

(1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\text{Log}(30m/3m)$$

(3) Limit for this EUT

All the emissions appearing within 15.205 and RSS-Gen section 8.10 restricted frequency bands shall not exceed the limits shown in 15.209 and RSS-Gen section 8.9, all the other emissions shall be at least 20dB below the fundamental emissions or comply with 15.209 limits and RSS-Gen section 8.9 limits.

13.3. Test Procedure

Below 30 MHz:

The setting of the spectrum Analyzer

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of 1 meter height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KdB 414788.

Below 1 GHz and above 30 MHz:

The setting of the spectrum Analyzer

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1 GHz:

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a band rejection filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209 and RSS-Gen section.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for AVG measurements. For the Duty Cycle please refer to clause 8.1.ON TIME AND DUTY CYCLE.

7. Restriction band: Investigated frequency range from 5.15-5.25 GHz, 5250-5350 GHz, 5470-5725 GHz, 5.725-5.85 GHz.

All restriction band should comply with 15.209 and RSS-Gen section 8.9, other emission should be at least 20 dB below the fundamental.

Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT does not support simultaneous transmission.

Note 3: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

13.4. Test Result

PASS. (See below detailed test result)

All the emissions except fundamental emission from 9kHz to 40GHz were comply with 15.209 limit and RSS-Gen section 8.9 Limis.

Note 1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz, so the final test was performed with frequency range from 30 MHz to 40 GHz and recorded in below.

Note 2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in 11AC40 mode.

Note 3: For below test data, when the limit tabular marked “/” means this frequency point is the fundamental emission and no need comply with this limit.

Note 4: As specified in 15.407(b) and RSS-247 section 7.3, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4) and RSS-247 section 7.3.4.4). However, an out-of-band emission that complies with both the average and peak limits of 15.209 and RSS-Gen section 8.9 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit

Note 5: For emissions Above 1 GHz, all mode have been tested, 11AC40 mode is worse case and recorded in report.

Note 6: For emissions Above 18 GHz, the all the emission is ambient noise, so only show the worse case channel and recorded in report.

For upper edge of the 26 dB bandwidth and 5350 MHz unwanted emission data reference bellow:

Test Mode	Ant.	Channel (MHz)	Power (dBm)	Frequency Range	Frequency (MHz)	Result (dBm)	Limt (dBm)	Verdict
11A	Ant1	5180	15.59	5191.72~5350	5193.49	-15.27	≤-10.41	PASS
	Ant2	5180	14.75	5191.96~5350	5193.79	-15.70	≤-11.25	PASS
	Ant1	5240	12.66	5252.12~5350	5344.94	-36.62	≤-13.34	PASS
	Ant2	5240	11.54	5251.72~5350	5253.43	-35.55	≤-14.46	PASS
11N20MIMO	Ant1	5180	13.96	5191.28~5350	5191.67	-12.92	≤-12.04	PASS
	Ant2	5180	12.73	5191.4~5350	5192.40	-14.02	≤-13.27	PASS
	Ant1	5240	10.37	5251.64~5350	5251.64	-35.40	≤-15.63	PASS
	Ant2	5240	10.08	5250.88~5350	5251.04	-31.94	≤-15.92	PASS
11N40MIMO	Ant1	5190	14.09	5209.76~5350	5210.01	-17.37	≤-11.91	PASS
	Ant2	5190	13.10	5210~5350	5210.45	-22.47	≤-12.9	PASS
	Ant1	5230	13.53	5249.76~5350	5249.88	-20.02	≤-12.47	PASS
	Ant2	5230	12.18	5249.76~5350	5249.95	-19.42	≤-13.82	PASS
11AC20MIMO	Ant1	5180	14.00	5192.28~5350	5193.68	-16.53	≤-12	PASS
	Ant2	5180	13.58	5191.84~5350	5193.61	-15.35	≤-12.42	PASS
	Ant1	5240	10.77	5252.08~5350	5254.96	-34.20	≤-15.23	PASS
	Ant2	5240	9.62	5251.24~5350	5251.27	-32.69	≤-16.38	PASS
11AC40MIMO	Ant1	5190	13.34	5210.48~5350	5210.63	-27.96	≤-12.66	PASS
	Ant2	5190	12.49	5210.08~5350	5210.30	-21.14	≤-13.51	PASS
	Ant1	5230	14.11	5250~5350	5250.02	-19.44	≤-11.89	PASS
	Ant2	5230	12.04	5249.44~5350	5249.76	-18.23	≤-13.96	PASS
11AC80MIMO	Ant1	5210	12.69	5249.68~5350	5249.78	-28.22	≤-13.31	PASS
	Ant2	5210	11.94	5249.36~5350	5249.41	-26.21	≤-14.06	PASS
11AX20MIMO	Ant1	5180	13.56	5191.6~5350	5192.49	-21.70	≤-12.44	PASS
	Ant2	5180	12.71	5191.44~5350	5192.44	-26.32	≤-13.29	PASS
	Ant1	5240	10.95	5250.48~5350	5250.55	-19.84	≤-15.05	PASS
	Ant2	5240	10.15	5250.16~5350	5250.35	-17.86	≤-15.85	PASS
11AX40MIMO	Ant1	5190	13.74	5209.6~5350	5209.74	-16.20	≤-12.26	PASS
	Ant2	5190	11.84	5209.6~5350	5209.61	-15.03	≤-14.16	PASS
	Ant1	5230	13.72	5249.6~5350	5249.65	-15.40	≤-12.28	PASS
	Ant2	5230	13.32	5249.6~5350	5249.60	-15.79	≤-12.68	PASS
11AX80MIMO	Ant1	5210	9.80	5250~5350	5330.83	-35.91	≤-16.2	PASS
	Ant2	5210	9.73	5250.16~5350	5250.41	-31.35	≤-16.27	PASS

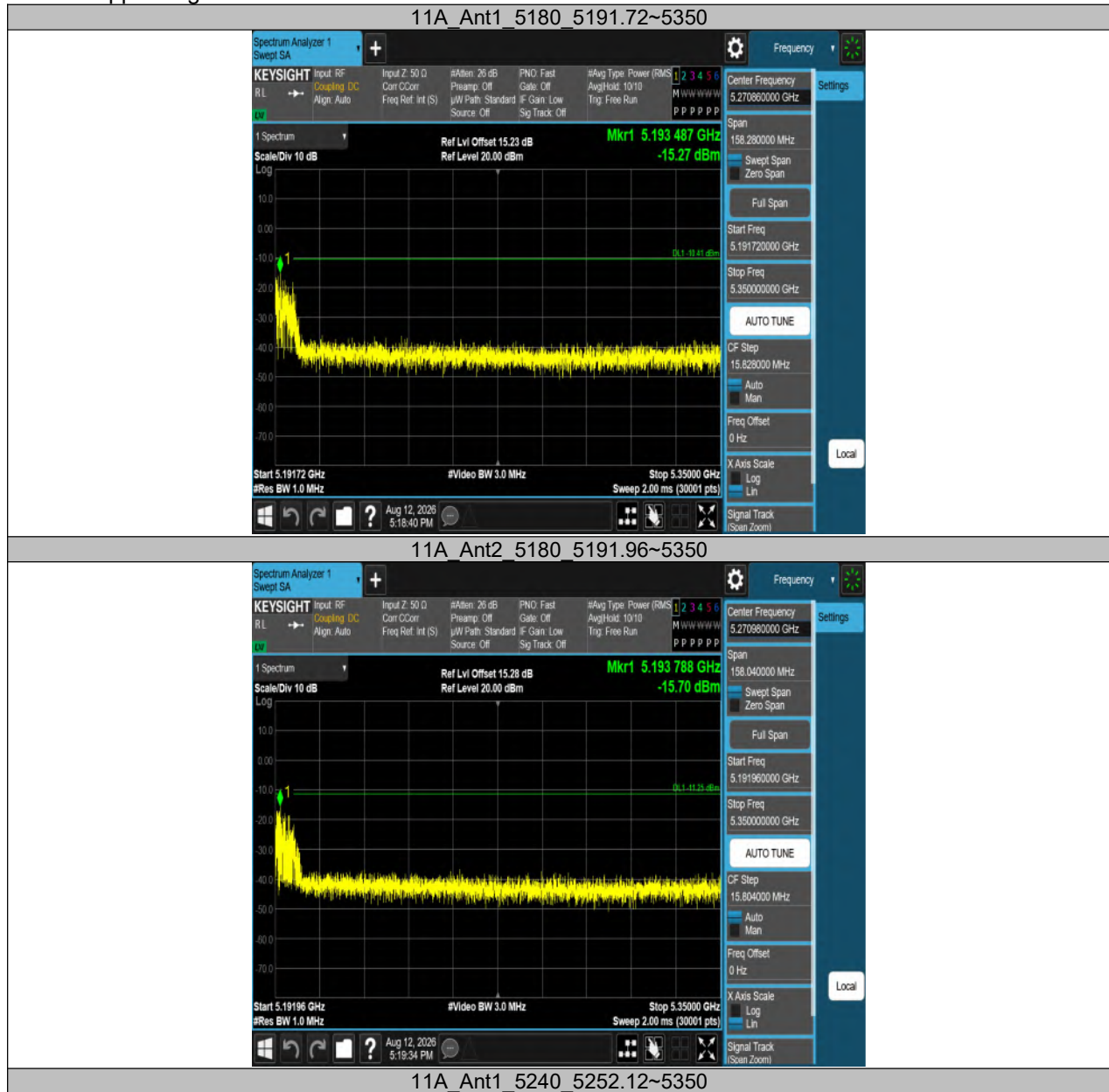
Note: This test only for 26dB bandwidth fall in 5250MHz ~ 5350MHz mode, So this is the conducted testing method used in this test and Diagram of test setup same as section 8.1.

13.5. Original Test Data

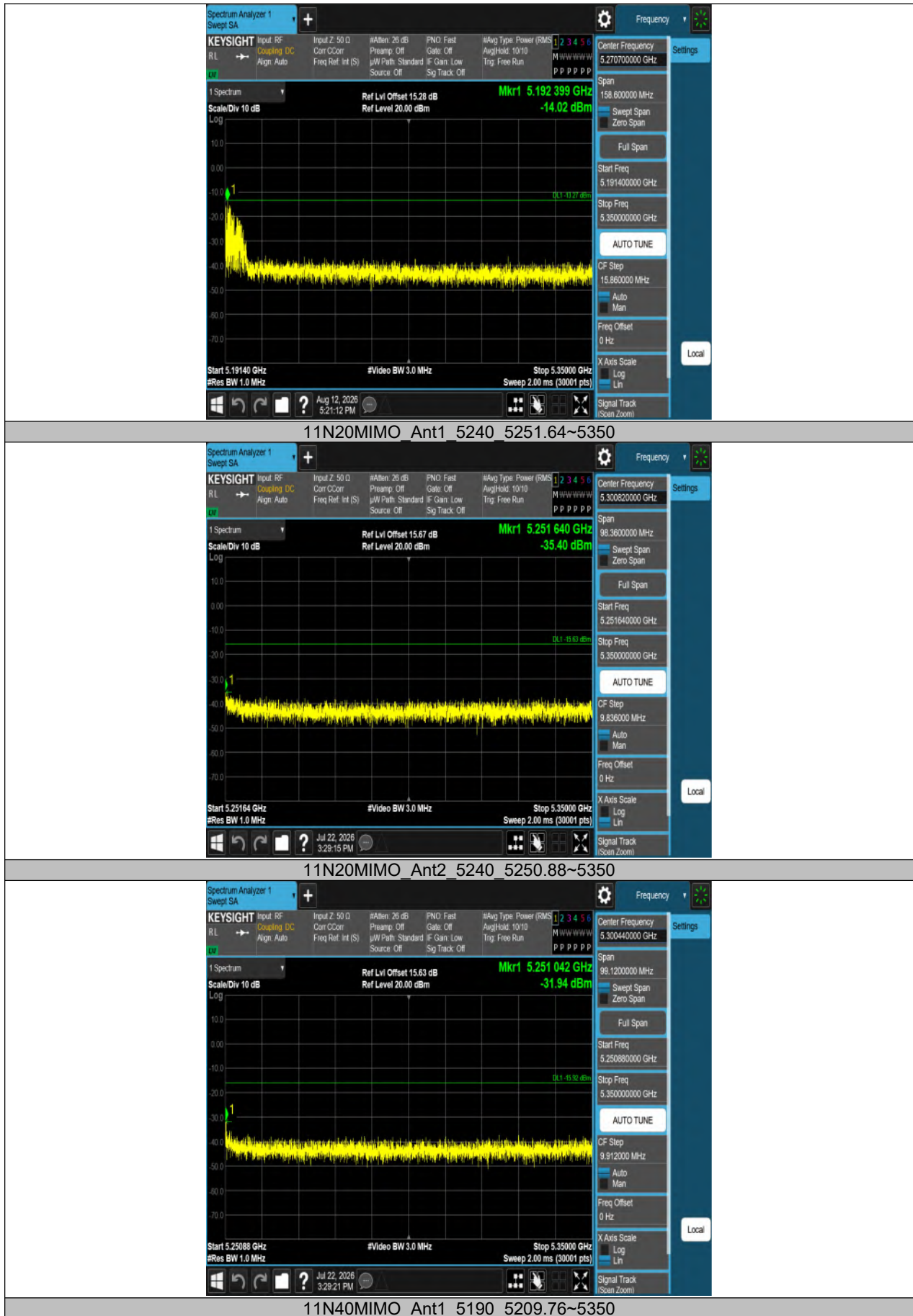
Below 1 GHz and above 30 MHz test data Refer to appendix A

