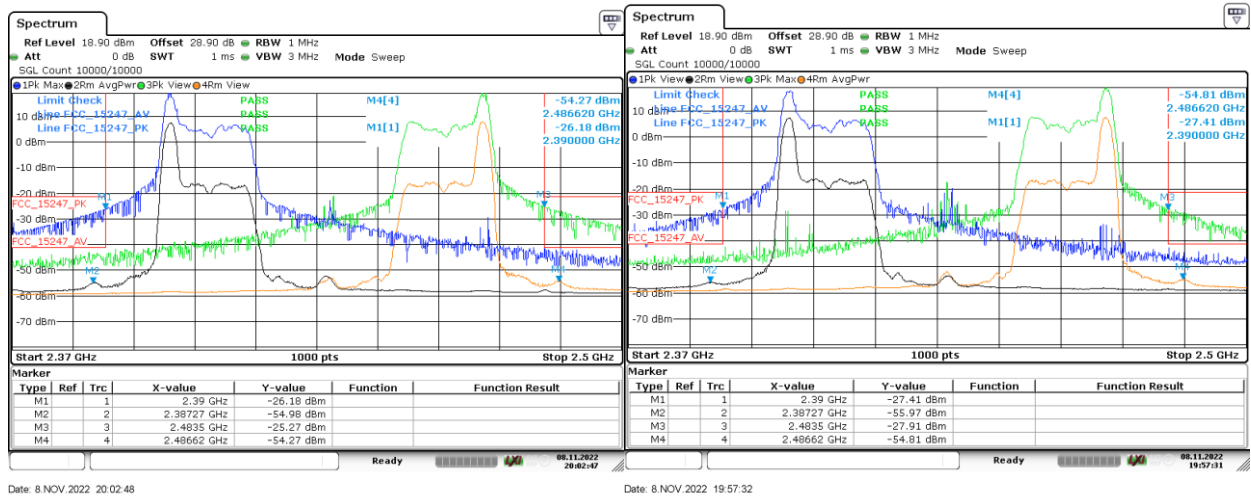


**OFDMA with one active Resource Unit (worst case OFDMA):**

Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = low + high, Band Edge = low + high (S01\_377\_AE01)

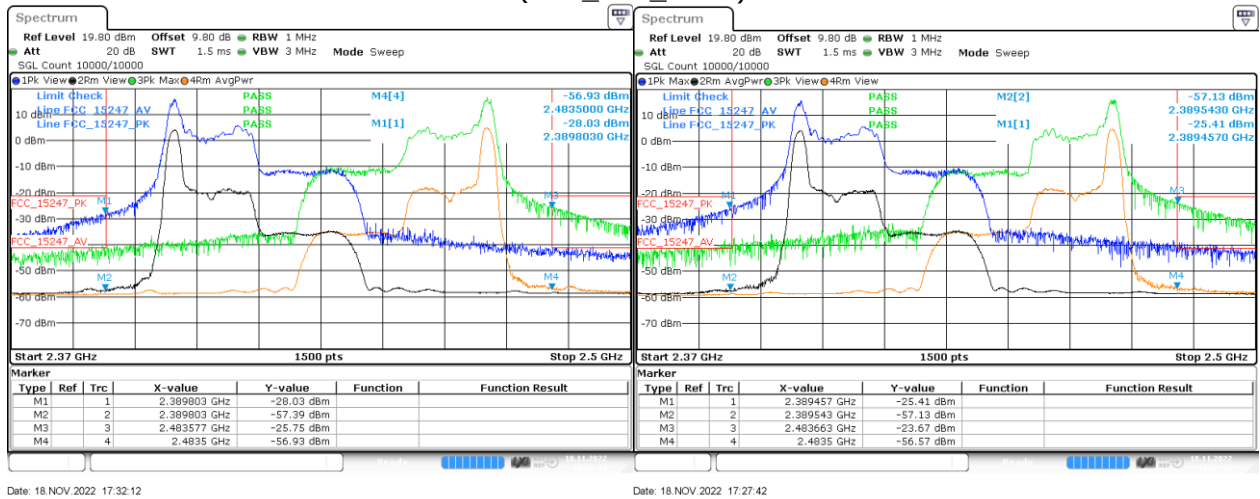


Antenna A

Power 9

Antenna B

Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = low + high, Band Edge = low + high (S01\_377\_AE01)



Antenna A

Power 6

Antenna B

**5.8.5 TEST EQUIPMENT USED**

- Radiated Emissions FAR 2.4 GHz FCC
- Radiated Emissions
- R&S TS8997

## 5.9 POWER DENSITY

Standard **FCC Part 15 Subpart C**

**The test was performed according to:**  
ANSI C63.10

### 5.9.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up in a shielded room to perform the Power Density measurements.

The results recorded were measured with the modulation which produces the worst-case (highest) power density.

The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.

Maximum Peak Power Spectral Density (e.g. Bluetooth low energy):

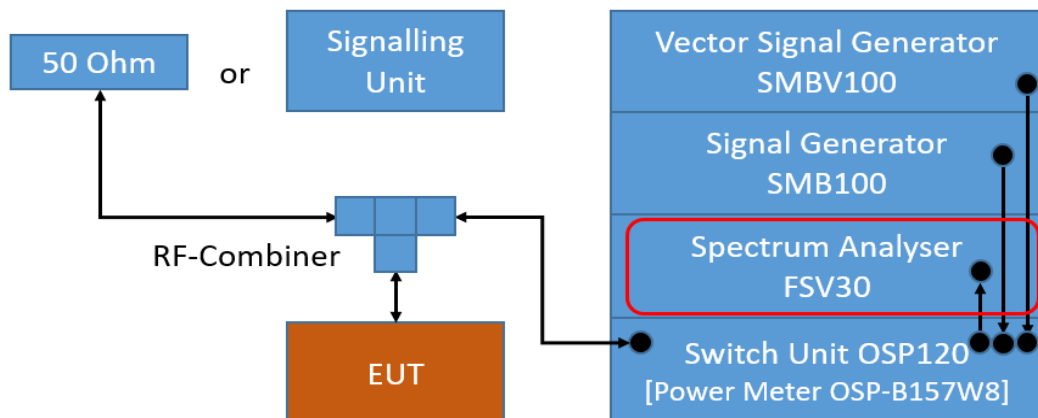
Analyser settings:

- Resolution Bandwidth (RBW): 100 kHz, 10 kHz or 3 kHz
- Video Bandwidth (VBW):  $\geq 3$  times RBW
- Trace: Maxhold
- Sweeps: Till stable (min. 200, max. 15000)
- Sweeptime: Auto
- Detector: Peak

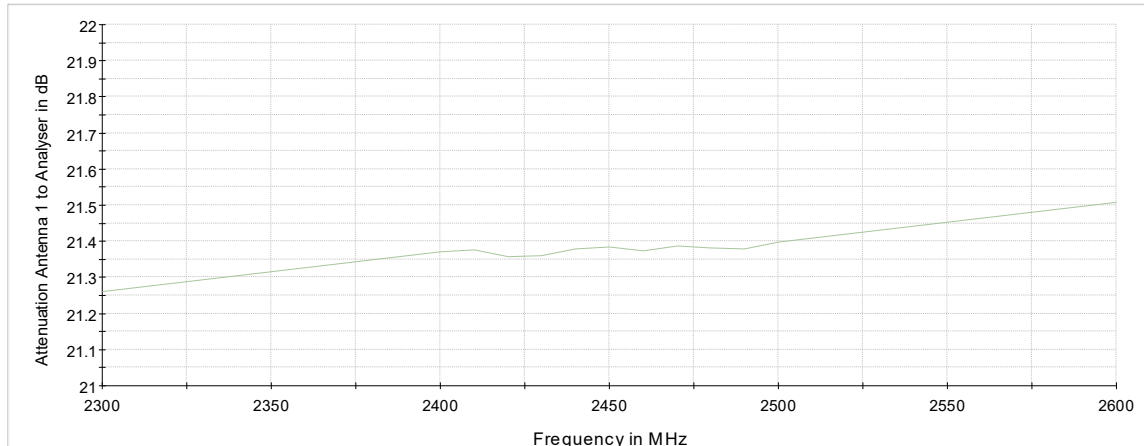
Maximum Average Power Spectral Density (e.g. WLAN):

Analyser settings:

- Resolution Bandwidth (RBW): 100 kHz, 10 kHz or 3 kHz
- Video Bandwidth (VBW):  $\geq 3$  times RBW
- Sweep Points:  $\geq 2$  times span / RBW
- Trace: Maxhold
- Sweeps: Till stable (max. 150)
- Sweeptime:  $\leq$  Number of Sweep Points x minimum transmission duration
- Detector: RMS



TS8997; Power Spectral Density



Attenuation of the measurement path

### 5.9.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (e)

For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

...

The same method of determining the conducted output power shall be used to determine the power spectral density.

FCC Part 15, Subpart C, §15.247 (f)

(f) For the purposes of this section, hybrid systems are those that employ a combination of both frequency hopping and digital modulation techniques.

...

