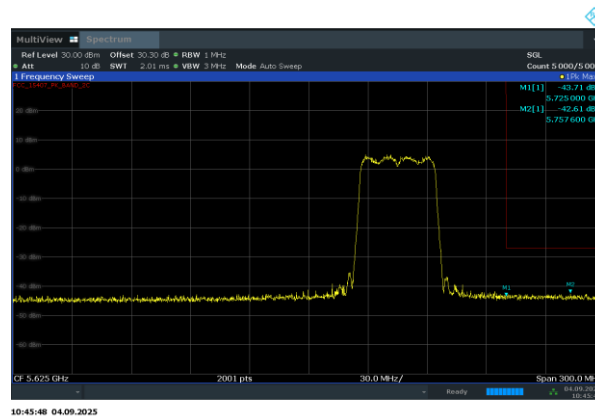
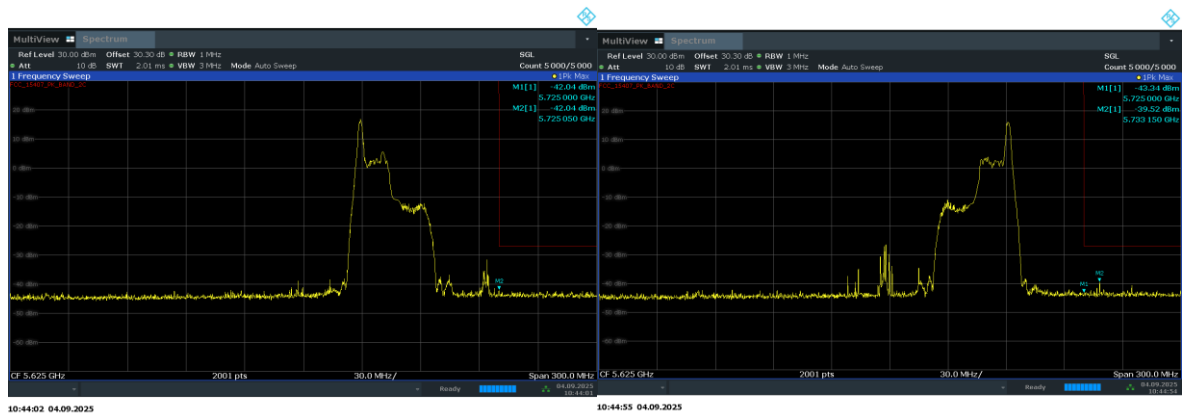
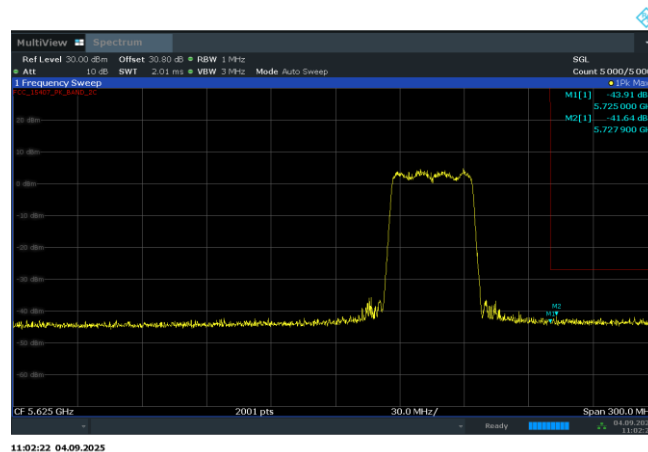
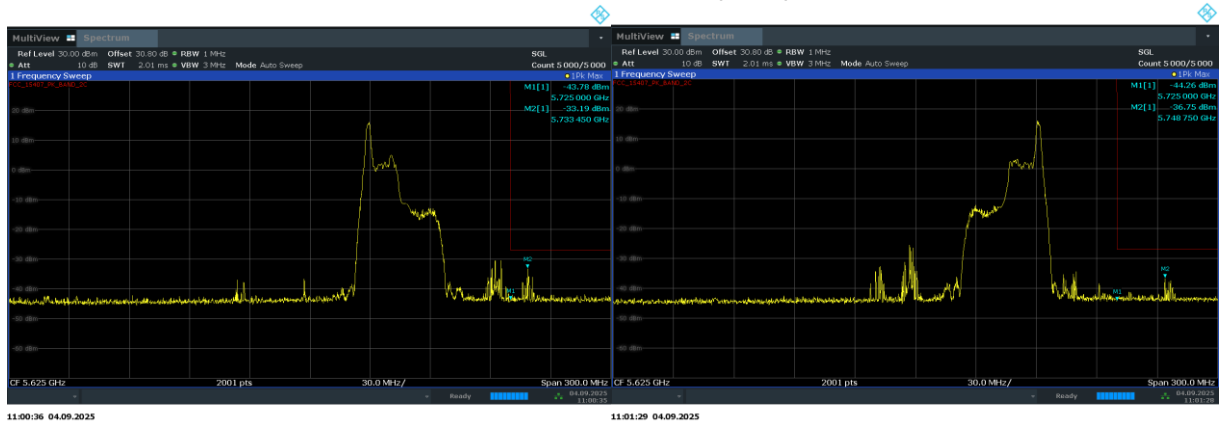




