TUV SUD Limited
Digitally signed by TUV SUD Limited
Date: 2024.10.08 17:21:19 +01'00'

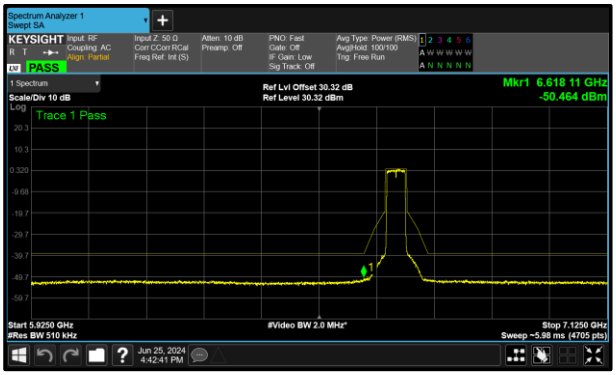

Figure 339 - A (Core 0) 6685 MHz (CH147)

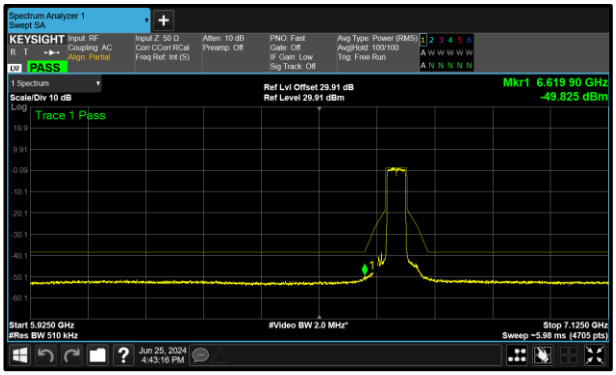

Figure 340 - B (Core 1) 6685 MHz (CH147)

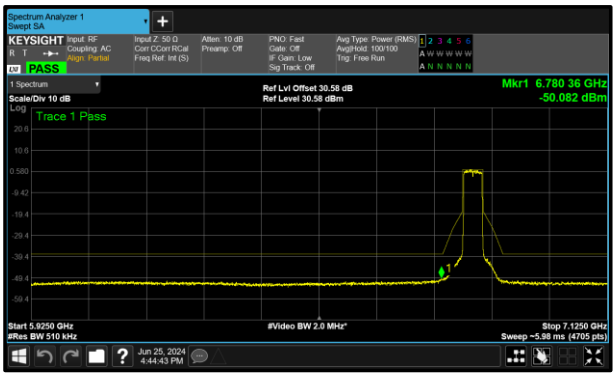

Figure 341 - A (Core 0) 6845 MHz (CH179)

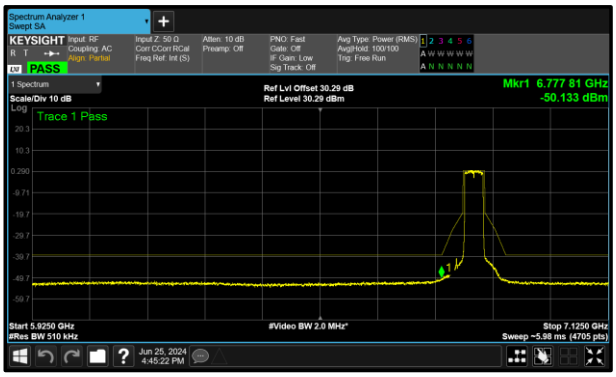

Figure 342 - B (Core 1) 6845 MHz (CH179)

Test Configuration			
Frequency Range:	5.955-6.875 GHz	Band:	U-NII-5, U-NII-6, U-NII-7
Limit Clause(s):	15.407(b)	Test Method(s):	KDB 987594 clause j

DUT Configuration			
Mode:	802.11ax HE80 SU SP	Duty Cycle (%):	-
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	TxBF	Peak Antenna Gain (dBi):	-
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain Id(s):	0+1

Test Frequency (MHz)	Unwanted Emissions Within the RLAN Band Margin (dB)			
	A	B	C	D
5985	9.38	9.26	-	-
6145	8.38	8.67	-	-
6385	8.29	7.98	-	-
6465	8.08	7.90	-	-
6545	8.44	8.27	-	-
6625	8.06	8.90	-	-
6705	8.93	8.98	-	-
6785	8.65	7.81	-	-

Table 393 - Unwanted Emissions Within the Band Results

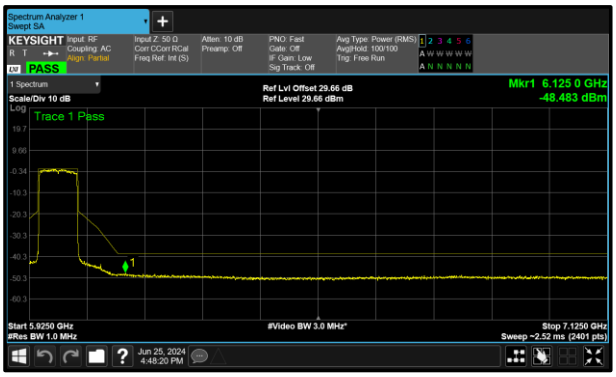

Figure 343 - A (Core 0) 5985 MHz (CH7)

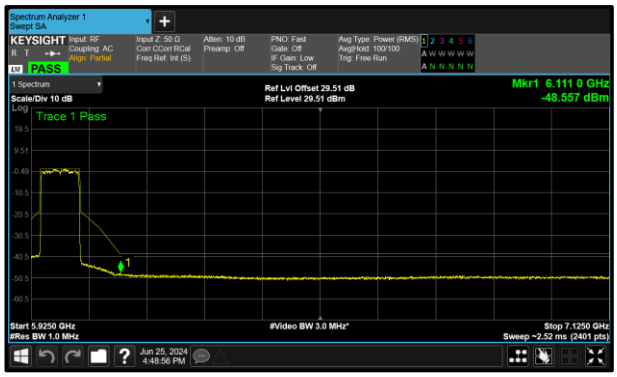

Figure 344 - B (Core 1) 5985 MHz (CH7)

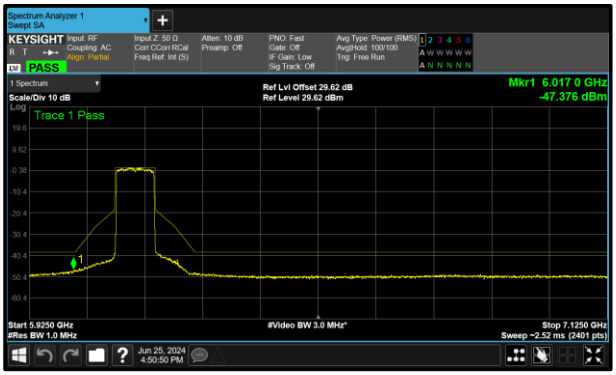

Figure 345 - A (Core 0) 6145 MHz (CH39)