The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

### 5.9.3 TEST PROTOCOL

Ambient temperature: 24 -26 °C  
 Air Pressure: 1004 - 1026 hPa  
 Humidity: 38 -40 %  
 BT LE 1 Mbit/s

| Variant | Ch. No. | Freq. [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|---------|-------------|---------------------------|-----------|------------------|----------------------|
| 374     | 0       | 2402        | -2.0                      | 10.0      | 8.0              | 10.0                 |
| 377     | 0       | 2402        | -1.7                      | 10.0      | 8.0              | 9.7                  |
| 374     | 19      | 2440        | -2.0                      | 10.0      | 8.0              | 10.0                 |
| 377     | 19      | 2440        | -1.7                      | 10.0      | 8.0              | 9.7                  |
| 377     | 39      | 2480        | -1.6                      | 10.0      | 8.0              | 9.6                  |
| 374     | 39      | 2480        | -2.1                      | 10.0      | 8.0              | 10.1                 |

BT LE 2 Mbit/s

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 0           | 2402            | -5.0                      | 10.0      | 8.0              | 13.0                 |
| 374     | 0           | 2402            | -5.3                      | 10.0      | 8.0              | 13.3                 |
| 377     | 19          | 2440            | -5.0                      | 10.0      | 8.0              | 13.0                 |
| 374     | 19          | 2440            | -5.3                      | 10.0      | 8.0              | 13.3                 |
| 374     | 39          | 2480            | -5.5                      | 10.0      | 8.0              | 13.5                 |
| 377     | 39          | 2480            | -5.0                      | 10.0      | 8.0              | 13.0                 |

BT GFSK (1-DH5)

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 0           | 2402            | 5.6                       | 10.0      | 8.0              | 2.4                  |
| 377     | 39          | 2441            | 5.6                       | 10.0      | 8.0              | 2.4                  |
| 377     | 78          | 2480            | 5.5                       | 10.0      | 8.0              | 2.5                  |
| 374     | 0           | 2402            | 5.5                       | 10.0      | 8.0              | 2.5                  |
| 374     | 39          | 2441            | 5.5                       | 10.0      | 8.0              | 2.5                  |
| 374     | 78          | 2480            | 5.4                       | 10.0      | 8.0              | 2.6                  |

BT DQPSK (2-DH5)

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 0           | 2402            | 2.0                       | 10.0      | 8.0              | 6.0                  |
| 377     | 39          | 2441            | 0.8                       | 10.0      | 8.0              | 7.2                  |
| 377     | 78          | 2480            | 0.8                       | 10.0      | 8.0              | 7.2                  |
| 374     | 0           | 2402            | 0.6                       | 10.0      | 8.0              | 7.4                  |
| 374     | 39          | 2441            | 0.7                       | 10.0      | 8.0              | 7.3                  |
| 374     | 78          | 2480            | 0.5                       | 10.0      | 8.0              | 7.5                  |

BT 8-DPSK (3-DH5)

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 0           | 2402            | 0.5                       | 10.0      | 8.0              | 7.5                  |
| 377     | 39          | 2441            | 0.9                       | 10.0      | 8.0              | 7.1                  |
| 377     | 78          | 2480            | 0.6                       | 10.0      | 8.0              | 7.4                  |
| 374     | 0           | 2402            | 0.7                       | 10.0      | 8.0              | 7.3                  |
| 374     | 39          | 2441            | 0.5                       | 10.0      | 8.0              | 7.5                  |
| 374     | 78          | 2480            | 0.6                       | 10.0      | 8.0              | 7.4                  |

WLAN b-Mode; 20 MHz; 1 Mbit/s

| Variant | Ch. No. | Freq. [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|---------|-------------|---------------------------|-----------|------------------|----------------------|
| 377     | 1       | 2412        | 1.4                       | 100.0     | 8.0              | 6.6                  |
| 377     | 6       | 2437        | 3.3                       | 100.0     | 8.0              | 4.7                  |
| 377     | 11      | 2462        | 1.9                       | 100.0     | 8.0              | 6.1                  |

WLAN g-Mode; 20 MHz; 6 Mbit/s

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 1           | 2412            | -5.3                      | 100.0     | 8.0              | 13.3                 |
| 377     | 6           | 2437            | -1.2                      | 100.0     | 8.0              | 9.2                  |
| 377     | 11          | 2462            | -5.7                      | 100.0     | 8.0              | 13.7                 |

WLAN n-Mode; 20 MHz; MCS0

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 1           | 2412            | -5.7                      | 100.0     | 8.0              | 13.7                 |
| 377     | 6           | 2437            | -3.0                      | 100.0     | 8.0              | 11.0                 |
| 377     | 11          | 2462            | -6.2                      | 100.0     | 8.0              | 14.2                 |

WLAN n-Mode; 40 MHz; MCS0

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 3           | 2422            | -9.7                      | 100.0     | 8.0              | 17.7                 |
| 377     | 6           | 2437            | -9.3                      | 100.0     | 8.0              | 17.3                 |
| 377     | 9           | 2452            | -10.1                     | 100.0     | 8.0              | 18.1                 |

WLAN ax-Mode; 20 MHz; MCS0

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 1           | 2412            | -7.7                      | 100.0     | 8.0              | 15.7                 |
| 377     | 6           | 2437            | -3.3                      | 100.0     | 8.0              | 11.3                 |
| 377     | 11          | 2462            | -8.4                      | 100.0     | 8.0              | 16.4                 |

WLAN ax-Mode; 40 MHz; MCS0

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 3           | 2422            | -10.3                     | 100.0     | 8.0              | 18.3                 |
| 377     | 6           | 2437            | -10.2                     | 100.0     | 8.0              | 18.2                 |
| 377     | 9           | 2452            | -10.7                     | 100.0     | 8.0              | 18.7                 |

WLAN n-Mode; 20 MHz MIMO; MCS8

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 1           | 2412            | -3.5                      | 100       | 8.0              | 11.5                 |
| 377     | 6           | 2437            | -1.1                      | 100       | 8.0              | 9.1                  |
| 377     | 11          | 2462            | -4.3                      | 100       | 8.0              | 12.3                 |

WLAN n-Mode; 40 MHz MIMO; MCS8

| Variant | Channel No. | Frequency [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|-------------|-----------------|---------------------------|-----------|------------------|----------------------|
| 377     | 3           | 2422            | -7.5                      | 100       | 8.0              | 15.5                 |
| 377     | 6           | 2437            | -7.5                      | 100       | 8.0              | 15.5                 |
| 377     | 9           | 2452            | -8.2                      | 100       | 8.0              | 16.2                 |

WLAN ax-Mode; 20 MHz; MCS0; MIMO

| Variant | Ch. No. | Freq. [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|---------|-------------|---------------------------|-----------|------------------|----------------------|
| 377     | 1       | 2412        | -5.4                      | 100       | 8.0              | 13.4                 |
| 377     | 6       | 2437        | -1.1                      | 100       | 8.0              | 9.1                  |
| 377     | 11      | 2462        | -6.2                      | 100       | 8.0              | 14.2                 |

WLAN ax-Mode; 40 MHz; MCS0; MIMO

| Variant | Ch. No. | Freq. [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/3kHz] | Margin to Limit [dB] |
|---------|---------|-------------|---------------------------|-----------|------------------|----------------------|
| 377     | 3       | 2422        | -8.2                      | 100       | 8.0              | 16.2                 |
| 377     | 6       | 2437        | -8.1                      | 100       | 8.0              | 16.1                 |
| 377     | 9       | 2452        | -9.1                      | 100       | 8.0              | 17.1                 |

Remark: Please see next sub-clause for the measurement plot.  
 WLAN SISO results of antenna A given in table above.

**OFDMA with one active Resource Unit (worst case OFDMA):**

WLAN ax-Mode; 20 MHz; MCS0; MIMO; RU 5

| Variant | Ch. No. | Freq. [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/ 3kHz] | Margin to Limit [dB] |
|---------|---------|-------------|---------------------------|-----------|-------------------|----------------------|
| 377     | 1       | 2412        | 0.5                       | 100       | 8.0               | 7.5                  |
| 377     | 6       | 2437        | 0.6                       | 100       | 8.0               | 7.4                  |
| 377     | 11      | 2462        | 0.8                       | 100       | 8.0               | 7.2                  |

WLAN ax-Mode; 40 MHz; MCS0; MIMO; RU 6

| Variant | Ch. No. | Freq. [MHz] | Power Density [dBm / RBW] | RBW [kHz] | Limit [dBm/ 3kHz] | Margin to Limit [dB] |
|---------|---------|-------------|---------------------------|-----------|-------------------|----------------------|
| 377     | 3       | 2422        | 0.6                       | 100       | 8.0               | 7.4                  |
| 377     | 6       | 2437        | 0.8                       | 100       | 8.0               | 7.2                  |
| 377     | 9       | 2452        | 0.7                       | 100       | 8.0               | 7.3                  |

Remark: Please see next sub-clause for the measurement plot.

Measurement was performed with active RU unit 5 (20 MHz BW) and 6 (40 MHz BW), which proved worst case in preliminary measurement.

WLAN ax 40 MHz tested at 9 dBm and not repeated for final setting of 6 dBm, since it is worse case.

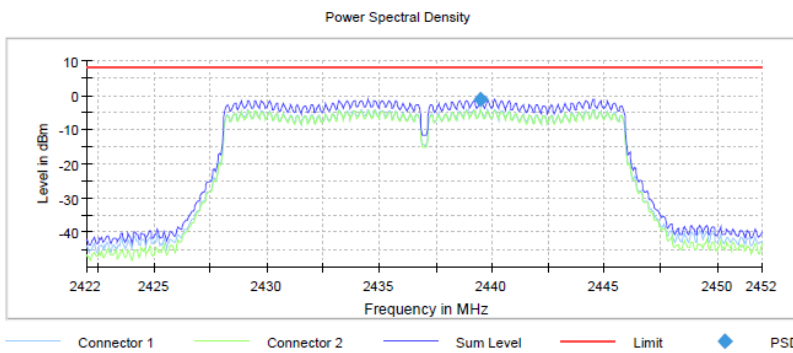
### 5.9.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = mid (S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2439.525000     | -1.299    | 8.0             | PASS   |

#### Ports

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |



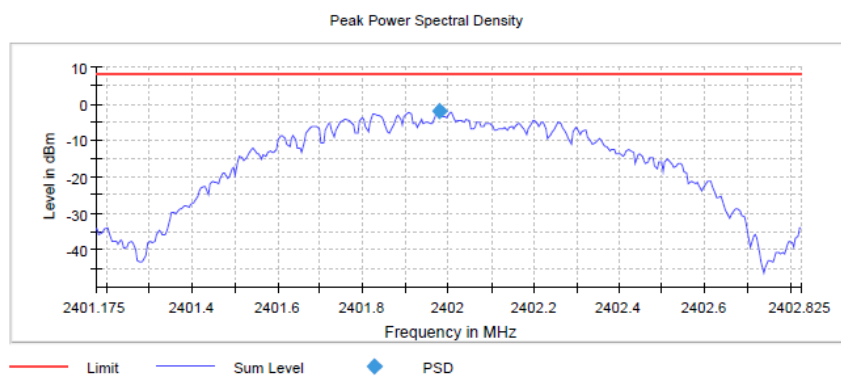
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.42200 GHz      |
| Stop Frequency        | 2.45200 GHz      |
| Span                  | 30.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 600              |
| SweepTime             | 600.000 ms       |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 9 / max. 150     |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.34 dB          |

