UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-E7
ISED ID	6545A-E7
Equipment Under Test	E7
Test Report Serial Number	TR9381_03
Date of Tests	20, 23 February; 9-12 April; 11-15 September 2024
Report Issue Date	12 September 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

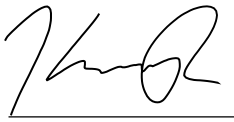
This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with 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	E7
FCC ID	SWX-E7
ISED ID	6545A-E7

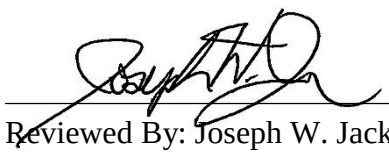
On this 12th day of September 2024, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete and correct to the best of my knowledge and are made in good faith.

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: Joseph W. Jackson

Revision History		
Revision	**Description**	**Date**
01	Original Report Release	12 September 2024
02	Amended KDB Reference in Sections 5.3, 5.4 and 5.6. Added clarification to limits for PSD section.	30 September 2024
03	Corrected UNII-2A Frequencies in Section 5.4	28 October 2024

Table of Contents

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	E7
Serial Number	1FD62F
Dimensions (cm)	9.8 x 9.8 x 1.7

2.2 Description of EUT

The E7 is a WiFi 7 access point with one 10GbE PoE port and one 1GbE PoE port. The E7 transmits in the 2.4 GHz, 5 GHz, and 6 GHz frequency bands using integral antennas and is powered by an 802.3at PoE power adapter.

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: E7 SN: 1FD62F	Access Point	PoE Input / Shielded Cat 5E cable
BN: UBIQUITI MN: GP-h480-065G SN: N/A	PoE Injector	PoE Output / Shielded Cat 5E to E7, and Ethernet / unshielded Cat 5E to PC
BN: DELL MN: XPS SN: N/A	Laptop PC	Ethernet / un-shielded Cat 5E

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
PoE Input	1	7m Shielded Cat 5E
PoE Output (PoE Injector)	1	7m Shielded Cat 5E to E7 PoE Input
LAN (PoE Injector)	1	unshielded Cat 5E to Laptop PC
AC (PoE Injector)	1	3 Conductor power cord to AC mains/80cm

2.5 Operating Environment

Power Supply	120 VAC
AC Mains Frequency	60 Hz
Temperature	20.5-22 °C
Humidity	21.31-28.23 %
Barometric Pressure	1021 mBar