TX on 5670 Path A RU 1 / 16 / 65



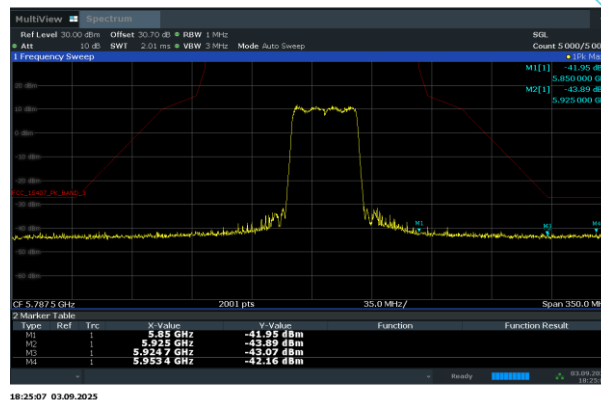
TX on 5670 Path B RU 1 / 16 / 65



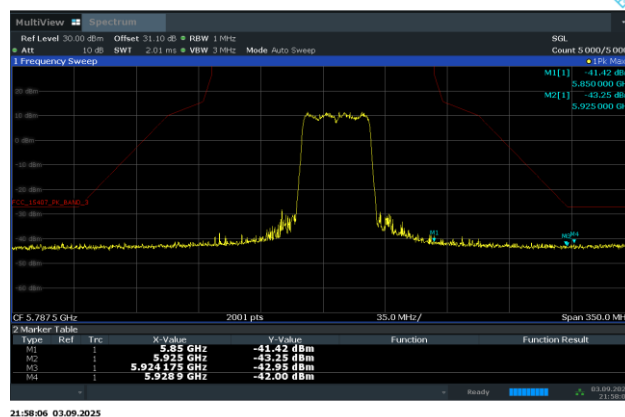
TX on 5755 Path A RU 16 / 65



TX on 5755 Path B RU 16 / 65



TX on 5795 Path A RU 1 / 16 / 65



TX on 5795 Path B RU 1 / 16 / 65



TX on 5875 Path A RU 1 / 16



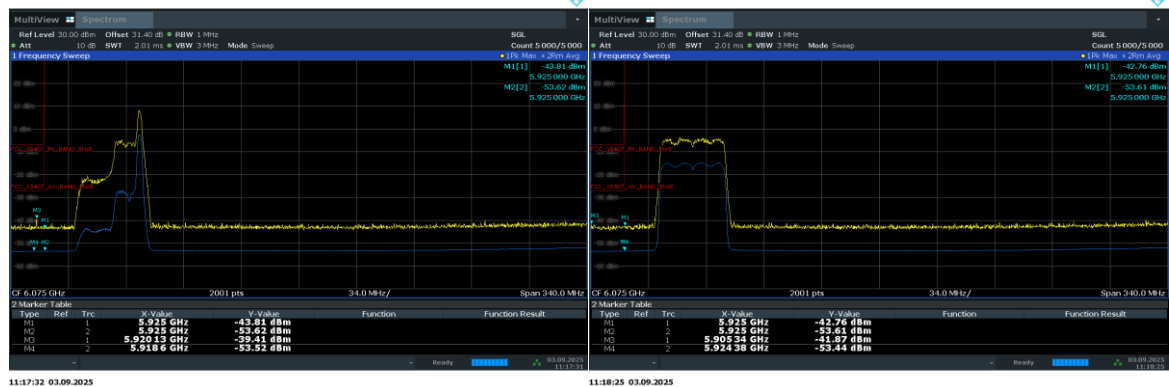
TX on 5875 Path A RU 17 / 65



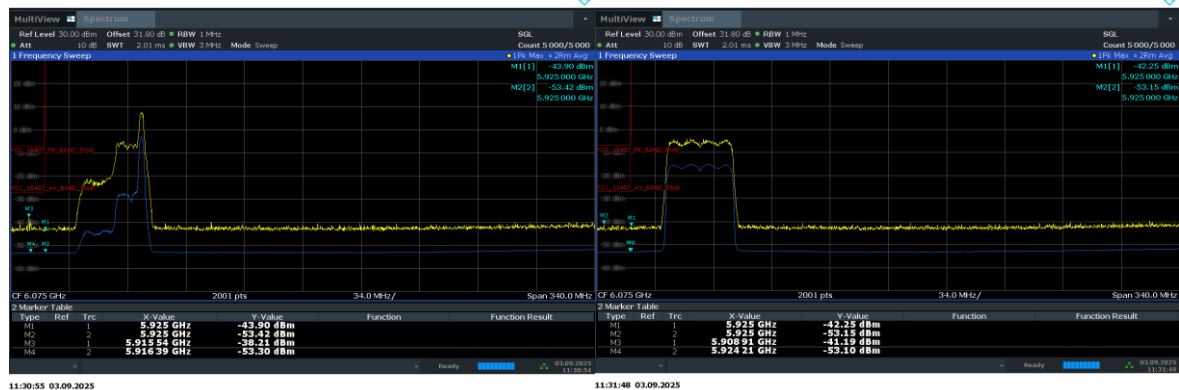
TX on 5875 Path B RU 1 / 16



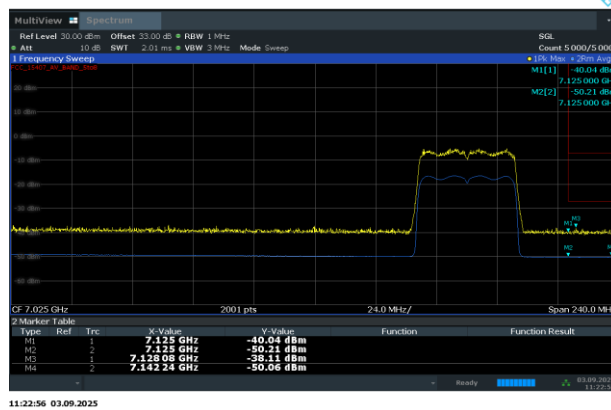
TX on 5875 Path B RU 17 / 65



TX on 5965 Path A RU 16 / 65



TX on 5965 Path B RU 16 / 65

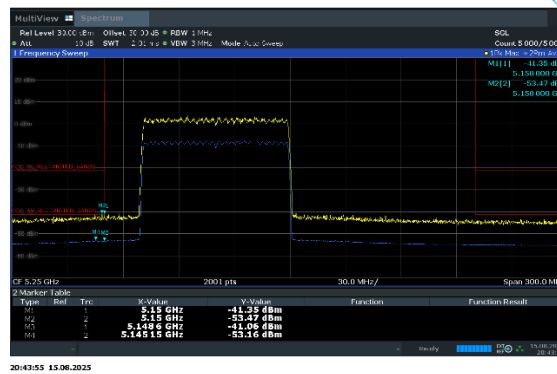


TX on 7085 Path A RU 1 / 16 / 65

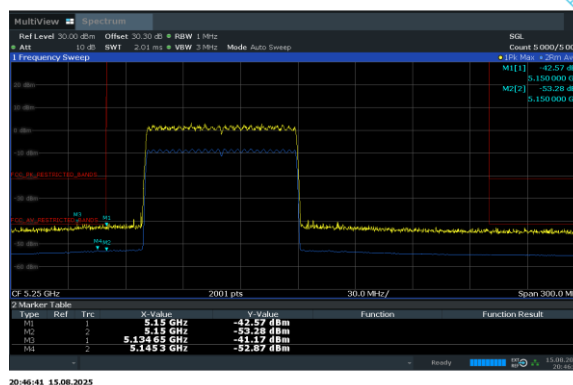
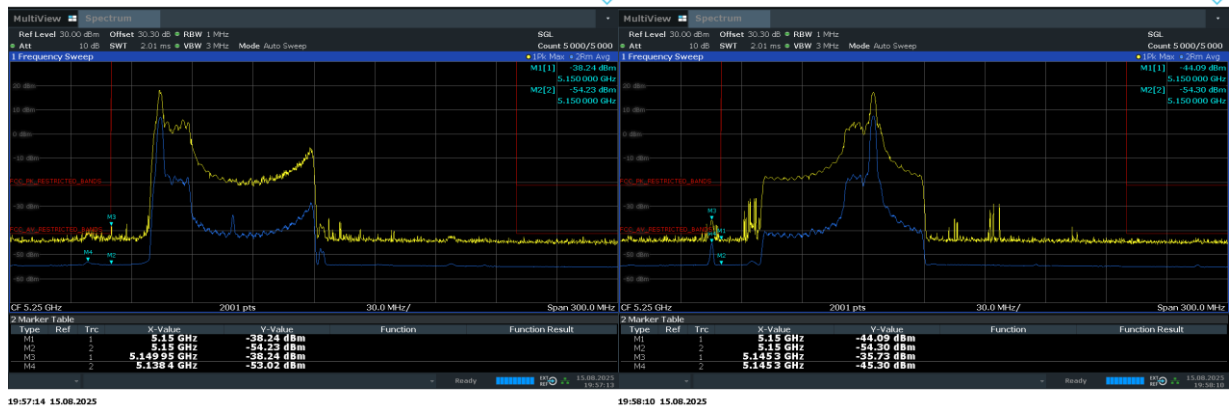


TX on 7085 Path B RU 1 / 16 / 65

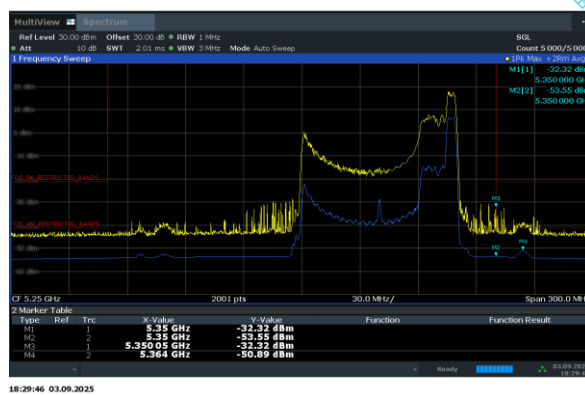
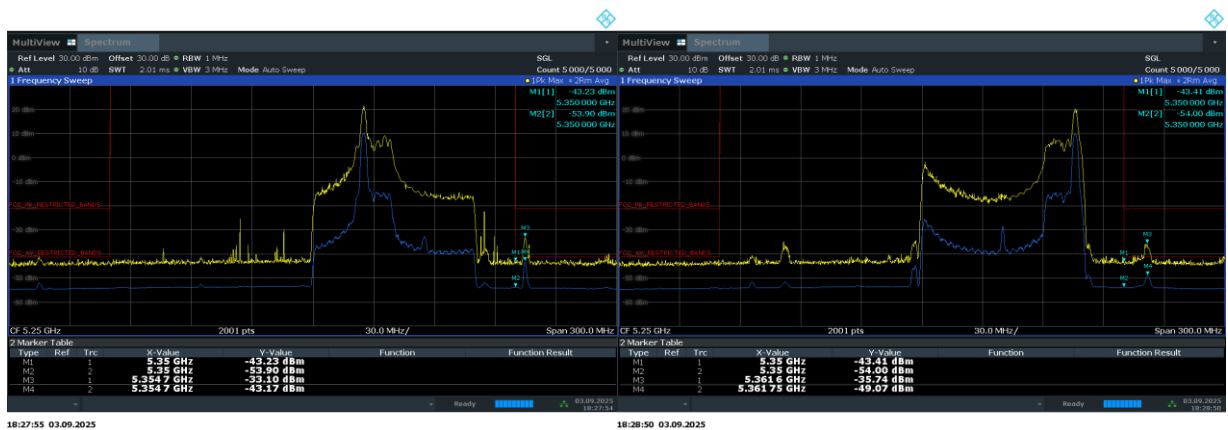
Radio Technology = WLAN ax 80 MHz (S01_AC01)