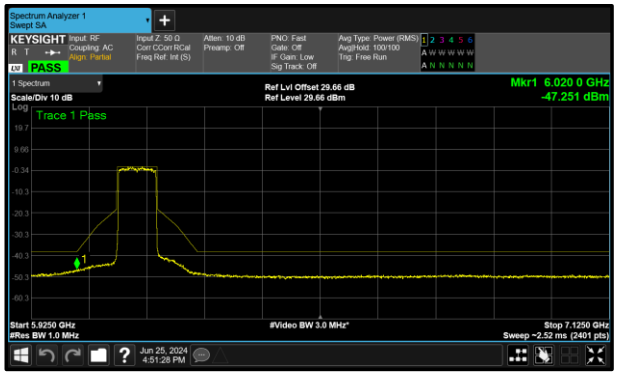

Figure 346 - B (Core 1) 6145 MHz (CH39)

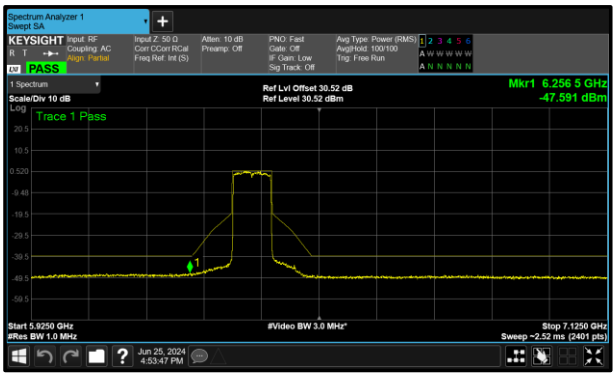

Figure 347 - A (Core 0) 6385 MHz (CH87)

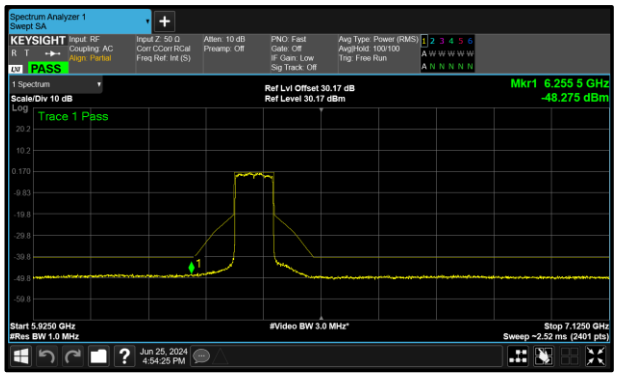

Figure 348 - B (Core 1) 6385 MHz (CH87)

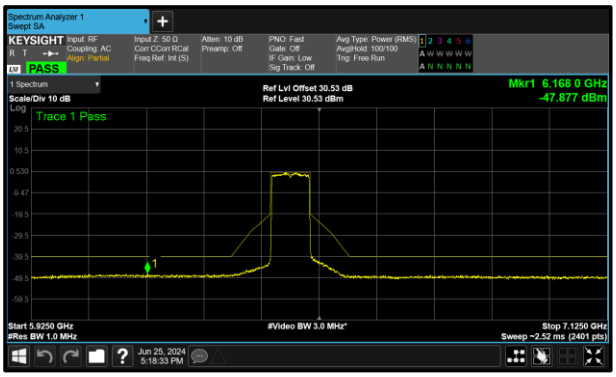

Figure 349 - A (Core 0) 6465 MHz (CH103)

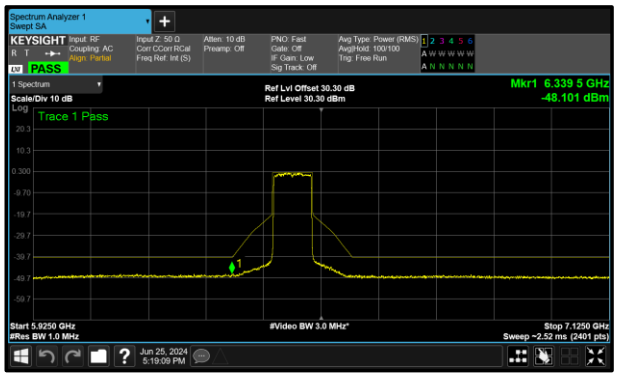

Figure 350 - B (Core 1) 6465 MHz (CH103)

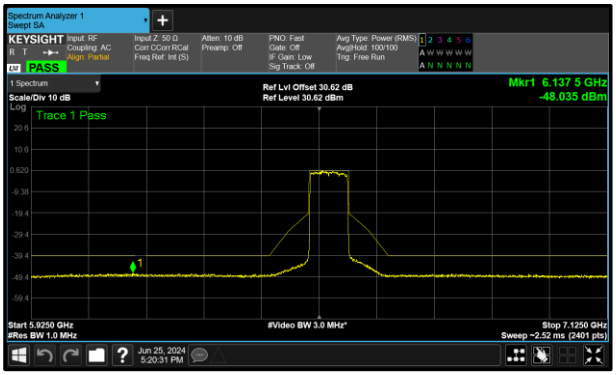

Figure 351 - A (Core 0) 6545 MHz (CH119)

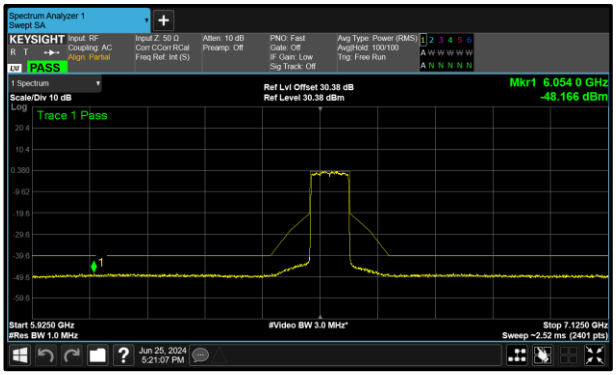

Figure 352 - B (Core 1) 6545 MHz (CH119)

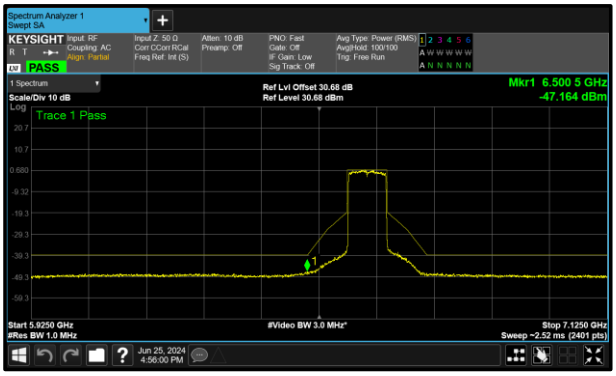

Figure 353 - A (Core 0) 6625 MHz (CH135)

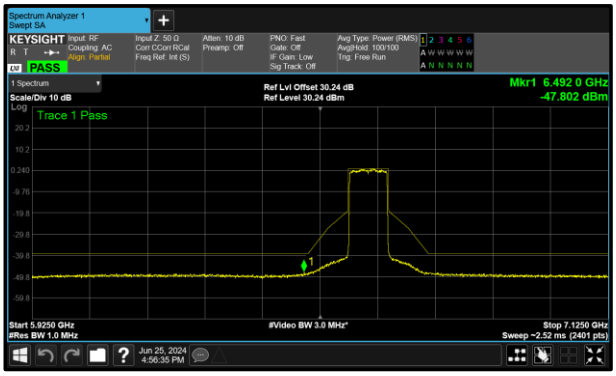

Figure 354 - B (Core 1) 6625 MHz (CH135)

