UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-U7PROW
ISED ID	6545A-U7PROW
Equipment Under Test	U7-Pro-Wall
Test Report Serial Number	TR8758_01
Date of Tests	24-30 October, 2-3, 8-9 November 2023; 18-24 January 2024
Report Issue Date	25 January 2024

Test Specification	Applicant
47 CFR FCC Part 15, Subpart E	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.

NVLAP TESTING ilac-MRA

NVLAP LAB CODE 600241-0

Certification of Engineering Report

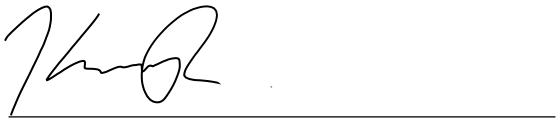
This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	UBIQUITI
Model Number	U7-Pro-Wall
FCC ID	SWX-U7PROW
ISED ID	6545A-U7PROW

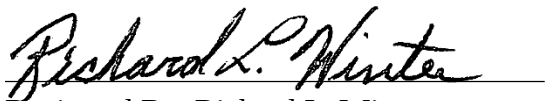
On this 25th day of January 2024, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete and correct to the best of my knowledge and are made in good faith.

Although NVLAP has accredited the Unified Compliance Laboratory testing facilities, this report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. federal government.

Unified Compliance Laboratory



Written By: Kimberly Rodriguez



Reviewed By: Richard L. Winter

Revision History		
Revision	**Description**	**Date**
01	Original Report Release	25 January 2024

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1 Client Information

1.1 Applicant

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Alex Macon
Title	Compliance

1.2 Manufacturer

Company	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
Contact Name	Alex Macon
Title	Compliance

2 Equipment Under Test (EUT)

2.1 Identification of EUT

Brand Name	UBIQUITI
Model Number	U7-Pro-Wall
Serial Number	05BF1C
Dimensions cm	15 x 10.3 x 3.6

2.2 Description of EUT

The U7-Pro-Wall is WiFi 7 access point that represents the next generation of competitively priced, prosumer wireless technology for home and enterprise users. The U7-Pro-Wall provides high aggregate throughput speeds. The U7-Pro-Wall transmit in the 2.4 GHz, 5 GHz and 6 GHz frequency bands and uses integrated antennas. The U7-Pro-Wall is powered from an 802.3at power adapter. The U7-Pro-Wall is an indoor device.

Band	Modulation Bandwidth	Frequency (MHz)
UNII-2A	20 MHz	5260, 5280, 5320
	40 MHz	5270, 5310
	80 MHz	5290
	160 MHz	5250
UNII-2C	20 MHz	5500, 5600*, 5720
	40 MHz	5510, 5590, 5710
	80 MHz	5530, 5610*, 5690
	160 MHz	5570
* Frequency not applicable in Canada		

Table 1: UNII-2A and UNII-2C Channel Settings

This report covers the circuitry of the device subject to FCC Part 15, Subpart E. The circuitry of the device subject to FCC Part 15 Subpart B was found to be compliant and is covered under a separate Unified Compliance Laboratory test report.

2.3 EUT and Support Equipment

The EUT and support equipment used during the test are listed below.

Brand Name Model Number Serial Number	Description	Name of Interface Ports / Interface Cables
BN: UBIQUITI MN: U7-Pro-Wall (Note 1) SN: 05BF1C	WiFi Access Point	See Section 2.4
BN: UBIQUITI MN: U-POE-at SN: N/A	PoE Power Adapter	Unshielded Cat 5e cable/1 meters
BN: Dell MN: XPS 13 SN: N/A	Laptop Personal Computer	Unshielded Cat 5e cable/1 meters

Notes: (1) EUT
(2) Interface port connected to EUT (See Section 2.4)

The support equipment listed above was not modified in order to achieve compliance with this standard.

2.4 Interface Ports on EUT

Name of Ports	No. of Ports Fitted to EUT	Cable Description/Length
AC Mains	1	3 conductor power cord/80 cm
POE (POE Injector)	1	Unshielded Cat 5e cable/8 meters
LAN (POE Injector)	1	Unshielded Cat 5e cable/1 meters

2.5 Operating Environment

Power Supply	120 Volts AC Mains to 48 Volts PoE
AC Mains Frequency	60 Hz
Temperature	21.5 – 24.1 °C
Humidity	16.4 – 34.54 %
Barometric Pressure	1016 mBar

2.6 Operating Modes

The U7-Pro-Wall was tested using test software in order to enable to constant transmission. The measurements within this report are corrected to reference a 100% duty cycle. All emission modes of 802.11 a/ax were investigated. All measurements are reported with the worst-case mode (802.11ax) unless otherwise stated.

2.7 EUT Exercise Software

EUT firmware version 1.0 was used to operate the transmitter using a constant transmit mode.

2.8 Block Diagram of Test Configuration

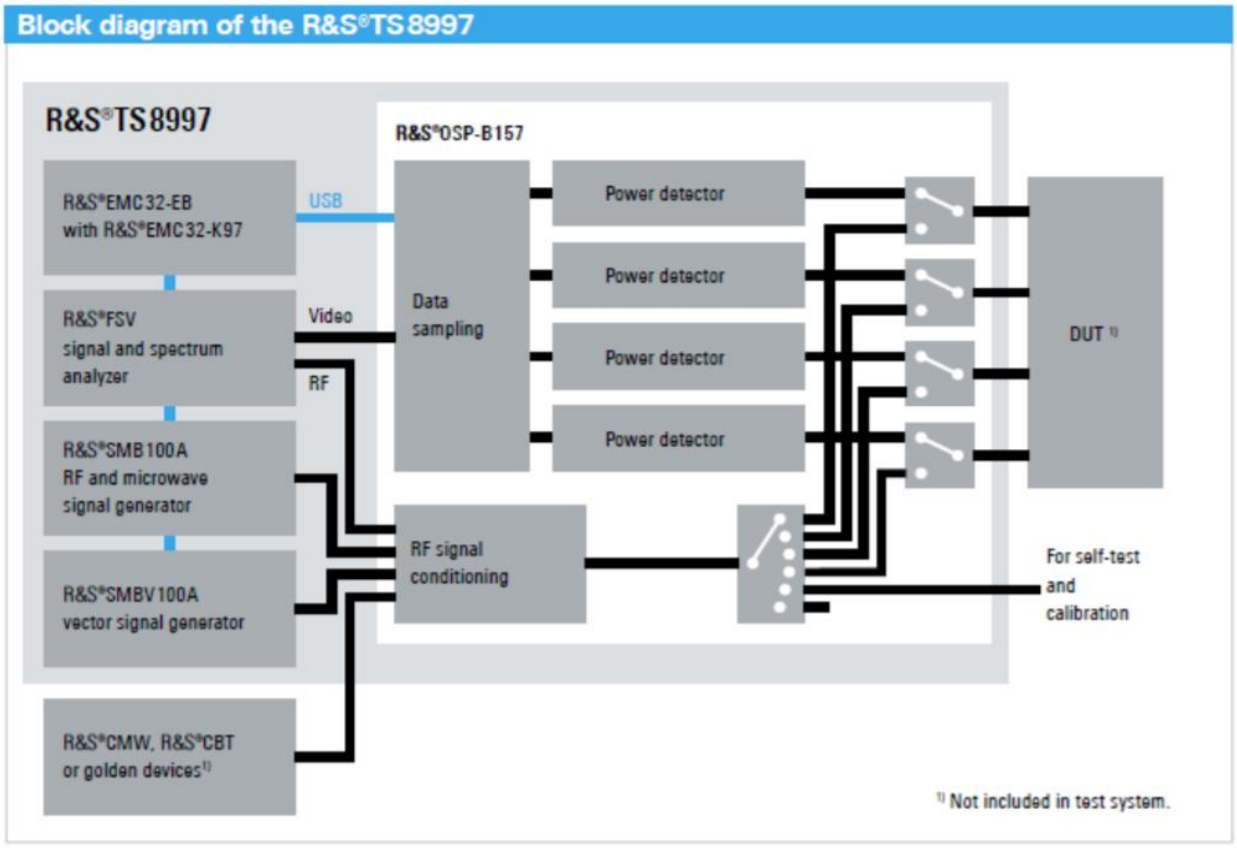


Diagram 1: Test Configuration Block Diagram

2.9 Modification Incorporated/Special Accessories on EUT

There were no modifications made to the EUT during testing to comply with the specification.

2.10 Deviation, Opinions Additional Information or Interpretations from Test Standard

There were no deviations, opinions, additional information or interpretations from the test specification.

3 Test Specification, Method and Procedures

3.1 Test Specification

Title	47 CFR FCC Part 15, Subpart E, Section 15.407 Limits and methods of measurement of radio interference characteristics of Unlicensed National Information Infrastructure Devices
Purpose of Test	The tests were performed to demonstrate initial compliance

3.2 Methods & Procedures

3.2.1 47 CFR FCC Part 15 Section 15.407

See test standard for details.

3.3 FCC Part 15, Subpart E

3.3.1 Summary of Tests

FCC Section	ISED Section	Environmental Phenomena	Frequency Range (MHZ)	Result
15.407(a)	N/A	Antenna requirements	Structural Requirement	Compliant
15.407(b)	RSS-Gen	Conducted Disturbance at Mains Port	0.15 to 30	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Bandwidth Requirement	5260 to 5570	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5260 to 5570	Compliant
15.407(b)	RSS-247 §6.2.2, §6.2.3	Antenna Conducted Spurious Emissions	0.009 to 40000	Compliant
15.407(b)	RSS-247 §6.2.2, §6.2.3	Radiated Spurious Emissions	0.009 to 40000	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Peak Power Spectral Density	5260 to 5570	Compliant
15.407(h)	RSS-247 §6.3	DFS Requirements	5260 to 5570	Compliant
The testing was performed according to the procedures in ANSI C63.10-2013, KDB 558074 and 47 CFR Part 15. Where applicable, KDB 662911 was followed to sum required measurements.				

3.4 Results

In the configuration tested, the EUT complied with the requirements of the specification.

3.5 Test Location

Testing was performed at the Unified Compliance Laboratory 3-Meter and 10-Meter chamber located at 427 West 12800 South, Draper, UT 84020. Unified Compliance Laboratory is accredited by National Voluntary Laboratory Accreditation Program (NVLAP); NVLAP Code 600241-0 which is effective until 30 June 2024. This site has also been registered with Innovations, Science and Economic Development (ISED) department as was accepted under Appendix B, Phase 1 procedures of the APEC Tel MRA for Canadian recognition. ISED No.: 25346, effective until 30 June 2024.

Unified Compliance Laboratory has been assigned Designation Number US5037 by the FCC and Conformity Assessment Number US0223 by ISED.

4 Test Equipment

4.1 Conducted Emissions at Mains Ports

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	AFJ	FFT3010	UCL-2500	7/13/2023	7/13/2024
LISN	AFJ	LS16C/10	UCL-2512	5/26/2023	5/26/2024
ISN	Teseq	ISN T800	UCL-2974	6/27/2022	6/272024
LISN	Com-Power	LIN-120C	UCL-2612	1/24/2023	1/24/2024
AC Power Source	Laplace Instruments	AC1000A	UCL-2857	N/A	N/A
Test Software	UCL	Revision 1	UCL-3107	N/A	N/A

Table 2: List of equipment used for Conducted Emissions Testing at Mains Port

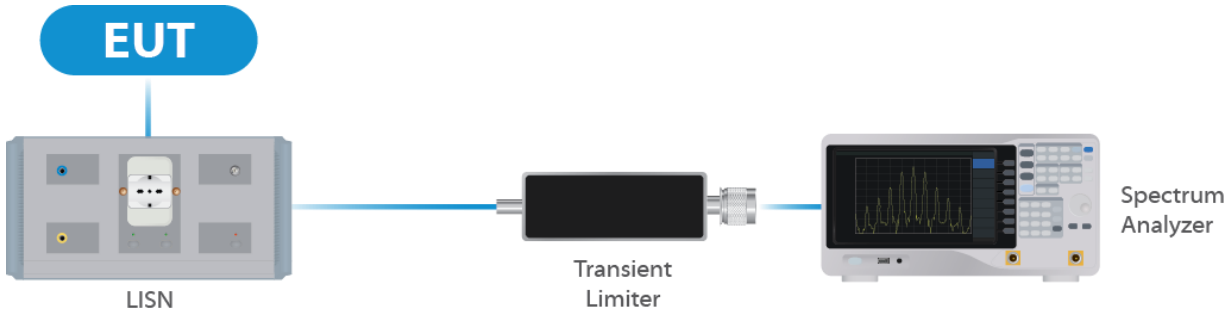


Figure 1: Conducted Emissions Test

4.2 Direct Connect at the Antenna Port Tests

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
Spectrum Analyzer	R&S	FSV40	UCL-2861	11/27/2023	11/27/2024
Signal Generator	R&S	SMB100A	UCL-2864	N/A	N/A
Vector Signal Generator	R&S	SMBV100A	UCL-2873	N/A	N/A
Switch Extension	R&S	OSP-B157WX	UCL-2867	2/22/2023	2/22/2024
Switch Extension	R&S	OSP-150W	UCL-2870	2/22/2023	2/22/2024

Table 3: List of equipment used for Direct Connect at the Antenna Port

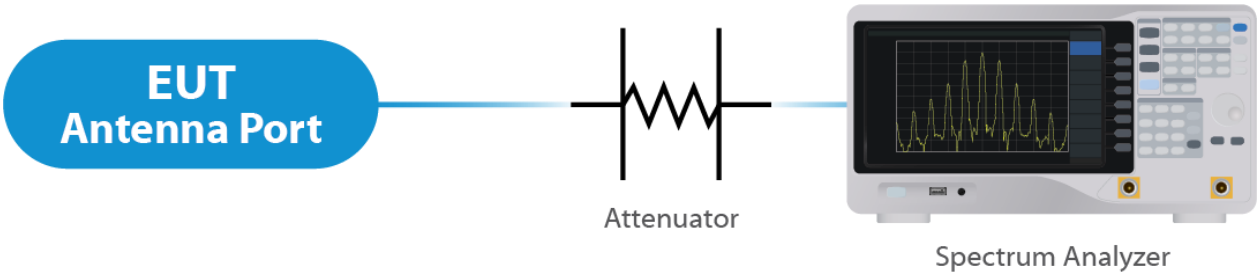


Figure 2: Direct Connect at the Antenna Port Test

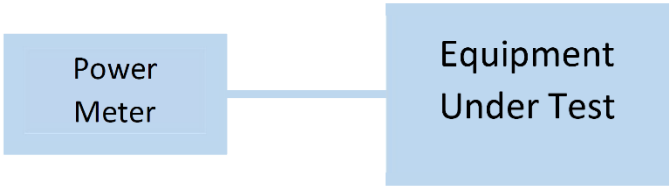


Figure 3: Output Power Measurement

4.3 Radiated Emissions

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	Keysight	N9038A	UCL-2778	1/27/2023	1/27/2024
Pre-Amplifier 9 kHz – 1 GHz	Sonoma Instruments	310N	UCL-2889	1/19/2024	1/19/2026
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3062	2/22/2023	2/22/2025
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3071	1/11/2023	1/11/2025
Double Ridge Horn Antenna	Scwarzbeck	BBHA 9120D	UCL-3065	9/22/2022	9/22/2024
Log Periodic	Scwarzbeck	STLP 9129	UCL-3068	1/27/2023	1/27/2025
15 - 40 GHz Horn Antenna	Scwarzbeck	BBHA 9170	UCL-2487	6/09/2022	6/09/2024
1 – 18 GHz Amplifier	Com-Power	PAM 118A	UCL-3833	1/19/2024	1/19/2026
Test Software	UCL	Revision 1	UCL-3108	N/A	N/A