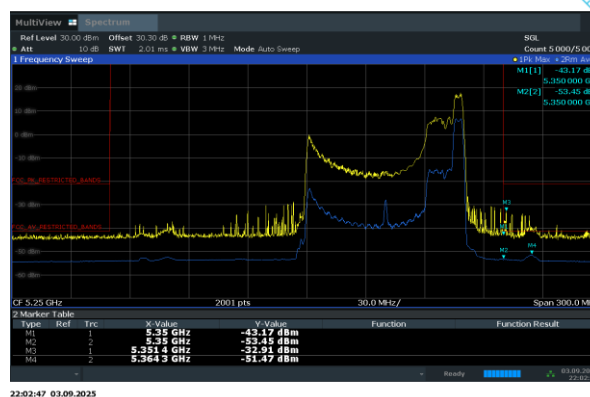
TX on 5210 Path A RU 1 / 25 / 67



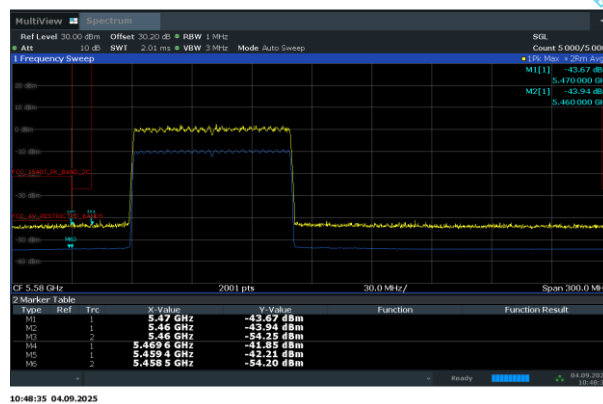
TX on 5210 Path B RU 1 / 25 / 67



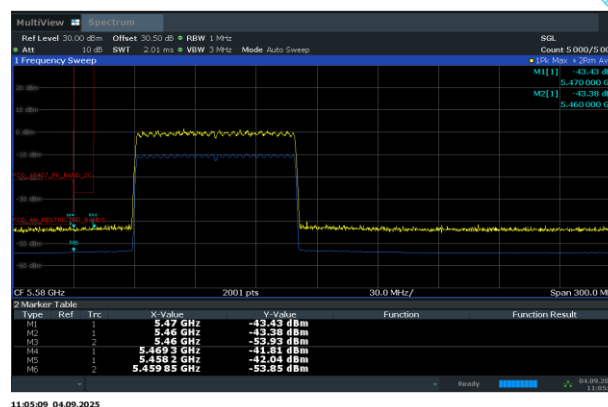
TX on 5290 Path A RU 11 / 35 / 52



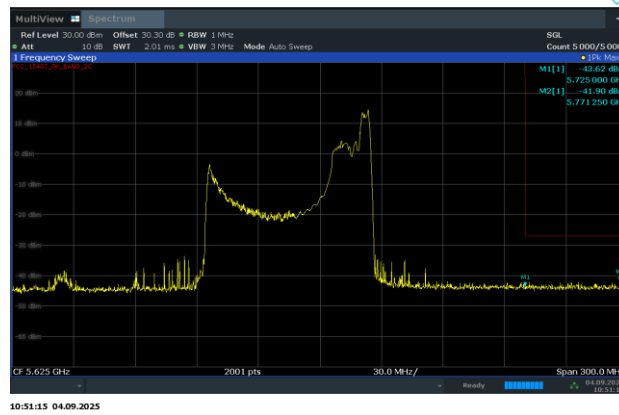
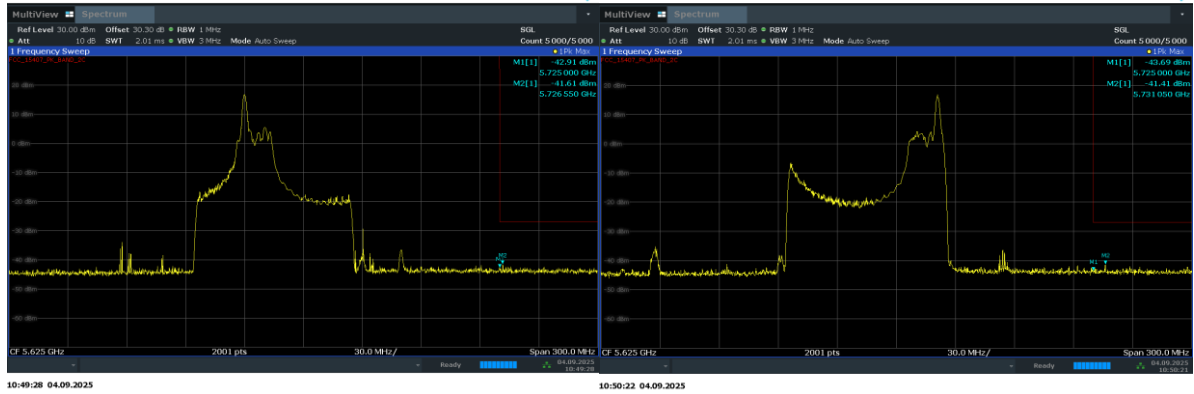
TX on 5290 Path B RU 11 / 35 / 52



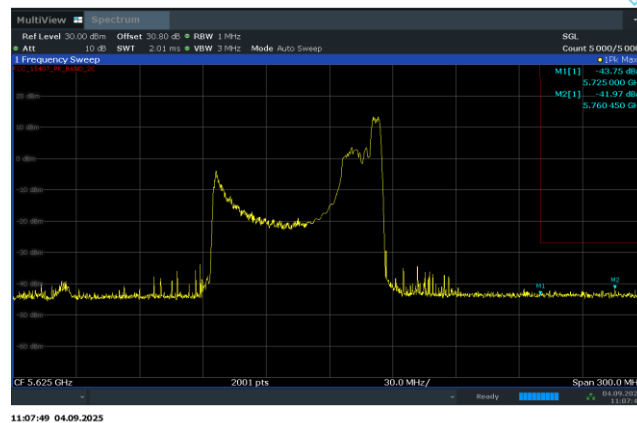
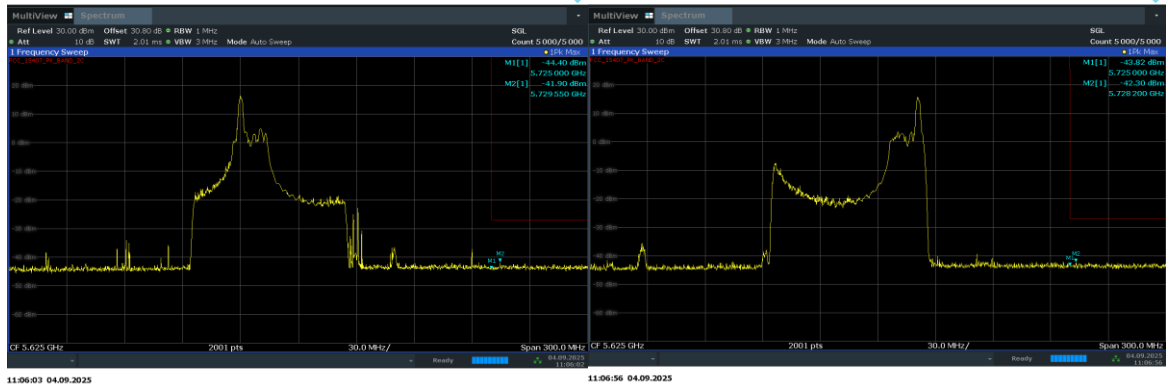
TX on 5530 Path A RU 1 / 25 / 67