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low (S01\_374\_BA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2402.000000         | 2401.977500     | -1.958    | 8.0             | PASS   |

#### Ports

| Port | State |
|------|-------|
| 1    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40118 GHz      |
| Stop Frequency        | 2.40283 GHz      |
| Span                  | 1.650 MHz        |
| RBW                   | 10.000 kHz       |
| VBW                   | 30.000 kHz       |
| SweepPoints           | 330              |
| SweepTime             | 1.650 ms         |
| Reference Level       | -10.000 dBm      |
| Attenuation           | 0.000 dB         |
| Detector              | MaxPeak          |
| SweepCount            | 100              |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 3 / max. 150     |
| Stable                | 2 / 2            |
| Max Stable Difference | 0.11 dB          |

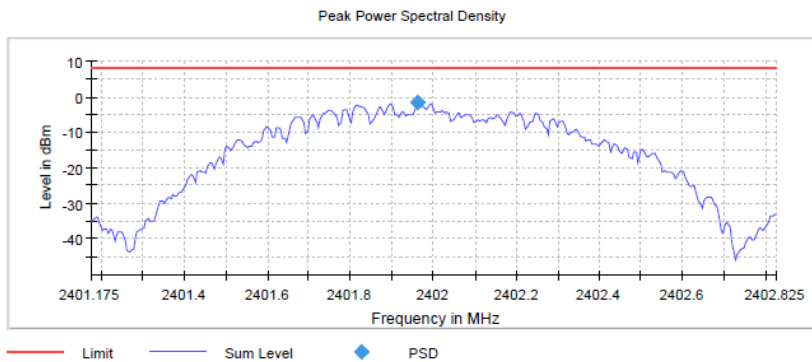
Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low  
(S01\_377\_AA01)

Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2402.000000         | 2401.962500     | -1.656    | 8.0             | PASS   |

Ports

| Port | State |
|------|-------|
| 1    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40118 GHz      |
| Stop Frequency        | 2.40283 GHz      |
| Span                  | 1.650 MHz        |
| RBW                   | 10.000 kHz       |
| VBW                   | 30.000 kHz       |
| SweepPoints           | 330              |
| SweepTime             | 1.650 ms         |
| Reference Level       | -10.000 dBm      |
| Attenuation           | 0.000 dB         |
| Detector              | MaxPeak          |
| SweepCount            | 100              |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 4 / max. 150     |
| Stable                | 2 / 2            |
| Max Stable Difference | 0.08 dB          |

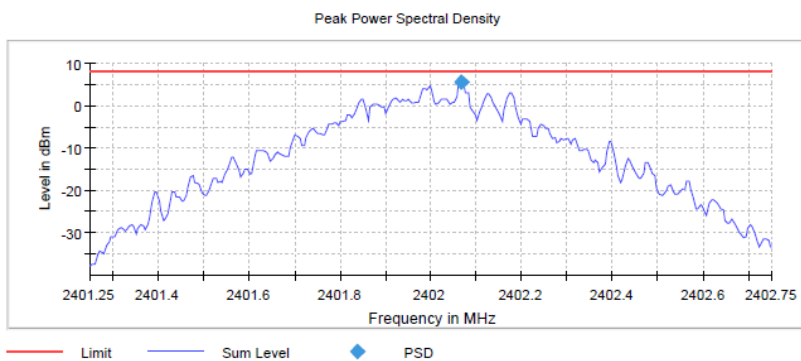
Radio Technology = Bluetooth BDR, Operating Frequency = low  
(S01\_377\_AA01)

Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2402.000000         | 2402.067500     | 5.573     | 8.0             | PASS   |

Ports

| Port | State |
|------|-------|
| 1    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40125 GHz      |
| Stop Frequency        | 2.40275 GHz      |
| Span                  | 1.500 MHz        |
| RBW                   | 10.000 kHz       |
| VBW                   | 30.000 kHz       |
| SweepPoints           | 300              |
| SweepTime             | 1.500 ms         |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | MaxPeak          |
| SweepCount            | 100              |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 9 / max. 150     |
| Stable                | 2 / 2            |
| Max Stable Difference | 0.08 dB          |



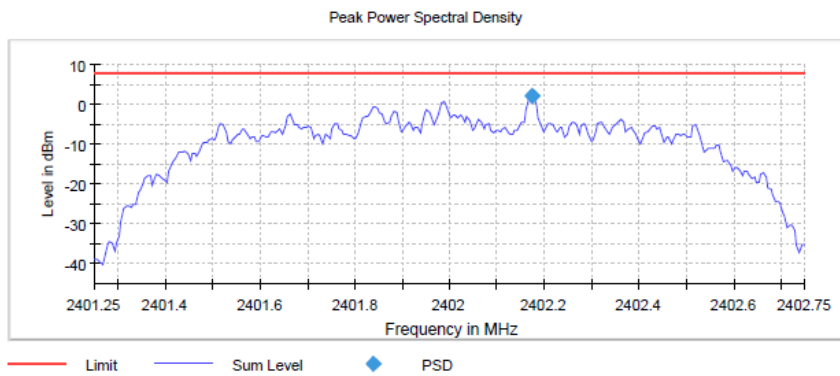
Radio Technology = Bluetooth EDR2, Operating Frequency = low  
(S01\_377\_AA01)

**Result**

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2402.000000         | 2402.172500     | 2.032     | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40125 GHz      |
| Stop Frequency        | 2.40275 GHz      |
| Span                  | 1.500 MHz        |
| RBW                   | 10.000 kHz       |
| VBW                   | 30.000 kHz       |
| SweepPoints           | 300              |
| SweepTime             | 1.500 ms         |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | MaxPeak          |
| SweepCount            | 100              |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 6 / max. 150     |
| Stable                | 2 / 2            |
| Max Stable Difference | 0.22 dB          |

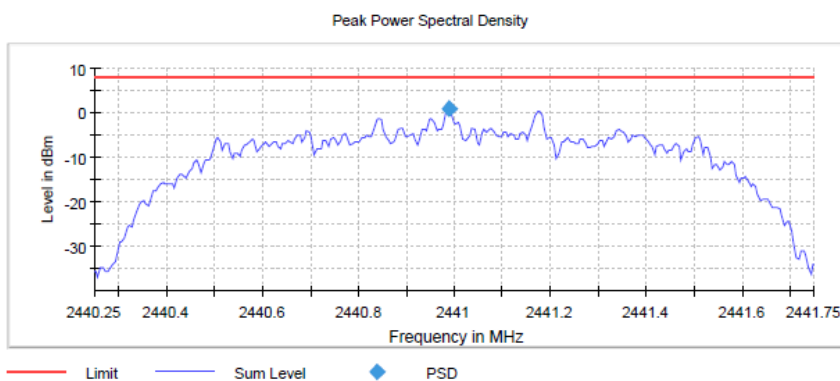
Radio Technology = EDR3, Operating Frequency = mid  
(S01\_377\_AA01)

**Result**

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2441.000000         | 2440.987500     | 0.858     | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.44025 GHz      |
| Stop Frequency        | 2.44175 GHz      |
| Span                  | 1.500 MHz        |
| RBW                   | 10.000 kHz       |
| VBW                   | 30.000 kHz       |
| SweepPoints           | 300              |
| SweepTime             | 1.500 ms         |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | MaxPeak          |
| SweepCount            | 100              |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 7 / max. 150     |
| Stable                | 2 / 2            |
| Max Stable Difference | 0.38 dB          |

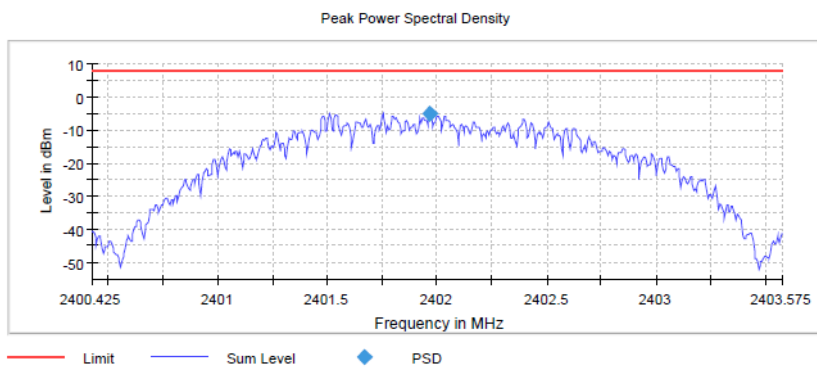
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low  
(S01\_377\_AA01)

**Result**

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2402.000000         | 2401.967500     | -5.006    | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



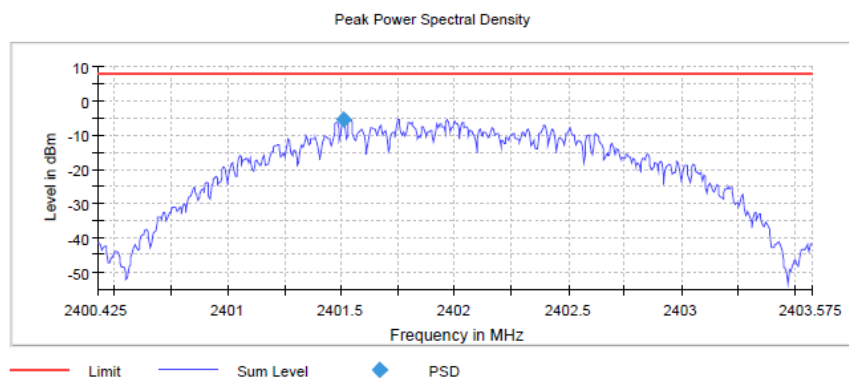
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40043 GHz      |
| Stop Frequency        | 2.40358 GHz      |
| Span                  | 3.150 MHz        |
| RBW                   | 10.000 kHz       |
| VBW                   | 30.000 kHz       |
| SweepPoints           | 630              |
| SweepTime             | 3.150 ms         |
| Reference Level       | -10.000 dBm      |
| Attenuation           | 0.000 dB         |
| Detector              | MaxPeak          |
| SweepCount            | 100              |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 4 / max. 150     |
| Stable                | 2 / 2            |
| Max Stable Difference | 0.15 dB          |