Table 4: List of equipment used for Radiated Emissions

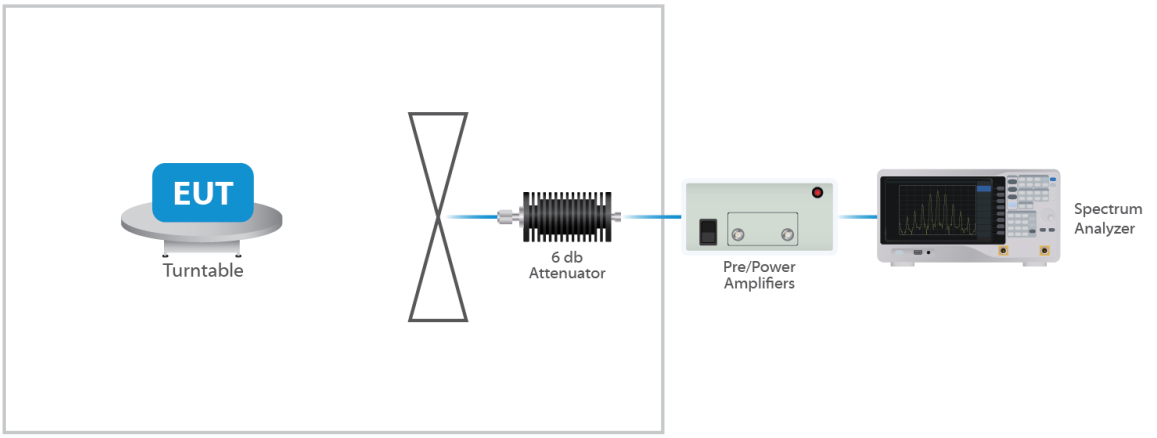


Figure 4: Radiated Emissions Test

4.4 DFS Testing

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
Vector Signal Generator	R&S	SMBV100A	UCL-2873	N/A	N/A
Spectrum Analyzer	Keysight	N9010B	UCL-7069	4/26/2023	4/26/2024

4.4.1 Master Test Set Up

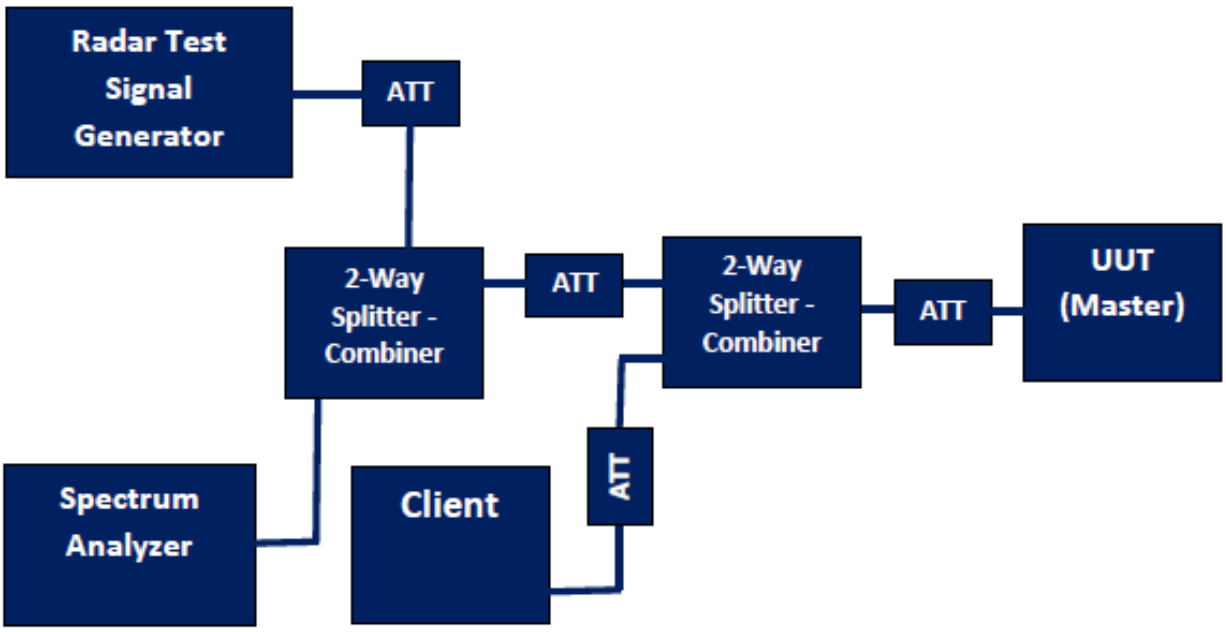


Figure 5: DFS Test Set Up - Master

4.5 Equipment Calibration

All applicable equipment is calibrated using either an independent calibration laboratory or Unified Compliance Laboratory personnel at intervals defined in ANSI C63.4:2014 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request.

4.6 Measurement Uncertainty

Test	Uncertainty (± dB)	Confidence (%)
Conducted Emissions	1.44	95
Radiated Emissions (9 kHz to 30 MHz)	2.50	95
Radiated Emissions (30 MHz to 1 GHz)	4.38	95
Radiated Emissions (1 GHz to 18 GHz)	4.37	95
Radiated Emissions (18 GHz to 40 GHz)	3.93	95
Direct Connect Tests	**K Factor**	**Value**
Emissions Bandwidth	2	2.0%
Output Power	2	1.0 dB
Peak Power Spectral Density	2	1.3 dB
Band Edge	2	0.8 dB
Transmitter Spurious Emissions	2	1.8 dB

5 Test Results

5.1 §15.203 Antenna Requirements

The EUT uses an integral folding antenna structure. Per the manufacturer, the maximum gain of the antenna per chain is 5 dBi. This is an 802.11 device and utilizes CDD as described in KDB 662911 D01. The antenna is not user replaceable.
For CDD transmissions, directional gain is calculated as follows.

Array Gain = 10 log(NANT/NSS) dB
NANT = number of transmit antennas and
NSS = number of spatial streams. NSS = 1 considered worst case.

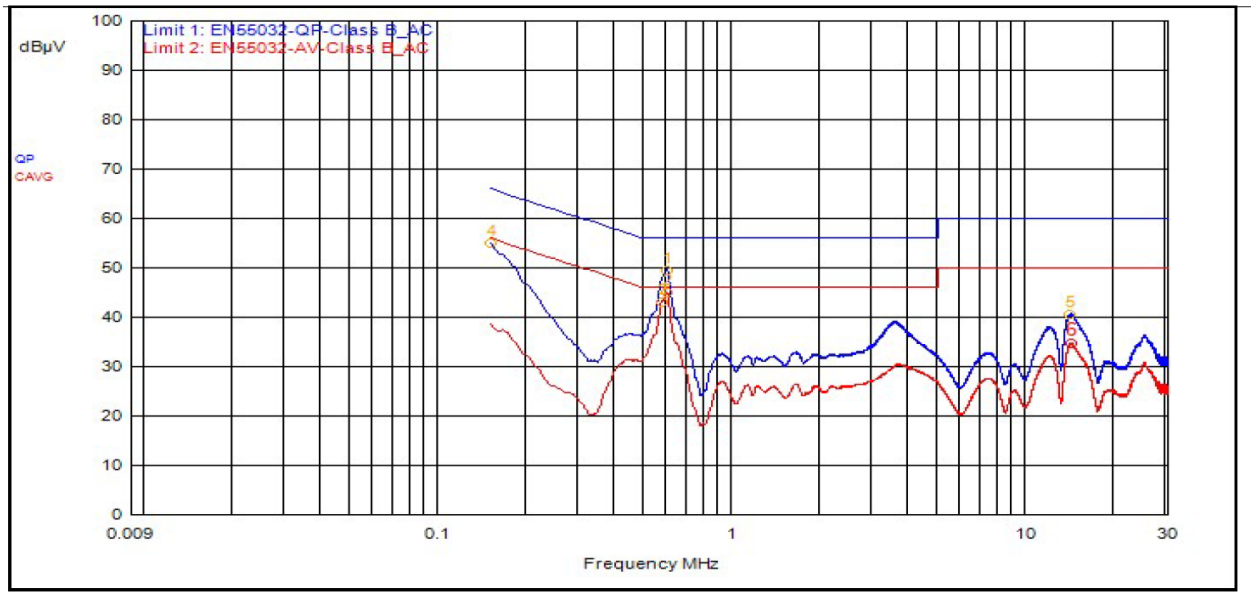
For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for NANT ≤ 4;
For PSD measurements when Nss=1: Array Gain = 10 log(NANT/NSS) dB + Antenna Gain (dBi). Or 3.01 dB + 5 dBi = 8.01 dBi.

Results

The EUT complied with the specification

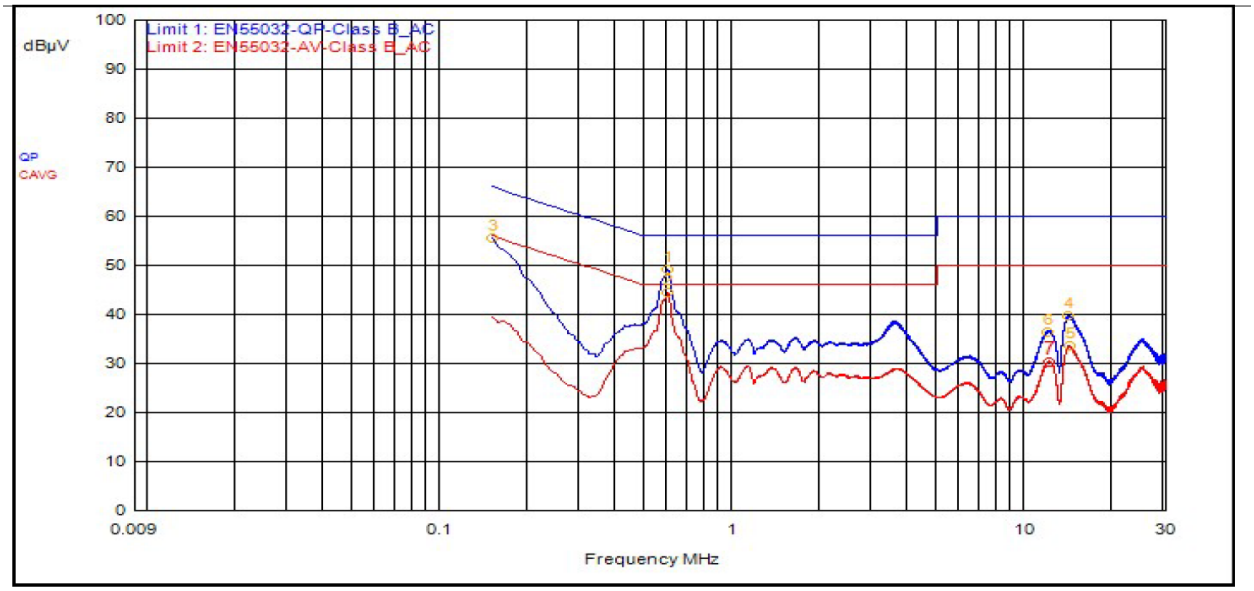
5.2 Conducted Emissions at Mains Ports Data

5.2.1 Line



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.	P/F
MU	MHz	dB	dB	dB	Type	dBµV	dBµV	dBµV	dB	dBµV	dB	P/F
1	591,000kHz	9.50	0.00		QPeak	39.98	49.48	56.00	-6.52			
4	150,000kHz	9.49	0.00		QPeak	45.58	55.07	66.00	-10.93			
5	13.893	9.67	0.00		QPeak	30.98	40.65	60.00	-19.35			
2	594,000kHz	9.50	0.00		C_AVG	35.43	44.93			46.00	-1.07	
3	570,000kHz	9.49	0.00		C_AVG	33.65	43.14			46.00	-2.86	
6	14.019	9.67	0.00		C_AVG	25.08	34.75			50.00	-15.25	

5.2.2 Neutral



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.	P/F
MU	MHz	dB	dB	dB	Type	dBµV	dBµV	dBµV	dB	dBµV	dB	P/F
1	594,000kHz	9.59	0.00		QPeak	39.62	49.21	56.00	-6.79			
3	150,000kHz	9.62	0.00		QPeak	45.80	55.42	66.00	-10.58			
4	13.935	9.72	0.00		QPeak	29.91	39.63	60.00	-20.37			
6	11.739	9.67	0.00		QPeak	26.82	36.49	60.00	-23.51			
2	597,000kHz	9.59	0.00		C_AVG	34.97	44.56			46.00	-1.44	
5	13.998	9.73	0.00		C_AVG	23.77	33.50			50.00	-16.50	
7	11.952	9.68	0.00		C_AVG	20.65	30.33			50.00	-19.67	

Result

The EUT complied with the specification limit.

5.3 §15.403(i) 26 dB Emissions Bandwidth

All chains were measured under the guidance of KDB 789033 Section II.C. and KDB 66291 D01. Please see associated annex for details on instrument settings.

5.3.1 UNII-2A

Bandwidth	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
a 20	5260	17.00	22.30
a 20	5280	16.80	22.30
a 20	5320	16.90	22.40
ax 20	5260	19.20	22.80
ax 20	5280	19.10	22.20
ax 20	5320	19.10	22.90
ax 40	5270	38.50	43.05
ax 40	5310	38.25	43.35
ax 80	5290	78.00	89.50
ax 160	5250	157.00	173.00

5.3.2 UNII-2C

Bandwidth	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
a 20	5500	16.90	22.40
a 20	5600	16.80	22.40
a 20	5720	16.90	22.40
ax 20	5500	19.10	22.30
ax 20	5600	19.20	22.60
ax 20	5720	19.10	22.50
ax 40	5510	38.25	43.50
ax 40	5590	38.25	42.90
ax 40	5710	38.25	43.95
ax 80	5530	77.50	87.00
ax 80	5610	77.50	90.00
ax 80	5690	77.50	88.00
ax 160	5570	158.00	175.00

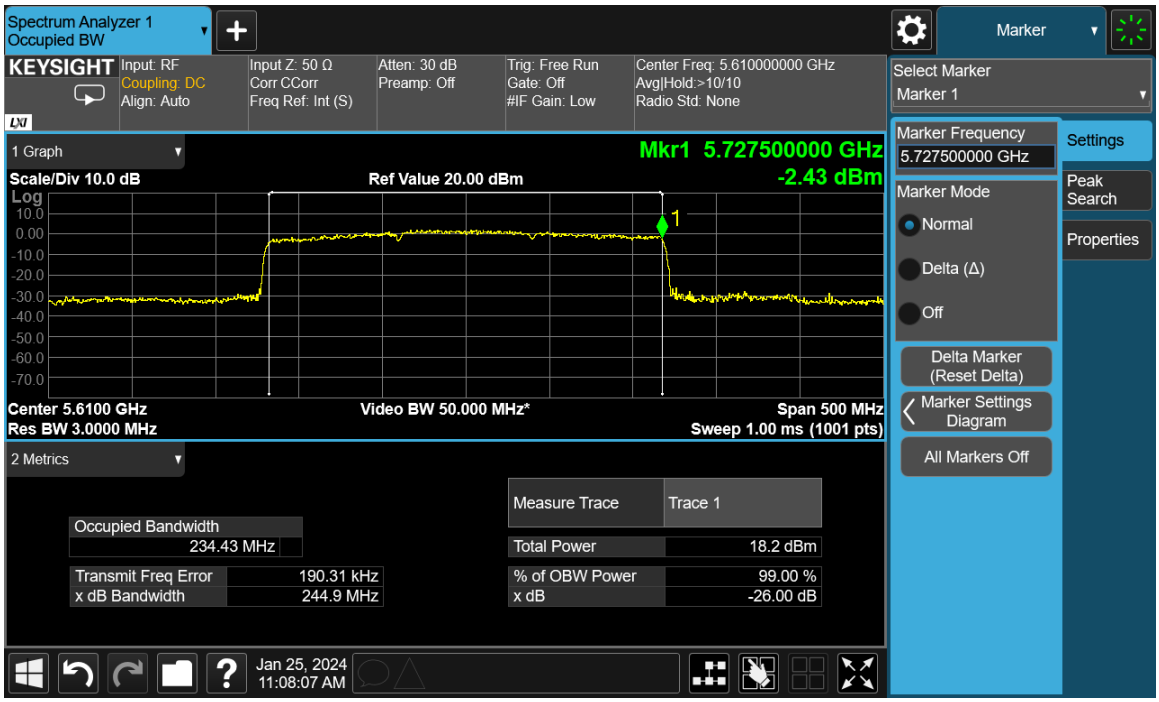
Result

The 26 dB bandwidths are reported for information purposes. Please see Annex for all bandwidth measurements.