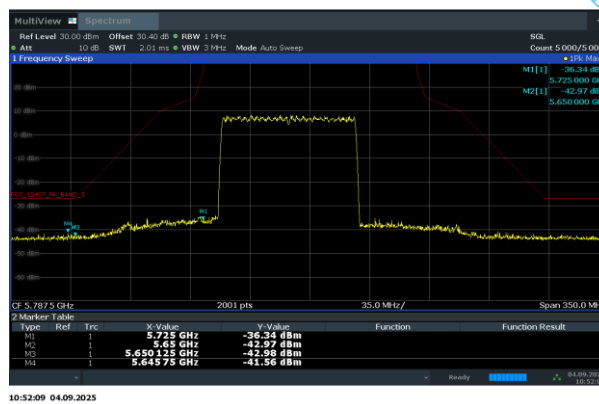
TX on 5530 Path B RU 1 / 25 / 67



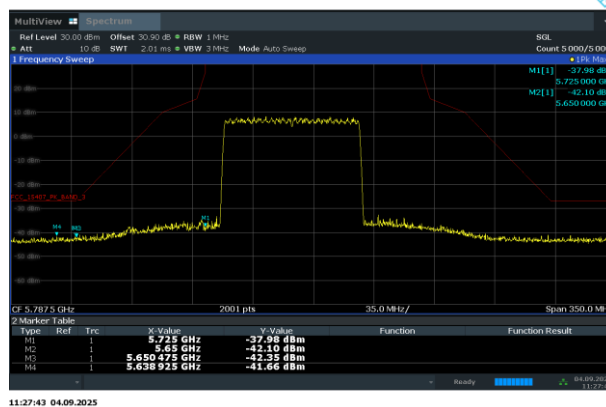
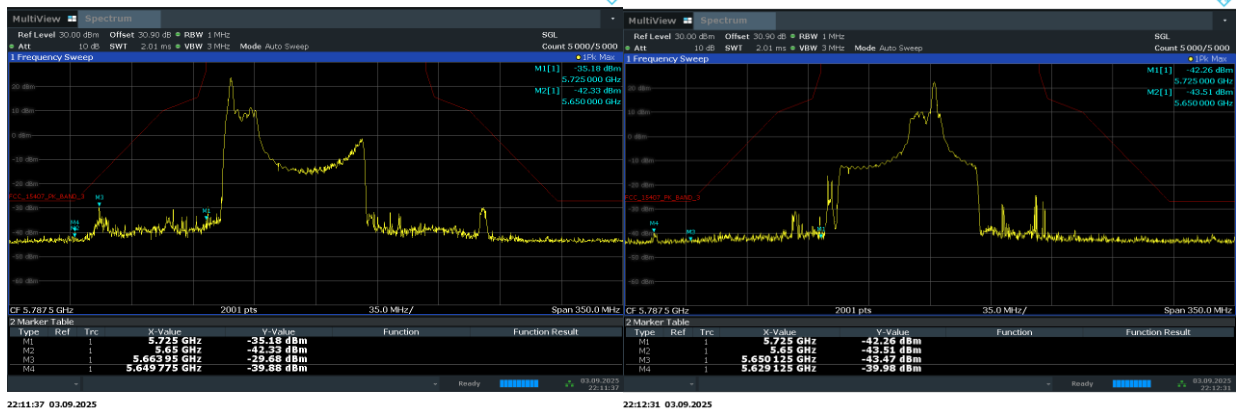
TX on 5610 Path A RU 11 / 35 / 52



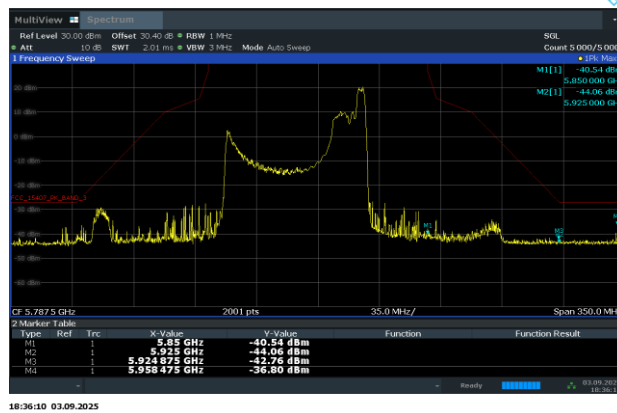
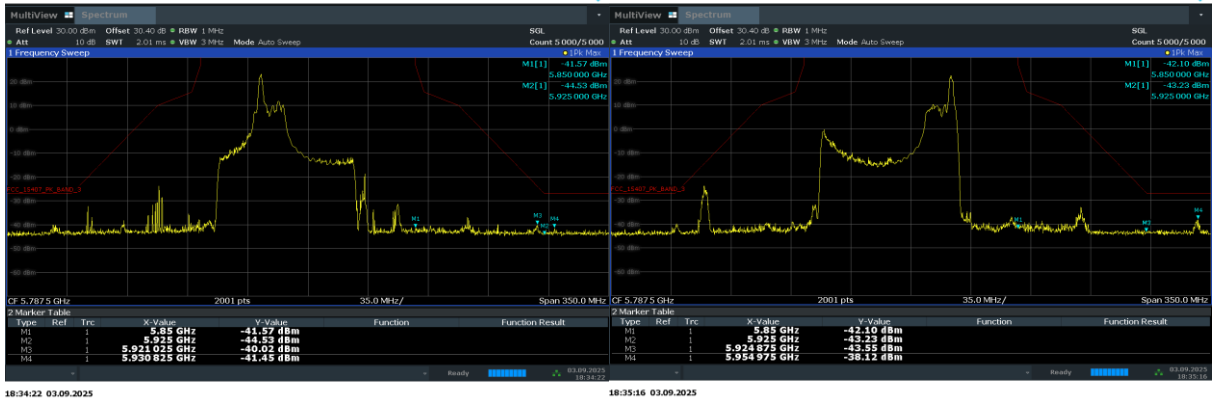
TX on 5610 Path B RU 11 / 35 / 52



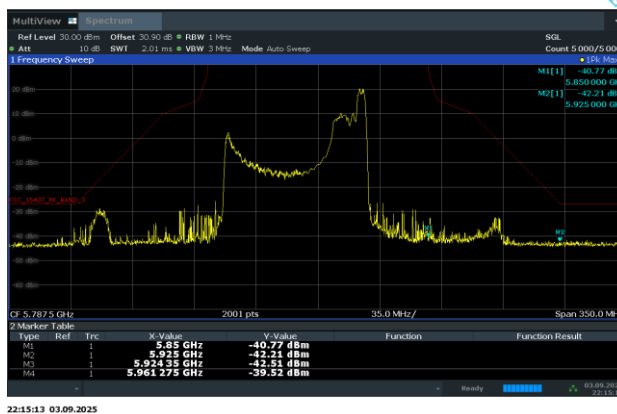
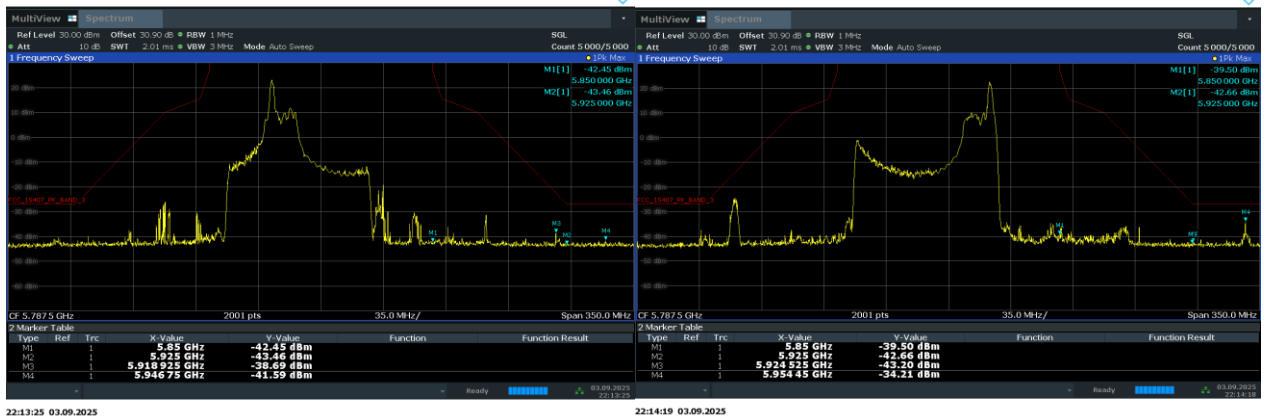
TX on 5775 Path A RU 1 / 25 / 67