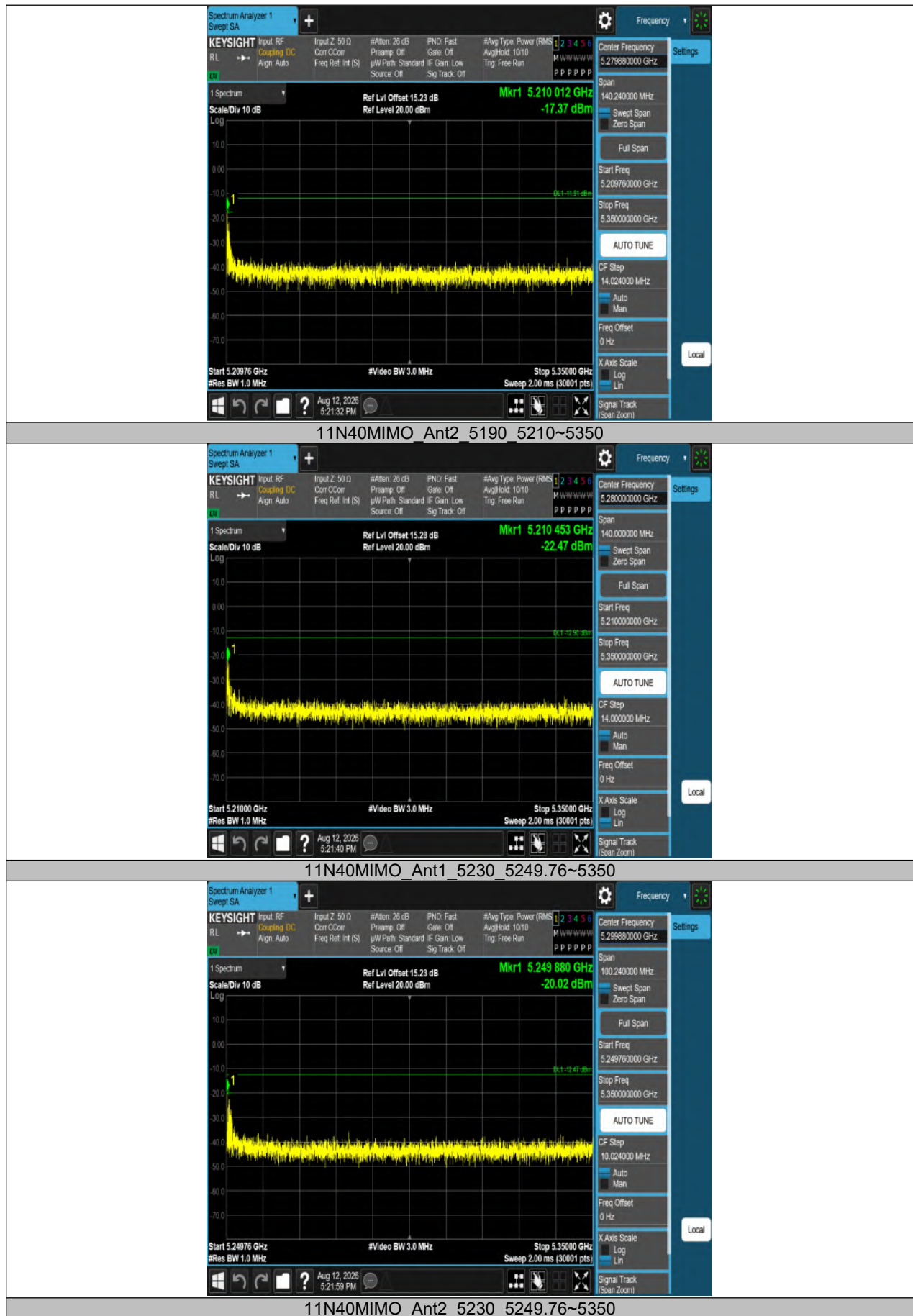
Above 1 GHz test data Refer to appendix B

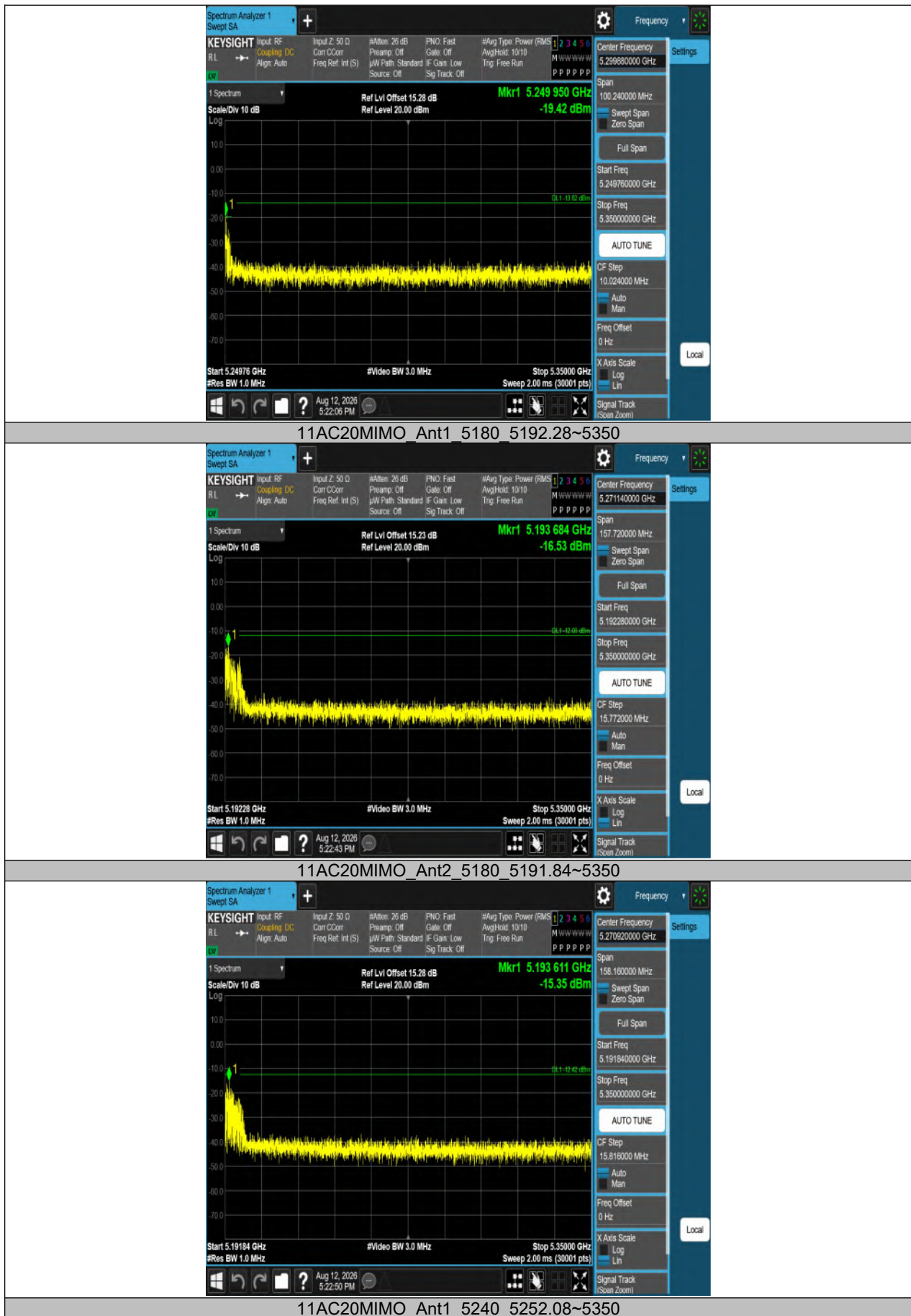
For upper edge of the 26 dB bandwidth and 5350 MHz unwanted emission reference below:

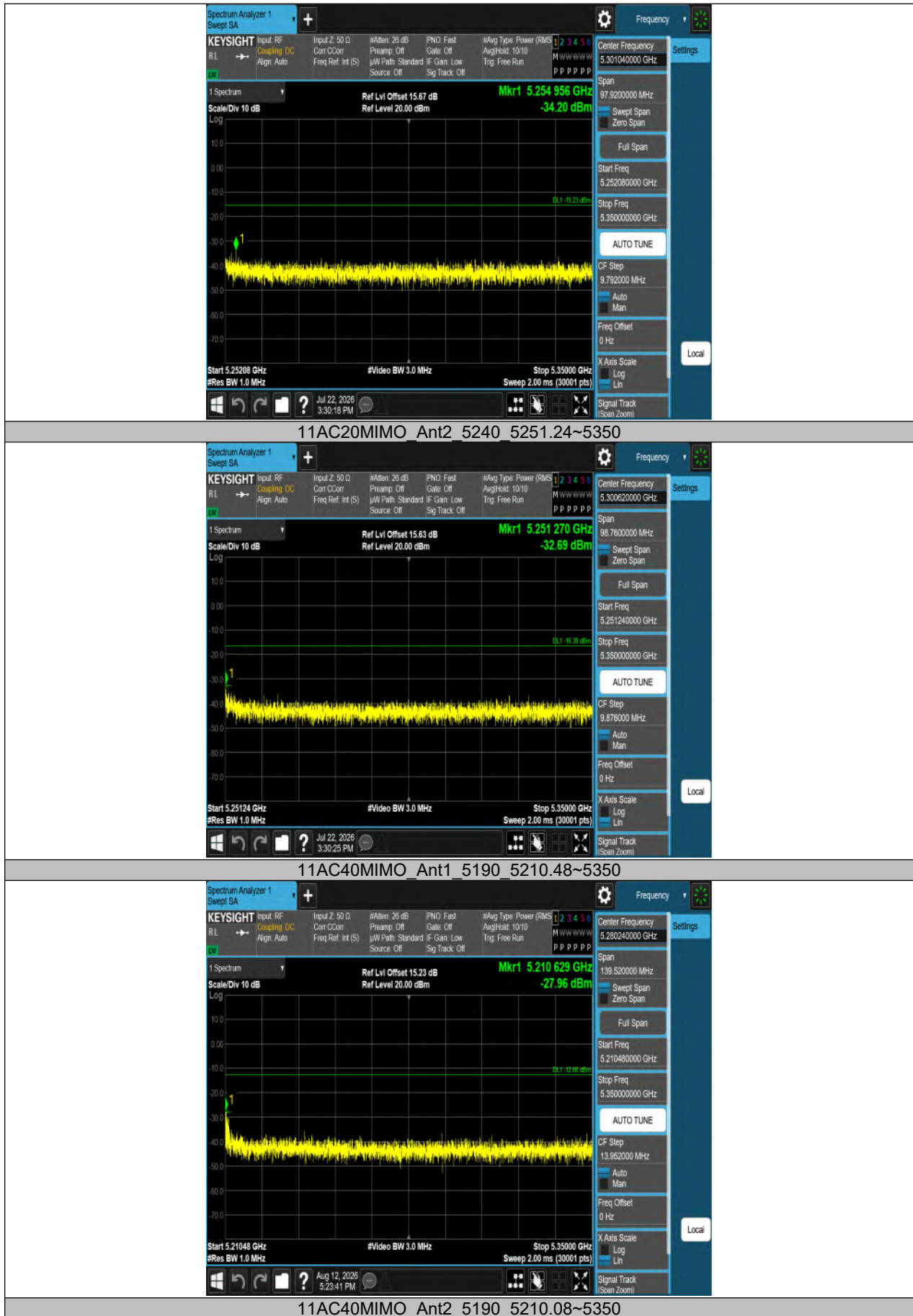


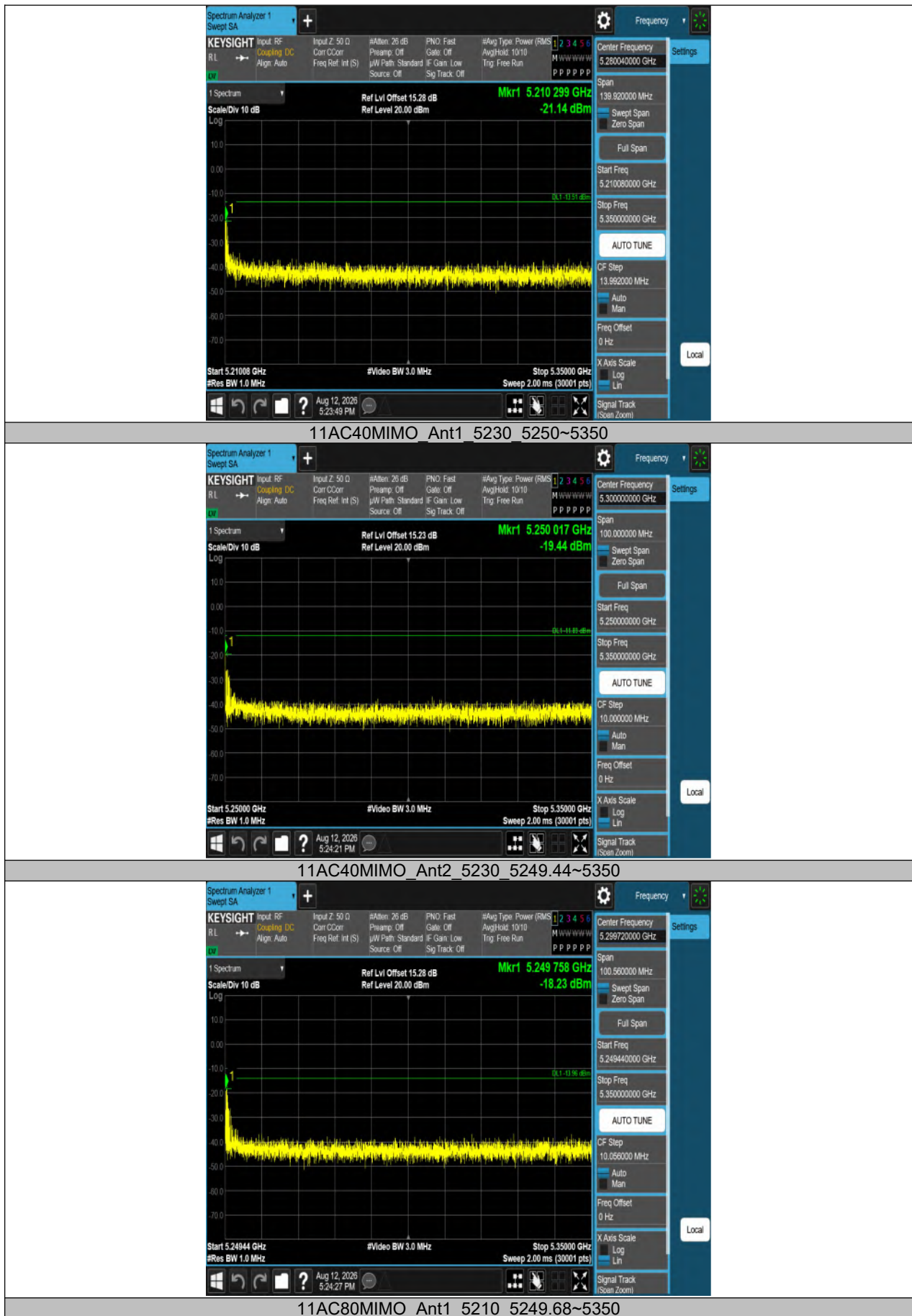




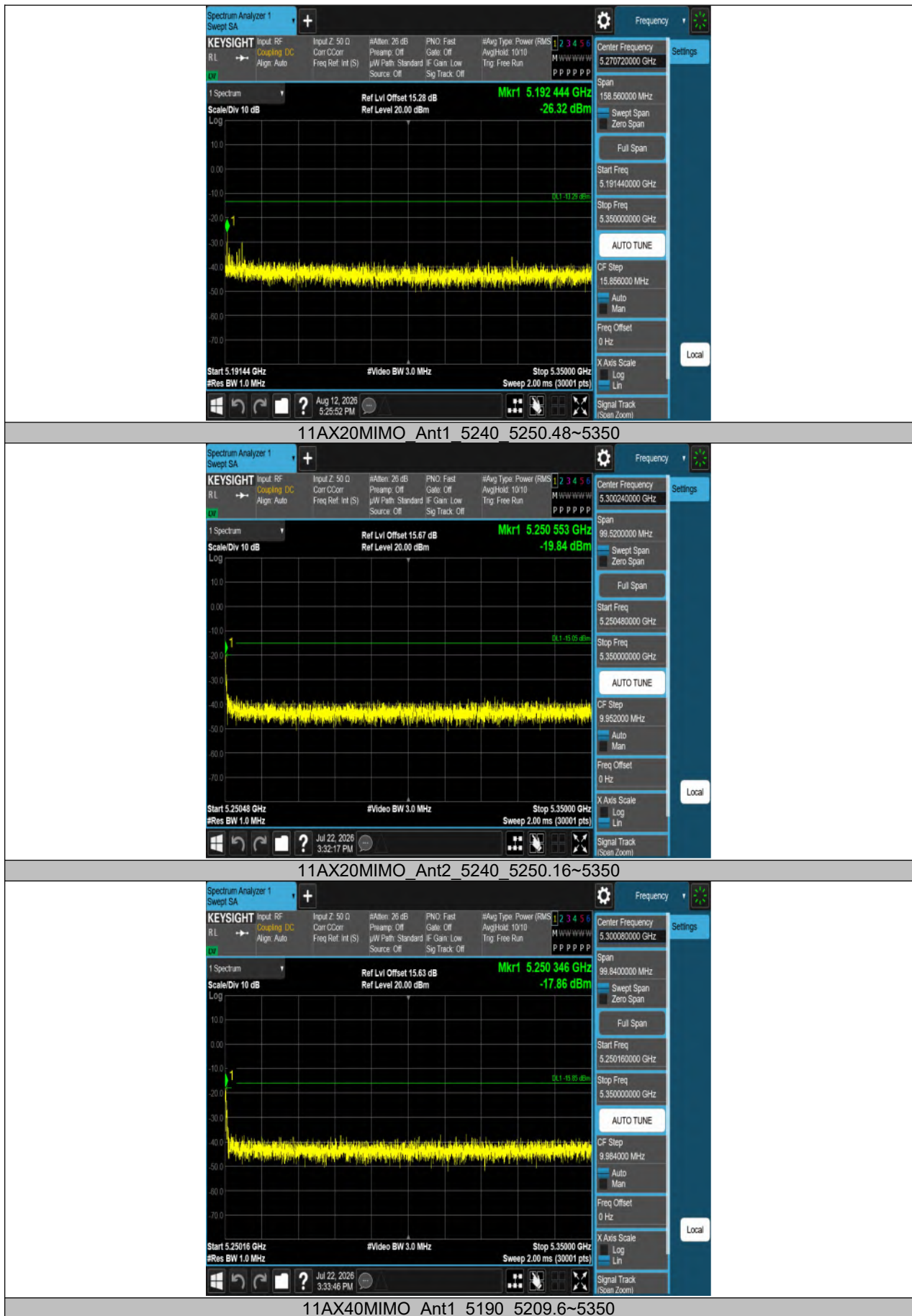










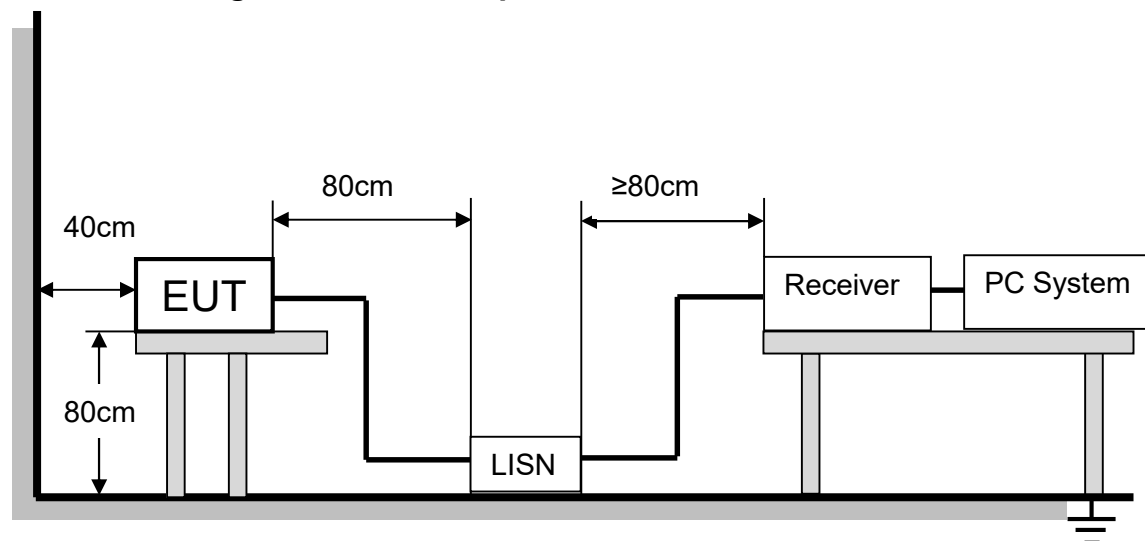






14. AC Power Line Conducted Emissions

14.1. Block Diagram of Test Setup



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

14.2. Limits

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8.

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

14.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

14.4. Test Result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded worse case.

Note3: Measurement=Reading Level + Correct Factor

Over=Measurement - Limit

14.5. Original Test Data

AC Power Line Conducted Emission Test Data Refer to appendix C

15. Dynamic Frequency Selection

15.1. Applicability of DFS Requirements

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	☐ Master	☒ Client Without Radar Detection	☐ Client with Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	☐ Master Device or Client with Radar Detection	☒ Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	☐ Master Device or Client with Radar Detection	☒ Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

15.2. Limit

(1) DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the

test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KdB Publication 662911 D01.

(2) DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel 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.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

For 5600-5650MHz:

IF Device with Radar Detection, the CAC need comply ETSI EN 301 893 V2.2.1 Annex D requirements.

Table D.1: DFS requirement values

Parameter	Value
Channel Availability Check (CAC) time	60 s (see note 1)
Minimum off-channel CAC time	6 minutes (see note 2)
Maximum off-channel CAC time	4 hours (see note 2)
Channel move time	10 s
Channel closing transmission time	1 s
Non-occupancy period	30 minutes
NOTE 1: For channels whose nominal channel bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the CAC time shall be 10 minutes.	
NOTE 2: For channels whose nominal channel bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the off-channel CAC time shall be within the range 1 hour to 24 hours.	