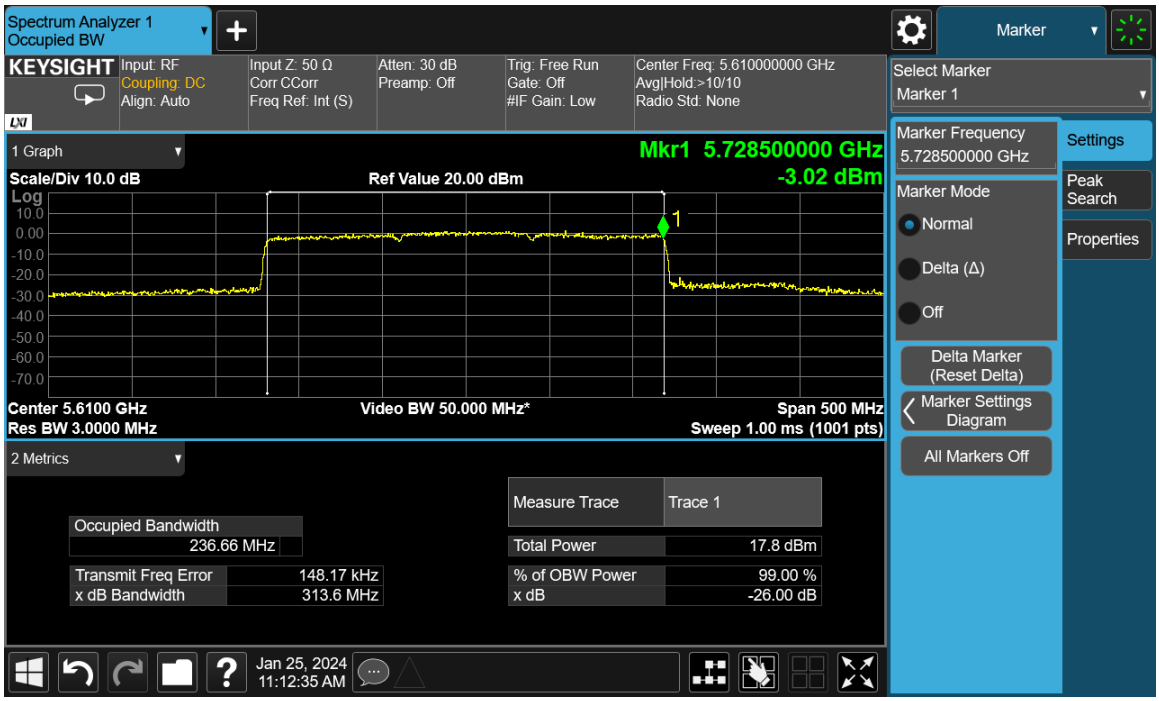
5.3.3 Channel Puncturing

All chains were measured under the guidance of KDB 789033 Section IV 1. This device uses Channel puncturing techniques which are verified below.

Channel 1



Channel 2



5.4 §15.407(a)(2) Maximum Average Output Power

All chains were measured and summed under the guidance of KDB 789033 Section II. E.2. and KDB 66291 D01. Please see associated annex for details on instrument settings.

The maximum average RF conducted output power measured for this device was 23.88 dBm or 244.34 mW. The limit is 24 dBm or 250 mW when using antennas with 6 dBi or less gain. The antenna has a maximum gain of 5 dBi.

5.4.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
a 20	5260	Mcs0	21	21.56	8.77
a 20	5280	Mcs0	21	21.56	8.90
a 20	5320	Mcs0	21	21.38	8.87
ax 20	5260	Mcs0	21	21.44	8.00
ax 20	5280	Mcs0	21	21.62	8.00
ax 20	5320	Mcs0	22	22.42	8.91
ax 40	5270	Mcs0	23	23.53	6.90
ax 40	5310	Mcs0	23	23.53	6.97
ax 80	5290	Mcs0	23	23.21	3.63
ax 160	5250	Mcs0	23	23.47	1.12

5.4.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
a 20	5500	Mcs0	21	21.02	8.11
a 20	5600	Mcs0	21	21.27	8.59
a 20	5720	Mcs0	21	21.44	8.70
ax 20	5500	Mcs0	22	22.04	8.69
ax 20	5600	Mcs0	21	21.37	8.12
ax 20	5720	Mcs0	21	21.65	8.30
ax 40	5510	Mcs0	23	23.04	6.53
ax 40	5590	Mcs0	23	23.23	6.88
ax 40	5710	Mcs0	23	23.77	7.23
ax 80	5530	Mcs0	24	23.88	4.35
ax 80	5610	Mcs0	23	23.25	3.94
ax 80	5690	Mcs0	23	23.50	4.00
ax 160	5570	Mcs0	23	23.19	1.10

Result

In the configuration tested, the maximum average RF output power was less than 1 watt; therefore, the EUT complied with the requirements of the specification.

5.5 §15.407(b) Spurious Emissions

5.5.1 Conducted Spurious Emissions

The frequency range from the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental frequency was investigated to measure any antenna-conducted emissions. The graphs show the measurement data from spurious emissions noted across the frequency range when transmitting at the lowest frequency, middle frequency and upper frequency. Shown below are plots with the EUT turned to the upper and lower channels with the antenna gain of 5 dBi accounted for. These demonstrate compliance with the provisions of this section at the band edges.

The emissions must be below -27 dBm EIRP.

Result

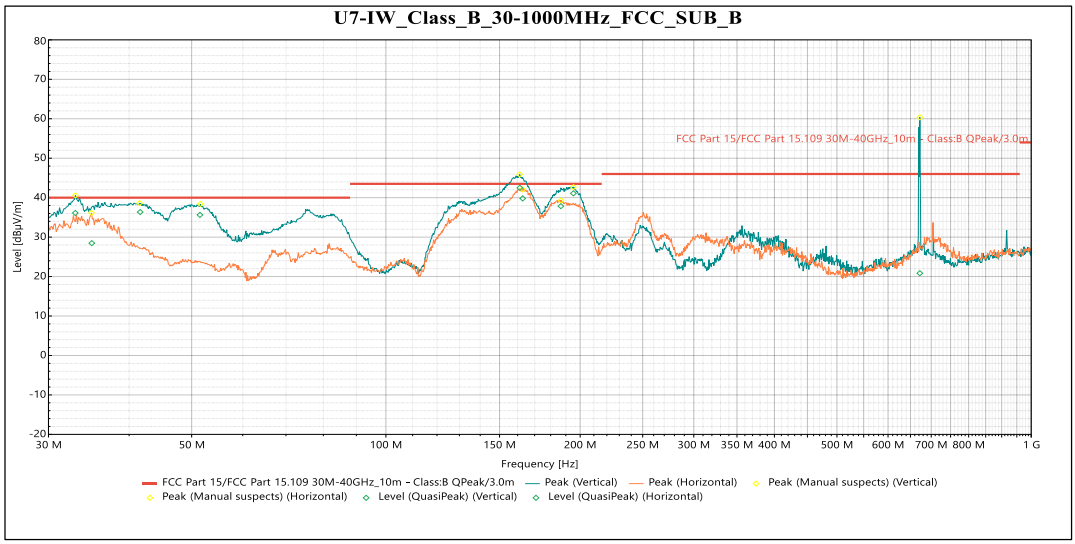
Conducted spurious emissions were below -27 dBm; therefore, the EUT complies with the specification. See Annex for results.

5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205

The frequency range from the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental emissions was investigated to measure any radiated emissions in the restricted bands. For frequencies above 18.0 GHz. The emissions in the restricted bans must meet the limits specified in § 15.209. Conducted measurement results are included in the Annex. Radiated data with the EUT transmitting into a load is included below. All emissions between the required frequencies were investigated, the following plots represent the worst case. The “fail” is the transmitted signal exceeding the spurious limit.

Correction Factor = Antenna Factor + Cable Loss - Pre-Amplifier Gain, and is added to the Receiver reading.

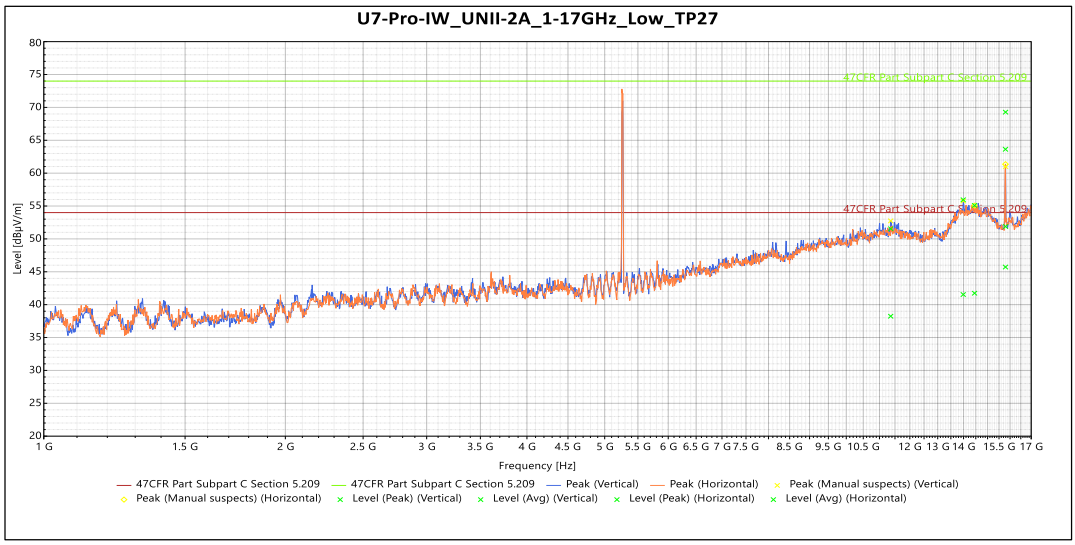
5.5.3 UNII-2A



Final source: QuasiPeak

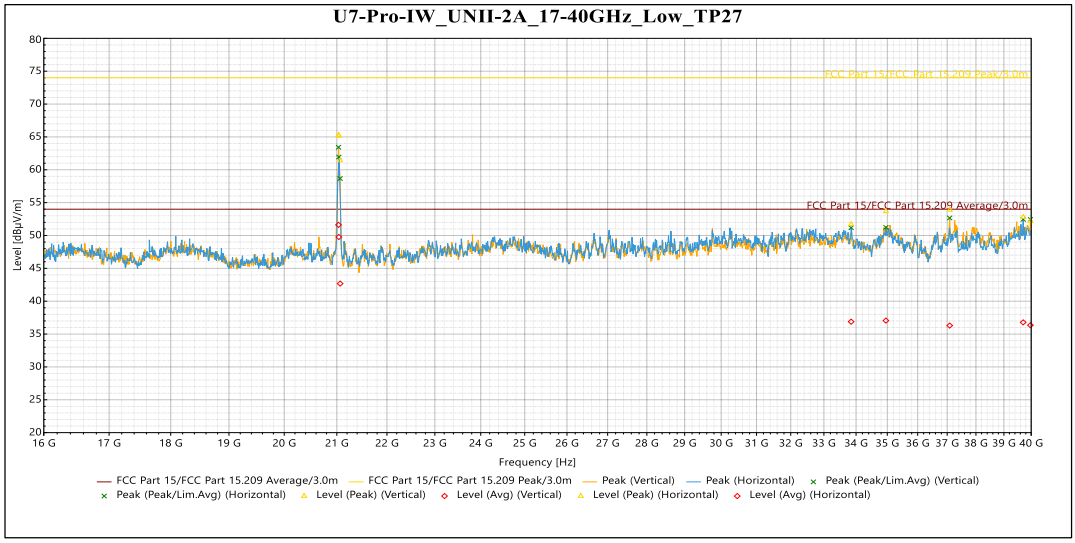
Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
33.017 MHz	36.111	40	-3.889	204	1.129	Vertical	-9.415
41.61 MHz	36.345	40	-3.655	359	1.129	Vertical	-15.523
51.502 MHz	35.629	40	-4.371	359	1.129	Vertical	-21.223
161.28 MHz	42.492	43.5	-1.008	358	1.132	Vertical	-16.039
195.23 MHz	41.094	43.5	-2.406	353	1.129	Vertical	-15.934
672.08 MHz	20.853	46	-25.147	83	1.667	Vertical	-6.922
35.016 MHz	28.469	40	-11.531	171	3.65	Horizontal	-10.579
162.92 MHz	39.812	43.5	-3.688	103	1.489	Horizontal	-16.105
186.7 MHz	37.853	43.5	-5.647	274	1.712	Horizontal	-16.813

Graph 1: Radiated Emissions within 30MHz - 1GHz



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
11.3594314 GHz	Peak	51.543	74	-22.457	76	2.811	Vertical	7.67
13.9880917 GHz	Peak	55.947	74	-18.053	356	3.158	Vertical	11.097
15.7933914 GHz	Peak	69.281	74	-4.719	328	2.65	Vertical	9.291
11.3594314 GHz	AVG	38.243	54	-15.757	76	2.811	Vertical	7.67
13.9880917 GHz	AVG	41.537	54	-12.463	356	3.158	Vertical	11.097
15.7933914 GHz	AVG	51.881	54	-2.119	328	2.65	Vertical	9.291
14.4498857 GHz	Peak	55.096	74	-18.904	26	1.5	Horizontal	11.667
15.7902359 GHz	Peak	63.63	74	-10.37	125	2.659	Horizontal	9.29
14.4498857 GHz	AVG	41.736	54	-12.264	26	1.5	Horizontal	11.667
15.7902359 GHz	AVG	45.72	54	-8.28	125	2.659	Horizontal	9.29