TX on 5775 Path B RU 1 / 25 / 67



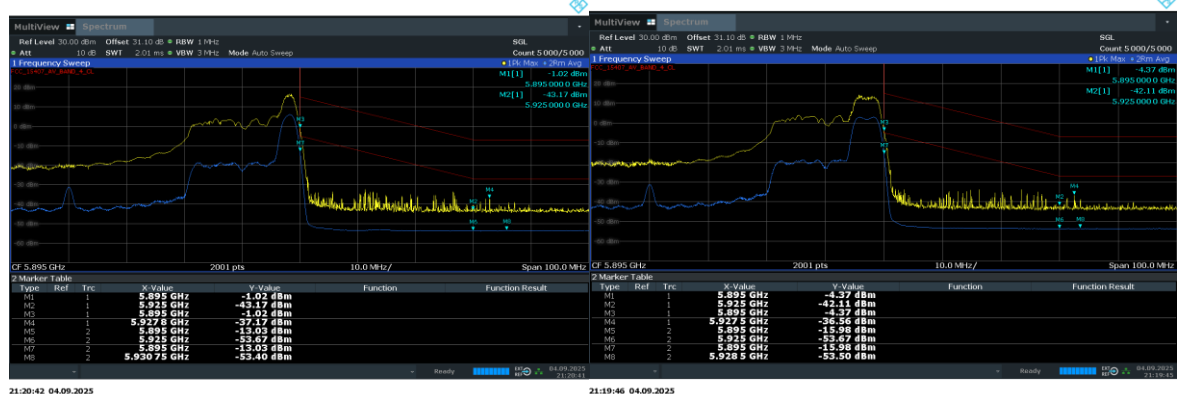
TX on 5775 Path A RU 11 / 35 / 52



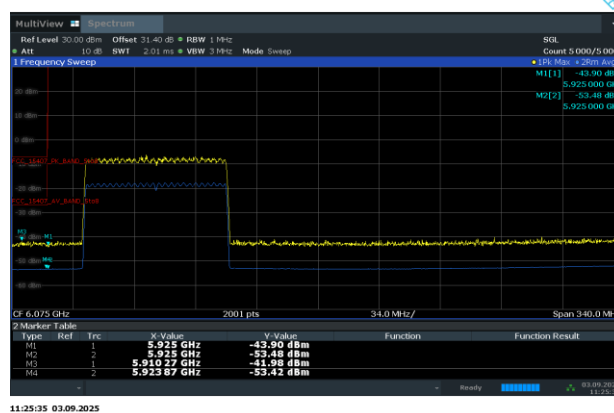
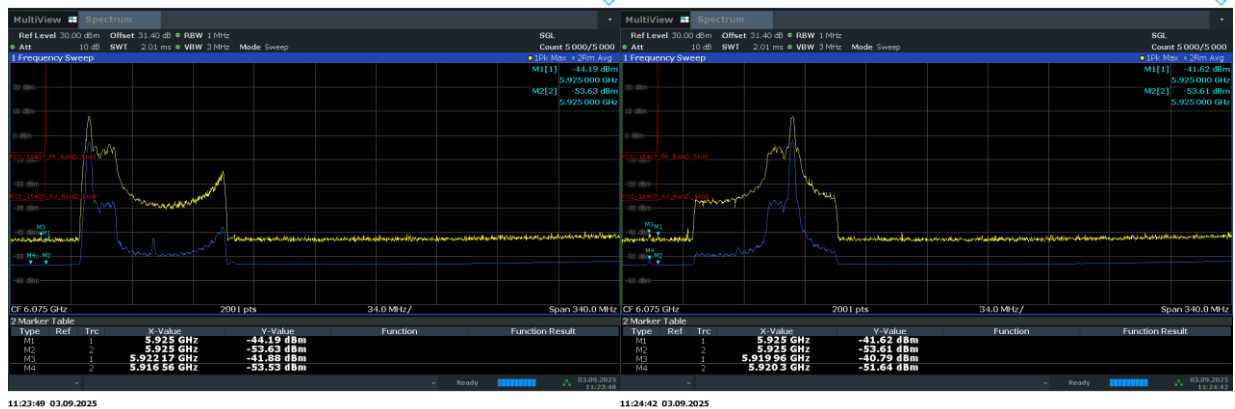
TX on 5775 Path B RU 11 / 35 / 52



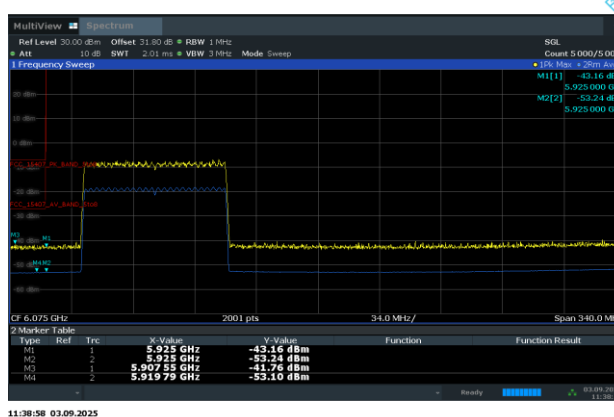
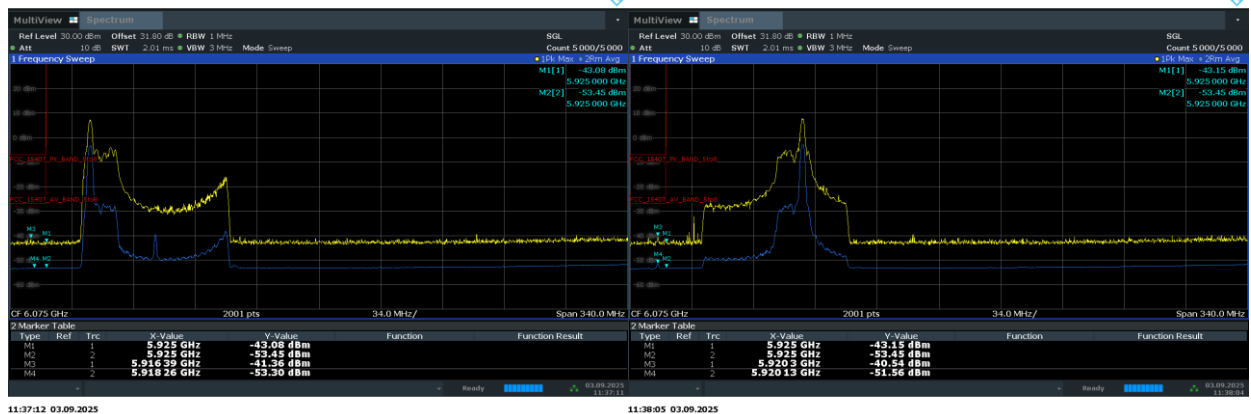
TX on 5855 Path A RU 11 / 35 / 36 / 52



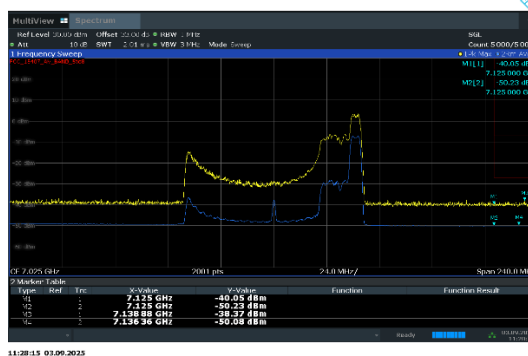
TX on 5855 Path B RU 11 / 35 / 52



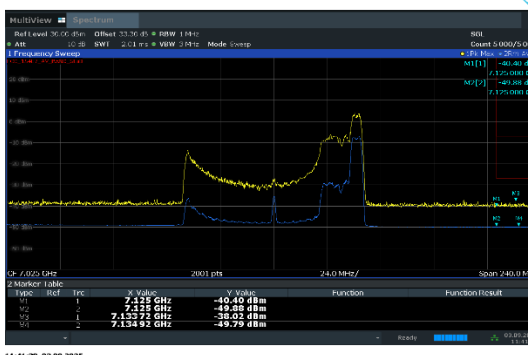
TX on 5985 Path A RU 1 / 25 / 67



TX on 5985 Path B RU 1 / 25 / 67



TX on 7025 Path A RU 11 / 35 / 52



TX on 7025 Path B RU 11 / 35 / 52

5.8.5 TEST EQUIPMENT USED

- R&S TS8997
- Radiated Emissions FAR 5 GHz FCC

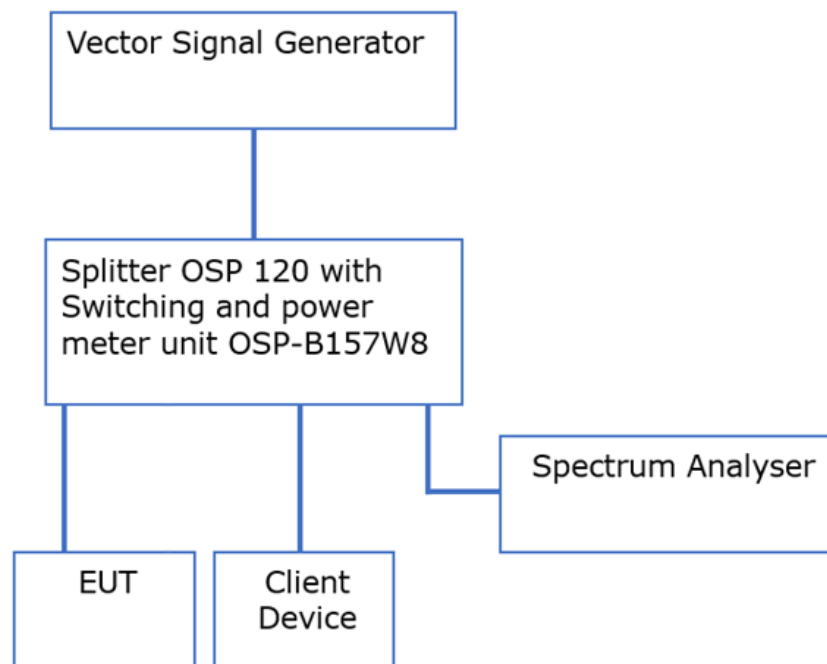
5.9 DYNAMIC FREQUENCY SELECTION - U-NII DETECTION BANDWIDTH

Standard **FCC Part 15 Subpart E**

The test was performed according to:
 KDB 905462

5.9.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up in a shielded room for the DFS measurements.



Since the DFS Master shall be tested stand alone, the DFS Client was connected but not activated.

After activating the EUT, a radar pulse of type 0 was sent on mid channel frequency from the radar signal generator and the response was noted. This was repeated 9 further times.