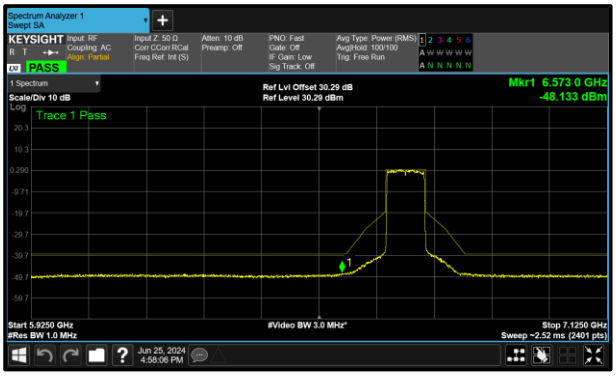

Figure 355 - A (Core 0) 6705 MHz (CH151)

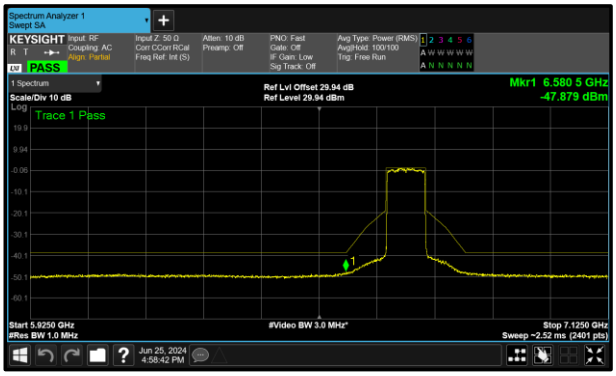

Figure 356 - B (Core 1) 6705 MHz (CH151)

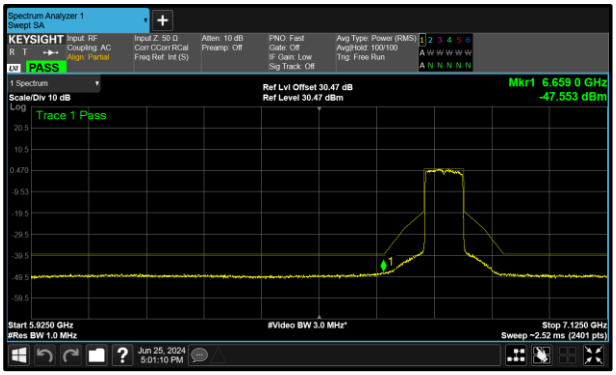

Figure 357 - A (Core 0) 6785 MHz (CH167)

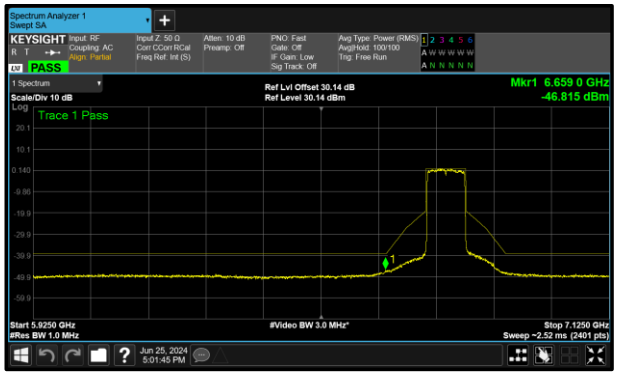

Figure 358 - B (Core 1) 6785 MHz (CH167)

FCC 47 CFR Part 15, Limit Clause 15.407(b)(6)

For transmitters operating within the 5.925-7.125 GHz bands:

Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel centre, and by 40 dB at one- and one-half times the channel bandwidth away from channel centre. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the centre of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel centre by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

ISED RSS-248, Limit Clause 4.6.2(b)

e.i.r.p. spectral density of unwanted emissions falling into the 5925-7125 MHz band shall be attenuated (in dB) below the reference power spectral density by:

i. 20 dB at 1 MHz away from the channel edge; and

ii. a linearly interpolated value between 20 dB and 28 dB at frequencies between 1 MHz outside of channel edge and one (1) channel bandwidth from the operating channel centre, respectively; and

iii. 28 dB at one (1) channel bandwidth away from the operating channel centre; and

iv. a linearly interpolated value between 28 dB and 40 dB at frequencies between one (1) channel bandwidth from the channel centre and one- and one-half (1.5) times the channel bandwidth away from the operating channel centre, respectively; and

v. 40 dB at one- and one-half (1.5) times the channel bandwidth away from the channel centre; and

vi. a minimum of 40 dB at frequencies that are further away than one and one-half (1.5) times the channel bandwidth from the channel centre.

2.8.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 18 and RF Laboratory 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Hygrometer	Rotronic	I-1000	3068	12	07-Nov-2024
1800-6000 MHz Power Splitter	Mini-Circuits	ZN2PD-63-S+	4055	-	O/P Mon
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	5505	12	22-Feb-2025
MXA Signal Analyser	Keysight Technologies	N9020B	5529	24	13-Dec-2024
2-Way Power Divider (2-8 GHz)	Aaren	AT30A-TE0208-2-AF	5685	12	02-Jan-2025
Digital Multimeter	Fluke	115	6145	12	06-Jun-2025
MXA Signal Analyser	Keysight Technologies	N9020B	6417	24	26-Feb-2025
MXA Signal Analyser	Keysight Technologies	N9020B	6419	24	28-Feb-2025
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6426	12	07-Feb-2025
Directional Coupler 2-8GHz	RF-Lambda	RFDC2G8G10	6447	-	O/P Mon
Directional Coupler 2-8GHz	RF-Lambda	RFDC2G8G10	6448	-	O/P Mon
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6517	12	22-Feb-2025
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6518	12	16-Feb-2025
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6526	12	22-Feb-2025
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6527	12	05-Mar-2025
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6529	12	16-Feb-2025
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6530	12	16-Feb-2025
AC Programmable Power Supply	iTech	IT7324	6662	-	O/P Mon
AC Programmable Power Supply	iTech	IT7324	6665	-	O/P Mon
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6752	12	06-Feb-2025
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6753	12	06-Feb-2025

Table 394

O/P Mon - Output Monitored using calibrated equipment

2.9 Contention Based Protocol

2.9.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (d)(6)
ISED RSS-248, Clause 4.7

2.9.2 Equipment Under Test and Modification State

A3137, S/N: DMKVPMJ9XD - Modification State 0

2.9.3 Date of Test

24-June-2024

2.9.4 Test Method

This test was performed in accordance with KDB 987594 D02, clause I.

The AWGN signal level was initially set at a level much less than the required threshold level (<< -62 dBm) it was verified at this point that transmissions from the device under test (DUT) were present. The signal level was gradually increased until it was observed that the DUT continuously ceased transmissions with the AWGN signal present, i.e. no partial transmissions other than short control signalling transmissions.

The AWGN Signal level recorded is the level into the DUT's receiver, corrected for all cable losses. The minimum antenna gain value was then used to correct the level as described in KDB 987594 D04.

Timing plots showing verification that transmissions from the DUT responded to the interferer have been included in the test results below.