Table D.5: Detection probability

Parameter	Detection probability (P_d) (see note)	
	Channels whose nominal channel bandwidth falls partly or completely within the 5 600 MHz to 5 650 MHz band	Other channels
CAC, off-channel CAC	99,99 %	60 %
In-service monitoring	60 %	60 %
NOTE: P_d gives the probability of detection per radar test signal and represents a minimum level of detection performance under defined conditions.		

15.3. Parameters of Radar Test Waveform

This section provides the parameters for required test waveforms, minimum percentage of successful detection, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

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	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B			
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. 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					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. Test aggregate is average of the percentage of successful detections of short pulse radar types 1-4

For 5600-5650MHz:

Table D.3: Parameters of the reference DFS test signal

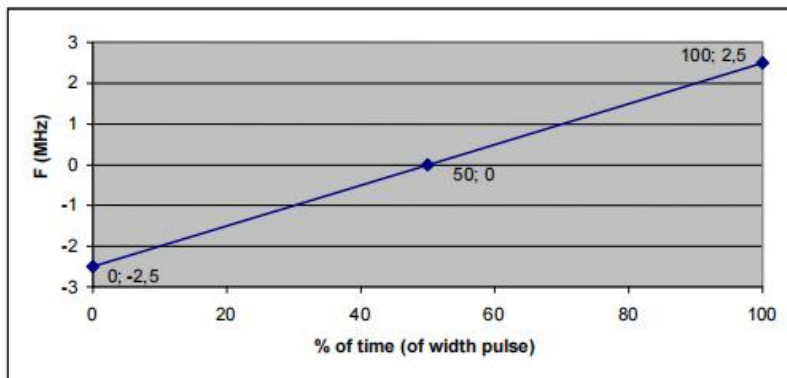
Pulse width W (μs)	PRF (PPS)	Pulses Per Burst (PPB)
1	700	18

Table D.4: Parameters of radar test signals

Radar test signal (see note 1 to note 3)	Pulse width W (μs)		PRF (PPS)		Number of different PRFs	PPB for each PRF (see note 5)
	Min	Max	Min	Max		
1	0,5	5	200	1 000	1	10 (see note 6)
2	0,5	15	200	1 600	1	15 (see note 6)
3	0,5	15	2 300	4 000	1	25
4	20	30	2 000	4 000	1	20
5	0,5	2	300	400	2/3	10 (see note 6)
6	0,5	2	400	1 200	2/3	15 (see note 6)

NOTE 1: Radar test signal 1 to signal 4 are signals with constant PRF (see figure D.1). These radar test signals are intended to simulate also radars using a packet-based staggered PRF (see figure D.2).

NOTE 2: Radar test signal 4 is a modulated radar test signal. The modulation is a chirp modulation with a $\pm 2,5$ MHz frequency deviation as shown in the following graph.



NOTE 3: Radar test signal 5 and radar test signal 6 are signals with single pulse-based staggered PRF using 2 or 3 different PRF values. For radar test signal 5, the difference between the PRF values chosen shall be between 20 PPS and 50 PPS. For radar test signal 6, the difference between the PRF values chosen shall be between 80 PPS and 400 PPS (see figure D.3).

NOTE 4: Apart from off-channel CAC testing, the radar test signals shall only contain a single burst of pulses (see figure D.1, figure D.3 and figure D.4). For off-channel CAC testing, repetitive bursts shall be used for the total duration of the test (see figure D.2 and figure D.5 (see also clause 4.2.6.2.3, clause 5.4.8.2.1.4.2 and clause 5.4.8.2.1.4.3)).

NOTE 5: The total number of pulses in a burst is equal to the number of pulses for a single PRF multiplied by the number of different PRFs used.

NOTE 6: For the CAC and off-channel CAC requirements, the minimum number of pulses (for each PRF) for any of the radar test signals to be detected in the band 5 600 MHz to 5 650 MHz shall be 18.

15.4. Calibration of Radar Waveform

Radar Waveform Calibration Procedure:

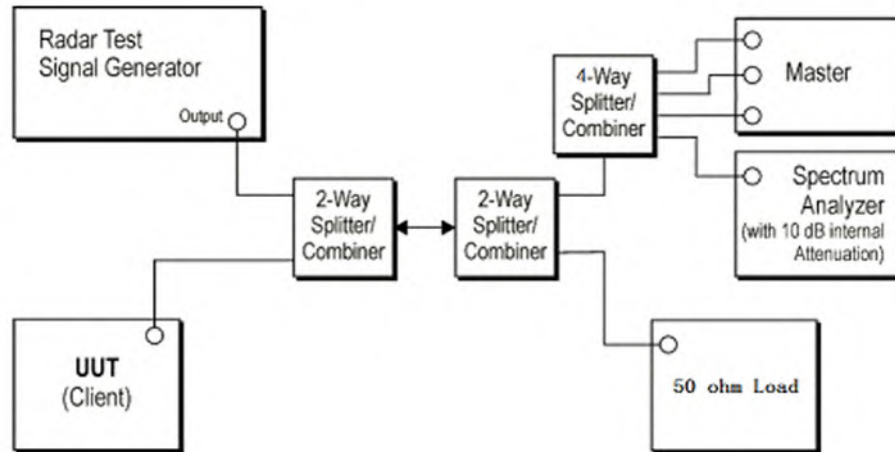
A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master

The interference Radar Detection Threshold Level is $-62\text{dBm} + 0\text{dBi} + 1\text{dB} = -61\text{dBm}$ that had been taken into account the output power range and antenna gain.

The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB.

The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was $-62\text{dBm} + 0\text{dBi} + 1\text{dB} = -61\text{dBm}$. Capture the spectrum analyzer plots on short pulse radar waveform.

Conducted Calibration Setup:

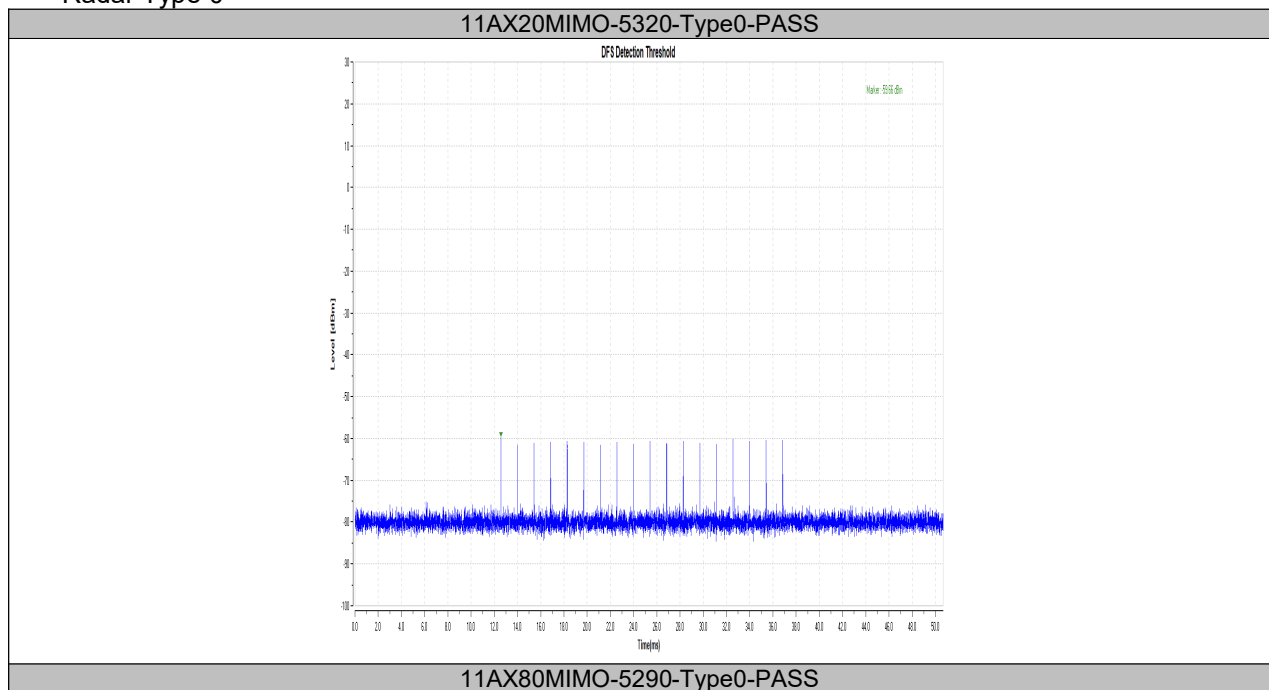


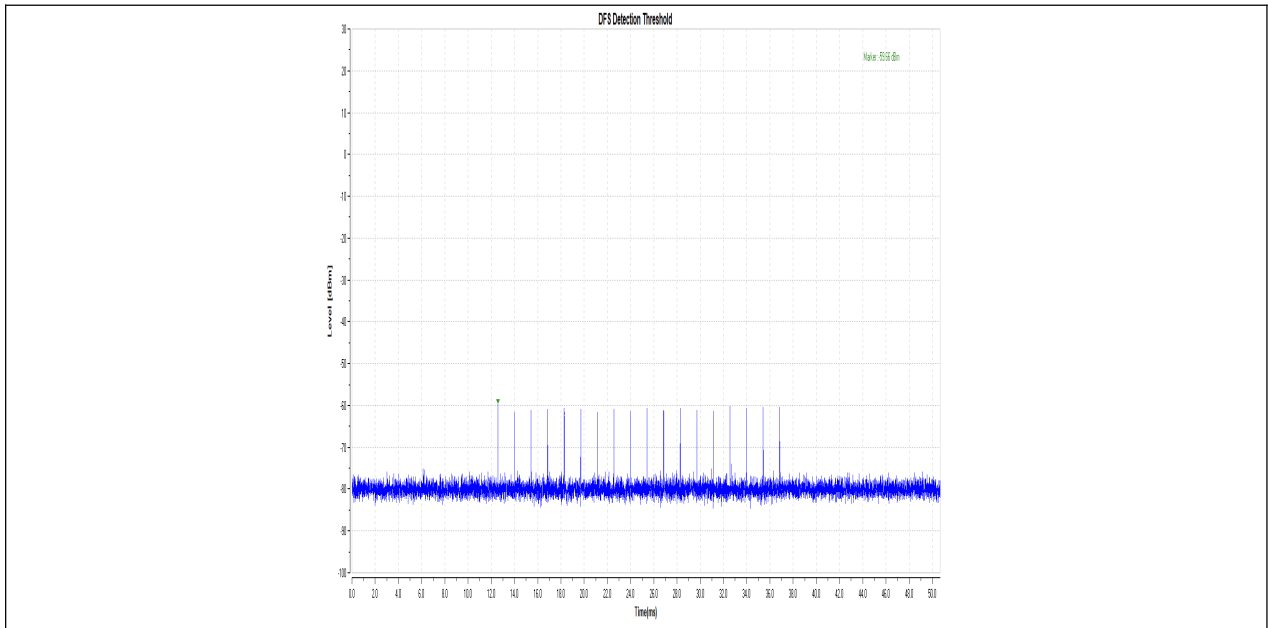
Note: 1. Use the software "Web" to set the frequency channel.