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low  
(S01\_374\_BA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2402.000000         | 2401.507500     | -5.324    | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



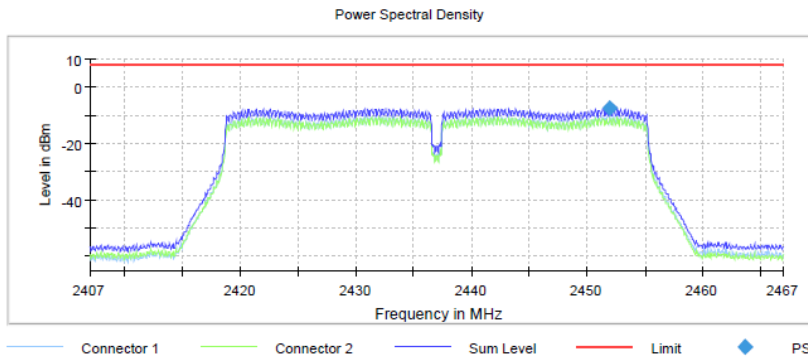
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40043 GHz      |
| Stop Frequency        | 2.40358 GHz      |
| Span                  | 3.150 MHz        |
| RBW                   | 10.000 kHz       |
| VBW                   | 30.000 kHz       |
| SweepPoints           | 630              |
| SweepTime             | 3.150 ms         |
| Reference Level       | -10.000 dBm      |
| Attenuation           | 0.000 dB         |
| Detector              | MaxPeak          |
| SweepCount            | 100              |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 4 / max. 150     |
| Stable                | 2 / 2            |
| Max Stable Difference | 0.16 dB          |

Radio Technology = WLAN n 40 MHz MIMO, Operating Frequency = mid (S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2451.975000     | -7.493    | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40700 GHz      |
| Stop Frequency        | 2.46700 GHz      |
| Span                  | 60.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 1200             |
| Sweeptime             | 1.200 s          |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 19 / max. 150    |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.47 dB          |

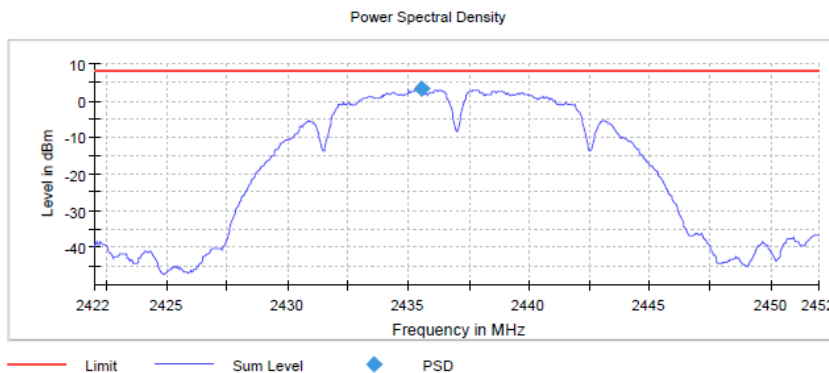
Radio Technology = WLAN b, Operating Frequency = mid (S01\_377\_AA01)

**Result**

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2435.525000     | 3.335     | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



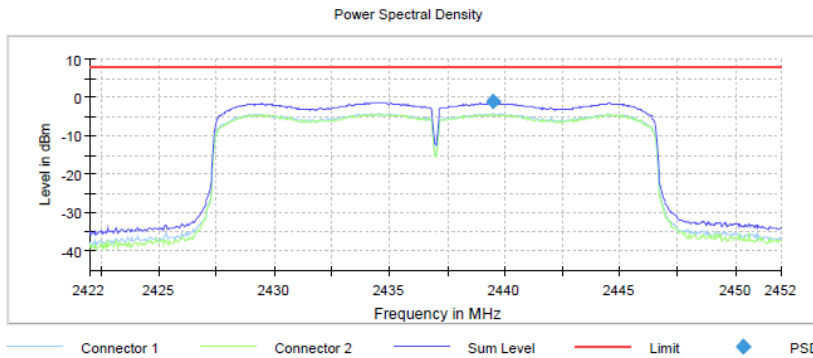
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.42200 GHz      |
| Stop Frequency        | 2.45200 GHz      |
| Span                  | 30.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 600              |
| Sweeptime             | 600.000 ms       |
| Reference Level       | 10.000 dBm       |
| Attenuation           | 20.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 11 / max. 150    |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.30 dB          |

Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = mid (S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2439.475000     | -1.122    | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |



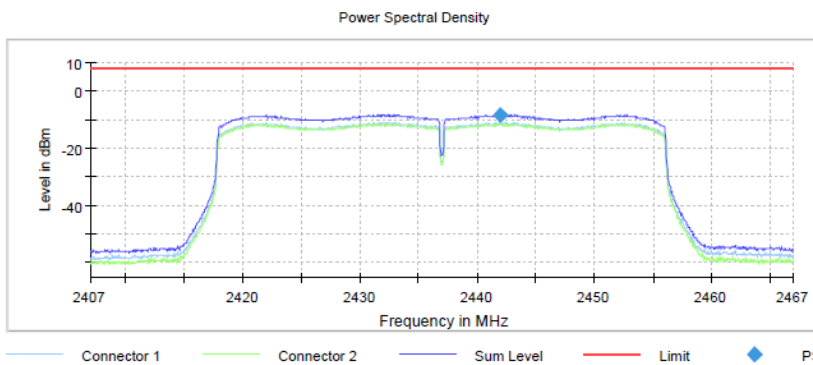
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.42200 GHz      |
| Stop Frequency        | 2.45200 GHz      |
| Span                  | 30.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 600              |
| SweepTime             | 600.000 ms       |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 7 / max. 150     |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.46 dB          |

Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = mid (S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2441.975000     | -8.150    | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |



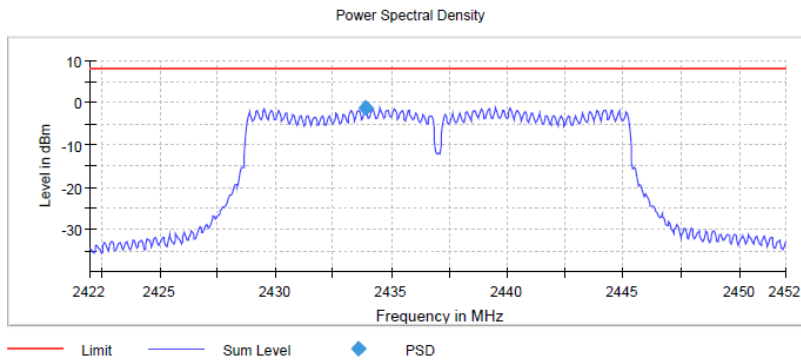
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40700 GHz      |
| Stop Frequency        | 2.46700 GHz      |
| Span                  | 60.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 1200             |
| SweepTime             | 1.200 s          |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 8 / max. 150     |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.41 dB          |

Radio Technology = WLAN g, Operating Frequency = mid  
(S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2433.875000     | -1.219    | 8.0             | PASS   |

Ports

| Port | State |
|------|-------|
| 1    | used  |



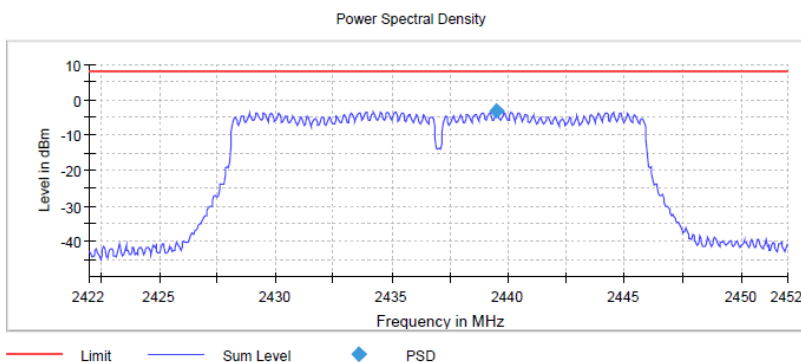
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.42200 GHz      |
| Stop Frequency        | 2.45200 GHz      |
| Span                  | 30.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 600              |
| SweepTime             | 600.000 ms       |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 7 / max. 150     |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.47 dB          |

Radio Technology = WLAN n 20 MHz, Operating Frequency = mid  
(S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2439.525000     | -3.015    | 8.0             | PASS   |

Ports

| Port | State |
|------|-------|
| 1    | used  |



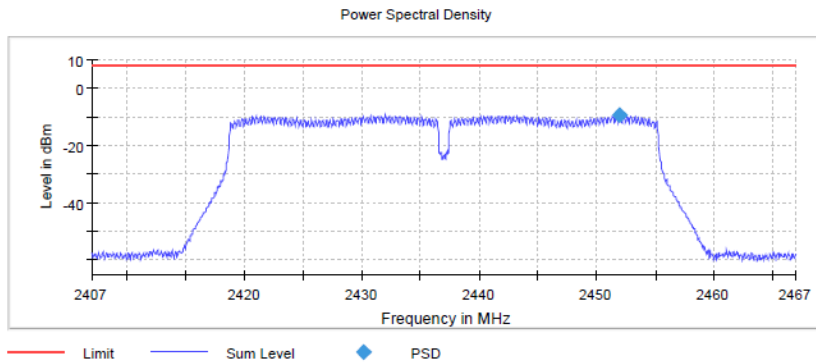
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.42200 GHz      |
| Stop Frequency        | 2.45200 GHz      |
| Span                  | 30.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 600              |
| SweepTime             | 600.000 ms       |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 10 / max. 150    |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.18 dB          |