If at least 9 of the 10 pulses were recognized by the device, the radar pulse frequency was increased or decreased by 5 MHz and the test was repeated. If the detection rate falls below 9 pulses, the step size is reduced to 1 MHz from the previous 5 MHz step until detection rate falls below 9 again. The result is compared to the 99 % Bandwidth.

5.9.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart E, §15.407 (h) (2)

The device must sense for radar signals at 100 percent of its emission bandwidth.

The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is –64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is –62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna.

5.9.3 TEST PROTOCOL

Ambient temperature: 22 °C
 Air Pressure: 995 hPa
 Humidity: 32 %

Radio Technology	TX Frequency [MHz]	Channel BW [MHz]	Radar Test Signal #	FL (MHz)	FH (MHz)	Detection BW [MHz]	Max. 99 % BW [MHz]
WLAN a	5500	20	Radar Type 0	5490	5510	20	18.9
WLAN ax 40 MHz	5510	40	Radar Type 0	5490	5530	40	37.7
WLAN ax 80 MHz	5530	80	Radar Type 0	5490	5570	80	77.7

Remark: Channel Move feature was deactivated for this test.
 Detection of radar pulses was monitored by console interface.
 Please see next sub-clause for the measurement results.

5.9.4 MEASUREMENT RESULT

Radar Pulse Frequency Deviation from Channel Centre Frequency [MHz]	Channel Centre Frequency [MHz]	Ch. BW [MHz]	Detected	TX Frequency [MHz]	Ch. BW [MHz]	Detected	TX Frequency [MHz]	Ch. BW [MHz]	Detected
-40	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10
-39	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
-38	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
-37	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
-36	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
-35	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10
-30	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10
-25	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10
-20	N/P	N/P	N/P	5510	40	10	5530	80	10
-19	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
-18	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
-17	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
-16	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
-15	N/P	N/P	N/P	5510	40	10	5530	80	10
-10	5500	20	10	5510	40	10	5530	80	10
-9	5500	20	N/P	5510	40	N/P	5530	80	N/P
-8	5500	20	N/P	5510	40	N/P	5530	80	N/P
-7	5500	20	N/P	5510	40	N/P	5530	80	N/P
-6	5500	20	N/P	5510	40	N/P	5530	80	N/P
-5	5500	20	10	5510	40	10	5530	80	10
0 (Centre Freq.)	5500	20	10	5510	40	10	5530	80	10
5	5500	20	10	5510	40	10	5530	80	10
6	5500	20	N/P	5510	40	N/P	5530	80	N/P
7	5500	20	N/P	5510	40	N/P	5530	80	N/P
8	5500	20	N/P	5510	40	N/P	5530	80	N/P
9	5500	20	N/P	5510	40	N/P	5530	80	N/P
10	5500	20	10	5510	40	10	5530	80	10
15	N/P	N/P	N/P	5510	40	10	5530	80	10
16	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
17	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
18	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
19	N/P	N/P	N/P	5510	40	N/P	5530	80	N/P
20	N/P	N/P	N/P	5510	40	10	5530	80	10
25	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10
30	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10
35	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10
36	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
37	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
38	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
39	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	N/P
40	N/P	N/P	N/P	N/P	N/P	N/P	5530	80	10

N/P = Not Performed

5.9.5 TEST EQUIPMENT USED

- R&S TS8997

5.10 DYNAMIC FREQUENCY SELECTION - CHANNEL AVAILABILITY CHECK TIME

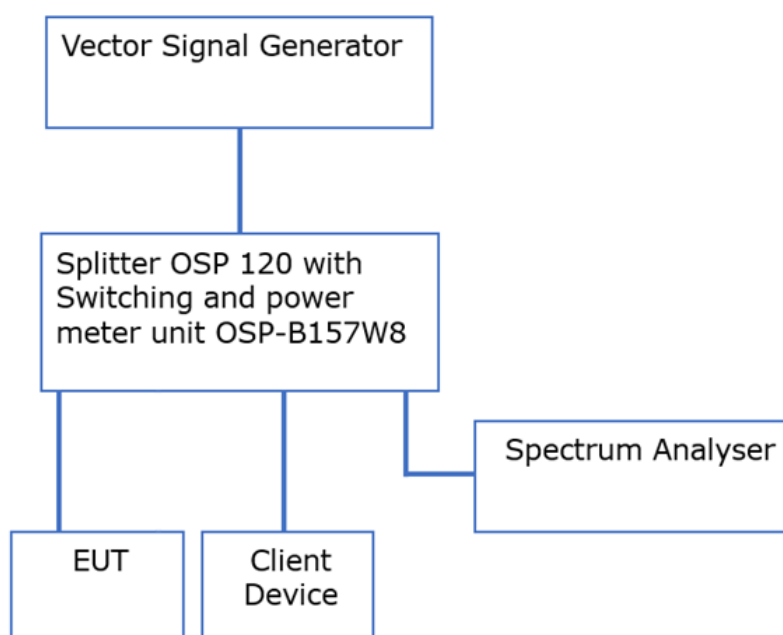
Standard **FCC Part 15 Subpart E**

The test was performed according to:

KDB 905462

5.10.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up in a shielded room for the DFS measurements.



The blocked channel list is reset by restart of EUT and AP Mode is afterwards activated by software script.

When the AP script is started, the measurement sweep on the spectrum analyser is started in parallel.

Analyzer settings:

- Resolution Bandwidth (RBW): 3 MHz
- Video Bandwidth (VBW): 3 MHz
- Trace: Clear/Write
- Sweeps: Single Sweep
- Sweep time: 150 s
- Detector: Peak

5.10.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart E, §15.407 (h) (2) (ii)

Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.

FCC Part 15, Subpart E, §15.407 (h) (2)

The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is –64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is –62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna.

5.10.3 TEST PROTOCOL

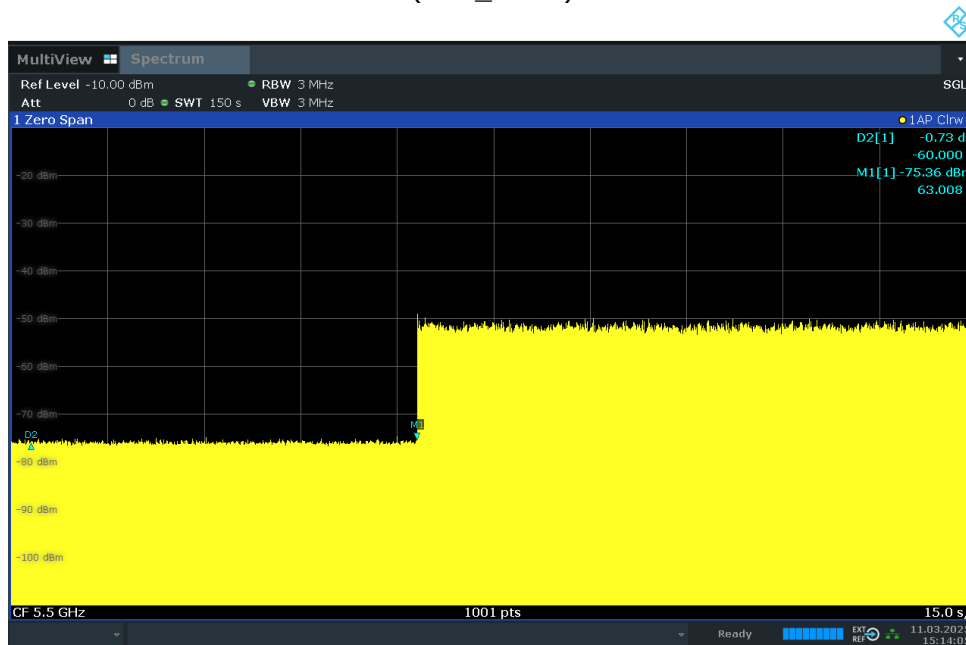
Ambient temperature: 22 °C
 Air Pressure: 995 hPa
 Humidity: 32 %

Radio Technology	TX Frequency [MHz]	Radar Test Signal #	Detected?	Transmissions within 150 s?
WLAN a	5500	Type 0 @ 0 to 6 s	Yes	No
WLAN a	5500	Type 0 @ 54 to 60 s	Yes	No