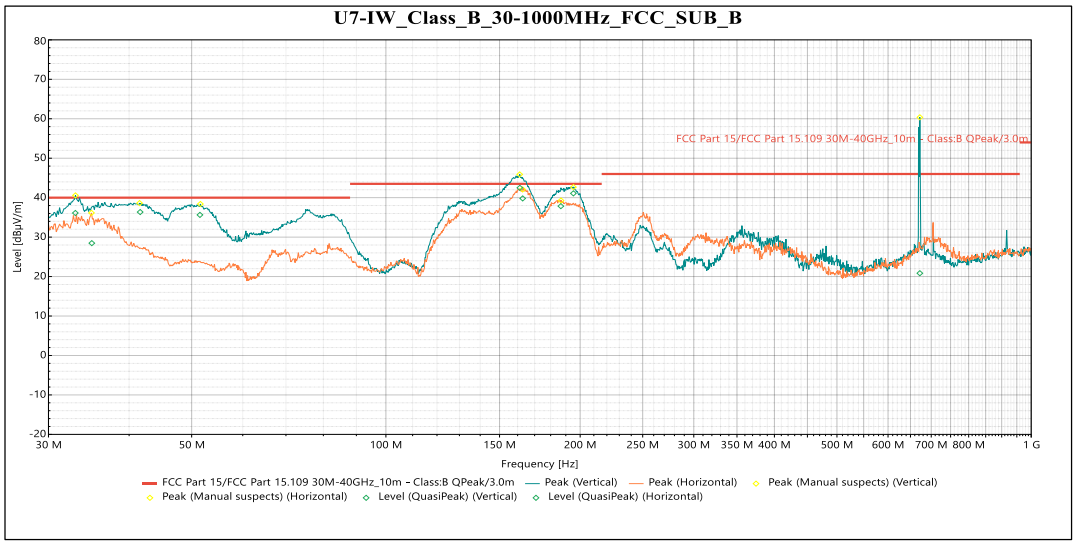
Graph 2: Radiated Emissions 1-17 GHz Low Channel (Worst Case)



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
21.033 GHz	Peak	65.288	74	-8.712	71	Vertical	0.485
21.065 GHz	Peak	61.413	74	-12.587	125	Vertical	-0.025
37.086 GHz	Peak	53.875	74	-20.125	9	Vertical	4.229
39.972 GHz	Peak	52.204	74	-21.796	326	Vertical	2.299
21.033 GHz	AVG	51.623	54	-2.377	71	Vertical	0.485
21.065 GHz	AVG	42.683	54	-11.317	125	Vertical	-0.025
37.086 GHz	AVG	36.291	54	-17.709	9	Vertical	4.229
39.972 GHz	AVG	36.351	54	-17.649	326	Vertical	2.299
21.039 GHz	Peak	65.163	74	-8.837	2	Horizontal	0.357
33.845 GHz	Peak	51.705	74	-22.295	178	Horizontal	1.932
34.955 GHz	Peak	53.669	74	-20.331	212	Horizontal	3.476
39.704 GHz	Peak	52.799	74	-21.201	306	Horizontal	2.854
21.039 GHz	AVG	49.773	54	-4.227	2	Horizontal	0.357
33.845 GHz	AVG	36.883	54	-17.117	178	Horizontal	1.932
34.955 GHz	AVG	37.052	54	-16.948	212	Horizontal	3.476
39.704 GHz	AVG	36.78	54	-17.22	306	Horizontal	2.854

Graph 3: Radiated Emissions 17-40 GHz Low Channel (Worst Case)

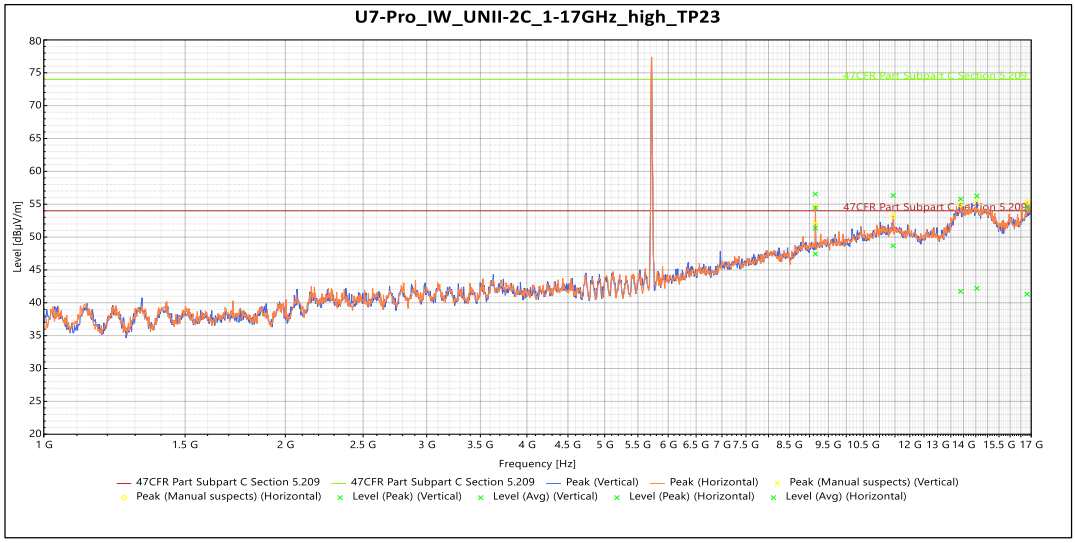
5.5.4 UNII-2C



Final source: QuasiPeak

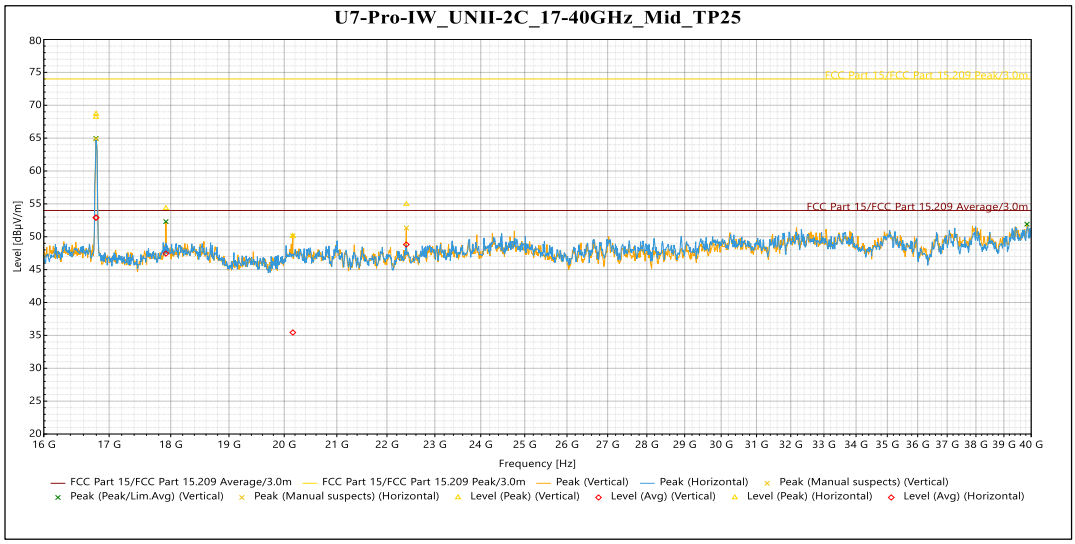
Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
33.017 MHz	36.111	40	-3.889	204	1.129	Vertical	-9.415
41.61 MHz	36.345	40	-3.655	359	1.129	Vertical	-15.523
51.502 MHz	35.629	40	-4.371	359	1.129	Vertical	-21.223
161.28 MHz	42.492	43.5	-1.008	358	1.132	Vertical	-16.039
195.23 MHz	41.094	43.5	-2.406	353	1.129	Vertical	-15.934
672.08 MHz	20.853	46	-25.147	83	1.667	Vertical	-6.922
35.016 MHz	28.469	40	-11.531	171	3.65	Horizontal	-10.579
162.92 MHz	39.812	43.5	-3.688	103	1.489	Horizontal	-16.105
186.7 MHz	37.853	43.5	-5.647	274	1.712	Horizontal	-16.813

Graph 4: Radiated Emissions within 30MHz - 1GHz



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
9.1517996 GHz	Peak	54.438	74	-19.562	0	1.636	Vertical	4.398
14.5474325 GHz	Peak	56.257	74	-17.743	289	2.138	Vertical	11.83
9.1517996 GHz	AVG	47.428	54	-6.572	0	1.636	Vertical	4.398
14.5474325 GHz	AVG	42.207	54	-11.793	289	2.138	Vertical	11.83
9.1518685 GHz	Peak	56.539	74	-17.461	22	1.632	Horizontal	4.398
11.4402966 GHz	Peak	56.334	74	-17.666	55	2.64	Horizontal	7.806
13.885802 GHz	Peak	55.786	74	-18.214	18	2.138	Horizontal	10.837
16.8030175 GHz	Peak	54.524	74	-19.476	69	2.642	Horizontal	12.864
9.1518685 GHz	AVG	51.369	54	-2.631	22	1.632	Horizontal	4.398
11.4402966 GHz	AVG	48.674	54	-5.326	55	2.64	Horizontal	7.806
13.885802 GHz	AVG	41.726	54	-12.274	18	2.138	Horizontal	10.837
16.8030175 GHz	AVG	41.314	54	-12.686	69	2.642	Horizontal	12.864

Graph 5: Radiated Emissions 1-17 GHz High Channel (Worst Case)



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
16.794 GHz	Peak	68.212	74	-5.788	82	Vertical	0.013
17.92 GHz	Peak	54.337	74	-19.663	138	Vertical	-0.351
20.16 GHz	Peak	50.114	74	-23.886	191	Vertical	0.486
22.4 GHz	Peak	54.953	74	-19.047	50	Vertical	-0.193
16.794 GHz	AVG	52.887	54	-1.113	82	Vertical	0.013
17.92 GHz	AVG	47.441	54	-6.559	138	Vertical	-0.351
20.16 GHz	AVG	35.443	54	-18.557	191	Vertical	0.486
22.4 GHz	AVG	48.823	54	-5.177	50	Vertical	-0.193
16.795 GHz	Peak	68.683	74	-5.317	5	Horizontal	0.018
16.795 GHz	AVG	52.935	54	-1.065	5	Horizontal	0.018

Graph 6: Radiated Emissions 17-40 GHz Middle Channel (Worst Case)

5.6 §15.407(a) Maximum Power Spectral Density

All chains were measured and summed under the guidance of KDB 789033 Section II. F. and KDB 66291 D01. Please see associated annex for details on instrument settings.

The maximum average power spectral density conducted from the intentional radiator of the antenna shall not be greater than 11 dBm in any 1 MHz band during any time interval of continuous transmission. Results of this testing are summarized. With a 5 dBi antenna, the conducted limit for power spectral density is 11 dBm. As per KDB 662911, When the EUT is using spatial-multiplexing in HT to HE modes, there is not additional array gain to accommodate. When the EUT uses Nss=1 data rates, the antenna gain is 5 dBi + Array gain of 3.01 dB which is a total of 8.01 dBi
Results of this testing are summarized.

5.6.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
a 20	5260	Mcs0_Nss2	21	21.56	8.77
a 20	5280	Mcs0_Nss2	21	21.56	8.90
a 20	5320	Mcs0_Nss2	21	21.38	8.87
ax 20	5260	Mcs0_Nss2	21	21.44	8.00
ax 20	5280	Mcs0_Nss2	21	21.62	8.00
ax 20	5320	Mcs0_Nss2	22	22.42	8.91
ax 40	5270	Mcs0_Nss2	23	23.53	6.90
ax 40	5310	Mcs0_Nss2	23	23.53	6.97
ax 80	5290	Mcs0_Nss2	23	23.21	3.63
ax 160	5250	Mcs0_Nss2	23	23.47	1.12

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
a 20	5260	Mcs0_Nss1	21	21.56	8.77
a 20	5280	Mcs0_Nss1	21	21.56	8.90
a 20	5320	Mcs0_Nss1	21	21.38	8.87
ax 20	5260	Mcs0_Nss1	21	21.44	8.00
ax 20	5280	Mcs0_Nss1	21	21.62	8.00
ax 20	5320	Mcs0_Nss1	22	22.42	8.91
ax 40	5270	Mcs0_Nss1	23	23.53	6.90
ax 40	5310	Mcs0_Nss1	23	23.53	6.97
ax 80	5290	Mcs0_Nss1	23	23.21	3.63
ax 160	5250	Mcs0_Nss1	23	23.47	1.12

5.6.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
a 20	5500	Mcs0_Nss2	21	21.02	8.11
a 20	5600	Mcs0_Nss2	21	21.27	8.59
a 20	5720	Mcs0_Nss2	21	21.44	8.70
ax 20	5500	Mcs0_Nss2	22	22.04	8.69
ax 20	5600	Mcs0_Nss2	21	21.37	8.12
ax 20	5720	Mcs0_Nss2	21	21.65	8.30
ax 40	5510	Mcs0_Nss2	23	23.04	6.53
ax 40	5590	Mcs0_Nss2	23	23.23	6.88
ax 40	5710	Mcs0_Nss2	23	23.77	7.23
ax 80	5530	Mcs0_Nss2	24	23.88	4.35
ax 80	5610	Mcs0_Nss2	23	23.25	3.94
ax 80	5690	Mcs0_Nss2	23	23.50	4.00
ax 160	5570	Mcs0_Nss2	23	23.19	1.10

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
a 20	5500	Mcs0_Nss1	21	21.02	8.11
a 20	5600	Mcs0_Nss1	21	21.27	8.59
a 20	5720	Mcs0_Nss1	21	21.44	8.70
ax 20	5500	Mcs0_Nss1	22	22.04	8.69
ax 20	5600	Mcs0_Nss1	21	21.37	8.12
ax 20	5720	Mcs0_Nss1	21	21.65	8.30
ax 40	5510	Mcs0_Nss1	23	23.04	6.53
ax 40	5590	Mcs0_Nss1	23	23.23	6.88
ax 40	5710	Mcs0_Nss1	23	23.77	7.23
ax 80	5530	Mcs0_Nss1	24	23.88	4.35
ax 80	5610	Mcs0_Nss1	23	23.25	3.94
ax 80	5690	Mcs0_Nss1	23	23.50	4.00
ax 160	5570	Mcs0_Nss1	23	23.19	1.10

Result

The maximum average power spectral density was less than the limit of 8.99 dBm; therefore, the EUT complies with the specification.

5.7 DFS Requirement

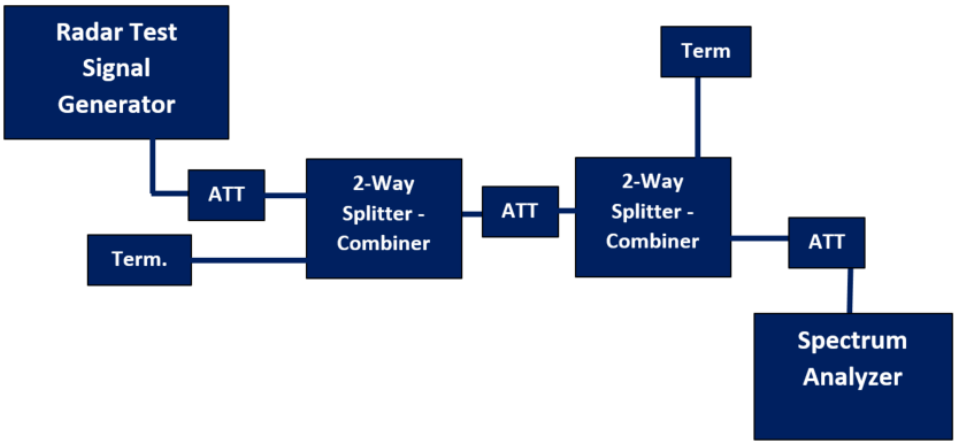
This product is a master with radar detection. The outcome of the required DFS tests is located in this section. DFS testing was performed following the test procedures as outlined in KDB 905462.