2.9.5 Test Setup Diagram

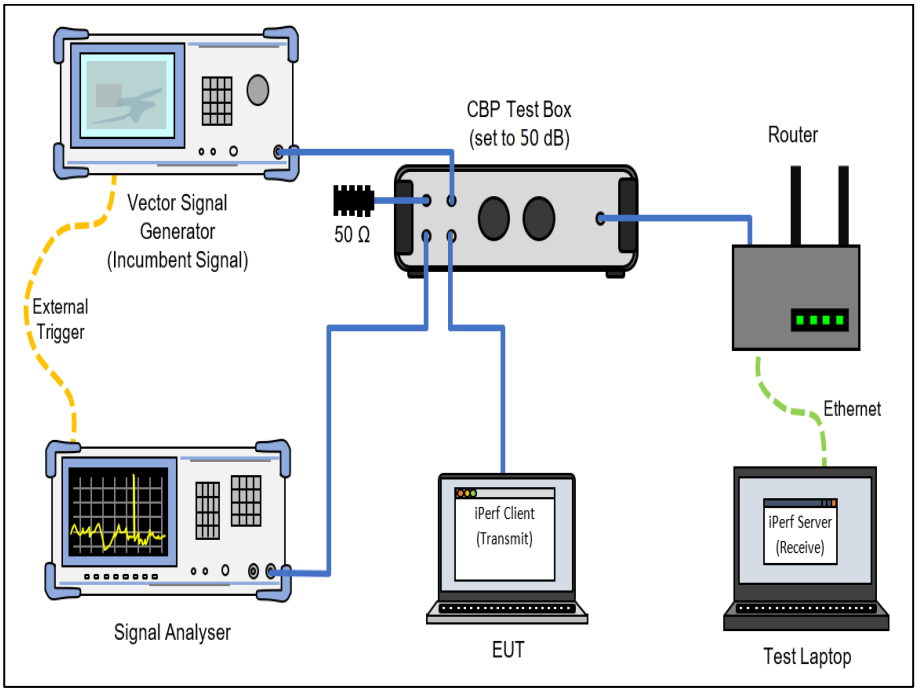

Figure 359 - Test Equipment Setup Diagram

2.9.6 Environmental Conditions

Ambient Temperature	24.7 °C
Relative Humidity	38.5 %

2.9.7 Test Results

6 GHz WLAN

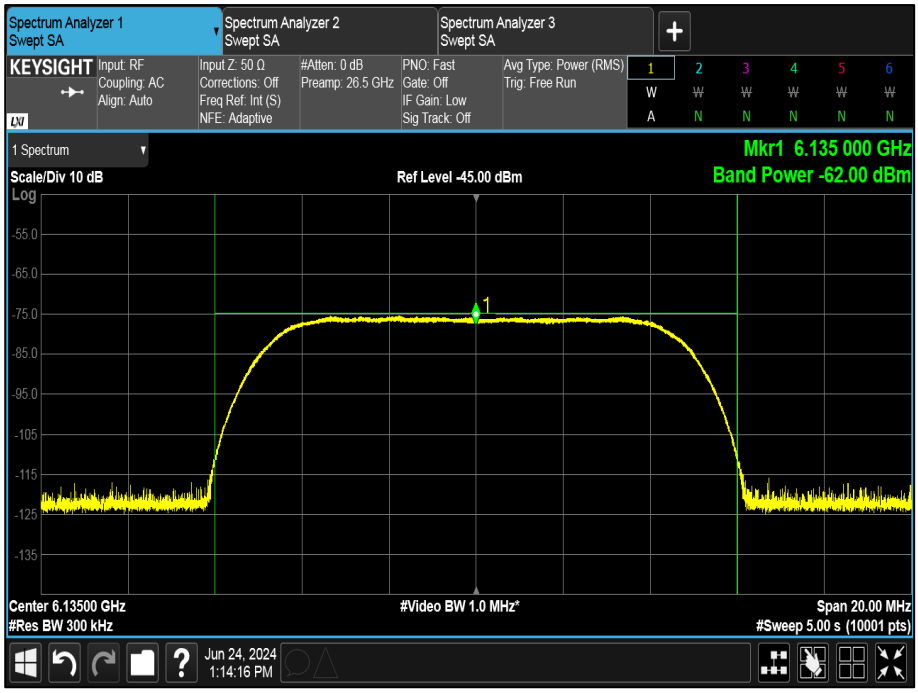

Figure 360 - Example of AWGN Signal

Parameter	Results		
U-NII Band	5	5	5
Channel Number	37	37	37
Bandwidth (MHz)	20	20	20
DUT Centre Frequency (MHz)	6135	6135	6135
AWGN Centre Frequency (MHz)	6135	6135	6135
AWGN Signal Power (dBm)	-70.55	-69.07	-67.07
Antenna Gain (dBi)	2.40	2.40	2.40
Adjusted Power (dBm)	-72.95	-71.47	-69.47
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 395 - U-NII-5, Minimum Bandwidth

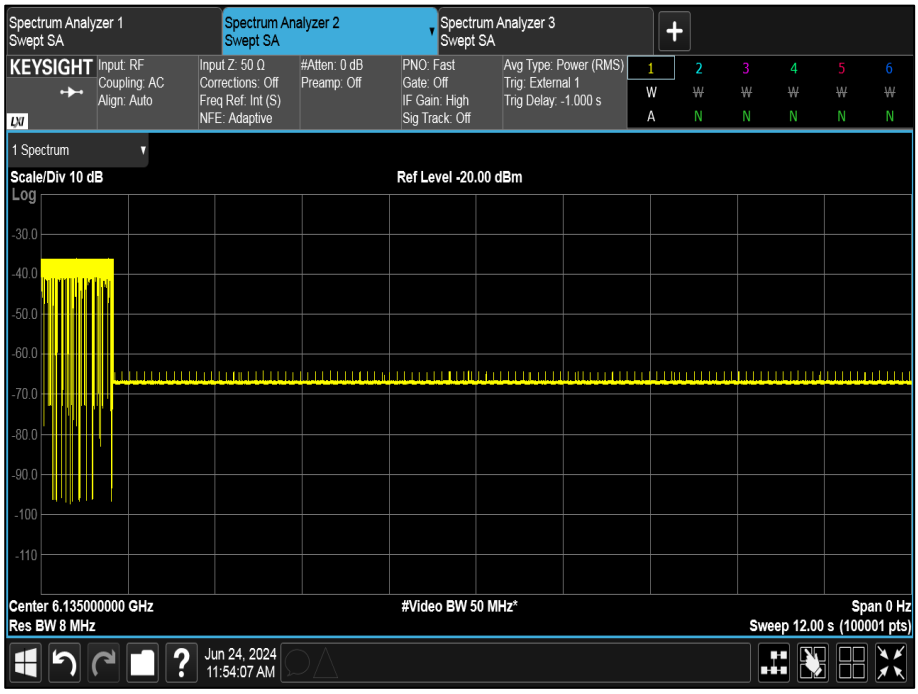

Figure 361 - U-NII-5, Minimum Bandwidth

Parameter	Results		
U-NII Band	5	5	5
Channel Number	47	47	47
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6185	6185	6185
AWGN Centre Frequency (MHz)	6110	6110	6110
AWGN Signal Power (dBm)	-68.71	-66.71	-65.91
Antenna Gain (dBi)	2.40	2.40	2.40
Adjusted Power (dBm)	-71.11	-69.11	-68.31
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 396 - U-NII-5, Maximum Bandwidth (AWGN Low)