2. EUT is not support TPC and not with Radar detection.

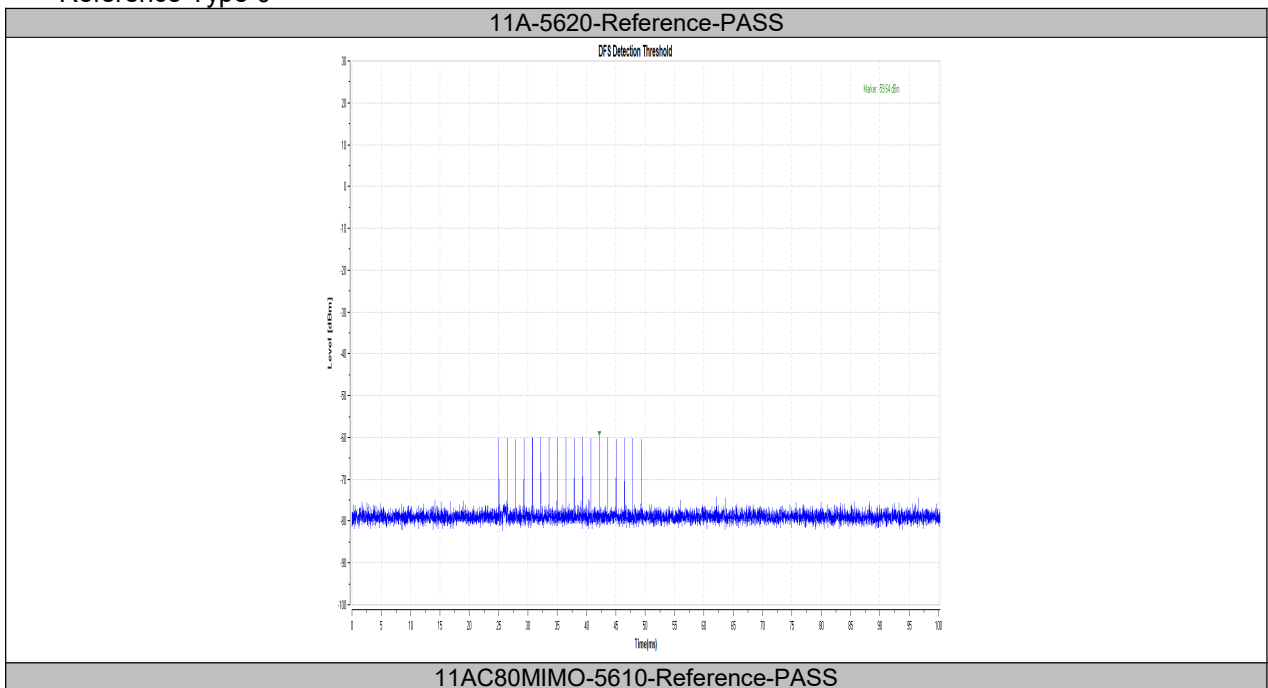
Radar Waveform Calibration Result:

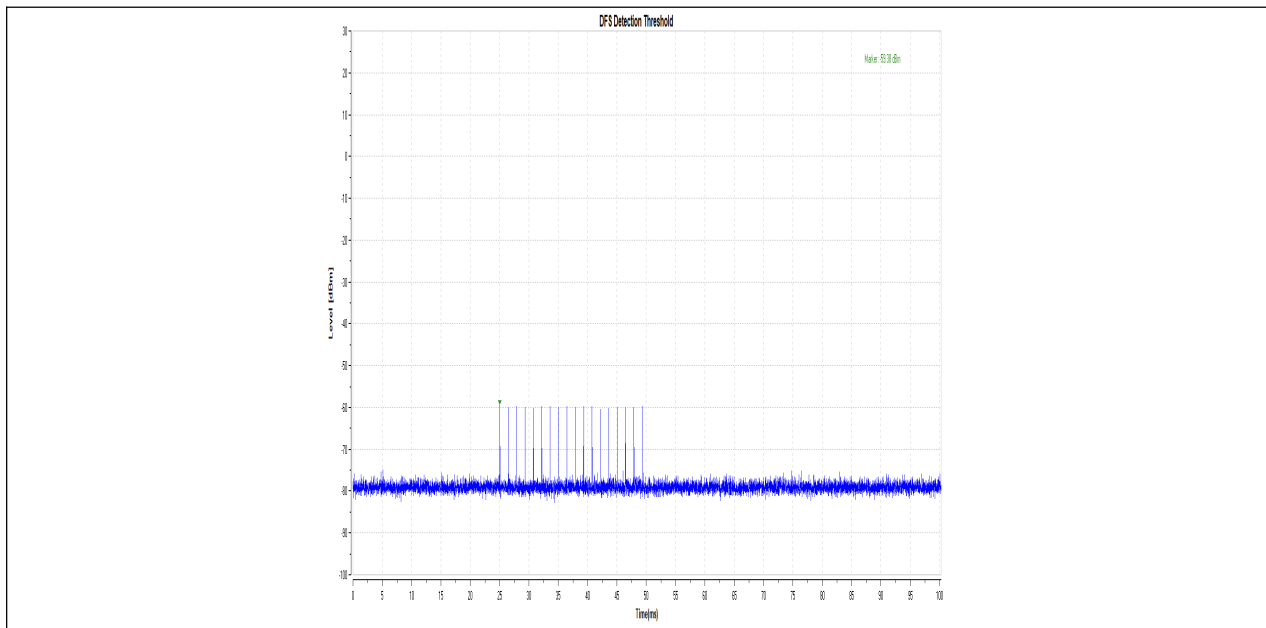
Radar Type 0





For 5600-5650MHz:
Reference Type 0





15.5. Channel Closing Transmission Time, Channel Move Time and Non-Occupancy Period

Block diagram of test setup Test Procedure:

The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.

The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device.

A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.

EUT will associate with the master at channel. The file “iperf.exe” specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Test Software in order to properly load the network for the entire period of the test.

When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.

Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type.

Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: $Dwell (0.3ms) = S (12000ms) / B (4000)$; where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: $C (ms) = N \times Dwell (0.3ms)$; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.

Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

For 5600-5650MHz:

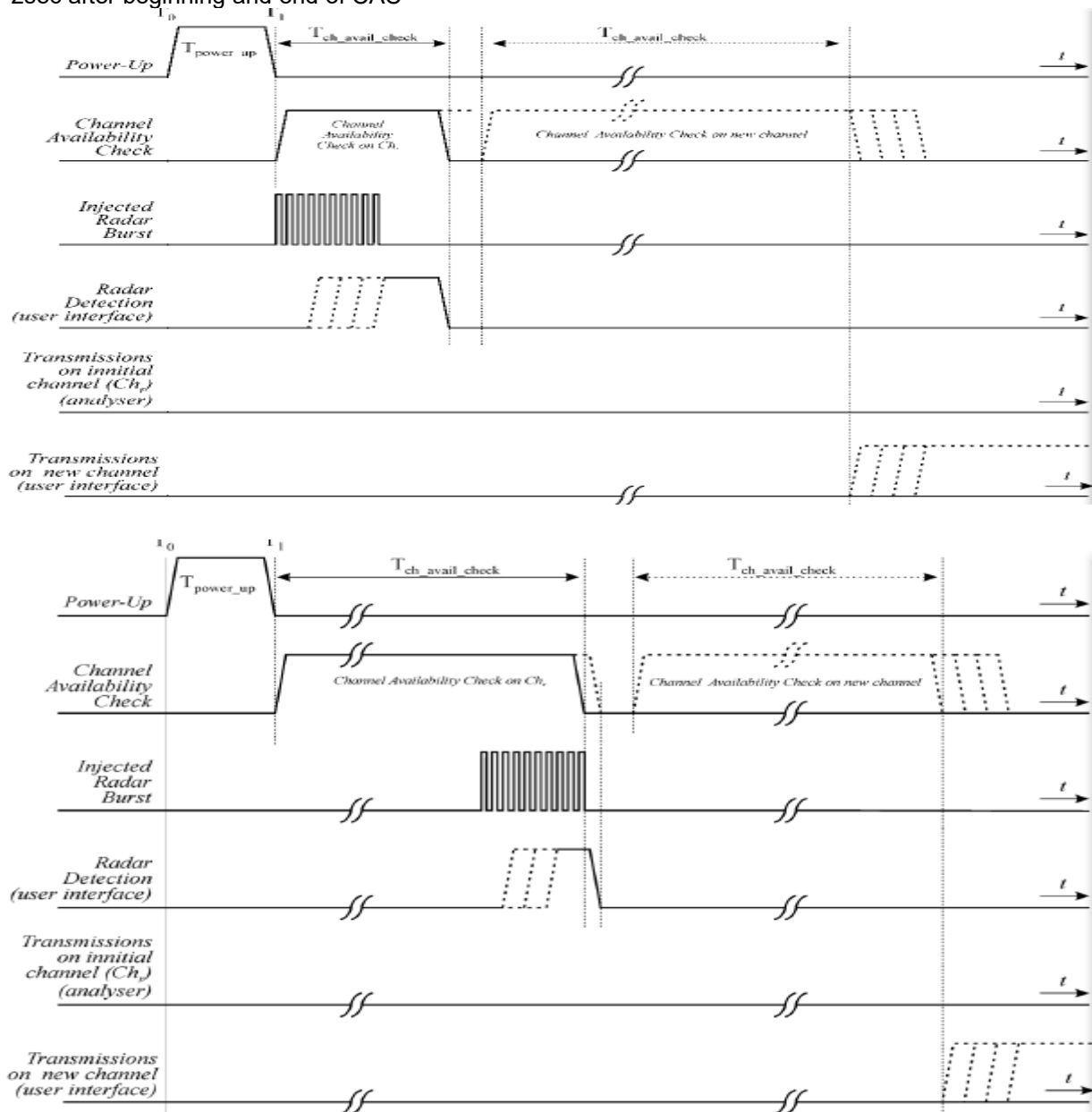
Channel Availability Check (CAC)

The Channel Availability Check (CAC) is defined as a mechanism by which an RLAN device checks channels for the presence of radar signals.

This mechanism is used for identifying Available Channels.

There shall be no transmissions by the device within the channels being checked during this process.

If no radars have been detected on a channel, then that channel becomes an Available Channel. Radar detection at the beginning and end of CAC (load reference radar waveform), radar injected within 2sec after beginning and end of CAC

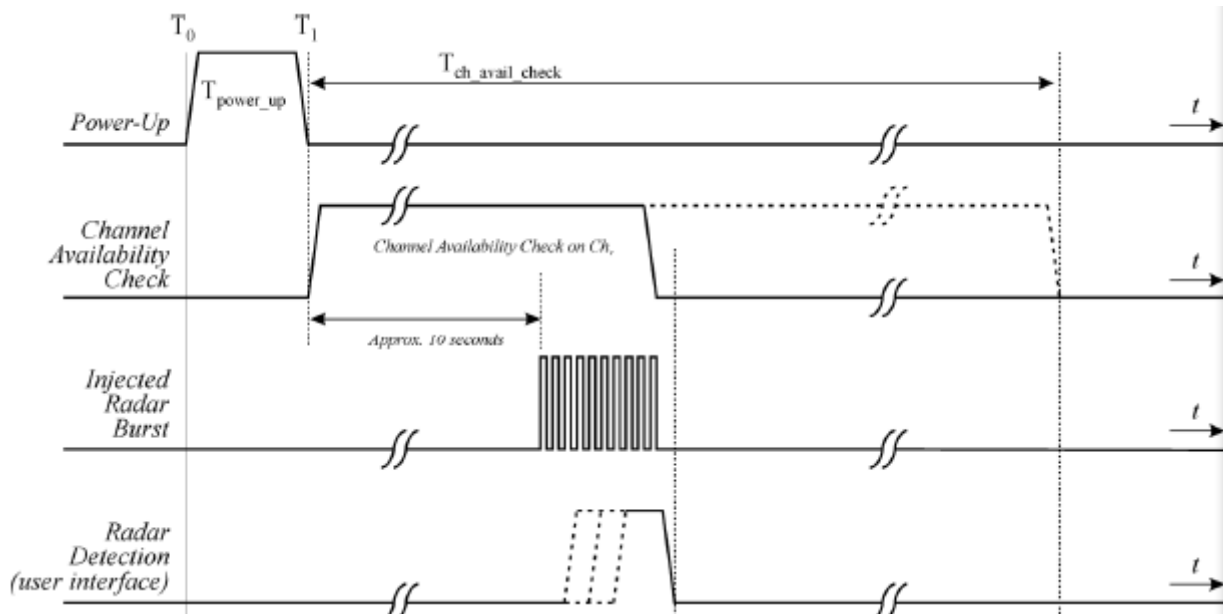


Radar Detection Threshold (during the Channel Availability Check)

The test shall be performed 20 times and each time a different radar test signal shall be generated.