Radio Technology = WLAN n 40 MHz, Operating Frequency = mid (S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2452.025000     | -9.273    | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



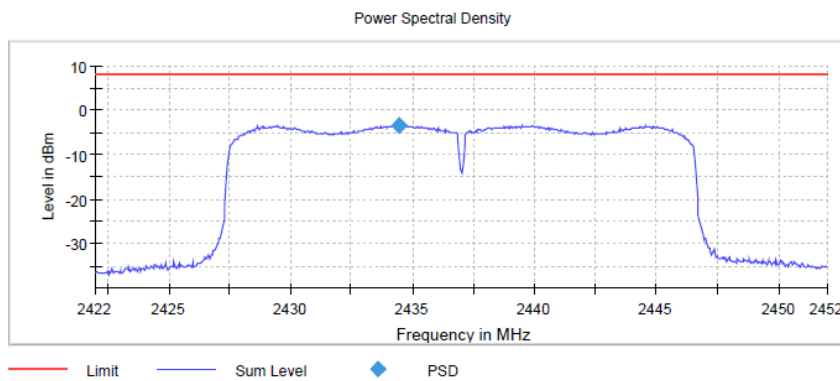
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40700 GHz      |
| Stop Frequency        | 2.46700 GHz      |
| Span                  | 60.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 1200             |
| Sweeptime             | 1.200 s          |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 21 / max. 150    |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.45 dB          |

Radio Technology = WLAN ax 20 MHz, Operating Frequency = mid (S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2434.425000     | -3.330    | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



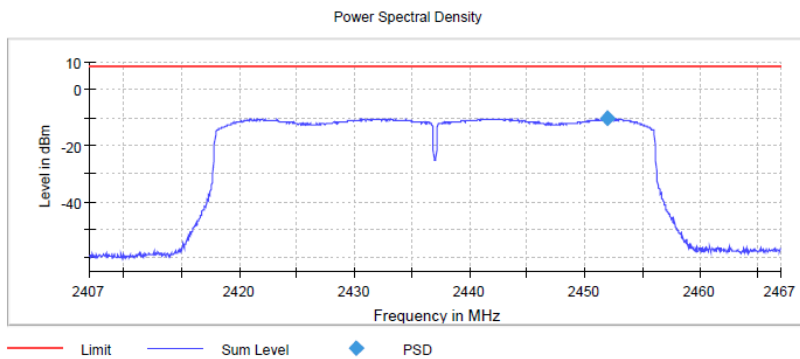
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.42200 GHz      |
| Stop Frequency        | 2.45200 GHz      |
| Span                  | 30.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 600              |
| Sweeptime             | 600.000 ms       |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 9 / max. 150     |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.38 dB          |

Radio Technology = WLAN ax 40 MHz, Operating Frequency = mid (S01\_377\_AA01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2452.025000     | -10.212   | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40700 GHz      |
| Stop Frequency        | 2.46700 GHz      |
| Span                  | 60.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 1200             |
| SweepTime             | 1.200 s          |
| Reference Level       | 0.000 dBm        |
| Attenuation           | 10.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 9 / max. 150     |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.42 dB          |

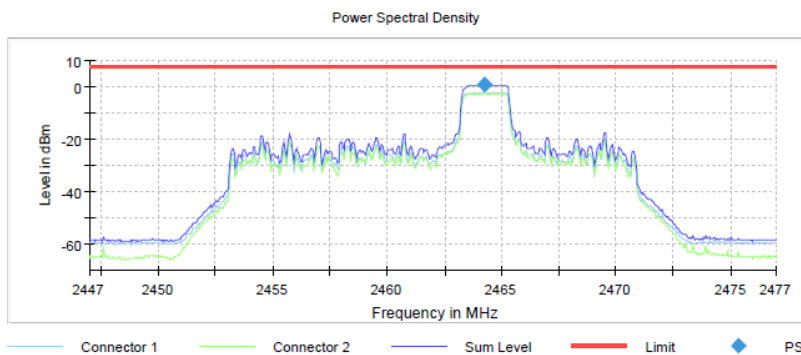
**OFDMA with one active Resource Unit (worst case OFDMA):**

Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high (S01\_377\_AE01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2462.000000         | 2464.225000     | 0.802     | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |



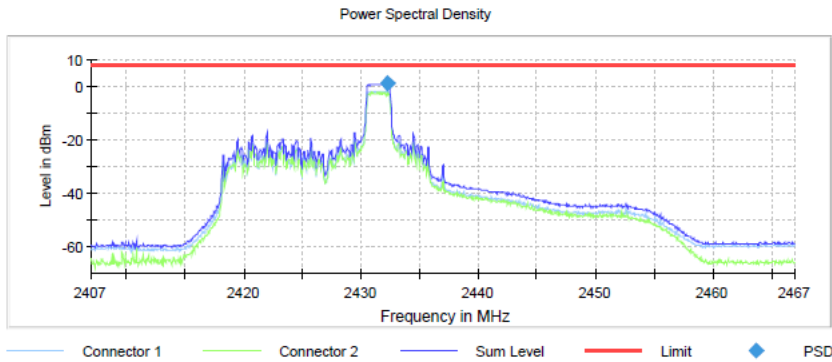
| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.44700 GHz      |
| Stop Frequency        | 2.47700 GHz      |
| Span                  | 30.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 600              |
| SweepTime             | 600.000 ms       |
| Reference Level       | 10.000 dBm       |
| Attenuation           | 20.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamp                | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 11 / max. 150    |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.39 dB          |

Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = mid (S01\_377\_AE01)

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2432.275000     | 0.821     | 8.0             | PASS   |

**Ports**

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |



| Setting               | Instrument Value |
|-----------------------|------------------|
| Start Frequency       | 2.40700 GHz      |
| Stop Frequency        | 2.46700 GHz      |
| Span                  | 60.000 MHz       |
| RBW                   | 100.000 kHz      |
| VBW                   | 300.000 kHz      |
| SweepPoints           | 1200             |
| SweepTime             | 1.200 s          |
| Reference Level       | 10.000 dBm       |
| Attenuation           | 20.000 dB        |
| Detector              | RMS              |
| SweepCount            | 1                |
| Filter                | 3 dB             |
| Trace Mode            | Max Hold         |
| SweepType             | Sweep            |
| Preamplifier          | off              |
| Stablemode            | Trace            |
| Stablevalue           | 0.50 dB          |
| Run                   | 11 / max. 150    |
| Stable                | 3 / 3            |
| Max Stable Difference | 0.49 dB          |

**5.9.5 TEST EQUIPMENT USED**

- R&S TS8997



## 6 TEST EQUIPMENT

- 1 Conducted Emissions FCC  
Conducted Emissions AC Mains for FCC standards

| Ref.No. | Device Name          | Description                      | Manufacturer                        | Serial Number | Last Calibration | Calibration Due |
|---------|----------------------|----------------------------------|-------------------------------------|---------------|------------------|-----------------|
| 1.1     | MFS                  | Rubidium Frequency Normal MFS    | Datum GmbH                          | 002           | 2021-11          | 2022-11         |
| 1.2     | Opus10 TPR (8253.00) | T/P Logger 13                    | Lufft Mess- und Regeltechnik GmbH   | 13936         | 2021-10          | 2023-10         |
| 1.3     | Chroma 6404          | AC Source                        | Chroma ATE INC.                     | 64040001304   |                  |                 |
| 1.4     | Shielded Room 02     | Shielded Room 4m x 3m            | Frankonia Germany EMC Solution GmbH | -             |                  |                 |
| 1.5     | ESH3-Z5              | Two-Line V-Network (EUT)         | Rohde & Schwarz GmbH & Co. KG       | 829996/002    | 2021-08          | 2023-08         |
| 1.6     | ESR 7                | EMI Receiver / Spectrum Analyzer | Rohde & Schwarz                     | 101424        | 2021-01          | 2023-01         |
| 1.7     | Opus10 THI (8152.00) | T/H Logger 02                    | Lufft Mess- und Regeltechnik GmbH   | 7489          | 2021-10          | 2023-10         |

- 2 R&S TS8997  
2.4 and 5 GHz Bands Conducted Test Lab

| Ref.No. | Device Name          | Description  | Manufacturer                      | Serial Number | Last Calibration | Calibration Due |
|---------|----------------------|--|-----------------------------------|---------------|------------------|-----------------|
| 2.1     | MFS                  | Rubidium Frequency Normal MFS                      | Datum GmbH                        | 002           | 2021-11          | 2022-11         |
| 2.2     | Opus10 TPR (8253.00) | T/P Logger 13                                      | Lufft Mess- und Regeltechnik GmbH | 13936         | 2021-10          | 2023-10         |
| 2.3     | SMB100A              | Signal Generator 9 kHz - 6 GHz                     | Rohde & Schwarz                   | 107695        | 2021-06          | 2024-06         |
| 2.4     | NGSM 32/10           | Power Supply                                       | Rohde & Schwarz GmbH & Co. KG     | 3456          | 2022-01          | 2024-01         |
| 2.5     | FSW43                | Signal analyser                                    | Rohde & Schwarz GmbH & Co. KG     | 102013        | 2021-06          | 2023-06         |
| 2.6     | Opus10 THI (8152.00) | T/H Logger 14                                      | Lufft Mess- und Regeltechnik GmbH | 13993         | 2021-08          | 2023-08         |
| 2.7     | SMBV100A             | Vector Signal Generator 9 kHz - 6 GHz              | Rohde & Schwarz                   | 259291        | 2019-11          | 2022-11         |
| 2.8     | OSP120               | Contains Power Meter and Switching Unit OSP-B157W8 | Rohde & Schwarz                   | 101158        | 2021-08          | 2024-08         |
| 2.9     | CMX500               | Radio Communication Tester New Radio 5G            | Rohde & Schwarz GmbH & Co. KG     | 101305-LP     | 2020-04          | 2023-04         |