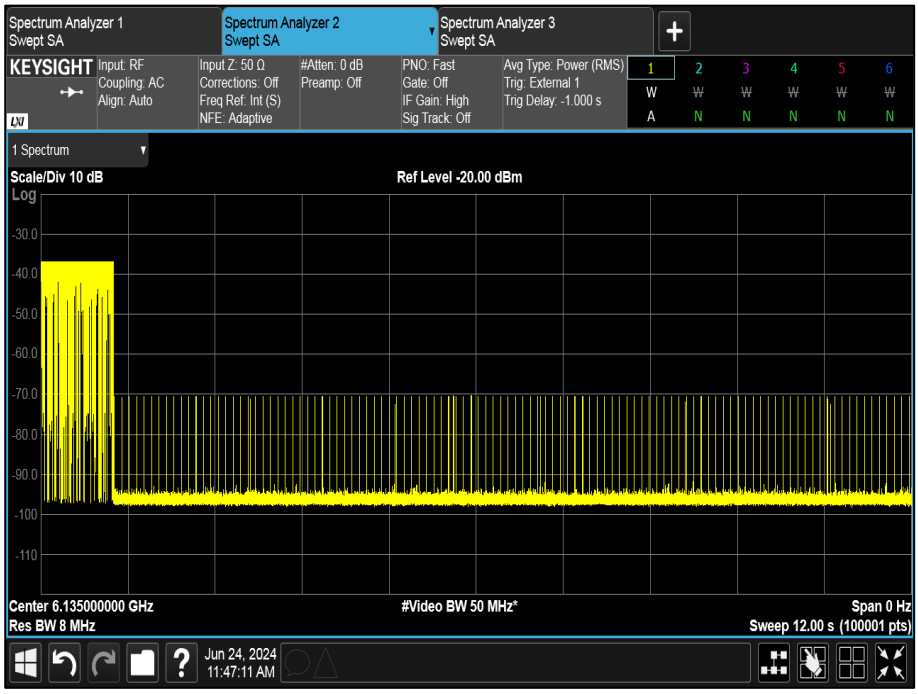

Figure 362 - U-NII-5, Minimum Bandwidth (AWGN Low)

Parameter	Results		
U-NII Band	5	5	5
Channel Number	47	47	47
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6185	6185	6185
AWGN Centre Frequency (MHz)	6185	6185	6185
AWGN Signal Power (dBm)	-69.52	-66.67	-65.87
Antenna Gain (dBi)	2.40	2.40	2.40
Adjusted Power (dBm)	-71.92	-69.07	-68.27
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 397 - U-NII-5, Maximum Bandwidth (AWGN Mid)

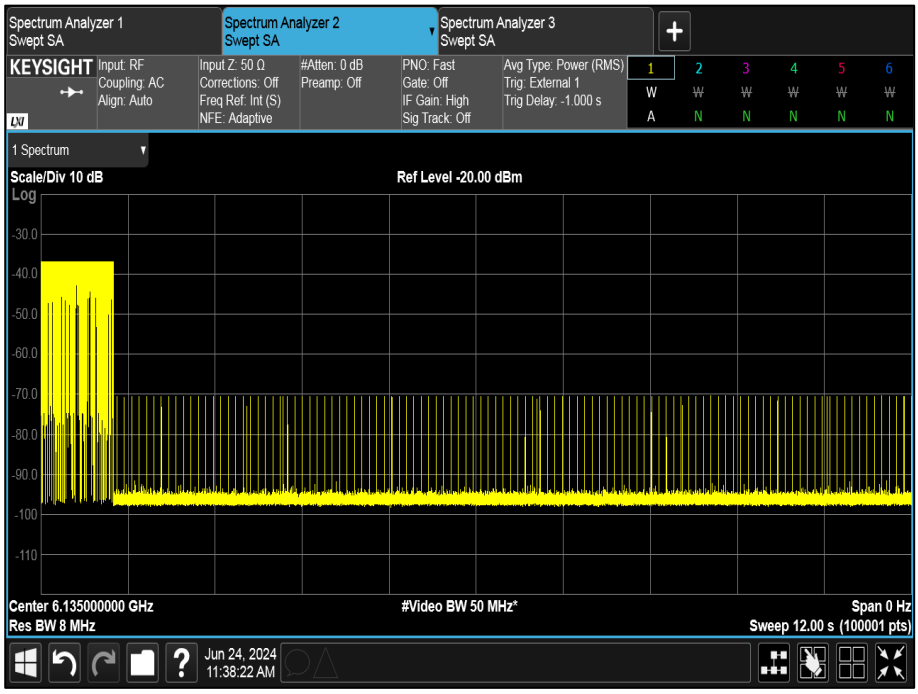

Figure 363 - U-NII-5, Minimum Bandwidth (AWGN Mid)

Parameter	Results		
U-NII Band	5	5	5
Channel Number	47	47	47
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6185	6185	6185
AWGN Centre Frequency (MHz)	6260	6260	6260
AWGN Signal Power (dBm)	-65.78	-63.98	-62.57
Antenna Gain (dBi)	2.40	2.40	2.40
Adjusted Power (dBm)	-68.18	-66.38	-64.97
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 398 - U-NII-5, Maximum Bandwidth (AWGN High)

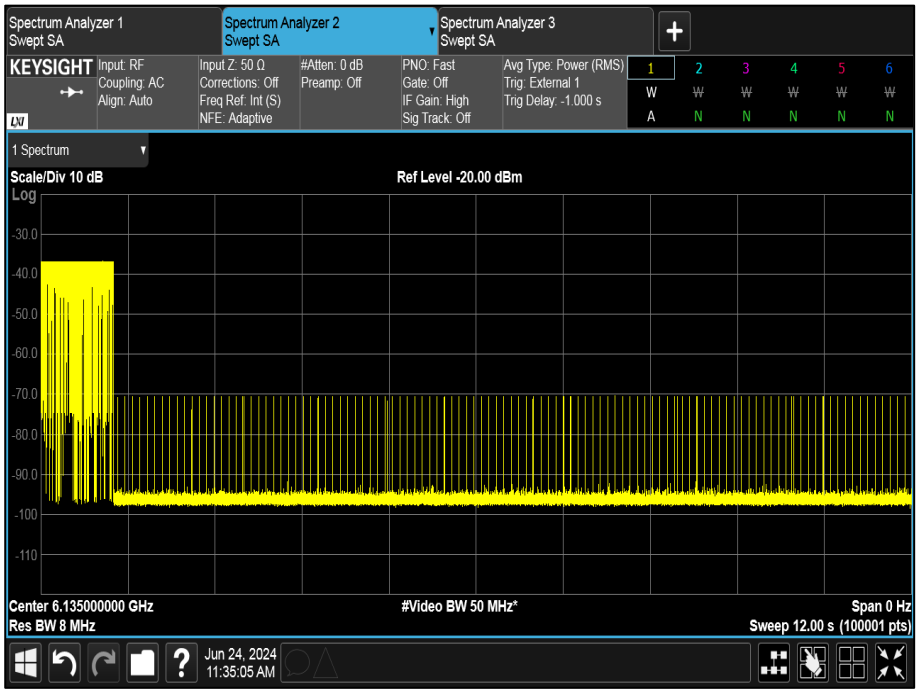

Figure 364 - U-NII-5, Minimum Bandwidth (AWGN High)