The radar test signal shall be detected at least 12 times out of the 20 trials in order to comply with the detection probability specified for this frequency range.

For the purpose of reducing test time, it is recommended that the single-burst radar test signal starts approximately 10 s after T_1 .



Off-Channel CAC

Off-Channel CAC is defined as an optional mechanism by which an RLAN monitors channel(s), different from the Operating Channel(s), for the presence of radar signals.

The Off-Channel CAC may be used in addition to the Channel Availability Check defined in clause 4.7.2.1, for identifying Available Channels.

Off-Channel CAC is performed by a number of non-continuous checks spread over a period in time. This time, which is required to determine the presence of radar signals, is defined as the Off-Channel CAC Time.

If no radars have been detected in a channel, then that channel becomes an Available Channel.

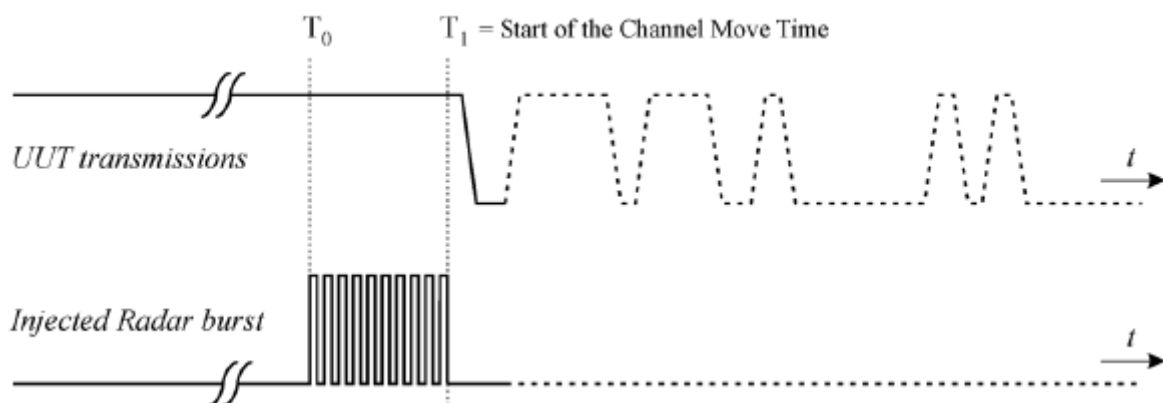
In-Service Monitoring

The In-Service Monitoring is defined as the process by which an RLAN monitors each Operating Channel for the presence of radar signals. The In-Service Monitoring shall be used to monitor each Operating Channel.

The In-Service-Monitoring shall start immediately after the RLAN has started transmissions on a channel.

Single burst radar test signal is generated and it shall be recorded if the radar test signal was detected.

Test shall be performed 20 times. The radar test signal shall be detected at least 12 times out of the 20 trials. This shall be repeated for each of the radar test signals.

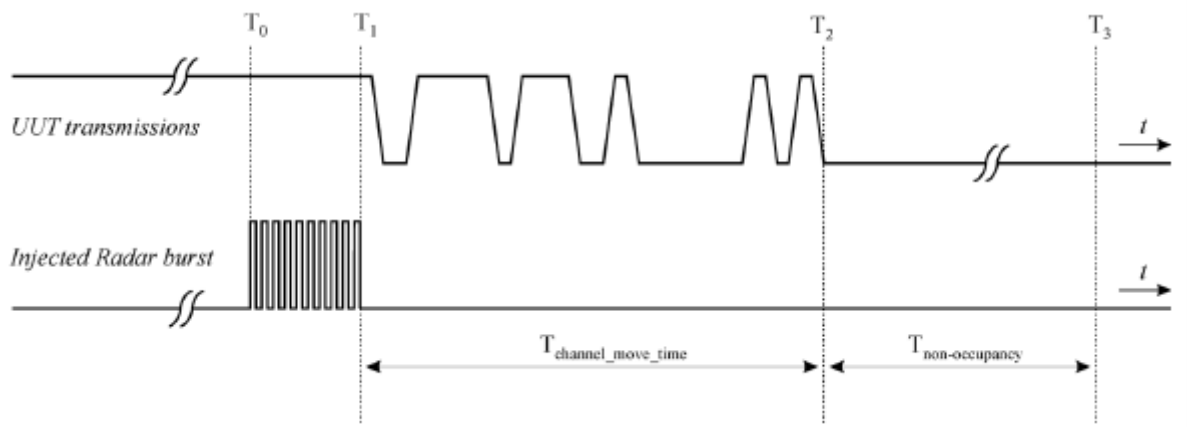


Channel Shutdown and Non-Occupancy Period

The Channel Shutdown is defined as the process initiated by the RLAN device on an Operating Channel after a radar signal has been detected during the In-Service Monitoring on that channel.

Master device shall instruct all associated slave devices to stop transmitting on this channel, which they shall do within the Channel Move Time. This is limited to the Channel Closing Transmission Time, defined as 1 sec.

The Non-Occupancy Period is defined as the time (30mins) during which the RLAN device shall not make any transmissions on a channel after a radar signal was detected on that channel.



Uniform Spreading

The Uniform Spreading is a mechanism to be used by the RLAN to provide, on aggregate, a uniform loading of the spectrum across all devices.

The Uniform Spreading is limited to the channels being declared as part of the channel plan.

Each of the declared Channel Plans (see clause 3.1) shall make use of at least 60 % of the spectrum available in the applicable sub-band(s).

Each of the Usable Channels shall be used with approximately equal probability.

RLAN equipment for which the declared channel plan includes channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz may omit these channels from the list of Usable Channels at initial power up or at initial installation.

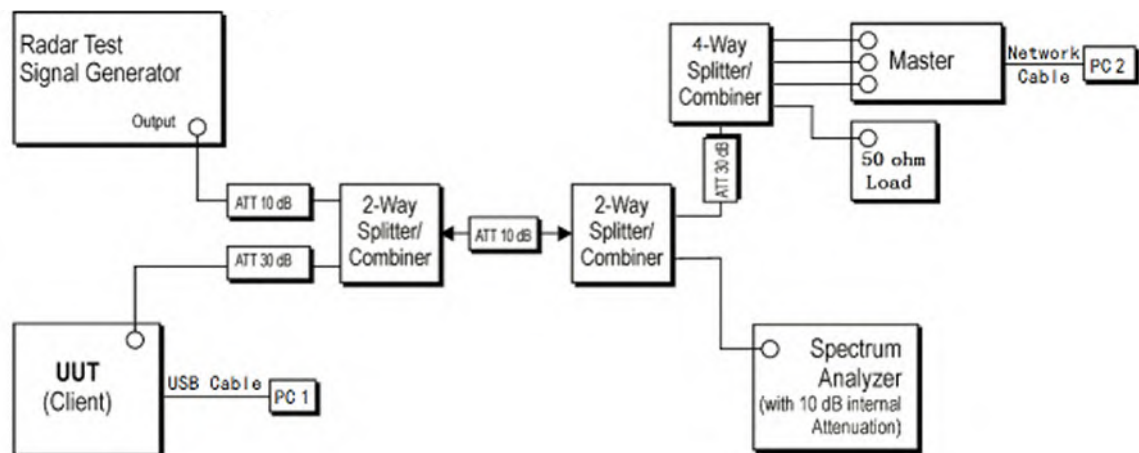
Channels being used by other RLAN equipment may be omitted from the list of Usable Channels

Please refer to ETSI EN 301 893 V2.2.1 (2024-11) Clause 5.4.8.2

15.6. Test Setup

Setup for Client with injection at the Master

Master Name	Brand Name	Model Name	FCC ID	Run-up Time(s)
ROG Rapture Tri-band Gaming Router	ASUS	GT-AXE11000	MSQ-RTAXJF00	90



15.7. Test Result

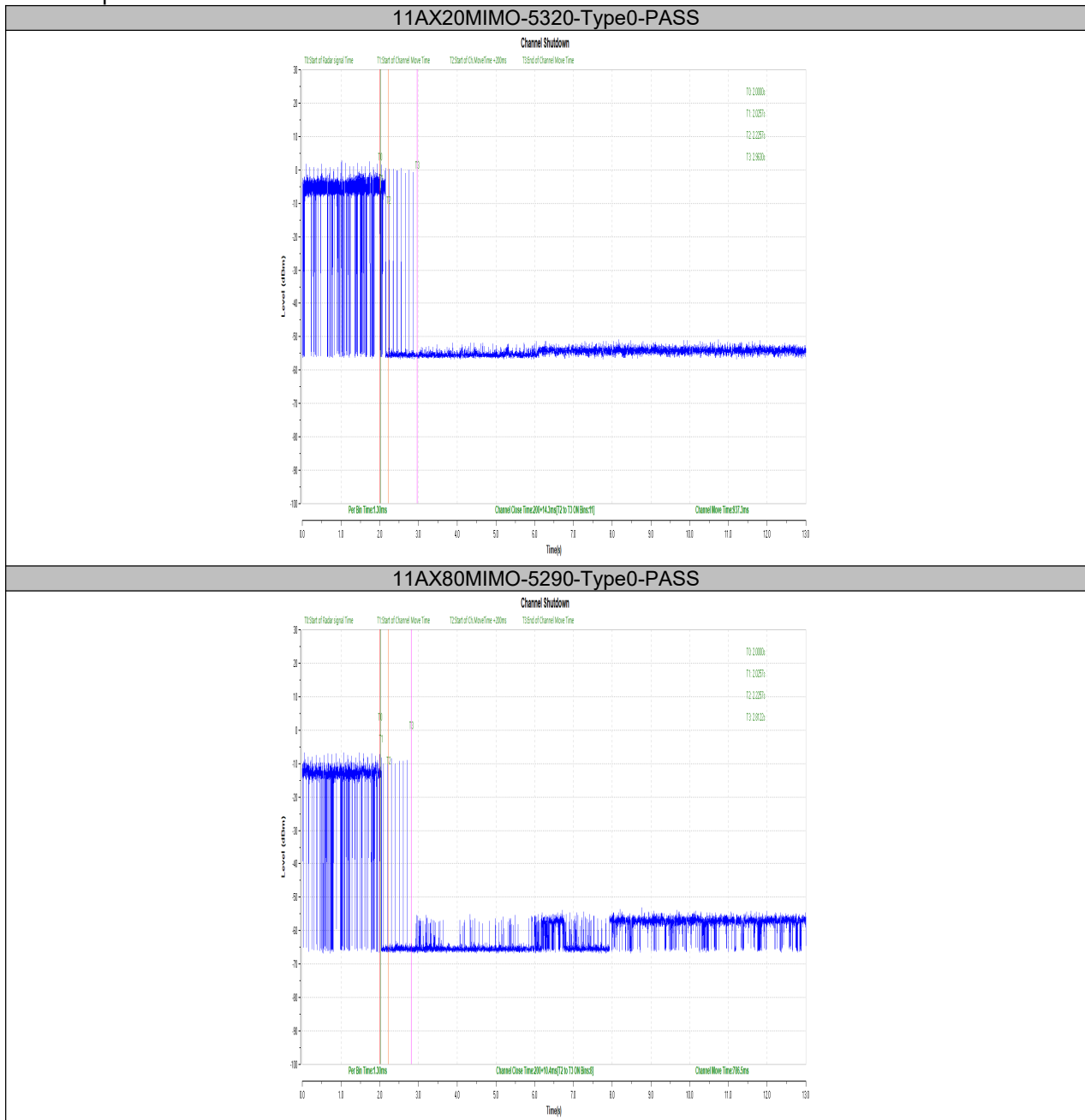
BW/Channel	Test Item	Test Result	Limit	Results
20M/5320MHz	Channel Move Time	0.94	< 10s	pass
	Channel Closing Transmission Time	0.21	< 0.26s	pass