3 Radiated Emissions FAR 2.4 GHz FCC  
 Radiated emission tests for 2.4 GHz ISM devices in a fully anechoic room

| Ref.No. | Device Name             | Description  | Manufacturer                        | Serial Number          | Last Calibration | Calibration Due |
|---------|-------------------------|--|-------------------------------------|------------------------|------------------|-----------------|
| 3.1     | Opus10 TPR (8253.00)    | T/P Logger 13  | Lufft Mess- und Regeltechnik GmbH   | 13936                  | 2021-10          | 2023-10         |
| 3.2     | AMF-7D00101800-30-10P-R | Broadband Amplifier 100 MHz - 18 GHz                     | Miteq                               |                        |                  |                 |
| 3.3     | Anechoic Chamber 03     | FAR, 8.80m x 4.60m x 4.05m (l x w x h)                   | Albatross Projects                  | P26971-647-001-PRB     | 2021-04          | 2023-04         |
| 3.4     | Fluke 177               | Digital Multimeter 03 (Multimeter)                       | Fluke Europe B.V.                   | 86670383               | 2022-06          | 2024-06         |
| 3.5     | JS4-18002600-32-5P      | Broadband Amplifier 18 GHz - 26 GHz                      | Miteq                               | 849785                 |                  |                 |
| 3.6     | FSW 43                  | Spectrum Analyzer  | Rohde & Schwarz                     | 103779                 | 2021-06          | 2023-06         |
| 3.7     | EP 1200/B, NA/B1        | AC Source, Amplifier with integrated variable Oscillator | Spitzenberger & Spies GmbH & Co. KG | B6278                  |                  |                 |
| 3.8     | 3160-09                 | Standard Gain / Pyramidal Horn Antenna 26.5 GHz          | EMCO Elektronik GmbH                | 00083069               |                  |                 |
| 3.9     | WHKX 7.0/18G-8SS        | High Pass Filter   | Wainwright Instruments GmbH         | 09                     |                  |                 |
| 3.10    | TT 1.5 WI               | Turn Table   | Maturo GmbH                         | -                      |                  |                 |
| 3.11    | 5HC3500/18000-1.2-KK    | High Pass Filter   | Trilithic                           | 200035008              |                  |                 |
| 3.12    | Opus 20 THI (8120.00)   | ThermoHygro Datalogger                                   | Lufft Mess- und Regeltechnik GmbH   | 115.0318.0802.033      | 2020-10          | 2022-10         |
| 3.13    | TD1.5-10kg              | EUT Tilt Device (Rohacell)                               | Maturo GmbH                         | TD1.5-10kg/024/3790709 |                  |                 |
| 3.14    | PAS 2.5 - 10 kg         | Antenna Mast   | Maturo GmbH                         | -                      |                  |                 |
| 3.15    | AFS42-00101800-25-S-42  | Broadband Amplifier 25 MHz - 18 GHz                      | Miteq                               | 2035324                |                  |                 |
| 3.16    | HF 907                  | Double-ridged horn                                       | Rohde & Schwarz                     | 102444                 | 2021-09          | 2024-09         |

4 Radiated Emissions SAC H-Field  
 Radiated emission tests in the H-Field in a semi anechoic room

| Ref.No. | Device Name          | Description                      | Manufacturer                      | Serial Number | Last Calibration | Calibration Due |
|---------|----------------------|----------------------------------|-----------------------------------|---------------|------------------|-----------------|
| 4.1     | Opus10 TPR (8253.00) | T/P Logger 13                    | Lufft Mess- und Regeltechnik GmbH | 13936         | 2021-10          | 2023-10         |
| 4.2     | ESW44                | EMI Receiver / Spectrum Analyzer | Rohde & Schwarz GmbH & Co. KG     | 101603        | 2022-01          | 2024-01         |

| Ref.No. | Device Name          | Description  | Manufacturer                        | Serial Number | Last Calibration | Calibration Due |
|---------|----------------------|--|-------------------------------------|---------------|------------------|-----------------|
| 4.3     | Anechoic Chamber 01  | SAC/FAR, 10.58 m x 6.38 m x 6.00 m                       | Frankonia                           | none          |                  |                 |
| 4.4     | Opus10 THI (8152.00) | T/H Logger 10  | Lufft Mess- und Regeltechnik GmbH   | 12488         | 2021-08          | 2023-08         |
| 4.5     | EP 1200/B, NA/B1     | AC Source, Amplifier with integrated variable Oscillator | Spitzenberger & Spies GmbH & Co. KG | B6278         |                  |                 |
| 4.6     | DS 420S              | Turn Table 2 m diameter                                  | HD GmbH                             | 420/573/99    |                  |                 |
| 4.7     | HFH2-Z2              | Loop Antenna + 3 Axis Tripod                             | Rohde & Schwarz GmbH & Co. KG       | 829324/006    | 2021-01          | 2024-01         |

5 Radiated Emissions SAC up to 1 GHz  
 Radiated emission tests up to 1 GHz in a semi anechoic room

| Ref.No. | Device Name          | Description  | Manufacturer                        | Serial Number      | Last Calibration | Calibration Due |
|---------|----------------------|--|-------------------------------------|--------------------|------------------|-----------------|
| 5.1     | Opus10 TPR (8253.00) | T/P Logger 13  | Lufft Mess- und Regeltechnik GmbH   | 13936              | 2021-10          | 2023-10         |
| 5.2     | ESW44                | EMI Receiver / Spectrum Analyzer                                   | Rohde & Schwarz GmbH & Co. KG       | 101603             | 2022-01          | 2024-01         |
| 5.3     | Anechoic Chamber 01  | SAC/FAR, 10.58 m x 6.38 m x 6.00 m                                 | Frankonia                           | none               |                  |                 |
| 5.4     | HL 562 ULTRALOG      | Biconical-log-per antenna (30 MHz - 3 GHz) with HL 562E biconicals | Rohde & Schwarz GmbH & Co. KG       | 830547/003         | 2021-09          | 2024-09         |
| 5.5     | Opus10 THI (8152.00) | T/H Logger 10  | Lufft Mess- und Regeltechnik GmbH   | 12488              | 2021-08          | 2023-08         |
| 5.6     | EP 1200/B, NA/B1     | AC Source, Amplifier with integrated variable Oscillator           | Spitzenberger & Spies GmbH & Co. KG | B6278              |                  |                 |
| 5.7     | DS 420S              | Turn Table 2 m diameter  | HD GmbH                             | 420/573/99         |                  |                 |
| 5.8     | AM 4.0               | Antenna Mast 4 m   | Maturo GmbH                         | AM4.0/180/11920513 |                  |                 |

The calibration interval is the time interval between "Last Calibration" and "Calibration Due"

## 7 ANTENNA FACTORS, CABLE LOSS AND SAMPLE CALCULATIONS

This chapter contains the antenna factors with their corresponding path loss of the used measurement path for all antennas as well as the insertion loss of the LISN.

### 7.1 LISN R&S ESH3-Z5 (150 KHZ – 30 MHZ)

| Frequency<br>MHz | Corr.<br>dB | LISN<br>insertion<br>loss<br>ESH3-<br>Z5<br>dB | cable<br>loss<br>(incl. 10<br>dB<br>atten-<br>uator)<br>dB |
|------------------|-------------|--|--|
| 0.15             | 10.1        | 0.1  | 10.0   |
| 5                | 10.3        | 0.1  | 10.2   |
| 7                | 10.5        | 0.2  | 10.3   |
| 10               | 10.5        | 0.2  | 10.3   |
| 12               | 10.7        | 0.3  | 10.4   |
| 14               | 10.7        | 0.3  | 10.4   |
| 16               | 10.8        | 0.4  | 10.4   |
| 18               | 10.9        | 0.4  | 10.5   |
| 20               | 10.9        | 0.4  | 10.5   |
| 22               | 11.1        | 0.5  | 10.6   |
| 24               | 11.1        | 0.5  | 10.6   |
| 26               | 11.2        | 0.5  | 10.7   |
| 28               | 11.2        | 0.5  | 10.7   |
| 30               | 11.3        | 0.5  | 10.8   |

#### Sample calculation

$$U_{\text{LISN}} (\text{dB } \mu\text{V}) = U (\text{dB } \mu\text{V}) + \text{Corr. (dB)}$$

U = Receiver reading

LISN Insertion loss = Voltage Division Factor of LISN

Corr. = sum of single correction factors of used LISN, cables, switch units (if used)

Linear interpolation will be used for frequencies in between the values in the table.

## 7.2 ANTENNA R&S HFH2-Z2 (9 KHZ – 30 MHZ)

| Frequency<br>MHz | AF<br>HFH-Z2)<br>dB (1/m) | Corr.<br>dB | cable<br>loss 1<br>(inside<br>chamber)<br>dB | cable<br>loss 2<br>(outside<br>chamber)<br>dB | cable<br>loss 3<br>(switch<br>unit)<br>dB | cable<br>loss 4<br>(to<br>receiver)<br>dB | distance<br>corr.<br>(-40 dB/<br>decade)<br>dB | d <sub>Limit</sub><br>(meas.<br>distance<br>(limit)<br>m | d <sub>used</sub><br>(meas.<br>distance<br>(used)<br>m |
|------------------|---------------------------|-------------|--|---|---|---|--|--|--|
| 0.009            | 20.50                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.01             | 20.45                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.015            | 20.37                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.02             | 20.36                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.025            | 20.38                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.03             | 20.32                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.05             | 20.35                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.08             | 20.30                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.1              | 20.20                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.2              | 20.17                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.3              | 20.14                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.49             | 20.12                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.490001         | 20.12                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 0.5              | 20.11                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 0.8              | 20.10                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 1                | 20.09                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 2                | 20.08                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 3                | 20.06                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 4                | 20.05                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 5                | 20.05                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 6                | 20.02                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 8                | 19.95                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 10               | 19.83                     | -39.4       | 0.2  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 12               | 19.71                     | -39.4       | 0.2  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 14               | 19.54                     | -39.4       | 0.2  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 16               | 19.53                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 18               | 19.50                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 20               | 19.57                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 22               | 19.61                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 24               | 19.61                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 26               | 19.54                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 28               | 19.46                     | -39.2       | 0.3  | 0.1   | 0.3                                       | 0.1                                       | -40  | 30   | 3  |
| 30               | 19.73                     | -39.1       | 0.4  | 0.1   | 0.3                                       | 0.1                                       | -40  | 30   | 3  |

### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + AF \text{ (dB 1/m)} + Corr. \text{ (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

distance correction =  $-40 * \text{LOG} (d_{\text{Limit}} / d_{\text{used}})$

Linear interpolation will be used for frequencies in between the values in the table.