2.6 Operating Modes

The E7 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

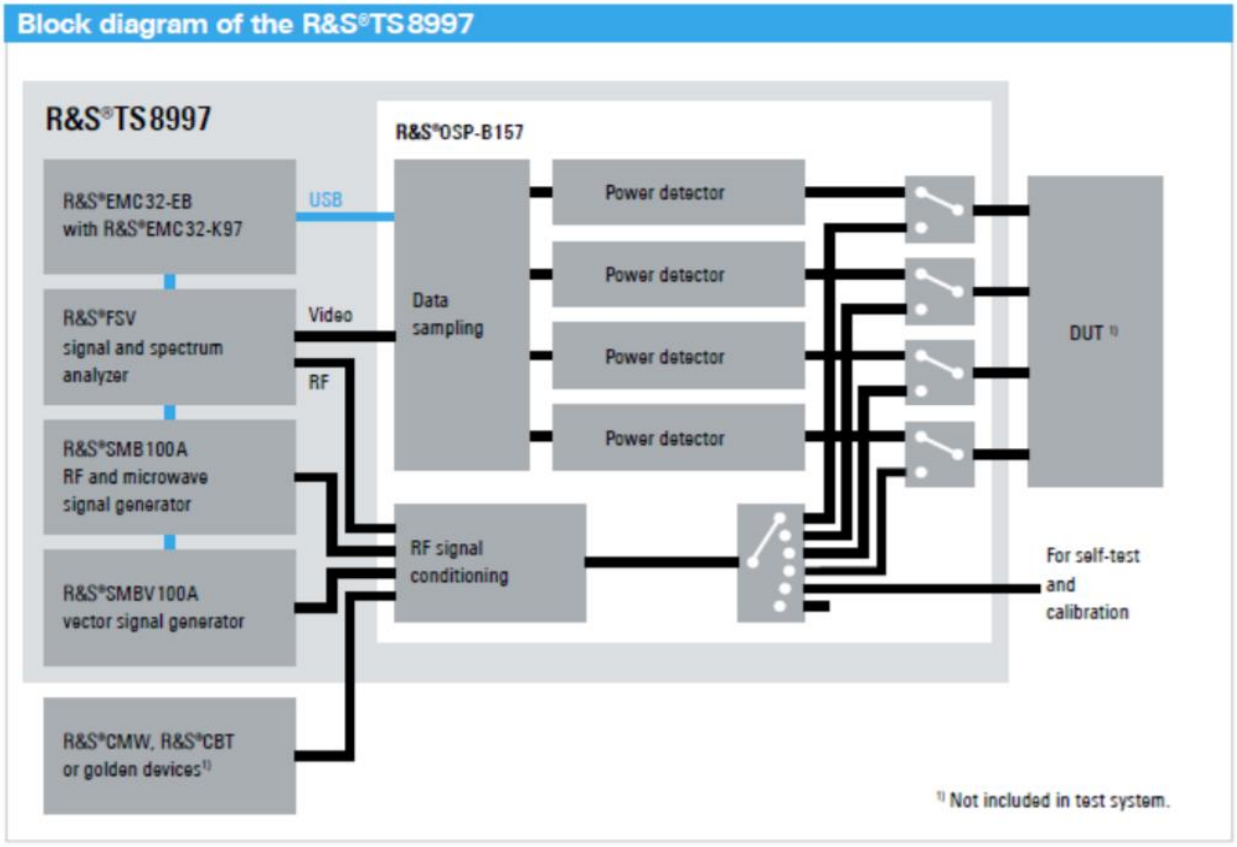


Diagram 1: Test Configuration Block Diagram

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	6/27/2023	6/272024
LISN	AFJ	LS16C\10	UCL-6749	1/29/2024	1/29/2025
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

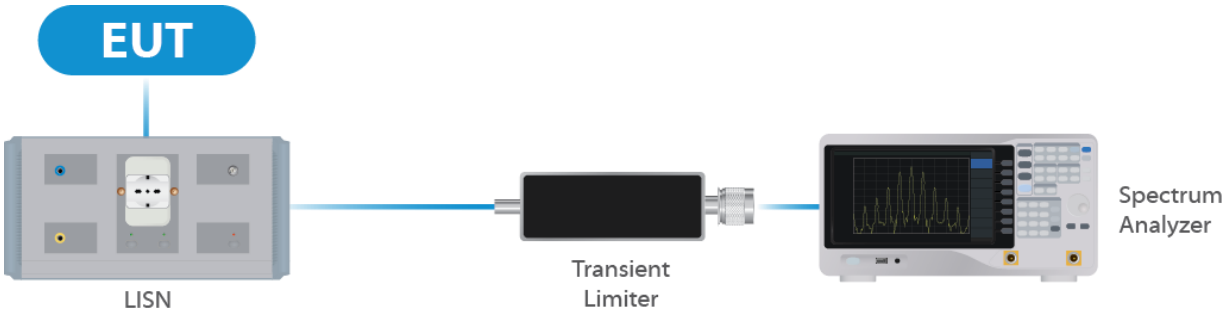


Figure 1: Conducted Emissions Test

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	3/20/2024
Switch Extension	R&S	OSP-150W	UCL-2870	2/22/2023	6/7/2024

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

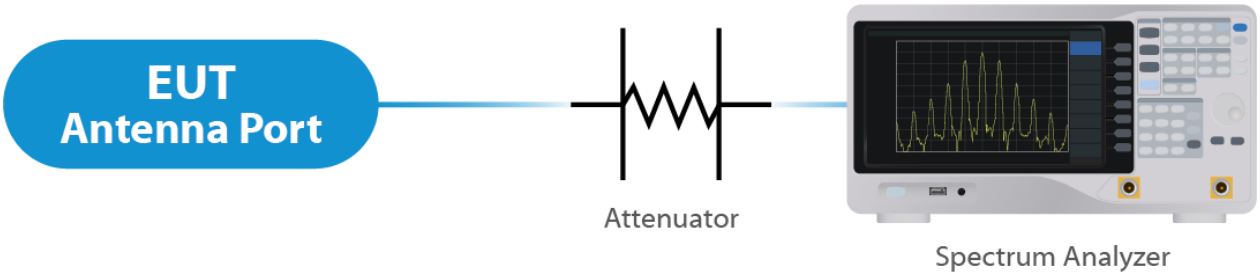


Figure 2: Direct Connect at the Antenna Port Test

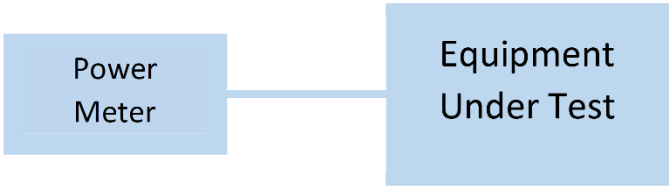


Figure 3: Output Power Measurement

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	1/25/2024	1/29/2025
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