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

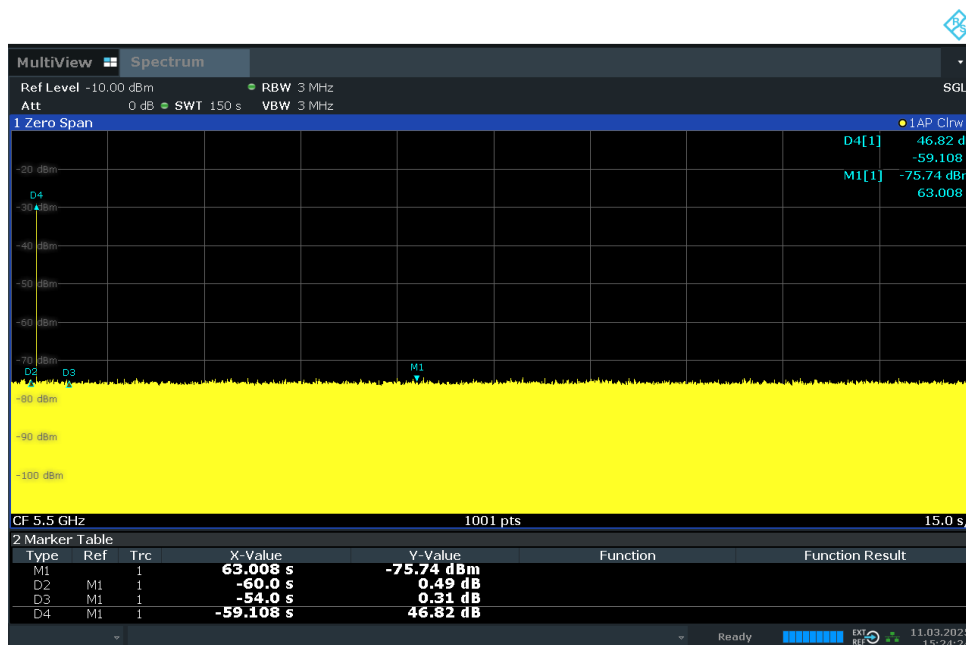
5.10.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN a
(S01_AC01)



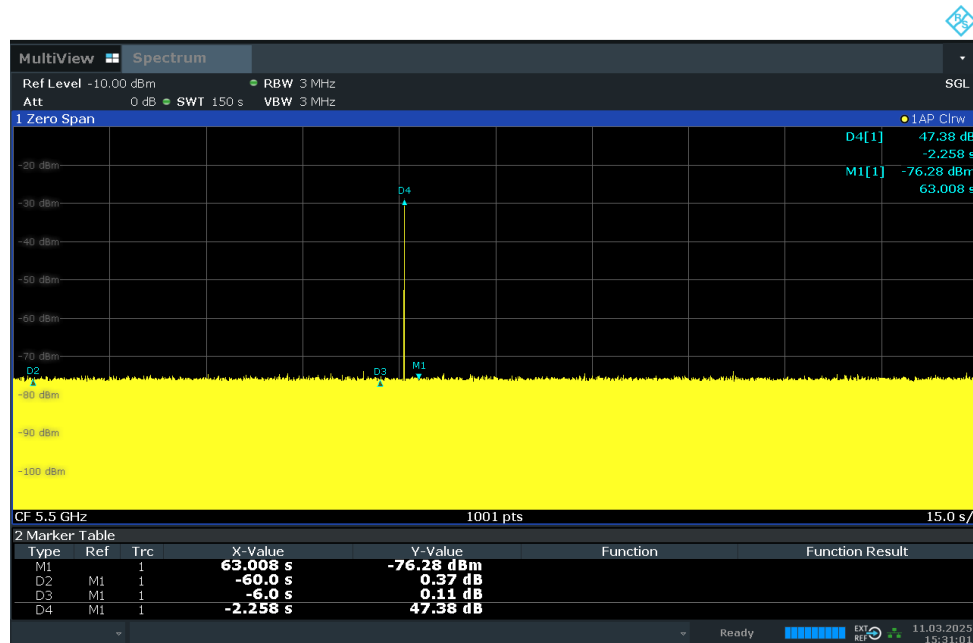
15:14:05 11.03.2025

Startup Time (M1 = startup time, D2 = beginning of CAC phase (startup - 60 s = 3.008s after activation))



15:24:25 11.03.2025

Pulse at beginning of CAC time (D4 = radar pulse at 0.9 s after CAC startup)



15:31:02 11.03.2025

Pulse at end of CAC time (D4 = radar pulse at 57.7 s after CAC startup)

5.10.5 TEST EQUIPMENT USED

- R&S TS8997

5.11 DYNAMIC FREQUENCY SELECTION - IN-SERVICE MONITORING FOR CHANNEL MOVE TIME, CHANNEL CLOSING TRANSMISSION TIME AND NON-OCCUPANCY PERIOD

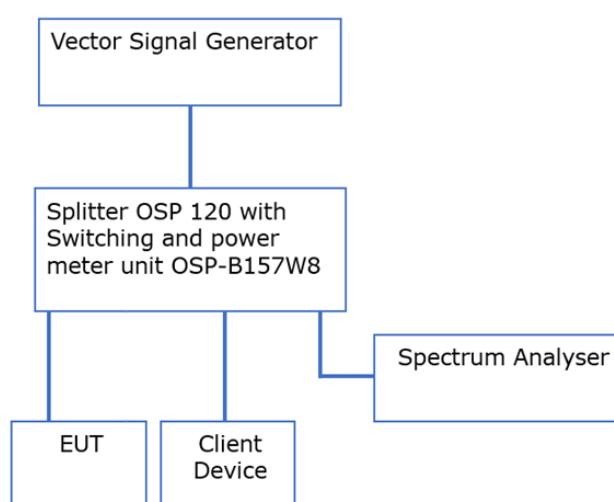
Standard **FCC Part 15 Subpart E**

The test was performed according to:

KDB 905462

5.11.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up in a shielded room for the DFS measurements.



The Master and Client EUT were powered and connected to each other at maximum supported bandwidth. Afterwards the script for traffic generation was started.

With established connection, a radar pulse of type 0 was send from the radar pulse generator. At the same time the spectrum analyser is triggered by the radar signal generator and a trace is recorded:

Analyzer settings:

- Resolution Bandwidth (RBW): 3 MHz
- Video Bandwidth (VBW): 3 MHz
- Trace: Clear/Write
- Sweeps: Single Sweep
- Sweep time: 20 s
- Detector: Peak
- Trigger: External

In addition to the plot, also the trace data is recorded to calculate the Channel Closing Time.

Afterwards the test is repeated with a sweep time of 32 minutes to monitor the Non-occupancy period.

5.11.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart E, §15.407 (h) (2) (iii)

Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

FCC Part 15, Subpart E, §15.407 (h) (2) (iii)

Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

Limits according KDB 905462 D02 UNII DFS Compliance Procedures New Rules

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.	

5.11.3 TEST PROTOCOL

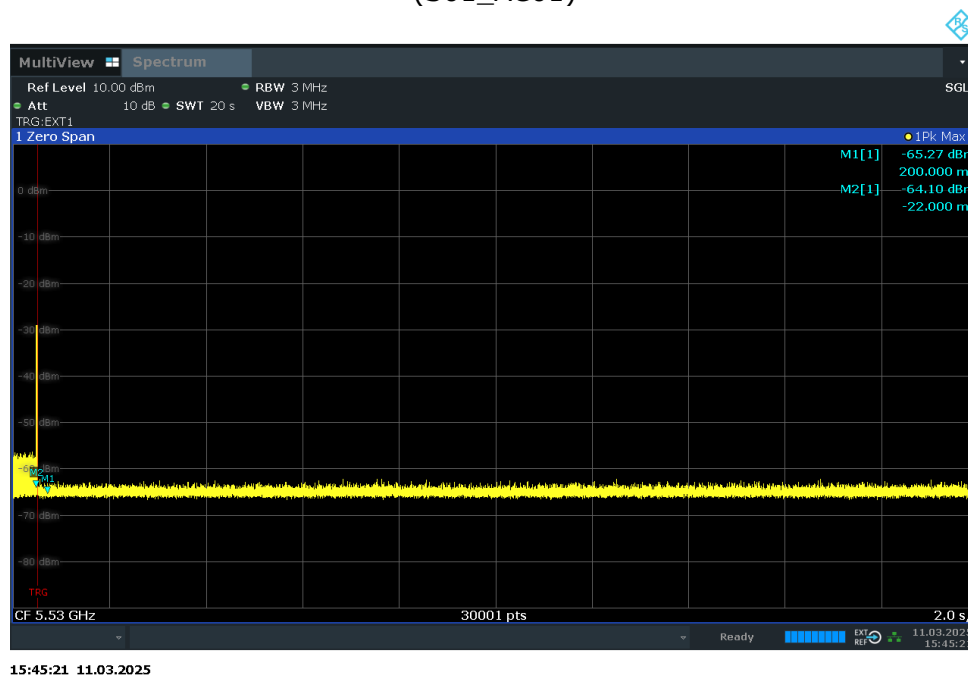
Ambient temperature: 22 °C
 Air Pressure: 995 hPa
 Humidity: 32 %

Operational Mode	Radio Technology	TX Frequency [MHz]	Radar Test Signal #	Channel Closing Transmission Time following the first 200 ms[ms]	Limit [ms]	Channel Move Time [s]	Limit [s]	Transmissions in Non Occupancy Period?
Master	WLAN ax 80 MHz	5510	Type 0	0.0	60	0.046	10	None
Client without Radar Detection	WLAN ax 80 MHz	5510	Type 0	0.0	60	0	10	Not Performed