80M/5290MHz	Channel Move Time	0.79	<10s	pass
	Channel Closing Transmission Time	0.21	<0.26s	pass

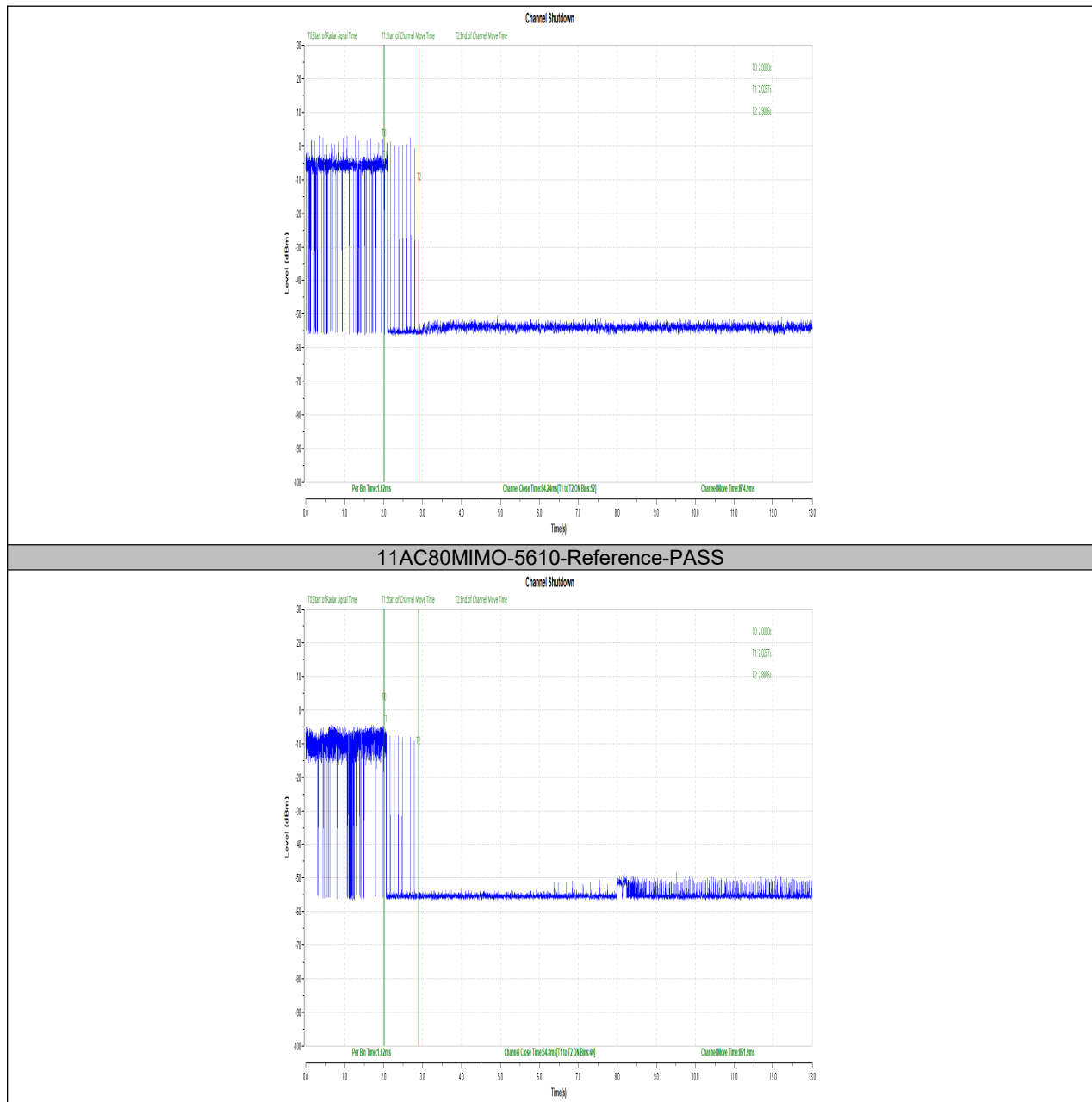
For 5600-5650MHz:

BW/Channel	Test Item	Test Result	Limit	Results
20M/5620MHz	Channel Move Time	0.87	<10s	pass
	Channel Closing Transmission Time	0.084	<0.26s	pass
80M/5610MHz	Channel Move Time	0.86	<10s	pass
	Channel Closing Transmission Time	0.064	<0.26s	pass

Test plots as follows:

**For 5600-5650MHz:**

11A-5620-Reference-PASS



Note 1: We test all channels that need to be tested for DFS, reporting only part of the test pattern and data. In this report, we have identified other parts that are compliant with FCC regulations.

Note 2: The method of establishing a connection between the master device and the slave device. After inserting the EUT USB port into the PC, the laptop opens the router control interface to connect to the EUT and control its corresponding signal transmission.

1. The frequency range of equipment operation is: UNII-1: 5180 MHz to 5240 MHz, U-NII-2A: 5260 MHz to 5320 MHz, U-NII-2C: 5500 MHz to 5700 MHz, U-NII-3: 5745 MHz to 5825 MHz
2. The operating mode is Client, Equipped with radar detection capability, the main U-NII device FCC ID used for DFS testing is MSQ-RTAXJF00.
3. (Equivalent Isotropic Radiated Power (EIRP)) of the equipment, The antenna gain is 2.74 dBi.
4. Test sequences or messages that should be used for communication between Master and Client Devices, which are used for Channel loading. Stream the test file from the master Device to the Client Device for IP based systems or frame based systems which dynamically allocate the talk/listen ratio.
5. The time required for the master and slave devices to fully start is 120 seconds.
6. The product belongs to Slave without radar detection.
7. Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user.
8. Manufacturers can manually select the first channel 5510 MHz.

16. Antenna Requirements

16.1. Applicable Requirements

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Please refer to RSS-GEN Clause 6.8

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to RSS-GEN Clause 6.8

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

16.2. Result

The device support 2T2R MIMO, the antennas both used for this product are dedicated PCB antennas and other than that furnished by the responsible party shall be used with the device, maximum antenna gain is 2.74 dBi for antenna 1, 2.74 dBi for antenna 2.

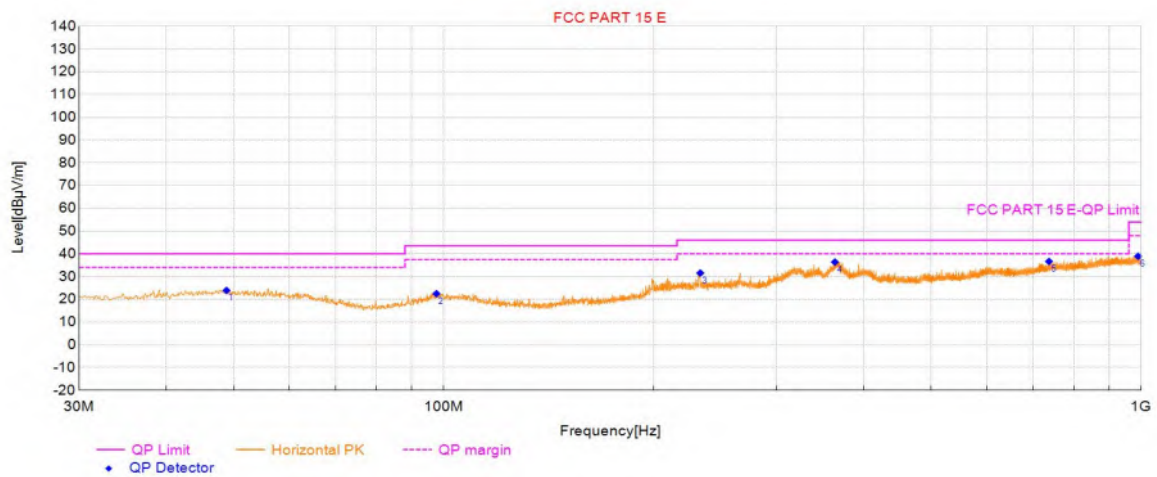
APPENDIX A - Radiated Emission Below 1GHz Test Data

Test Report

Project Information			
EUT:			
Customer:	IEEE 802.11b/g/n/a/ac/ax 2T2R WiFi Module Integrated BT 5.2		
Model:	SKO.WB920TU.6	SN:	
Mode:	11AC40_MCS0_5190	Voltage:	DC 5V
Environment:	25.3°C 53%	Engineer:	Soho Liu
Remark:			

Start of Test:2026-07-23 21:23:09

Test Graph



Final Data List

NO.	Freq. (MHz)	QP Reading (dBμV/m)	Factor (dB)	QP Level (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	48.82	2.77	21.16	23.93	40.00	16.07	100	299	Horizontal	PASS
2	97.62	3.07	19.41	22.48	43.50	21.02	100	24	Horizontal	PASS
3	233.24	10.59	20.96	31.55	46.00	14.45	100	63	Horizontal	PASS
4	363.71	11.92	24.50	36.42	46.00	9.58	100	134	Horizontal	PASS
5	737.39	4.98	31.70	36.68	46.00	9.32	100	28	Horizontal	PASS
6	989.33	3.83	35.08	38.91	54.00	15.09	100	1	Horizontal	PASS

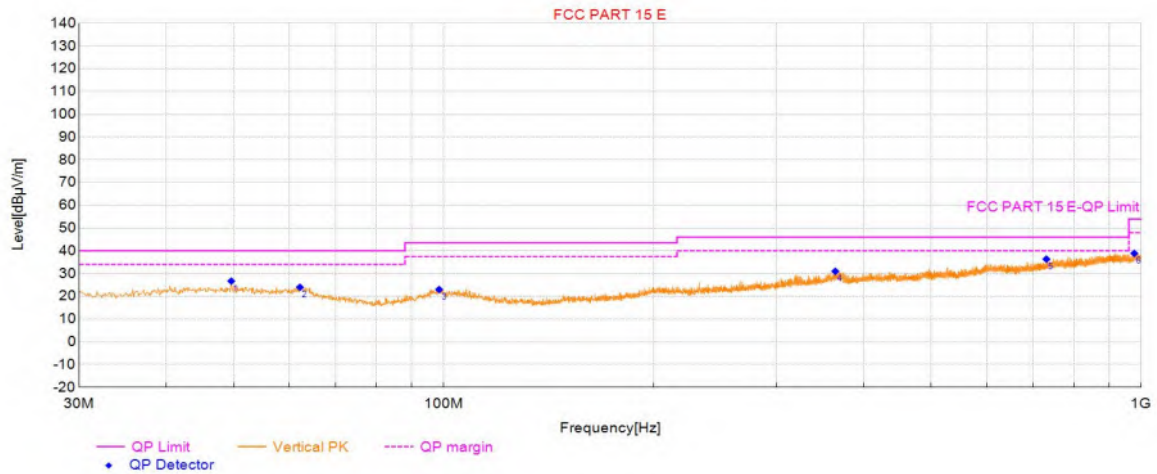
Note: Margin=QP Limit - QP Level, QP Level=Reading + Factor

Test Report

Project Information			
EUT:			
Customer:	IEEE 802.11b/g/n/a/ac/ax 2T2R WiFi Module Integrated BT 5.2		
Model:	SKO.WB920TU.6	SN:	
Mode:	11AC40_MCS0_5190	Voltage:	DC 5V
Environment:	25.3°C 53%	Engineer:	Soho Liu
Remark:			

Start of Test:2026-07-23 21:23:51

Test Graph



Final Data List

NO.	Freq. (MHz)	QP Reading (dBμV/m)	Factor (dB)	QP Level (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	49.60	5.47	21.25	26.72	40.00	13.28	100	201	Vertical	PASS
2	62.21	4.38	19.61	23.99	40.00	16.01	100	80	Vertical	PASS
3	98.49	3.38	19.62	23.00	43.50	20.50	100	55	Vertical	PASS
4	364.20	6.48	24.52	31.00	46.00	15.00	100	2	Vertical	PASS
5	731.09	4.96	31.41	36.37	46.00	9.63	100	107	Vertical	PASS
6	977.11	4.2	34.70	38.90	54.00	15.10	100	27	Vertical	PASS