Parameter	Results		
U-NII Band	6	6	6
Channel Number	101	101	101
Bandwidth (MHz)	20	20	20
DUT Centre Frequency (MHz)	6455	6455	6455
AWGN Centre Frequency (MHz)	6455	6455	6455
AWGN Signal Power (dBm)	-72.51	-70.81	-68.16
Antenna Gain (dBi)	4.50	4.50	4.50
Adjusted Power (dBm)	-77.01	-75.31	-72.66
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 399 - U-NII-6, Minimum Bandwidth

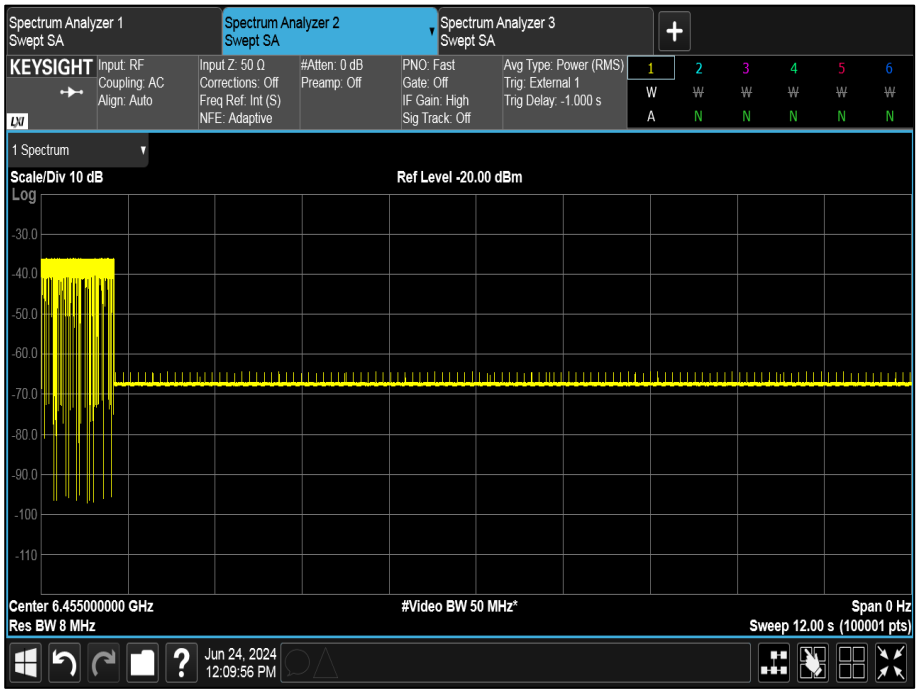

Figure 365 - U-NII-6, Minimum Bandwidth

Parameter	Results		
U-NII Band	6	6	6
Channel Number	111	111	111
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6505	6505	6505
AWGN Centre Frequency (MHz)	6430	6430	6430
AWGN Signal Power (dBm)	-70.91	-68.63	-67.77
Antenna Gain (dBi)	4.50	4.50	4.50
Adjusted Power (dBm)	-75.41	-73.13	-72.27
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 400 - U-NII-6, Maximum Bandwidth (AWGN Low)

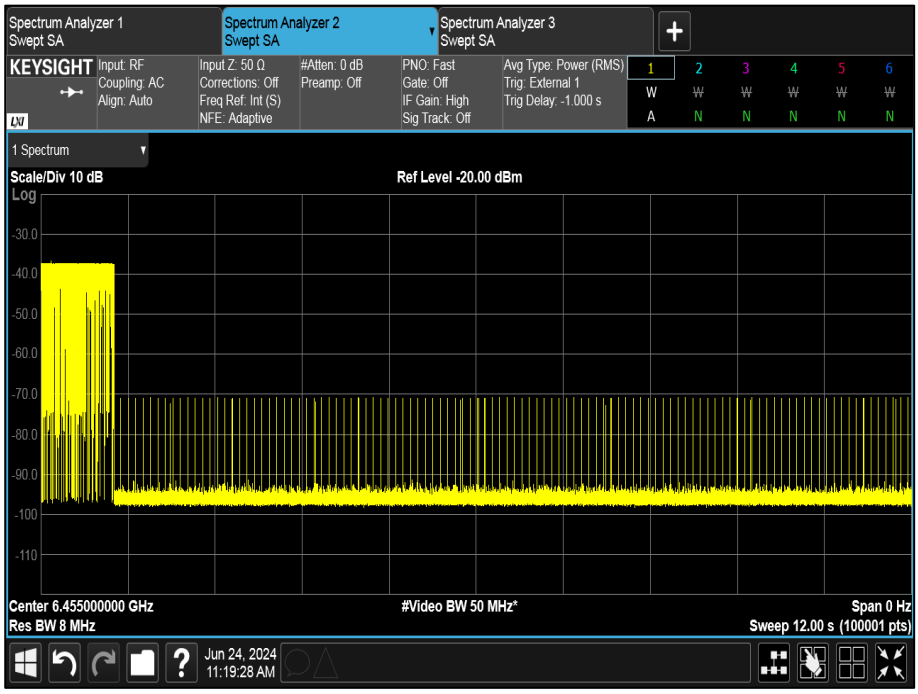

Figure 366 - U-NII-6, Minimum Bandwidth (AWGN Low)

Parameter	Results		
U-NII Band	6	6	6
Channel Number	111	111	111
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6505	6505	6505
AWGN Centre Frequency (MHz)	6505	6505	6505
AWGN Signal Power (dBm)	-70.04	-67.60	-66.24
Antenna Gain (dBi)	4.50	4.50	4.50
Adjusted Power (dBm)	-74.54	-72.10	-70.74
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 401 - U-NII-6, Maximum Bandwidth (AWGN Mid)

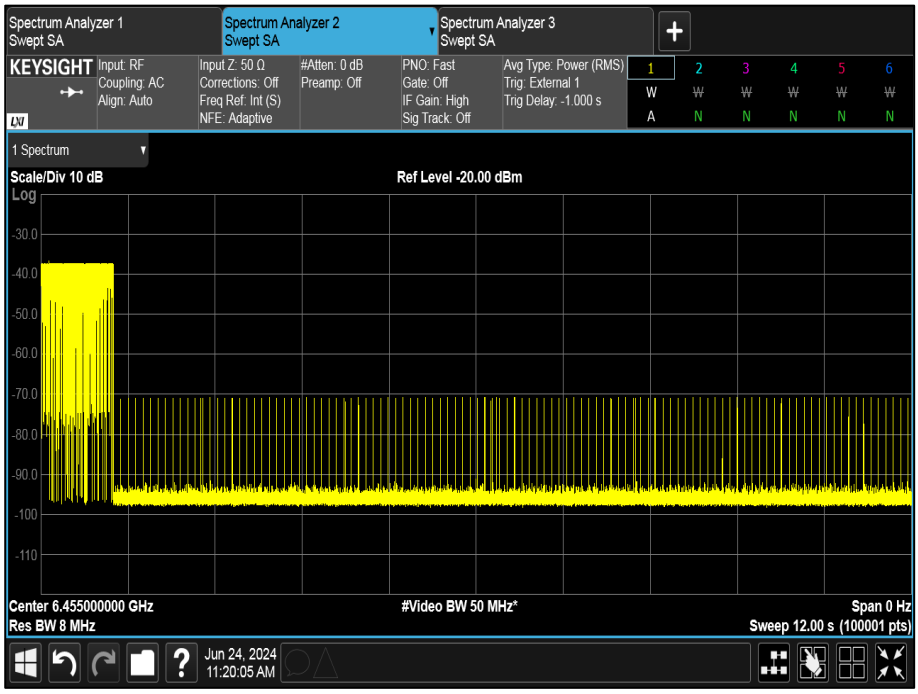

Figure 367 - U-NII-6, Minimum Bandwidth (AWGN Mid)