The product passes all required DFS tests for a master with radar detection.

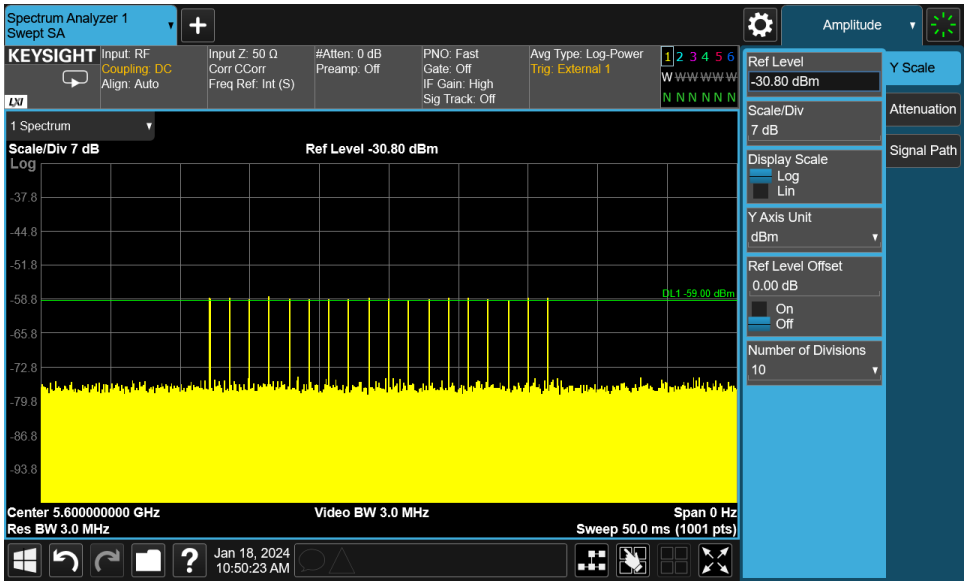
Information	Status
Possible Antenna/s	Integral 5 dBi
Antenna used for test	Integral 5 dBi
Operating mode	Master
Port used for testing	J1
EIRP range	> 200 milliwatts
Impedance of port	50 ohms
Channel loading technique	Data transfer was enacted to achieve a minimum channel loading of approximately 17%
Antenna measurement technique	See note 1
Time of power-on cycle	107s
Detection threshold level	-59 dBm

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

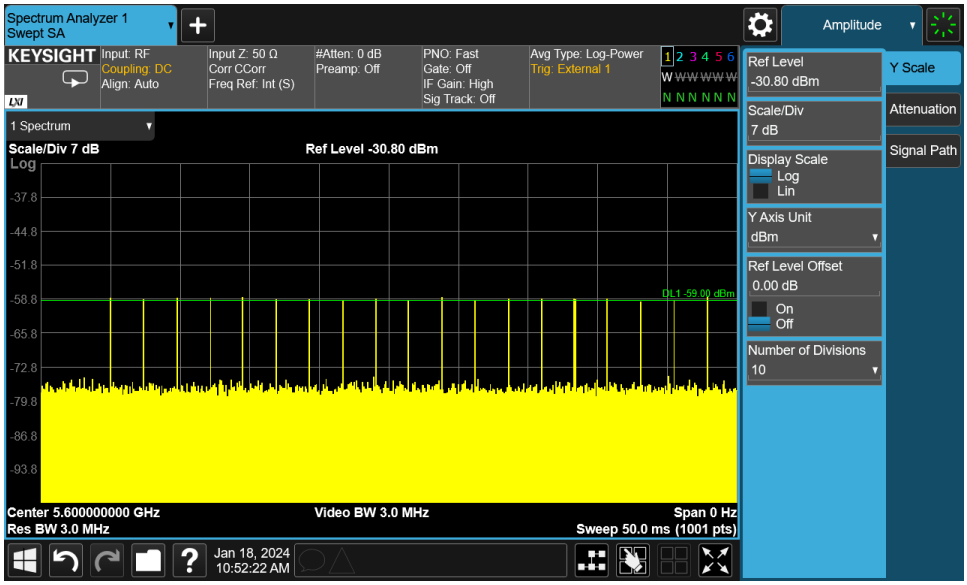
Requirement	Operational Mode	
	Master or Client Client Without Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not Required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not Required



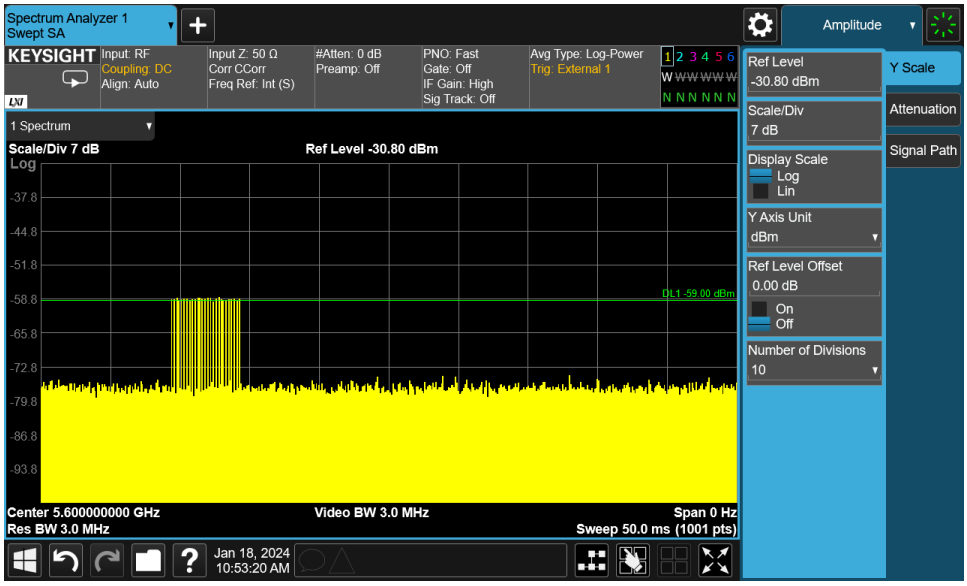
Maximum Transmit Power	**Value (See Notes 1, 2, and 3)**
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming 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.	



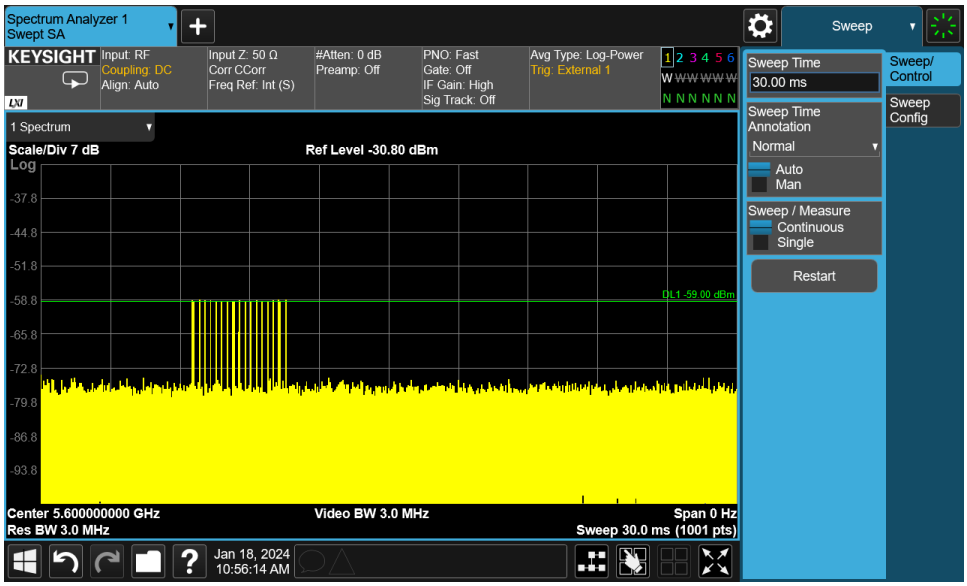
Plot 1: Radar Level 0



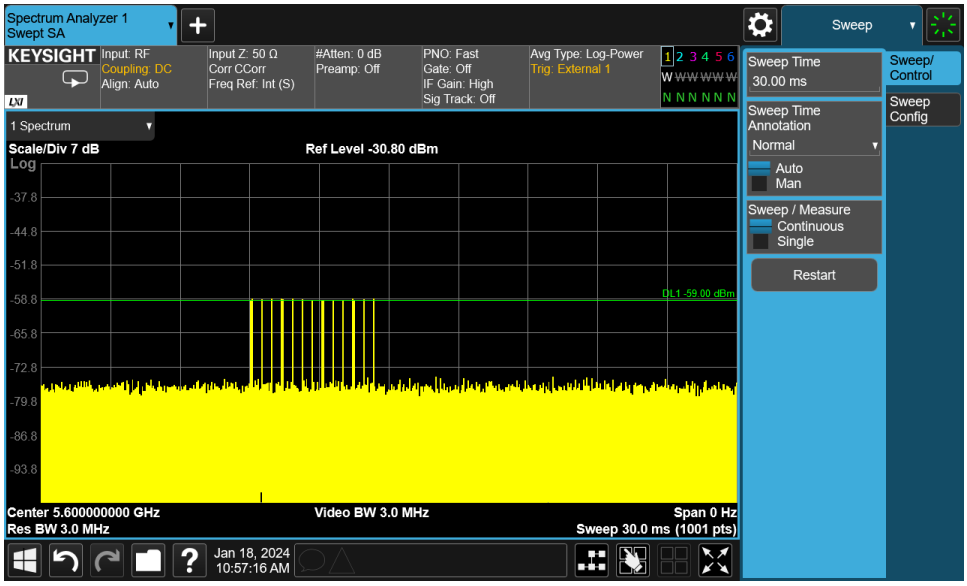
Plot 2: Radar Level 1



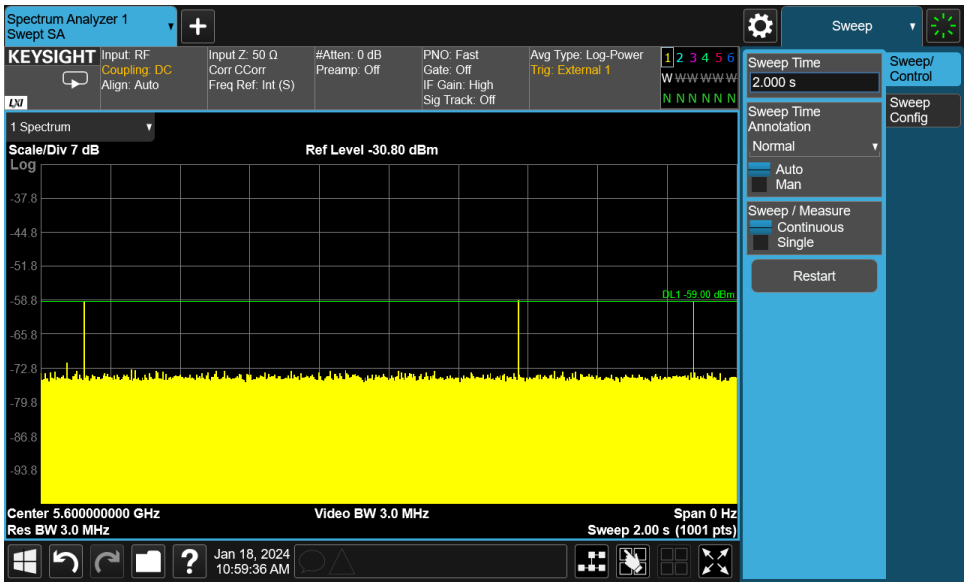
Plot 3: Radar Level 2



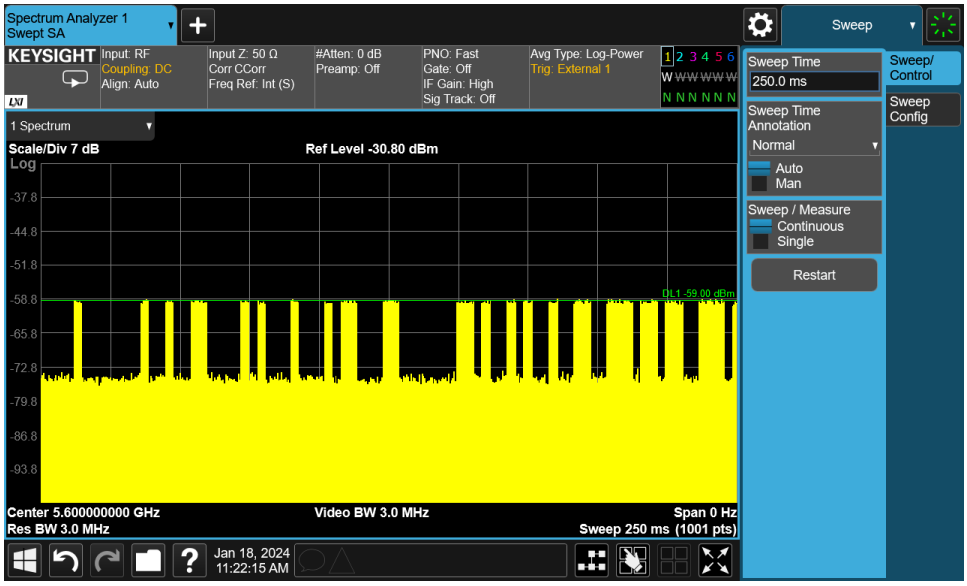
Plot 4: Radar Level 3



Plot 5: Radar Level 4



Plot 6: Radar Level 5



Plot 7: Radar Level 6

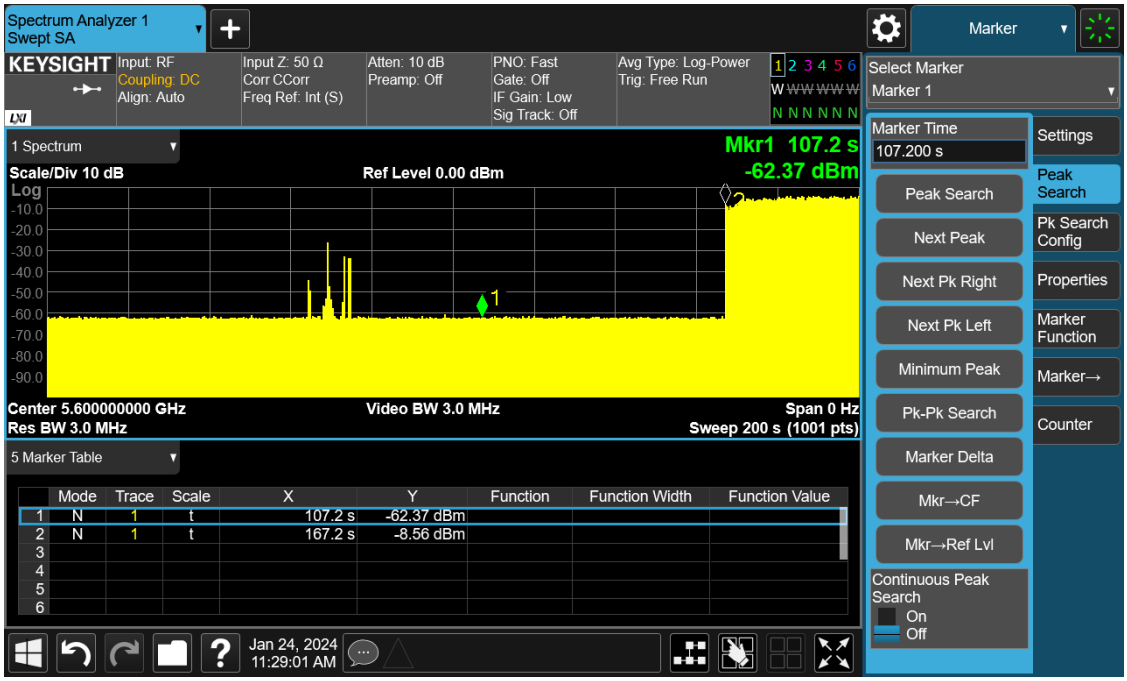
5.7.1 Channel Availability Check (CAC)

The EUT shall perform a CAC to ensure that there is no radar operating on the channel. After the power-up sequence, at-east 1 minute shall be monitored on the intended operating frequency. For initial CAC, the EUT does not emit beacon, control, or data signals on the test channel until the power-up sequence has been completed and the UNII device checks for radar waveforms for one minute on the test channel. This test does not use any radar waveforms. The markers in the associated plots indicate initial beacons.