Table shows an extract of values

### 7.3 ANTENNA R&S HL562 (30 MHZ – 1 GHZ)

( $d_{Limit} = 3\text{ m}$ )

| Frequency | AF R&S HL562 | Corr. |
|-----------|--------------|-------|
| MHz       | dB (1/m)     | dB    |
| 30        | 18.6         | 0.6   |
| 50        | 6.0          | 0.9   |
| 100       | 9.7          | 1.2   |
| 150       | 7.9          | 1.6   |
| 200       | 7.6          | 1.9   |
| 250       | 9.5          | 2.1   |
| 300       | 11.0         | 2.3   |
| 350       | 12.4         | 2.6   |
| 400       | 13.6         | 2.9   |
| 450       | 14.7         | 3.1   |
| 500       | 15.6         | 3.2   |
| 550       | 16.3         | 3.5   |
| 600       | 17.2         | 3.5   |
| 650       | 18.1         | 3.6   |
| 700       | 18.5         | 3.6   |
| 750       | 19.1         | 4.1   |
| 800       | 19.6         | 4.1   |
| 850       | 20.1         | 4.4   |
| 900       | 20.8         | 4.7   |
| 950       | 21.1         | 4.8   |
| 1000      | 21.6         | 4.9   |

| cable loss 1 (inside chamber) | cable loss 2 (outside chamber) | cable loss 3 (switch unit) | cable loss 4 (to receiver) | distance corr. (-20 dB/decade) | $d_{Limit}$ (meas. distance (limit)) | $d_{used}$ (meas. distance (used)) |
|-------------------------------|--------------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------------|------------------------------------|
| dB                            | dB                             | dB                         | dB                         | dB                             | m                                    | m                                  |
| 0.29                          | 0.04                           | 0.23                       | 0.02                       | 0.0                            | 3                                    | 3                                  |
| 0.39                          | 0.09                           | 0.32                       | 0.08                       | 0.0                            | 3                                    | 3                                  |
| 0.56                          | 0.14                           | 0.47                       | 0.08                       | 0.0                            | 3                                    | 3                                  |
| 0.73                          | 0.20                           | 0.59                       | 0.12                       | 0.0                            | 3                                    | 3                                  |
| 0.84                          | 0.21                           | 0.70                       | 0.11                       | 0.0                            | 3                                    | 3                                  |
| 0.98                          | 0.24                           | 0.80                       | 0.13                       | 0.0                            | 3                                    | 3                                  |
| 1.04                          | 0.26                           | 0.89                       | 0.15                       | 0.0                            | 3                                    | 3                                  |
| 1.18                          | 0.31                           | 0.96                       | 0.13                       | 0.0                            | 3                                    | 3                                  |
| 1.28                          | 0.35                           | 1.03                       | 0.19                       | 0.0                            | 3                                    | 3                                  |
| 1.39                          | 0.38                           | 1.11                       | 0.22                       | 0.0                            | 3                                    | 3                                  |
| 1.44                          | 0.39                           | 1.20                       | 0.19                       | 0.0                            | 3                                    | 3                                  |
| 1.55                          | 0.46                           | 1.24                       | 0.23                       | 0.0                            | 3                                    | 3                                  |
| 1.59                          | 0.43                           | 1.29                       | 0.23                       | 0.0                            | 3                                    | 3                                  |
| 1.67                          | 0.34                           | 1.35                       | 0.22                       | 0.0                            | 3                                    | 3                                  |
| 1.67                          | 0.42                           | 1.41                       | 0.15                       | 0.0                            | 3                                    | 3                                  |
| 1.87                          | 0.54                           | 1.46                       | 0.25                       | 0.0                            | 3                                    | 3                                  |
| 1.90                          | 0.46                           | 1.51                       | 0.25                       | 0.0                            | 3                                    | 3                                  |
| 1.99                          | 0.60                           | 1.56                       | 0.27                       | 0.0                            | 3                                    | 3                                  |
| 2.14                          | 0.60                           | 1.63                       | 0.29                       | 0.0                            | 3                                    | 3                                  |
| 2.22                          | 0.60                           | 1.66                       | 0.33                       | 0.0                            | 3                                    | 3                                  |
| 2.23                          | 0.61                           | 1.71                       | 0.30                       | 0.0                            | 3                                    | 3                                  |

( $d_{Limit} = 10\text{ m}$ )

|      |      |      |
|------|------|------|
| 30   | 18.6 | -9.9 |
| 50   | 6.0  | -9.6 |
| 100  | 9.7  | -9.2 |
| 150  | 7.9  | -8.8 |
| 200  | 7.6  | -8.6 |
| 250  | 9.5  | -8.3 |
| 300  | 11.0 | -8.1 |
| 350  | 12.4 | -7.9 |
| 400  | 13.6 | -7.6 |
| 450  | 14.7 | -7.4 |
| 500  | 15.6 | -7.2 |
| 550  | 16.3 | -7.0 |
| 600  | 17.2 | -6.9 |
| 650  | 18.1 | -6.9 |
| 700  | 18.5 | -6.8 |
| 750  | 19.1 | -6.3 |
| 800  | 19.6 | -6.3 |
| 850  | 20.1 | -6.0 |
| 900  | 20.8 | -5.8 |
| 950  | 21.1 | -5.6 |
| 1000 | 21.6 | -5.6 |

|      |      |      |      |       |    |   |
|------|------|------|------|-------|----|---|
| 0.29 | 0.04 | 0.23 | 0.02 | -10.5 | 10 | 3 |
| 0.39 | 0.09 | 0.32 | 0.08 | -10.5 | 10 | 3 |
| 0.56 | 0.14 | 0.47 | 0.08 | -10.5 | 10 | 3 |
| 0.73 | 0.20 | 0.59 | 0.12 | -10.5 | 10 | 3 |
| 0.84 | 0.21 | 0.70 | 0.11 | -10.5 | 10 | 3 |
| 0.98 | 0.24 | 0.80 | 0.13 | -10.5 | 10 | 3 |
| 1.04 | 0.26 | 0.89 | 0.15 | -10.5 | 10 | 3 |
| 1.18 | 0.31 | 0.96 | 0.13 | -10.5 | 10 | 3 |
| 1.28 | 0.35 | 1.03 | 0.19 | -10.5 | 10 | 3 |
| 1.39 | 0.38 | 1.11 | 0.22 | -10.5 | 10 | 3 |
| 1.44 | 0.39 | 1.20 | 0.19 | -10.5 | 10 | 3 |
| 1.55 | 0.46 | 1.24 | 0.23 | -10.5 | 10 | 3 |
| 1.59 | 0.43 | 1.29 | 0.23 | -10.5 | 10 | 3 |
| 1.67 | 0.34 | 1.35 | 0.22 | -10.5 | 10 | 3 |
| 1.67 | 0.42 | 1.41 | 0.15 | -10.5 | 10 | 3 |
| 1.87 | 0.54 | 1.46 | 0.25 | -10.5 | 10 | 3 |
| 1.90 | 0.46 | 1.51 | 0.25 | -10.5 | 10 | 3 |
| 1.99 | 0.60 | 1.56 | 0.27 | -10.5 | 10 | 3 |
| 2.14 | 0.60 | 1.63 | 0.29 | -10.5 | 10 | 3 |
| 2.22 | 0.60 | 1.66 | 0.33 | -10.5 | 10 | 3 |
| 2.23 | 0.61 | 1.71 | 0.30 | -10.5 | 10 | 3 |

#### Sample calculation

$$E\text{ (dB } \mu\text{V/m)} = U\text{ (dB } \mu\text{V)} + \text{AF (dB 1/m)} + \text{Corr. (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

distance correction =  $-20 * \text{LOG}(d_{Limit}/d_{used})$

Linear interpolation will be used for frequencies in between the values in the table.

Tables show an extract of values.

### 7.4 ANTENNA R&S HF907 (1 GHZ – 18 GHZ)

| Frequency | AF R&S HF907 | Corr. |
|-----------|--------------|-------|
| MHz       | dB (1/m)     | dB    |
| 1000      | 24.4         | -19.4 |
| 2000      | 28.5         | -17.4 |
| 3000      | 31.0         | -16.1 |
| 4000      | 33.1         | -14.7 |
| 5000      | 34.4         | -13.7 |
| 6000      | 34.7         | -12.7 |
| 7000      | 35.6         | -11.0 |

| cable loss 1 (relay + cable inside chamber) | cable loss 2 (outside chamber) | cable loss 3 (switch unit, attenuator & pre-amp) | cable loss 4 (to receiver) |  |  |
|---|--------------------------------|--|----------------------------|--|--|
| dB  | dB                             | dB   | dB                         |  |  |
| 0.99  | 0.31                           | -21.51   | 0.79                       |  |  |
| 1.44  | 0.44                           | -20.63   | 1.38                       |  |  |
| 1.87  | 0.53                           | -19.85   | 1.33                       |  |  |
| 2.41  | 0.67                           | -19.13   | 1.31                       |  |  |
| 2.78  | 0.86                           | -18.71   | 1.40                       |  |  |
| 2.74  | 0.90                           | -17.83   | 1.47                       |  |  |
| 2.82  | 0.86                           | -16.19   | 1.46                       |  |  |

| Frequency | AF R&S HF907 | Corr. |
|-----------|--------------|-------|
| MHz       | dB (1/m)     | dB    |
| 3000      | 31.0         | -23.4 |
| 4000      | 33.1         | -23.3 |
| 5000      | 34.4         | -21.7 |
| 6000      | 34.7         | -21.2 |
| 7000      | 35.6         | -19.8 |

