.830075  | 32.56            | 23.44             | 56.000   | 24.58         | 21.42          | 46.000   |
| 2.921459  | 33.59            | 22.41             | 56.000   | 26.24         | 19.76          | 46.000   |
| 4.080798  | 32.83            | 23.17             | 56.000   | 24.99         | 21.01          | 46.000   |
| 8.532974  | 34.73            | 25.27             | 60.000   | 26.76         | 23.24          | 50.000   |
| 10.313818 | 33.35            | 26.65             | 60.000   | 25.93         | 24.07          | 50.000   |
| 16.166091 | 36.34            | 23.66             | 60.000   | 31.23         | 18.77          | 50.000   |
| 16.228939 | 37.31            | 22.69             | 60.000   | 32.40         | 17.60          | 50.000   |

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

| Frequency | Quasi peak level | Margin quasi peak | Limit QP | Average level | Margin average | Limit AV |
|-----------|------------------|-------------------|----------|---------------|----------------|----------|
| MHz       | dBµV             | dB                | dBµV     | dBµV          | dB             | dBµV     |
| 0.170648  | 49.61            | 15.32             | 64.929   | 35.05         | 20.36          | 55.410   |
| 0.232076  | 42.85            | 19.52             | 62.375   | 27.84         | 25.81          | 53.655   |
| 0.296348  | 39.10            | 21.24             | 60.345   | 28.66         | 23.15          | 51.819   |
| 0.364845  | 40.23            | 18.38             | 58.617   | 31.68         | 18.18          | 49.862   |
| 1.462499  | 32.98            | 23.02             | 56.000   | 25.89         | 20.11          | 46.000   |
| 2.957401  | 33.72            | 22.28             | 56.000   | 26.53         | 19.47          | 46.000   |
| 3.552671  | 27.95            | 28.05             | 56.000   | 20.97         | 25.03          | 46.000   |
| 4.003277  | 32.20            | 23.80             | 56.000   | 24.79         | 21.21          | 46.000   |
| 7.155819  | 34.48            | 25.52             | 60.000   | 26.21         | 23.79          | 50.000   |
| 9.459229  | 34.36            | 25.64             | 60.000   | 26.50         | 23.50          | 50.000   |
| 16.226526 | 37.62            | 22.38             | 60.000   | 32.27         | 17.73          | 50.000   |
| 16.473488 | 34.68            | 25.32             | 60.000   | 28.65         | 21.35          | 50.000   |

## 13 Observations

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

## Annex A Glossary

|                        |                                                    |
|------------------------|----------------------------------------------------|
| <b>EUT</b>             | Equipment under test                               |
| <b>DUT</b>             | Device under test                                  |
| <b>UUT</b>             | Unit under test                                    |
| <b>GUE</b>             | GNSS User Equipment                                |
| <b>ETSI</b>            | European Telecommunications Standards Institute    |
| <b>EN</b>              | European Standard                                  |
| <b>FCC</b>             | Federal Communications Commission                  |
| <b>FCC ID</b>          | Company Identifier at FCC                          |
| <b>IC</b>              | Industry Canada                                    |
| <b>PMN</b>             | Product marketing name                             |
| <b>HMN</b>             | Host marketing name                                |
| <b>HVIN</b>            | Hardware version identification number             |
| <b>FVIN</b>            | Firmware version identification number             |
| <b>EMC</b>             | Electromagnetic Compatibility                      |
| <b>HW</b>              | Hardware                                           |
| <b>SW</b>              | Software                                           |
| <b>Inv. No.</b>        | Inventory number                                   |
| <b>S/N or SN</b>       | Serial number                                      |
| <b>C</b>               | Compliant                                          |
| <b>NC</b>              | Not compliant                                      |
| <b>NA</b>              | Not applicable                                     |
| <b>NP</b>              | Not performed                                      |
| <b>PP</b>              | Positive peak                                      |
| <b>QP</b>              | Quasi peak                                         |
| <b>AVG</b>             | Average                                            |
| <b>OC</b>              | Operating channel                                  |
| <b>OCW</b>             | Operating channel bandwidth                        |
| <b>OBW</b>             | Occupied bandwidth                                 |
| <b>OOB</b>             | Out of band                                        |
| <b>DFS</b>             | Dynamic frequency selection                        |
| <b>CAC</b>             | Channel availability check                         |
| <b>OP</b>              | Occupancy period                                   |
| <b>NOP</b>             | Non occupancy period                               |
| <b>DC</b>              | Duty cycle                                         |
| <b>PER</b>             | Packet error rate                                  |
| <b>CW</b>              | Clean wave                                         |
| <b>MC</b>              | Modulated carrier                                  |
| <b>WLAN</b>            | Wireless local area network                        |
| <b>RLAN</b>            | Radio local area network                           |
| <b>DSSS</b>            | Dynamic sequence spread spectrum                   |
| <b>OFDM</b>            | Orthogonal frequency division multiplexing         |
| <b>FHSS</b>            | Frequency hopping spread spectrum                  |
| <b>GNSS</b>            | Global Navigation Satellite System                 |
| <b>C/N<sub>0</sub></b> | Carrier to noise-density ratio, expressed in dB-Hz |

## Annex B Document history

| Version | Applied changes | Date of release |
|---------|-----------------|-----------------|
| -/-     | Initial release | 2018-02-22      |

## Annex C Accreditation Certificate

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

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

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