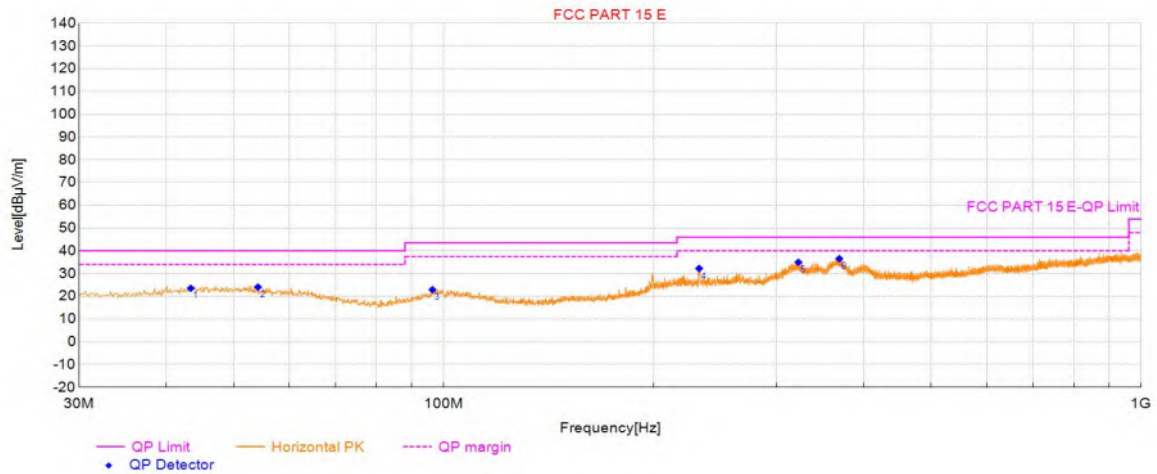
Note: Margin=QP Limit - QP Level, QP Level=Reading + Factor

Test Report

Project Information			
EUT:			
Customer:	IEEE 802.11b/g/n/a/ac/ax 2T2R WiFi Module Integrated BT 5.2		
Model:	SKO.WB920TU.6	SN:	
Mode:	11AC40_MCS0_5310	Voltage:	DC 5V
Environment:	25.3℃ 53%	Engineer:	Soho Liu
Remark:			

Start of Test:2026-07-23 21:25:32

Test Graph



Final Data List

NO.	Freq. (MHz)	QP Reading (dBμV/m)	Factor (dB)	QP Level (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	43.39	3.1	20.44	23.54	40.00	16.46	100	155	Horizontal	PASS
2	54.16	3.19	20.87	24.06	40.00	15.94	100	284	Horizontal	PASS
3	96.35	3.81	19.10	22.91	43.50	20.59	100	53	Horizontal	PASS
4	232.36	11.32	20.94	32.26	46.00	13.74	100	83	Horizontal	PASS
5	322.39	11.9	23.09	34.99	46.00	11.01	100	31	Horizontal	PASS
6	369.05	11.91	24.65	36.56	46.00	9.44	100	142	Horizontal	PASS

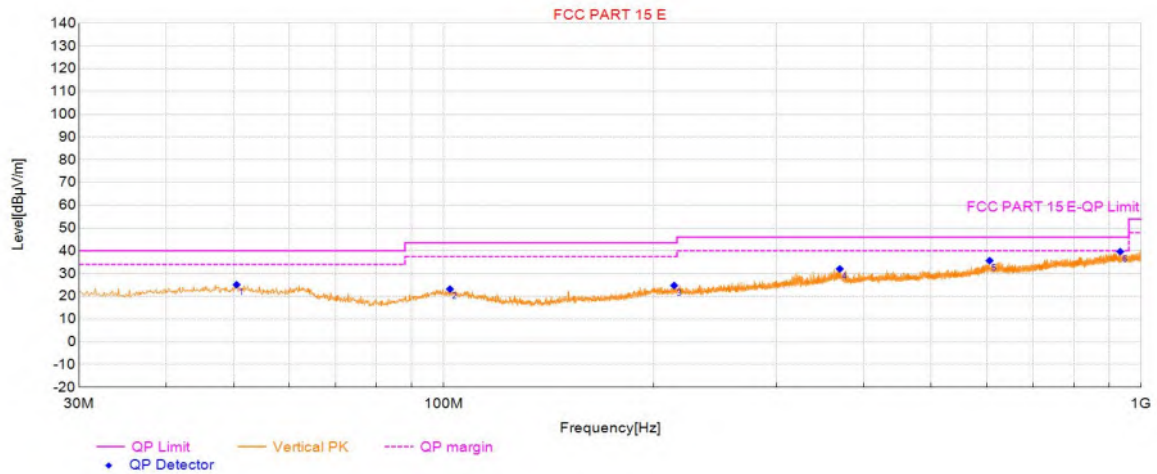
Note: Margin=QP Limit - QP Level, QP Level=Reading + Factor

Test Report

Project Information			
EUT:			
Customer:	IEEE 802.11b/g/n/a/ac/ax 2T2R WiFi Module Integrated BT 5.2		
Model:	SKO.WB920TU.6	SN:	
Mode:	11AC40_MCS0_5310	Voltage:	DC 5V
Environment:	25.3°C 53%	Engineer:	Soho Liu
Remark:			

Start of Test:2026-07-23 21:26:13

Test Graph



Final Data List

NO.	Freq. (MHz)	QP Reading (dBμV/m)	Factor (dB)	QP Level (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	50.47	3.87	21.24	25.11	40.00	14.89	100	102	Vertical	PASS
2	102.08	3.29	19.89	23.18	43.50	20.32	100	168	Vertical	PASS
3	213.93	4.36	20.42	24.78	43.50	18.72	100	116	Vertical	PASS
4	369.63	7.4	24.66	32.06	46.00	13.94	100	2	Vertical	PASS
5	606.04	5.9	29.80	35.70	46.00	10.30	100	204	Vertical	PASS
6	932.77	5.61	34.05	39.66	46.00	6.34	100	355	Vertical	PASS

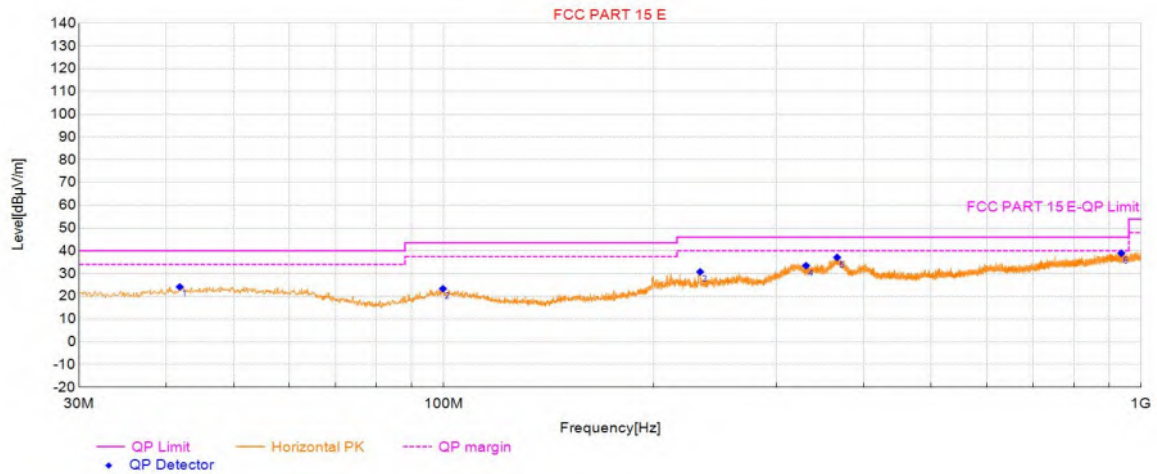
Note: Margin=QP Limit - QP Level, QP Level=Reading + Factor

Test Report

Project Information			
EUT:			
Customer:	IEEE 802.11b/g/n/a/ac/ax 2T2R WiFi Module Integrated BT 5.2		
Model:	SKO.WB920TU.6	SN:	
Mode:	11AC40_MCS0_5670	Voltage:	DC 5V
Environment:	25.3°C 53%	Engineer:	Soho Liu
Remark:			

Start of Test:2026-07-23 21:28:31

Test Graph



Final Data List

NO.	Freq. (MHz)	QP Reading (dBμV/m)	Factor (dB)	QP Level (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	41.84	4.04	20.12	24.16	40.00	15.84	100	70	Horizontal	PASS
2	99.75	3.41	19.93	23.34	43.50	20.16	100	44	Horizontal	PASS
3	233.14	9.83	20.96	30.79	46.00	15.21	100	74	Horizontal	PASS
4	330.63	10.06	23.42	33.48	46.00	12.52	100	39	Horizontal	PASS
5	366.43	12.54	24.58	37.12	46.00	8.88	100	145	Horizontal	PASS
6	936.07	4.88	34.07	38.95	46.00	7.05	100	322	Horizontal	PASS

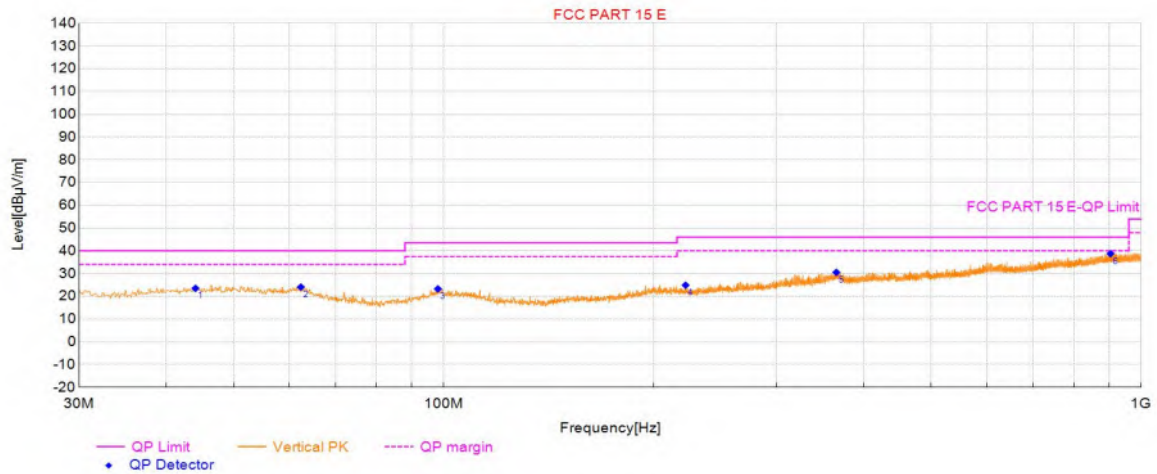
Note: Margin=QP Limit - QP Level, QP Level=Reading + Factor

Test Report

Project Information			
EUT:			
Customer:	IEEE 802.11b/g/n/a/ac/ax 2T2R WiFi Module Integrated BT 5.2		
Model:	SKO.WB920TU.6	SN:	
Mode:	11AC40_MCS0_5670	Voltage:	DC 5V
Environment:	25.3°C 53%	Engineer:	Soho Liu
Remark:			

Start of Test:2026-07-23 21:29:13

Test Graph



Final Data List

NO.	Freq. (MHz)	QP Reading (dBμV/m)	Factor (dB)	QP Level (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Polarity	Verdict
1	44.07	2.94	20.57	23.51	40.00	16.49	100	105	Vertical	PASS
2	62.40	4.52	19.55	24.07	40.00	15.93	100	28	Vertical	PASS
3	98.10	3.74	19.53	23.27	43.50	20.23	100	198	Vertical	PASS
4	222.18	4.17	20.72	24.89	46.00	21.11	100	2	Vertical	PASS
5	365.46	5.97	24.56	30.53	46.00	15.47	100	72	Vertical	PASS
6	903.38	5.04	33.70	38.74	46.00	7.26	100	102	Vertical	PASS

Note: Margin=QP Limit - QP Level, QP Level=Reading + Factor