| cable loss 1 (relay inside chamber) | cable loss 2 (inside chamber) | cable loss 3 (outside chamber) | cable loss 4 (switch unit, attenuator & pre-amp) | cable loss 5 (to receiver) | used for FCC 15.247 |
|-------------------------------------|-------------------------------|--------------------------------|--|----------------------------|---------------------|
| dB                                  | dB                            | dB                             | dB   | dB                         |                     |
| 0.47                                | 1.87                          | 0.53                           | -27.58   | 1.33                       |                     |
| 0.56                                | 2.41                          | 0.67                           | -28.23   | 1.31                       |                     |
| 0.61                                | 2.78                          | 0.86                           | -27.35   | 1.40                       |                     |
| 0.58                                | 2.74                          | 0.90                           | -26.89   | 1.47                       |                     |
| 0.66                                | 2.82                          | 0.86                           | -25.58   | 1.46                       |                     |

| Frequency | AF R&S HF907 | Corr. |
|-----------|--------------|-------|
| MHz       | dB (1/m)     | dB    |
| 7000      | 35.6         | -57.3 |
| 8000      | 36.3         | -56.3 |
| 9000      | 37.1         | -55.3 |
| 10000     | 37.5         | -56.2 |
| 11000     | 37.5         | -55.3 |
| 12000     | 37.6         | -53.7 |
| 13000     | 38.2         | -53.5 |
| 14000     | 39.9         | -56.3 |
| 15000     | 40.9         | -54.1 |
| 16000     | 41.3         | -54.1 |
| 17000     | 42.8         | -54.4 |
| 18000     | 44.2         | -54.7 |

| cable loss 1 (relay inside chamber) | cable loss 2 (High Pass) | cable loss 3 (pre-amp) | cable loss 4 (inside chamber) | cable loss 5 (outside chamber) | cable loss 6 (to receiver) |
|-------------------------------------|--------------------------|------------------------|-------------------------------|--------------------------------|----------------------------|
| dB                                  | dB                       | dB                     | dB                            | dB                             | dB                         |
| 0.56                                | 1.28                     | -62.72                 | 2.66                          | 0.94                           | 1.46                       |
| 0.69                                | 0.71                     | -61.49                 | 2.84                          | 1.00                           | 1.53                       |
| 0.68                                | 0.65                     | -60.80                 | 3.06                          | 1.09                           | 1.60                       |
| 0.70                                | 0.54                     | -61.91                 | 3.28                          | 1.20                           | 1.67                       |
| 0.80                                | 0.61                     | -61.40                 | 3.43                          | 1.27                           | 1.70                       |
| 0.84                                | 0.42                     | -59.70                 | 3.53                          | 1.26                           | 1.73                       |
| 0.83                                | 0.44                     | -59.81                 | 3.75                          | 1.32                           | 1.83                       |
| 0.91                                | 0.53                     | -63.03                 | 3.91                          | 1.40                           | 1.77                       |
| 0.98                                | 0.54                     | -61.05                 | 4.02                          | 1.44                           | 1.83                       |
| 1.23                                | 0.49                     | -61.51                 | 4.17                          | 1.51                           | 1.85                       |
| 1.36                                | 0.76                     | -62.36                 | 4.34                          | 1.53                           | 2.00                       |
| 1.70                                | 0.53                     | -62.88                 | 4.41                          | 1.55                           | 1.91                       |

#### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + \text{AF (dB 1/m)} + \text{Corr. (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

Linear interpolation will be used for frequencies in between the values in the table.

Tables show an extract of values.

### 7.5 ANTENNA EMCO 3160-09 (18 GHZ – 26.5 GHZ)

| Frequency<br>MHz | AF<br>EMCO<br>3160-09<br>dB (1/m) | Corr.<br>dB |
|------------------|-----------------------------------|-------------|
| 18000            | 40.2                              | -23.5       |
| 18500            | 40.2                              | -23.2       |
| 19000            | 40.2                              | -22.0       |
| 19500            | 40.3                              | -21.3       |
| 20000            | 40.3                              | -20.3       |
| 20500            | 40.3                              | -19.9       |
| 21000            | 40.3                              | -19.1       |
| 21500            | 40.3                              | -19.1       |
| 22000            | 40.3                              | -18.7       |
| 22500            | 40.4                              | -19.0       |
| 23000            | 40.4                              | -19.5       |
| 23500            | 40.4                              | -19.3       |
| 24000            | 40.4                              | -19.8       |
| 24500            | 40.4                              | -19.5       |
| 25000            | 40.4                              | -19.3       |
| 25500            | 40.5                              | -20.4       |
| 26000            | 40.5                              | -21.3       |
| 26500            | 40.5                              | -21.1       |

| cable<br>loss 1<br>(inside<br>chamber)<br>dB | cable<br>loss 2<br>(pre-<br>amp)<br>dB | cable<br>loss 3<br>(inside<br>chamber)<br>dB | cable<br>loss 4<br>(switch<br>unit)<br>dB | cable<br>loss 5<br>(to<br>receiver)<br>dB |
|--|--|--|---|---|
| 0.72   | -35.85                                 | 6.20   | 2.81                                      | 2.65                                      |
| 0.69   | -35.71                                 | 6.46   | 2.76                                      | 2.59                                      |
| 0.76   | -35.44                                 | 6.69   | 3.15                                      | 2.79                                      |
| 0.74   | -35.07                                 | 7.04   | 3.11                                      | 2.91                                      |
| 0.72   | -34.49                                 | 7.30   | 3.07                                      | 3.05                                      |
| 0.78   | -34.46                                 | 7.48   | 3.12                                      | 3.15                                      |
| 0.87   | -34.07                                 | 7.61   | 3.20                                      | 3.33                                      |
| 0.90   | -33.96                                 | 7.47   | 3.28                                      | 3.19                                      |
| 0.89   | -33.57                                 | 7.34   | 3.35                                      | 3.28                                      |
| 0.87   | -33.66                                 | 7.06   | 3.75                                      | 2.94                                      |
| 0.88   | -33.75                                 | 6.92   | 3.77                                      | 2.70                                      |
| 0.90   | -33.35                                 | 6.99   | 3.52                                      | 2.66                                      |
| 0.88   | -33.99                                 | 6.88   | 3.88                                      | 2.58                                      |
| 0.91   | -33.89                                 | 7.01   | 3.93                                      | 2.51                                      |
| 0.88   | -33.00                                 | 6.72   | 3.96                                      | 2.14                                      |
| 0.89   | -34.07                                 | 6.90   | 3.66                                      | 2.22                                      |
| 0.86   | -35.11                                 | 7.02   | 3.69                                      | 2.28                                      |
| 0.90   | -35.20                                 | 7.15   | 3.91                                      | 2.36                                      |

#### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + AF \text{ (dB 1/m)} + Corr. \text{ (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

Linear interpolation will be used for frequencies in between the values in the table.

Table shows an extract of values.



## 7.6 ANTENNA EMCO 3160-10 (26.5 GHZ – 40 GHZ)

| Frequency<br>GHz | AF<br>EMCO<br>3160-10<br>dB (1/m) | Corr.<br>dB | cable<br>loss 1<br>(inside<br>chamber)<br>dB | cable<br>loss 2<br>(outside<br>chamber)<br>dB | cable<br>loss 3<br>(switch<br>unit)<br>dB | cable<br>loss 4<br>(to<br>receiver)<br>dB | distance<br>corr.<br>(-20 dB/<br>decade)<br>dB | d <sub>Limit</sub><br>(meas.<br>distance<br>(limit)<br>m | d <sub>used</sub><br>(meas.<br>distance<br>(used)<br>m |
|------------------|-----------------------------------|-------------|--|---|---|---|--|--|--|
| 26.5             | 43.4                              | -11.2       | 4.4  |   |   |   | -9.5   | 3  | 1.0  |
| 27.0             | 43.4                              | -11.2       | 4.4  |   |   |   | -9.5   | 3  | 1.0  |
| 28.0             | 43.4                              | -11.1       | 4.5  |   |   |   | -9.5   | 3  | 1.0  |
| 29.0             | 43.5                              | -11.0       | 4.6  |   |   |   | -9.5   | 3  | 1.0  |
| 30.0             | 43.5                              | -10.9       | 4.7  |   |   |   | -9.5   | 3  | 1.0  |
| 31.0             | 43.5                              | -10.8       | 4.7  |   |   |   | -9.5   | 3  | 1.0  |
| 32.0             | 43.5                              | -10.7       | 4.8  |   |   |   | -9.5   | 3  | 1.0  |
| 33.0             | 43.6                              | -10.7       | 4.9  |   |   |   | -9.5   | 3  | 1.0  |
| 34.0             | 43.6                              | -10.6       | 5.0  |   |   |   | -9.5   | 3  | 1.0  |
| 35.0             | 43.6                              | -10.5       | 5.1  |   |   |   | -9.5   | 3  | 1.0  |
| 36.0             | 43.6                              | -10.4       | 5.1  |   |   |   | -9.5   | 3  | 1.0  |
| 37.0             | 43.7                              | -10.3       | 5.2  |   |   |   | -9.5   | 3  | 1.0  |
| 38.0             | 43.7                              | -10.2       | 5.3  |   |   |   | -9.5   | 3  | 1.0  |
| 39.0             | 43.7                              | -10.2       | 5.4  |   |   |   | -9.5   | 3  | 1.0  |
| 40.0             | 43.8                              | -10.1       | 5.5  |   |   |   | -9.5   | 3  | 1.0  |

### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + \text{AF (dB 1/m)} + \text{Corr. (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

Linear interpolation will be used for frequencies in between the values in the table.

$$\text{distance correction} = -20 * \text{LOG} (d_{\text{Limit}} / d_{\text{used}})$$

Linear interpolation will be used for frequencies in between the values in the table.

Table shows an extract of values.



## 9 PHOTO REPORT

Please see separate photo report.