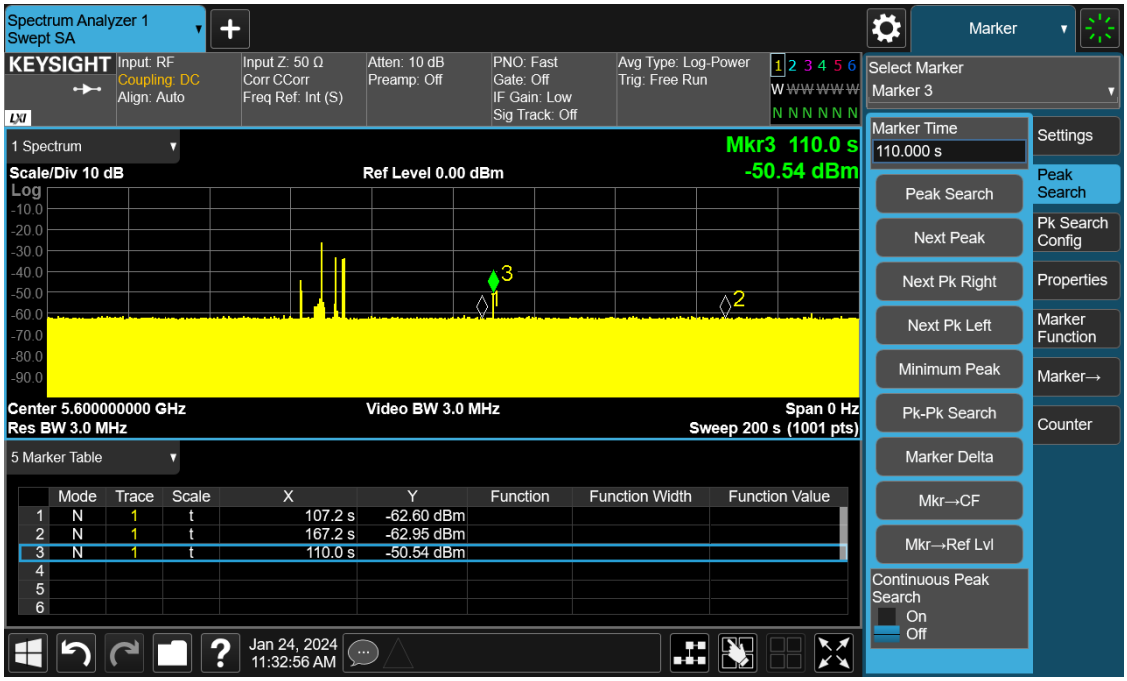
For radar burst at the beginning of the CAC. To verify successful radar detection on the selected channel during a period equal to the beginning of the CAC time, visual indication on the EUT of successful detection of the radar burst will be recorded and reported. Observation of the radar burst is show on the associated plot to be within the beginning of the CAC time. Emissions will continue to be monitored for the remaining 300 seconds.

For radar burst at the end of the CAC. To verify successful radar detection on the selected channel during a period equal to the end of the CAC time, visual indication on the EUT of successful detection of the radar burst will be recorded and reported. Observation of the radar burst is show on the associated plot to be within the end of the CAC time. Emissions will continue to be monitored for the remaining 300 seconds.

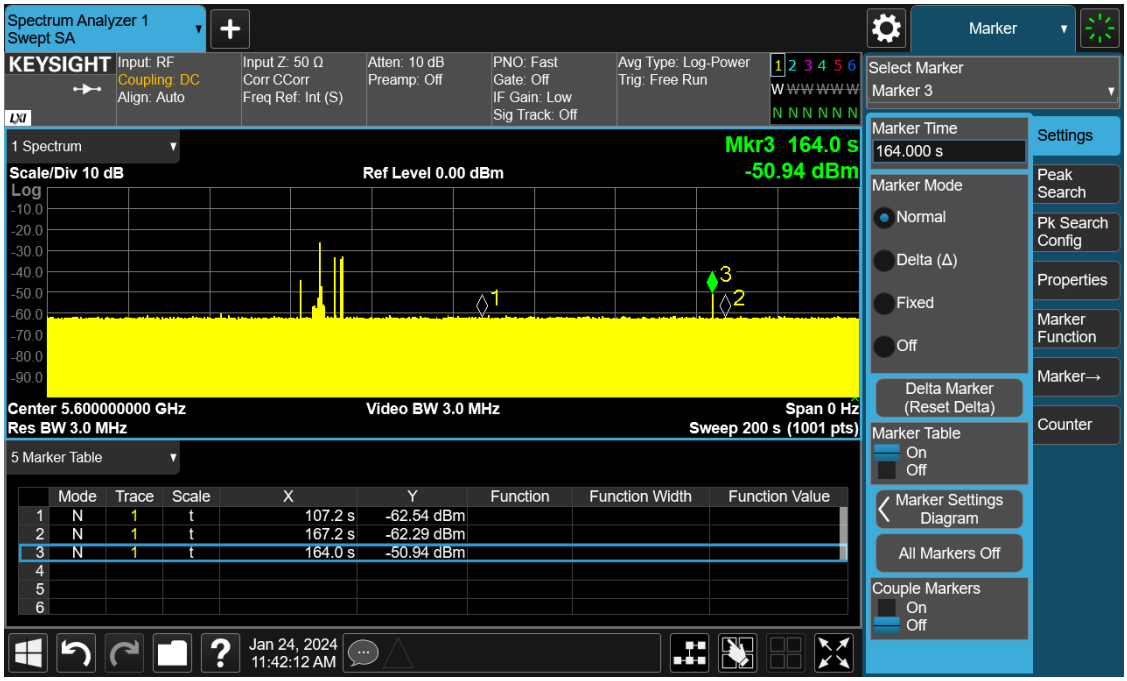
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the channel within the channel closing transmission time and channel move time, and does not transmit on a channel during the non-occupancy period after the detection and channel move.



Plot 8: DUT Turn On



Plot 9: Beginning



Plot 10: End

5.7.2 In-service Monitoring

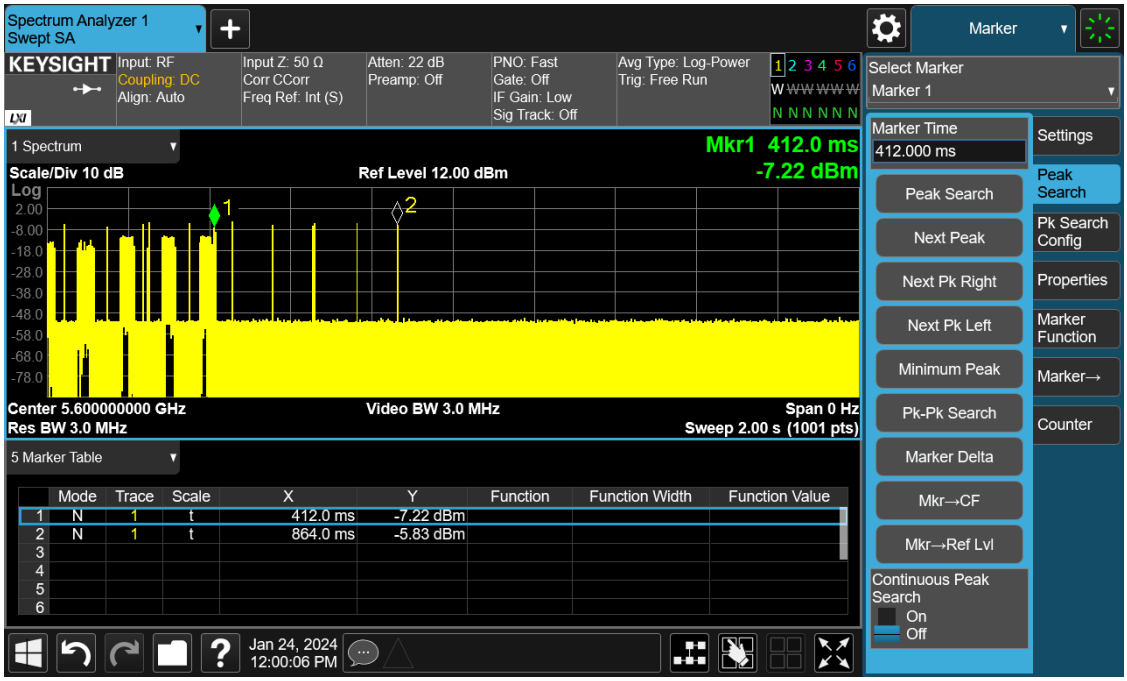
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 ms + aggregate of 60 ms over remaining 10 second period
Non-occupancy period	Minimum 30 minutes

Verified during in-service monitoring: channel closing transmission time and channel move time. The transmissions were observed at the end of the radar burst on the operating channel for a duration of greater than 10 seconds. The transmissions were measured and recorded during the observation time. This was compared to the channel move time and channel closing time limits. One 12 second plot is reported for the short pulse radar type 0. A 60 ms plot is also provided to verify closing time for the aggregate transmission time starting from 200 ms after the end of the radar signal to the completion of the channel move.

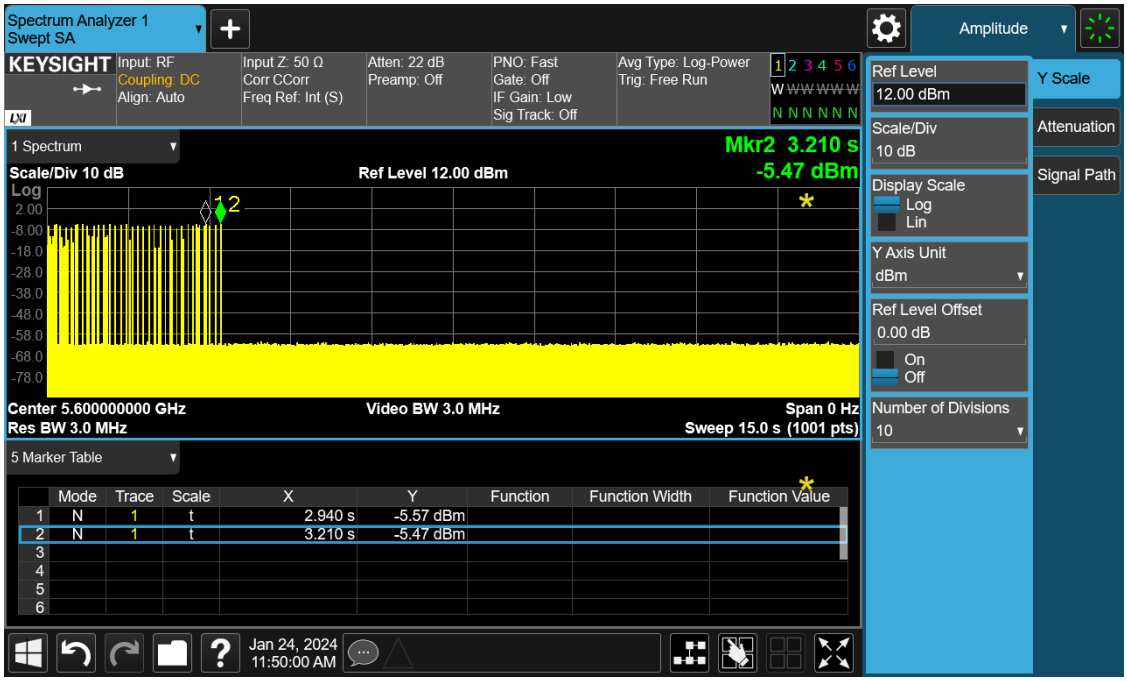
During the 30 minutes observation time, the EUT did not make any transmissions on a channel after a radar signal was detected.

Please see plots below.

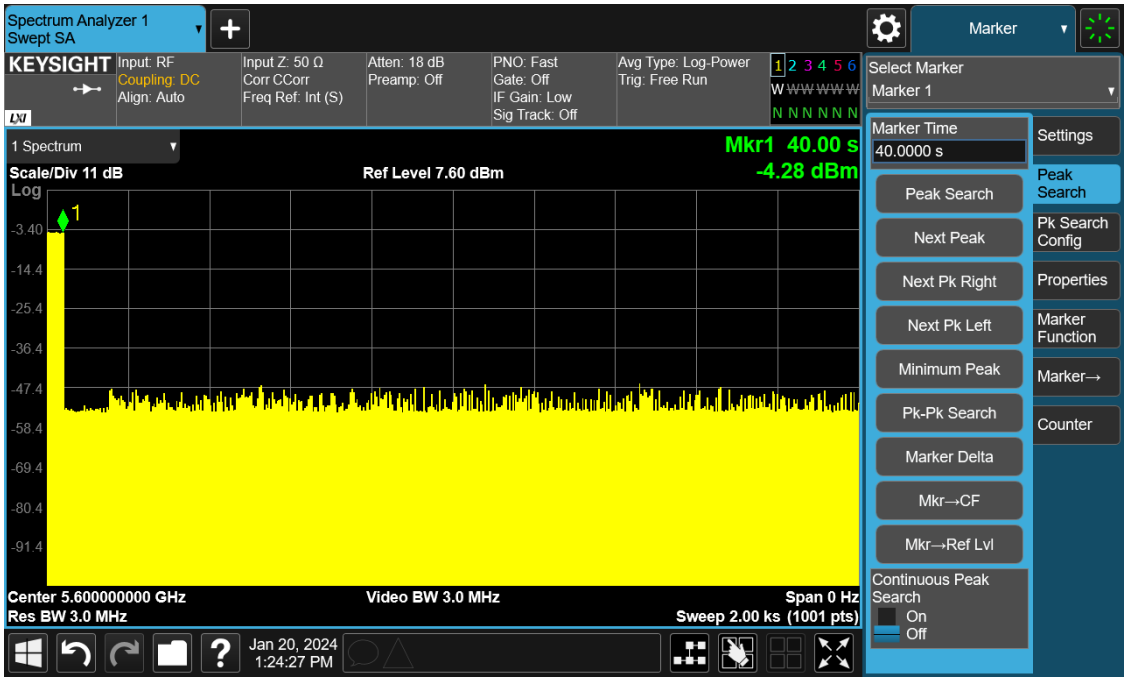
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the channel within the channel closing transmission time and channel move time, and does not transmit on a channel during the non-occupancy period after the detection and channel move.