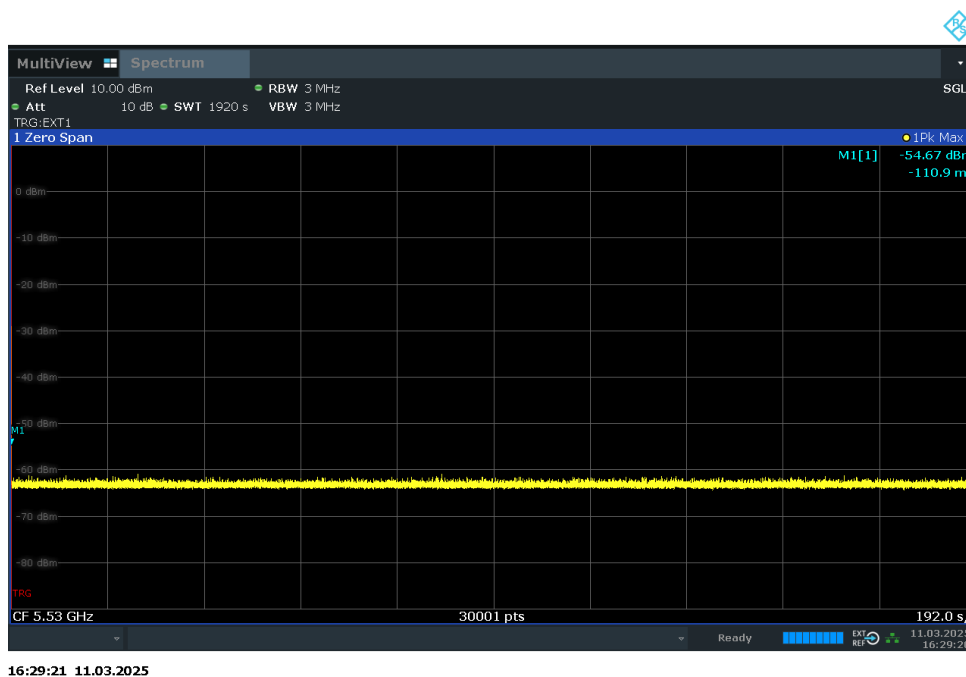
Remark: Please see next sub-clause for the measurement plot.

5.11.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN ax 80 MHz
 (S01_AC01)

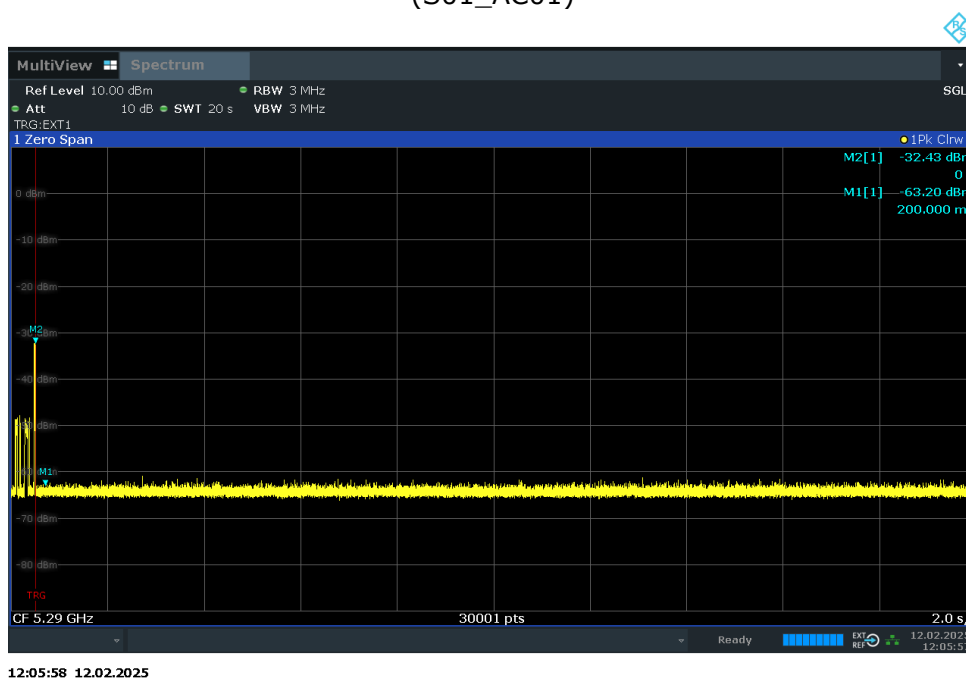


Channel Move Time Master



Non-Occupancy Period Master

Radio Technology = WLAN ax 80 MHz
(S01_AC01)



Channel Move Time Client

5.11.5 TEST EQUIPMENT USED

- R&S TS8997

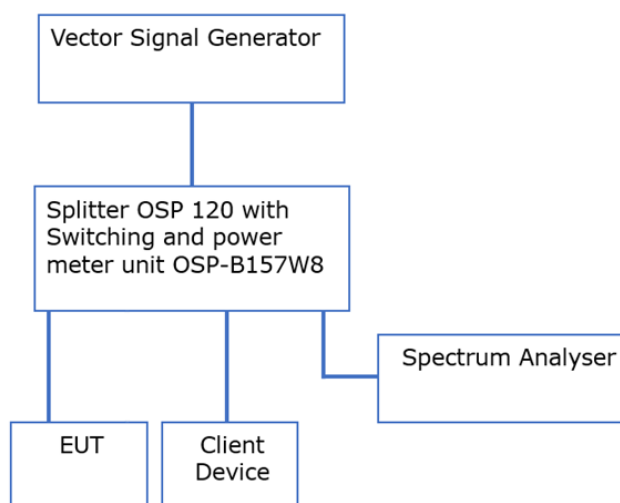
5.12 DYNAMIC FREQUENCY SELECTION - STATISTICAL PERFORMANCE CHECK

Standard **FCC Part 15 Subpart E**

The test was performed according to:
KDB 905462

5.12.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up in a shielded room for the DFS measurements.



The Master and Client EUT were powered and connected to each other at maximum supported bandwidth. Afterwards the script for traffic generation was started.

Using command line commands provided by the customer, the device's channel move functionality was deactivated and non-occupancy period reduced to 1 s to reduce testing time.

Detection of radar pulse is monitored by console interface.

30 unique pulses of radar type 1 to 6 are send while for each type 10 pulses are send at the lower end of the 99 % detection BW, 10 pulses at the higher end of the detection BW and 10 are send mid channel.

For each send pulse detection is recorded.

Testing is repeated for all supported channel bandwidths.

5.12.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart E, §15.407 (h) (2)

U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is –64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is –62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna.

Limits according KDB 905462 D02 UNII DFS Compliance Procedures New Rules

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{PRI_{\mu sec}} \right) \right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

5.12.3 TEST PROTOCOL

Ambient temperature: 25 °C
 Air Pressure: 1014 hPa
 Humidity: 40 %

Radio Technology	TX Frequency [MHz]	Radar Test Signal #	Number of send pulses	Number of detected pulses	Successful Detection Percentage [%]	Limit [%]	Margin to Limit [%]
WLAN a	5500	Type 1	30	30	100	60	40
WLAN a	5500	Type 2	30	30	100	60	40
WLAN a	5500	Type 3	30	30	100	60	40
WLAN a	5500	Type 4	30	30	100	60	40
WLAN a	5500	Aggregate 1-4	120	120	100	80	20
WLAN a	5500	Type 5	30	30	100	80	20
WLAN a	5500	Type 6	30	30	100	70	30
WLAN ax 40 MHz	5510	Type 1	30	30	100	60	40
WLAN ax 40 MHz	5510	Type 2	30	30	100	60	40
WLAN ax 40 MHz	5510	Type 3	30	30	100	60	40
WLAN ax 40 MHz	5510	Type 4	30	30	100	60	40
WLAN ax 40 MHz	5510	Aggregate 1-4	120	120	100	80	20
WLAN ax 40 MHz	5510	Type 5	30	30	100	80	20
WLAN ax 40 MHz	5510	Type 6	30	30	100	70	30
WLAN ax 80 MHz	5530	Type 1	30	30	100	60	40
WLAN ax 80 MHz	5530	Type 2	30	27	90	60	30
WLAN ax 80 MHz	5530	Type 3	30	27	90	60	30
WLAN ax 80 MHz	5530	Type 4	30	18	60	60	0
WLAN ax 80 MHz	5530	Aggregate 1-4	120	102	85	80	5
WLAN ax 80 MHz	5530	Type 5	30	29	96.7	80	16.7
WLAN ax 80 MHz	5530	Type 6	30	30	100	70	30

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