Parameter	Results		
U-NII Band	6	6	6
Channel Number	111	111	111
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6505	6505	6505
AWGN Centre Frequency (MHz)	6580	6580	6580
AWGN Signal Power (dBm)	-67.85	-65.94	-63.64
Antenna Gain (dBi)	4.50	4.50	4.50
Adjusted Power (dBm)	-72.35	-70.44	-68.14
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 402 - U-NII-6, Maximum Bandwidth (AWGN High)

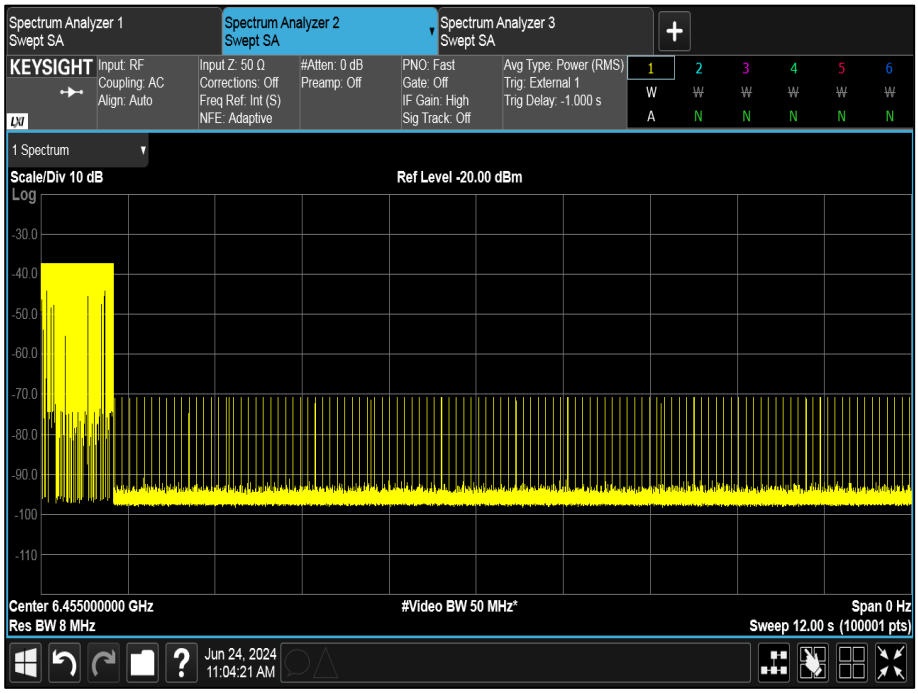

Figure 368 - U-NII-6, Minimum Bandwidth (AWGN High)

Parameter	Results		
U-NII Band	7	7	7
Channel Number	133	133	133
Bandwidth (MHz)	20	20	20
DUT Centre Frequency (MHz)	6615	6615	6615
AWGN Centre Frequency (MHz)	6615	6615	6615
AWGN Signal Power (dBm)	-71.88	-70.27	-68.28
Antenna Gain (dBi)	3.80	3.80	3.80
Adjusted Power (dBm)	-75.68	-74.07	-72.08
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 403 - U-NII-7, Minimum Bandwidth

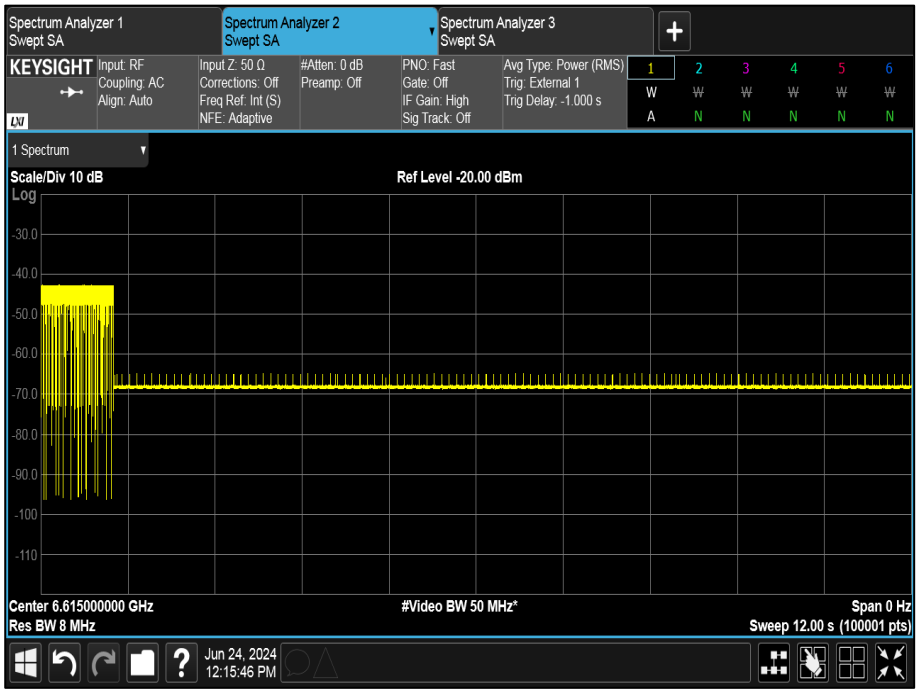

Figure 369 - U-NII-7, Minimum Bandwidth

Parameter	Results		
U-NII Band	7	7	7
Channel Number	143	143	143
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6665	6665	6665
AWGN Centre Frequency (MHz)	6590	6590	6590
AWGN Signal Power (dBm)	-69.46	-67.59	-65.67
Antenna Gain (dBi)	3.80	3.80	3.80
Adjusted Power (dBm)	-73.26	-71.39	-69.47
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 404 - U-NII-7, Maximum Bandwidth (AWGN Low)

Figure 370 - U-NII-7, Minimum Bandwidth (AWGN Low)

Parameter	Results		
U-NII Band	7	7	7
Channel Number	143	143	143
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6665	6665	6665
AWGN Centre Frequency (MHz)	6665	6665	6665
AWGN Signal Power (dBm)	-70.73	-68.27	-66.27
Antenna Gain (dBi)	3.80	3.80	3.80
Adjusted Power (dBm)	-74.53	-72.07	-70.07
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 405 - U-NII-7, Maximum Bandwidth (AWGN Mid)

Figure 371 - U-NII-7, Minimum Bandwidth (AWGN Mid)

Parameter	Results		
U-NII Band	7	7	7
Channel Number	143	143	143
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6665	6665	6665
AWGN Centre Frequency (MHz)	6740	6740	6740
AWGN Signal Power (dBm)	-66.25	-64.16	-62.49
Antenna Gain (dBi)	3.80	3.80	3.80
Adjusted Power (dBm)	-70.05	-67.96	-66.29
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 406 - U-NII-7, Maximum Bandwidth (AWGN High)