Plot 11: Channel Close (2 s)

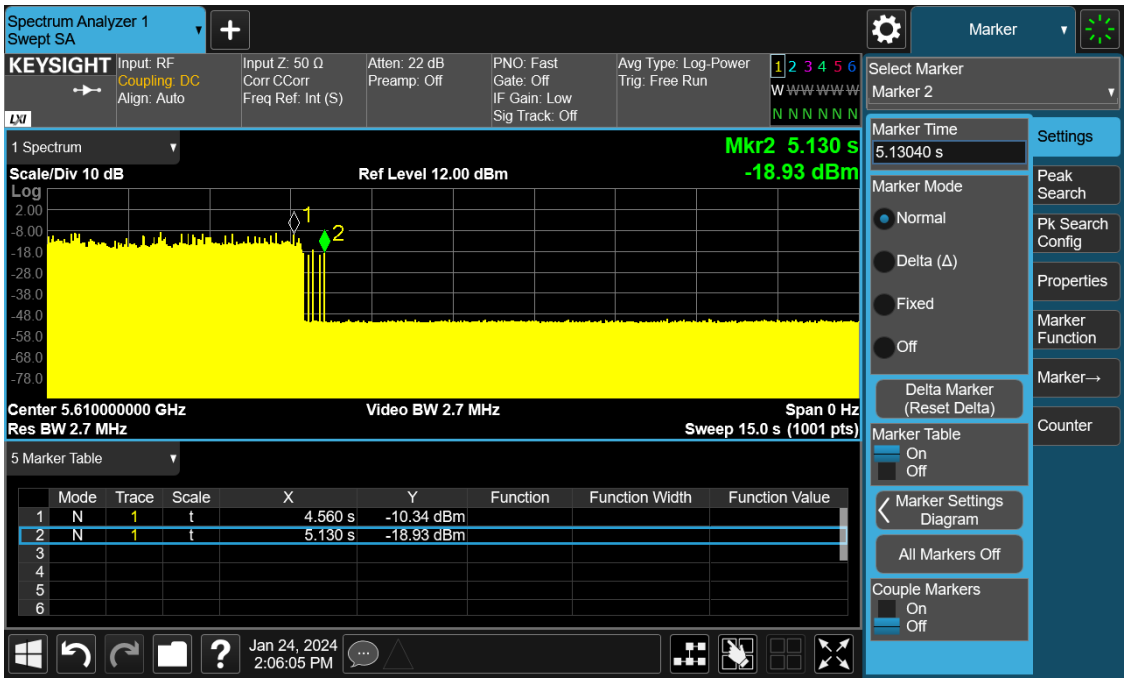


Plot 12: Channel Move

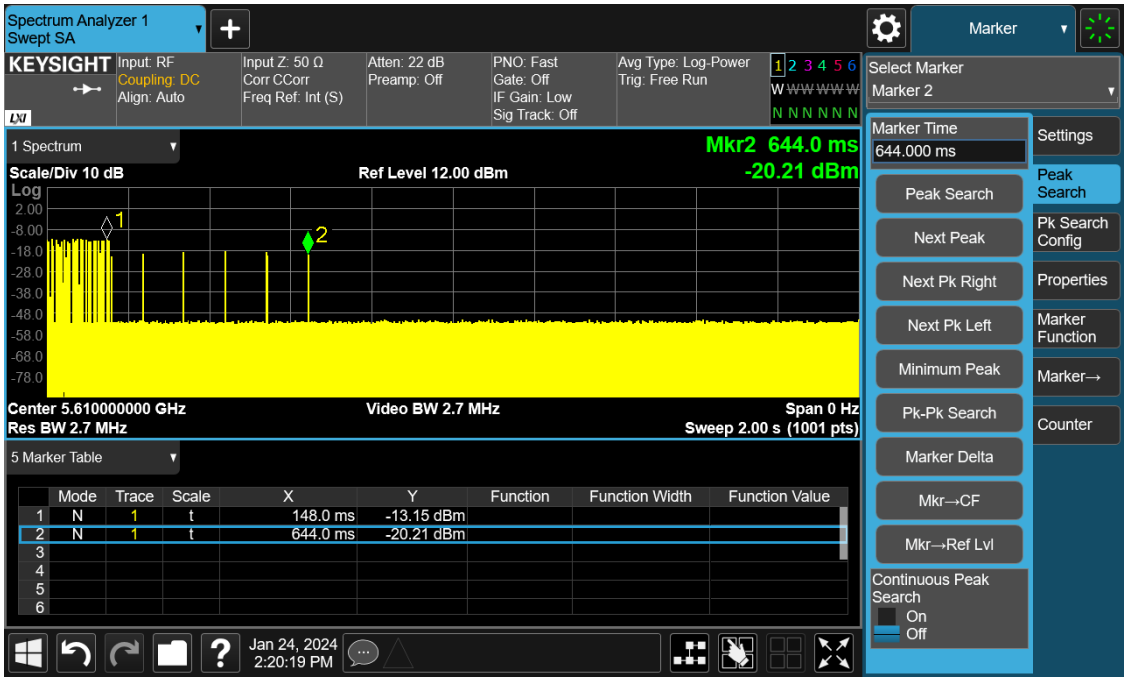


Plot 13: Non-Occupancy

5.7.3 Channel Puncturing DFS 240MHz BW



Plot 14: 240MHz BW Channel Move



Plot 15: 240MHz BW Channel Close

5.7.4 DFS Detection Bandwidth

20 MHz

EUT Frequency = 5600 MHz ; Bandwidth = 20 MHz											
Radar Frequency MHz	DFS Detection Trials (1 = Detection, 0 = No Detection)										Detection Rate %
	Trials										
	1	2	3	4	5	6	7	8	9	10	
F_Low 5590	1	1	1	1	1	1	1	1	1	1	100
5595	1	1	1	1	1	1	1	1	1	1	100
5600	1	1	1	1	1	1	1	1	1	1	100
5605	1	1	1	1	1	1	1	1	1	1	100
F_High 5610	1	1	1	1	1	1	1	1	1	1	100
Total Detection Percentage											100
Detection Bandwidth = FH-FL = 5590 MHz - 5610 MHz = 20 MHz											
99% Bandwidth = 19.8 MHz											

40 MHz

EUT Frequency = 5590 MHz ; Bandwidth = 40 MHz											
Radar Frequency MHz	DFS Detection Trials (1 = Detection, 0 = No Detection)										Detection Rate %
	Trials										
	1	2	3	4	5	6	7	8	9	10	
F_Low 5570	1	1	1	1	1	1	1	1	1	1	100
5580	1	1	1	1	1	1	1	1	1	1	100
5590	1	1	1	1	1	1	1	1	1	1	100
5600	1	1	1	1	1	1	1	1	1	1	100
F_High 5610	1	1	1	1	1	1	1	1	1	1	100
Total Detection Percentage											100
Detection Bandwidth = FH-FL = 5570 MHz - 5610 MHz = 40 MHz											
99% Bandwidth = 39.6 MHz											

80 MHz

EUT Frequency = 5610 MHz ; Bandwidth = 80 MHz											
Radar Frequency MHz	DFS Detection Trials (1 = Detection, 0 = No Detection)										Detection Rate %
	Trials										
	1	2	3	4	5	6	7	8	9	10	
F_Low 5570	1	1	1	1	1	1	1	1	1	1	100
5590	1	1	1	1	1	1	1	1	1	1	100
5610	1	1	1	1	1	1	1	1	1	1	100
5630	1	1	1	1	1	1	1	1	1	1	100
F_High 5650	1	1	1	1	1	1	1	1	1	1	100
Total Detection Percentage											100
Detection Bandwidth = FH-FL = 5570 MHz - 5650 MHz = 80 MHz											
99% Bandwidth = 79.2 MHz											

160 MHz

EUT Frequency = 5570 MHz ; Bandwidth = 160 MHz											
Radar Frequency MHz	DFS Detection Trials (1 = Detection, 0 = No Detection)										Detection Rate %
	Trials										
	1	2	3	4	5	6	7	8	9	10	
F_Low 5490	1	1	1	1	1	1	1	1	1	1	100
5530	1	1	1	1	1	1	1	1	1	1	100
5570	1	1	1	1	1	1	1	1	1	1	100
5610	1	1	1	1	1	1	1	1	1	1	100
F_High 5650	1	1	1	1	1	1	1	1	1	1	100
Total Detection Percentage											100
Detection Bandwidth = FH-FL = 5490 MHz - 5650 MHz = 160 MHz											
99% Bandwidth = 158.4 MHz											

5.7.5 Detection Probability

For statistical performance check. Demonstrating a minimum channel loading of approximately 17% or greater of the test. Observe the transmissions of the EUT at the end of the burst on the operating channel for duration greater than 10 seconds for short pulse radar type 1-4 and 6 to ensure detection occurs. Then observe the transmissions of the EUT at the end of the burst on the operating channel for duration greater than 22 seconds for long pulse radar type 5 to ensure detection occurs. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs.
Please see data below.

Radar Type	Min successful detection (%)	Minimum Trials
1	60	30
2	60	30
3	60	30
4	60	30
Types 1 - 4	80	120
5	80	30
6	70	30

20 MHz

Summary

Type	Detections	Trials	Detection Probability
Type 1	29	30	97%
Type 2	28	30	93%
Type 3	26	30	87%
Type 4	27	30	90%
Type 5	30	30	100%
Type 6	29	30	97%
Aggregate 1-4	110	120	92%

RADAR TYPE 1 — Rohde & Schwarz K350 Pulse Sequencer DFS

Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	60	1	880	y
2	87	1	607	y
3	60	1	881	y
4	38	1	1401	y
5	19	1	2790	y
6	20	1	2766	y
7	33	1	1641	y
8	18	1	3005	y
9	22	1	2475	y
10	21	1	2614	y
11	22	1	2504	y
12	34	1	1579	y
13	25	1	2132	y
14	21	1	2590	y
15	22	1	2502	y
16	53	1	1006	y
17	24	1	2278	y
18	36	1	1504	y
19	30	1	1767	y
20	23	1	2357	n
21	63	1	837	y
22	20	1	2713	y
23	40	1	1332	y
24	29	1	1881	y
25	20	1	2740	y
26	27	1	1974	y
27	42	1	1257	y
28	33	1	1621	y
29	82	1	649	y
30	31	1	1707	y
				29/30: 96.7%

RADAR TYPE 2 — Rohde & Schwarz K350 Pulse Sequencer DFS

Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	28	1.7	205	y
2	28	4.3	165	y
3	27	1	226	y
4	29	2.3	196	y
5	28	3.5	187	y
6	29	2.2	164	y
7	27	4.2	172	y
8	26	1.6	179	y
9	26	2.7	226	y
10	25	2.4	228	y
11	25	1.9	177	n
12	25	2.7	166	y
13	27	4.6	166	y
14	26	2.8	158	y
15	25	1.2	184	n
16	26	1	203	y
17	25	4	179	y
18	25	3.7	181	y
19	24	2.7	192	y
20	25	1.5	189	y
21	25	2	198	y
22	24	1.1	180	y
23	27	3.5	171	y
24	26	2.8	204	y
25	25	3.5	169	y
26	28	1	212	y
27	28	4.2	157	y
28	29	4.2	228	y
29	24	3.2	209	y
30	28	2.3	162	y
				28/30: 93.3%

RADAR TYPE 3				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	17	8.7	406	y
2	17	7.8	426	y
3	18	7.8	406	y
4	17	9.2	286	y
5	16	8.5	223	y
6	17	9.6	235	y
7	18	7.8	219	y
8	17	8.5	261	y
9	18	9.8	497	n
10	17	7.1	416	y
11	18	8.1	421	y
12	16	8.3	276	y
13	18	6.1	386	y
14	16	7.3	429	y
15	17	9.4	359	y
16	17	7.3	410	n
17	18	7.5	412	y
18	17	7.5	449	y
19	16	6.2	406	y
20	16	7.7	370	n
21	16	7.7	214	y
22	17	9.1	490	y
23	17	6.1	392	y
24	18	8.9	417	y
25	18	7.5	252	y
26	16	8.7	497	n
27	17	7.3	329	y
28	18	7.6	492	y
29	17	7.1	306	y
30	18	7	456	y
				26/30: 86.7%

RADAR TYPE 4				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	12	14.3	412	y
2	13	18	235	y
3	13	14	346	y
4	16	12.5	247	y
5	16	18.4	257	y
6	13	11.5	272	y
7	13	18.8	416	y
8	13	14.7	278	y
9	14	16	391	y
10	13	16.1	394	y
11	13	14.9	418	n
12	16	12.5	238	y
13	16	16.9	410	n
14	13	15	487	n
15	13	12.7	326	y
16	15	11.7	274	y
17	13	11.4	433	y
18	16	19.5	480	y
19	13	11.2	380	y
20	14	15.3	214	y
21	14	18.3	242	y
22	15	12	463	y
23	12	14.9	439	y
24	16	15.1	386	y
25	13	13.6	323	y
26	13	12.7	363	y
27	15	13	361	y
28	15	13.6	242	y
29	16	14.8	221	y
30	15	16.9	286	y
				27/30: 90%

TYPE 5		Rohde & Schwarz K350 Pulse Sequencer DFS		
Trial #	Detection (yes/no)	Chirp Width (MHz)	Subset	Fc
1	y	9	1	5600
2	y	5	1	5600
3	y	16	1	5600
4	y	18	1	5600
5	y	14	1	5600
6	y	12	1	5600
7	y	7	1	5600
8	y	13	1	5600
9	y	12	1	5600
10	y	16	1	5600
11	y	16	2	5596.4
12	y	10	2	5594
13	y	16	2	5596.4
14	y	16	2	5596.4
15	y	10	2	5594
16	y	7	2	5592.8
17	y	11	2	5594.4
18	y	15	2	5596
19	y	7	2	5592.8
20	y	6	2	5592.4
21	y	18	3	5602.8
22	y	15	3	5604
23	y	5	3	5608
24	y	8	3	5606.8
25	y	12	3	5605.2
26	y	9	3	5606.4
27	y	12	3	5605.2
28	y	9	3	5606.4
29	y	17	3	5603.2
30	y	13	3	5604.8
	30/30: 100%			

TYPE 6 S	Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Detection (yes/no)**
1	y
2	y
3	y
4	y
5	y
6	y
7	y
8	y
9	y
10	y
11	y
12	y
13	y
14	y
15	y
16	y
17	y
18	y
19	y
20	y
21	y
22	y
23	y
24	y
25	y
26	n
27	y
28	y
29	y
30	y
	29/30: 96.7%

40 MHz

Summary			
Type	**Detections**	**Trials**	**Detection Probability**
Type 1	30	30	100%
Type 2	27	30	90%
Type 3	25	30	83%
Type 4	23	30	77%
Type 5	30	30	100%
Type 6	30	30	100%
Aggregate 1-4	105	120	88%

RADAR TYPE 1				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	89	1	593	y
2	59	1	901	y
3	29	1	1866	y
4	26	1	2076	y
5	44	1	1221	y
6	54	1	982	y
7	20	1	2703	y
8	52	1	1029	y
9	27	1	1975	y
10	29	1	1879	y
11	55	1	960	y
12	27	1	2009	y
13	58	1	914	y
14	46	1	1149	y
15	20	1	2658	y
16	19	1	2807	y
17	72	1	738	y
18	23	1	2311	y
19	26	1	2082	y
20	24	1	2224	y
21	47	1	1134	y
22	20	1	2659	y
23	24	1	2274	y
24	102	1	519	y
25	44	1	1216	y
26	18	1	3024	y
27	23	1	2315	y
28	22	1	2421	y
29	38	1	1415	y
30	52	1	1032	y
				30/30: 100%

RADAR TYPE 2				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	26	2.1	225	y
2	24	3	165	y
3	25	2.2	191	y
4	27	4.1	180	y
5	28	3.2	187	y
6	24	2.2	226	n
7	28	2.6	156	y
8	25	3	169	y
9	25	3	225	y
10	26	1.9	209	y
11	27	2.8	204	y
12	25	2.3	184	y
13	26	4.1	169	y
14	27	3.3	159	y
15	25	2	191	y
16	23	2.2	207	y
17	23	4.1	154	y
18	24	4.7	215	n
19	25	1.3	158	y
20	26	2.4	209	y
21	27	4.5	187	y
22	25	4.1	169	y
23	24	4.8	171	y
24	27	1.4	174	y
25	27	2.6	175	n
26	24	2.9	159	y
27	25	3.9	202	y
28	29	2.3	218	y
29	27	2.4	229	y
30	26	4.7	177	y
				27/30: 90%

RADAR TYPE 3				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	17	7.5	462	y
2	17	6.3	389	y
3	18	7	248	y
4	18	6.6	308	y
5	18	6.1	474	n
6	17	6.4	227	y
7	16	6	238	y
8	17	8.4	376	n
9	18	9.5	251	y
10	17	6.4	244	y
11	17	8.9	383	y
12	16	6	497	y
13	17	6.1	356	y
14	17	9.6	343	y
15	16	7.5	489	n
16	17	8.3	307	y
17	18	8.5	493	y
18	18	9.4	224	y
19	17	6.8	379	n
20	16	8.1	308	y
21	16	7.2	245	y
22	17	8.9	434	y
23	17	6.5	454	y
24	16	8.6	283	n
25	18	9	497	y
26	18	7.7	242	y
27	18	8	443	y
28	17	7.2	377	y
29	18	6.7	373	y
30	16	8.8	390	y
				25/30: 83.3%

RADAR TYPE 4				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	14	13.8	433	y
2	15	17.7	242	y
3	14	15.9	240	y
4	15	15.8	241	y
5	14	16.6	493	n
6	14	12.8	417	y
7	14	17.3	210	y
8	14	14.2	320	y
9	15	12.4	419	y
10	14	13.7	355	y
11	14	15.7	387	y
12	13	19.6	366	y
13	12	17	346	n
14	15	18.9	249	n
15	14	17.4	396	y
16	13	13.8	434	y
17	16	11.3	351	y
18	14	12	385	y
19	13	14	291	y
20	13	18.8	419	y
21	14	19.8	357	n
22	12	16.2	230	y
23	13	18.9	264	n
24	14	18.2	210	y
25	15	11	399	y
26	12	15	366	n
27	14	19.7	381	y
28	15	17.1	323	y
29	12	17.3	308	y
30	14	12.4	208	n
				23/30: 76.7%

TYPE 5	Rohde & Schwarz K350 Pulse Sequencer DFS			
Trial #	**Detection (yes/no)**	**Chirp Width (MHz)**	**Subset**	**Fc**
1	y	6	1	5590
2	y	11	1	5590
3	y	13	1	5590
4	y	10	1	5590
5	y	7	1	5590
6	y	17	1	5590
7	y	17	1	5590
8	y	16	1	5590
9	y	8	1	5590
10	y	5	1	5590
11	y	5	2	5572
12	y	19	2	5577.6
13	y	10	2	5574
14	y	8	2	5573.2
15	y	13	2	5575.2
16	y	6	2	5572.4
17	y	11	2	5574.4
18	y	5	2	5572
19	y	8	2	5573.2
20	y	7	2	5572.8
21	y	15	3	5604
22	y	5	3	5608
23	y	17	3	5603.2
24	y	11	3	5605.6
25	y	5	3	5608
26	y	8	3	5606.8
27	y	19	3	5602.4
28	y	8	3	5606.8
29	y	6	3	5607.6
30	y	5	3	5608
	30/30: 100%			

TYPE 6 S	Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Detection (yes/no)**
1	y
2	y
3	y
4	y
5	y
6	y
7	y
8	y
9	y
10	y
11	y
12	y
13	y
14	y
15	y
16	y
17	y
18	y
19	y
20	y
21	y
22	y
23	y
24	y
25	y
26	y
27	y
28	y
29	y
30	y
	30/30: 100%

80 MHz

Summary			
Type	Detections	Trials	Detection Probability
Type 1	29	30	97%
Type 2	25	30	83%
Type 3	19	30	63%
Type 4	23	30	77%
Type 5	30	30	100%
Type 6	30	30	100%
Aggregate 1-4	96	120	80%

RADAR TYPE 1				Rohde & Schwarz K350 Pulse Sequencer DFS	RADAR TYPE 2				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)	Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	23	1	2384	y	1	24	4.8	188	y
2	61	1	864	y	2	26	2.6	203	y
3	79	1	674	y	3	26	1.3	187	y
4	20	1	2753	y	4	23	4.5	151	y
5	23	1	2387	y	5	26	4.8	156	y
6	36	1	1489	y	6	26	3.6	227	y
7	34	1	1566	y	7	28	4.7	175	y
8	39	1	1362	y	8	26	1.2	224	y
9	40	1	1344	y	9	29	4	224	y
10	69	1	769	y	10	25	1.7	201	y
11	29	1	1862	y	11	25	2.4	228	n
12	43	1	1238	y	12	29	3.9	208	n
13	22	1	2499	y	13	25	1.4	194	y
14	25	1	2131	y	14	26	2.4	187	y
15	62	1	850	y	15	28	3.1	199	y
16	46	1	1161	y	16	23	1.7	171	y
17	24	1	2251	y	17	24	3.2	172	y
18	19	1	2831	y	18	28	1.5	227	n
19	25	1	2174	n	19	29	3	214	n
20	49	1	1088	y	20	26	4.9	198	y
21	55	1	959	y	21	25	3.4	182	y
22	20	1	2748	y	22	29	1.1	196	n
23	20	1	2702	y	23	25	2.5	168	y
24	25	1	2163	y	24	26	4.7	192	y
25	34	1	1582	y	25	29	4.3	189	y
26	24	1	2270	y	26	28	2	197	y
27	61	1	866	y	27	28	1.1	193	y
28	26	1	2035	y	28	26	3.1	219	y
29	20	1	2673	y	29	27	2.6	178	y
30	34	1	1560	y	30	27	1.6	225	y
				29/30: 96.7%					25/30: 83.3%

RADAR TYPE 3				Rohde & Schwarz K350 Pulse Sequencer DFS	RADAR TYPE 4				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)	Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	17	9.2	472	y	1	16	12.1	353	y
2	16	8.7	307	y	2	12	15.9	458	n
3	16	9.3	333	n	3	12	19.6	358	y
4	17	7.1	486	y	4	13	12.5	288	y
5	17	9.7	203	y	5	16	18.8	310	n
6	17	7.8	436	y	6	13	16.4	234	y
7	16	6.9	283	n	7	14	13.7	458	n
8	17	8.8	414	y	8	16	11.1	347	y
9	16	6.5	458	y	9	14	18.6	208	n
10	17	7.7	291	y	10	14	11.2	399	y
11	17	8.8	470	n	11	12	16.3	225	y
12	16	8.5	452	y	12	16	14.9	218	y
13	17	6.6	434	y	13	15	17	244	y
14	17	6.7	459	y	14	13	13.8	273	n
15	17	6.4	425	y	15	16	18	236	y
16	16	7.3	249	n	16	13	17.4	446	y
17	16	9.4	460	y	17	13	18.6	464	n
18	18	9.7	222	y	18	12	19.5	371	y
19	17	7.2	241	y	19	14	17.8	208	y
20	17	9.4	312	n	20	12	14.1	361	y
21	16	6.1	342	n	21	15	13.8	267	n
22	16	7.4	324	n	22	15	19.3	488	y
23	18	9.9	365	n	23	13	13.9	205	y
24	17	6.7	360	y	24	14	12.6	309	y
25	17	6.6	451	y	25	12	17	323	y
26	18	6.7	284	n	26	13	17.3	361	y
27	17	8.3	453	n	27	16	13.4	422	y
28	17	6.4	225	y	28	13	13	247	y
29	16	7.4	431	n	29	13	12.7	365	y
30	16	8.5	223	y	30	14	12.6	377	y
				19/30: 63.3%					23/30: 76.7%

TYPE 5		Rohde & Schwarz K350 Pulse Sequencer DFS		
Trial #	Detection (yes/no)	Chirp Width (MHz)	Subset	Fc
1	y	17	1	5610
2	y	6	1	5610
3	y	10	1	5610
4	y	11	1	5610
5	y	18	1	5610
6	y	8	1	5610
7	y	16	1	5610
8	y	8	1	5610
9	y	6	1	5610
10	y	5	1	5610
11	y	14	2	5575.6
12	y	14	2	5575.6
13	y	18	2	5577.2
14	y	10	2	5574
15	y	14	2	5575.6
16	y	11	2	5574.4
17	y	11	2	5574.4
18	y	5	2	5572
19	y	19	2	5577.6
20	y	18	2	5577.2
21	y	15	3	5644
22	y	19	3	5642.4
23	y	13	3	5644.8
24	y	13	3	5644.8
25	y	5	3	5648
26	y	18	3	5642.8
27	y	7	3	5647.2
28	y	7	3	5647.2
29	y	16	3	5643.6
30	y	13	3	5644.8
	30/30: 100%			

TYPE 6 S	Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Detection (yes/no)**
1	y
2	y
3	y
4	y
5	y
6	y
7	y
8	y
9	y
10	y
11	y
12	y
13	y
14	y
15	y
16	y
17	y
18	y
19	y
20	y
21	y
22	y
23	y
24	y
25	y
26	y
27	y
28	y
29	y
30	y
	30/30: 100%

160 MHz

Summary			
Type	**Detections**	**Trials**	**Detection Probability**
Type 1	29	30	97%
Type 2	24	30	80%
Type 3	26	30	87%
Type 4	26	30	87%
Type 5	30	30	100%
Type 6	29	30	97%
Aggregate 1-4	105	120	88%

RADAR TYPE 1				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	39	1	1353	y
2	19	1	2901	y
3	38	1	1417	y
4	19	1	2912	y
5	25	1	2173	y
6	50	1	1071	y
7	18	1	2949	y
8	22	1	2435	y
9	18	1	3042	y
10	30	1	1776	y
11	19	1	2886	y
12	50	1	1073	n
13	21	1	2550	y
14	63	1	846	y
15	18	1	2989	y
16	22	1	2420	y
17	40	1	1346	y
18	49	1	1082	y
19	20	1	2750	y
20	24	1	2246	y
21	18	1	3056	y
22	65	1	815	y
23	19	1	2838	y
24	20	1	2734	y
25	19	1	2921	y
26	18	1	2964	y
27	20	1	2710	y
28	61	1	872	y
29	27	1	1989	y
30	25	1	2115	y
				29/30: 96.7%

RADAR TYPE 2				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	28	3.4	206	y
2	28	4.1	228	y
3	28	1.4	215	n
4	24	4.2	176	y
5	27	2.8	153	y
6	23	4.4	159	n
7	29	3.7	203	y
8	27	1.5	207	n
9	25	3	175	y
10	24	2.1	206	y
11	28	4.2	193	y
12	28	1.4	171	y
13	27	2.1	166	n
14	24	4.4	168	n
15	25	2.3	199	y
16	23	4.8	210	y
17	26	2.3	195	y
18	27	2.8	154	y
19	25	4.5	165	y
20	28	1.1	203	y
21	25	1.1	180	y
22	25	3.9	199	n
23	28	1.5	199	y
24	28	2.9	201	y
25	26	4.1	153	y
26	27	2.3	229	y
27	27	3.2	217	y
28	28	2.5	172	y
29	26	1	219	y
30	27	2.4	188	y
				24/30: 80%

RADAR TYPE 3				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	18	9.4	392	y
2	17	6.1	290	y
3	18	6	215	n
4	16	7.2	386	n
5	16	6.1	475	y
6	17	6.8	230	y
7	17	9.8	361	y
8	18	8.6	484	y
9	17	9.7	335	y
10	16	7	317	y
11	17	8.2	244	y
12	17	8	227	y
13	17	9.2	306	y
14	18	9.6	337	y
15	17	8.4	248	y
16	18	8.4	489	y
17	16	6.1	434	y
18	17	8.2	303	n
19	16	7.5	394	y
20	18	7.7	458	y
21	16	8.1	272	y
22	16	9.3	459	y
23	16	9.9	291	y
24	17	8.9	290	y
25	17	8.9	371	y
26	17	7.9	390	n
27	16	6	261	y
28	17	7.7	266	y
29	16	9.4	470	y
30	17	6.1	388	y
				26/30: 86.7%

RADAR TYPE 4				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	14	12.6	388	y
2	14	12.9	234	y
3	14	12.1	412	y
4	15	18.6	466	y
5	14	16.7	394	y
6	12	16.4	446	n
7	15	15	354	y
8	14	14.8	320	y
9	14	19.8	292	y
10	13	11.4	465	n
11	14	18.9	298	y
12	15	17.4	332	y
13	12	14.8	237	y
14	14	19.5	203	y
15	13	13	245	y
16	14	12.3	372	y
17	14	15.6	295	y
18	12	13.9	382	y
19	15	19	430	y
20	16	13.2	369	n
21	12	18.4	480	y
22	15	19.7	466	y
23	16	12.3	210	y
24	12	12.2	429	y
25	14	18.4	425	y
26	15	15.8	228	y
27	14	17.7	369	y
28	16	12.5	358	y
29	15	16.2	454	y
30	15	18.7	400	n
				26/30: 86.7%

TYPE 5	Rohde & Schwarz K350 Pulse Sequencer DFS			
Trial #	**Detection (yes/no)**	**Chirp Width (MHz)**	**Subset**	**Fc**
1	y	11	1	5500
2	y	9	1	5500
3	y	8	1	5500
4	y	12	1	5500
5	y	16	1	5500
6	y	13	1	5500
7	y	16	1	5500
8	y	19	1	5500
9	y	8	1	5500
10	y	6	1	5500
11	y	15	2	5497
12	y	15	2	5497
13	y	6	2	5493.4
14	y	19	2	5498.6
15	y	14	2	5496.6
16	y	7	2	5493.8
17	y	6	2	5493.4
18	y	6	2	5493.4
19	y	12	2	5495.8
20	y	9	2	5494.6
21	y	15	3	5503
22	y	11	3	5504.6
23	y	16	3	5502.6
24	y	19	3	5501.4
25	y	12	3	5504.2
26	y	11	3	5504.6
27	y	10	3	5505
28	y	6	3	5506.6
29	y	13	3	5503.8
30	y	19	3	5501.4
	30/30: 100%			

TYPE 6 S	Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Detection (yes/no)**
1	y
2	y
3	y
4	y
5	y
6	y
7	y
8	y
9	y
10	y
11	y
12	y
13	y
14	y
15	y
16	y
17	y
18	y
19	y
20	y
21	y
22	y
23	y
24	y
25	n
26	y
27	y
28	y
29	y
30	y
	29/30: 96.7%

-- End of Test Report --