Figure 372 - U-NII-7, Minimum Bandwidth (AWGN High)

Parameter	Results		
U-NII Band	8	8	8
Channel Number	197	197	197
Bandwidth (MHz)	20	20	20
DUT Centre Frequency (MHz)	6935	6935	6935
AWGN Centre Frequency (MHz)	6935	6935	6935
AWGN Signal Power (dBm)	-71.57	-69.71	-68.93
Antenna Gain (dBi)	3.20	3.20	3.20
Adjusted Power (dBm)	-74.77	-72.91	-72.13
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 407 - U-NII-8, Minimum Bandwidth

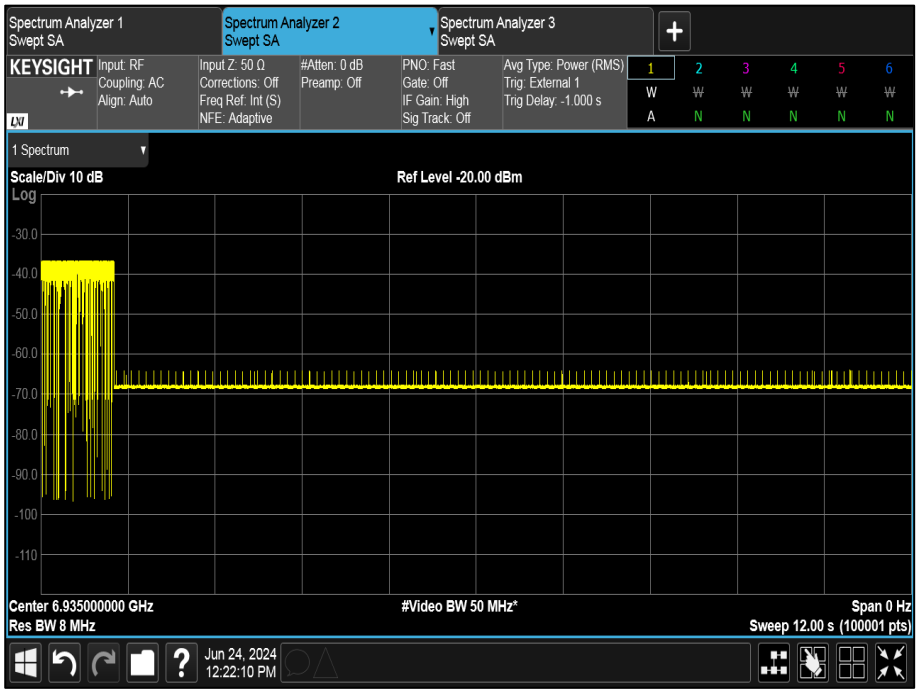

Figure 373 - U-NII-8, Minimum Bandwidth

Parameter	Results		
U-NII Band	8	8	8
Channel Number	207	207	207
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6985	6985	6985
AWGN Centre Frequency (MHz)	6910	6910	6910
AWGN Signal Power (dBm)	-67.32	-65.42	-60.62
Antenna Gain (dBi)	3.20	3.20	3.20
Adjusted Power (dBm)	-70.52	-68.62	-63.82
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 408 - U-NII-8, Maximum Bandwidth (AWGN Low)

Figure 374 - U-NII-8, Minimum Bandwidth (AWGN Low)

Parameter	Results		
U-NII Band	8	8	8
Channel Number	207	207	207
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6985	6985	6985
AWGN Centre Frequency (MHz)	6985	6985	6985
AWGN Signal Power (dBm)	-68.14	-65.28	-64.37
Antenna Gain (dBi)	3.20	3.20	3.20
Adjusted Power (dBm)	-71.34	-68.48	-67.57
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 409 - U-NII-8, Maximum Bandwidth (AWGN Mid)

Figure 375 - U-NII-8, Minimum Bandwidth (AWGN Mid)

Parameter	Results		
U-NII Band	8	8	8
Channel Number	207	207	207
Bandwidth (MHz)	160	160	160
DUT Centre Frequency (MHz)	6985	6985	6985
AWGN Centre Frequency (MHz)	7060	7060	7060
AWGN Signal Power (dBm)	-64.88	-63.41	-62.13
Antenna Gain (dBi)	3.20	3.20	3.20
Adjusted Power (dBm)	-68.08	-66.61	-65.33
Detection Limit (dBm)	-62.0	-62.0	-62.0
EUT Tx Status (OFF/Minimal/ON)	ON	Minimal	OFF

Table 410 - U-NII-8, Maximum Bandwidth (AWGN High)

Figure 376 - U-NII-8, Minimum Bandwidth (AWGN High)

FCC 47 CFR Part 15.407 (d)(6)

Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band must employ a contention-based protocol.

KDB 987594, Limit Clause I

Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band (herein referred to as unlicensed devices) are required to use technologies that include a contention-based protocol to avoid co-channel interference with incumbent devices sharing the band. To ensure incumbent co-channel operations are detected in a technology-agnostic manner, unlicensed devices are required to detect co-channel radio frequency energy (energy detect) and avoid simultaneous transmission.

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel (in which incumbent signal is transmitted) and stay off the incumbent channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm). The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain.

To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

ISED RSS-248, Limit Clause 4.7.2

The minimum detection threshold power is the received power referenced to a 0 dBi antenna. Devices shall use a contention-based protocol to detect the presence of any emissions on the channel that the device intends to occupy. The device shall be able to detect, within its entire occupied bandwidth, a radio frequency power of at least -62 dBm or lower.

If an emission is detected on a channel, the device shall cease transmissions and shall not resume transmissions on this channel while the detected radio frequency power is at or above the -62 dBm threshold.

2.9.8 Test Location and Test Equipment Used

This test was carried out in Shielded Laboratory 1.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
EXA Signal Analyser	Keysight Technologies	N9010B	4968	24	29-Jan-2026
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5429	12	16-May-2025
4m cable with K type Connector up to 40GHz	Rosenberger	LU1-500-4000	5628	12	07-Mar-2025
3.5mm Cable (1m)	Junkosha	MWX221/B	5837	12	27-Jul-2024
3.5mm Cable (1m)	Junkosha	MWX221/B	5838	12	27-Jul-2024
Vector Signal Generator	Rohde & Schwarz	SMM100A	5915	36	01-Mar-2026
WiFi 6E Tri-Band Gaming Router	Asus	GT-AXE110000	5926	-	TU
Humidity & Temperature meter	R.S Components	1364	6148	12	21-Jul-2024
Test Coupling Network	TUV SUD	TUV_RxTest_001	6441	12	30-Apr-2025

Table 411

TU - Traceability Unscheduled

3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Emission Bandwidth	± 3.91 MHz
Dual Client Test	± 1.38 dB
Transmit Power Control	± 1.49 dB
Maximum Conducted Output Power	± 1.38 dB
Maximum Conducted Power Spectral Density	± 1.49 dB
Authorised Band Edges	± 6.3 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Unwanted Emissions within the 5925-7125 MHz band	± 3.45 dB
Contention Based Protocol	Time: 0.30% Interferer BW: 267.98 kHz Interferer Level: 0.80 dB

Table 412

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.