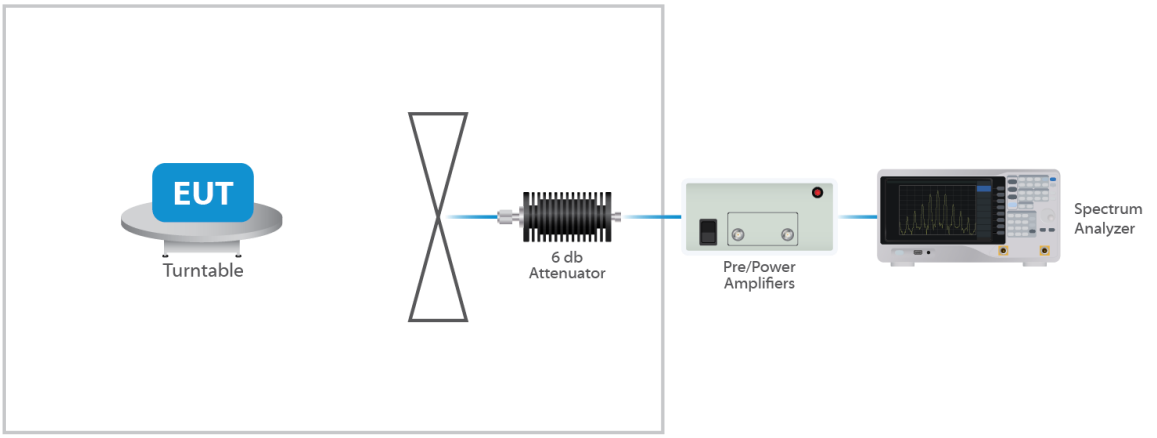


Figure 4: Radiated Emissions Test

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

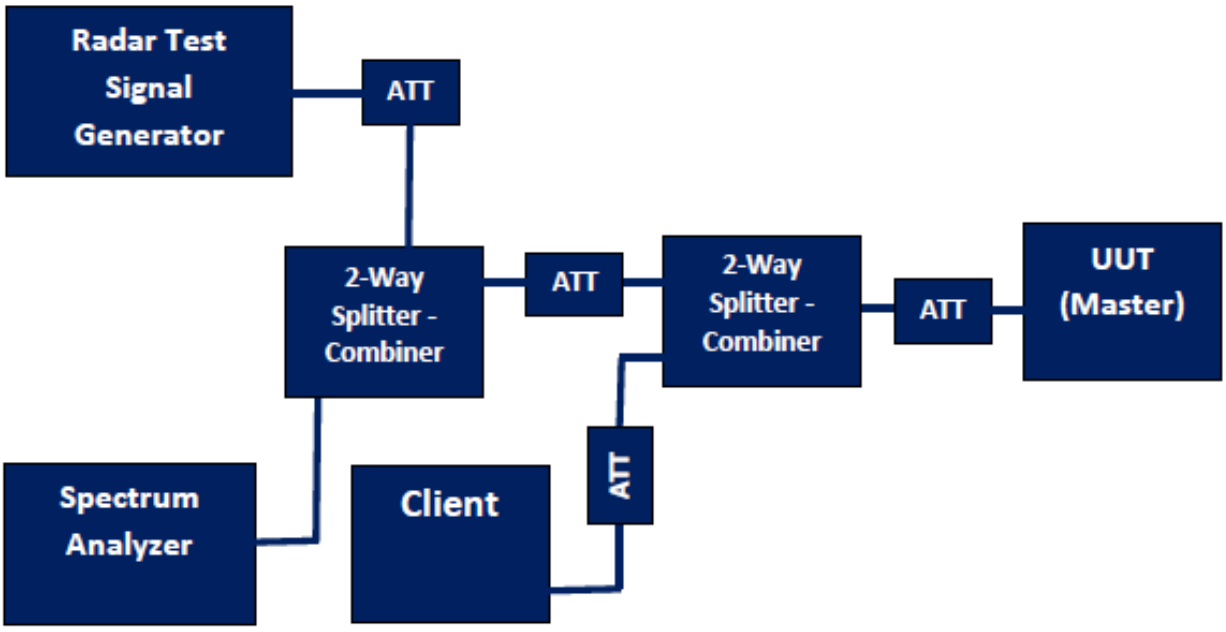


Figure 5: DFS Test Set Up - Master

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 antenna. Per the manufacturer, the Maximum gain of the antenna per chain is 6 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.

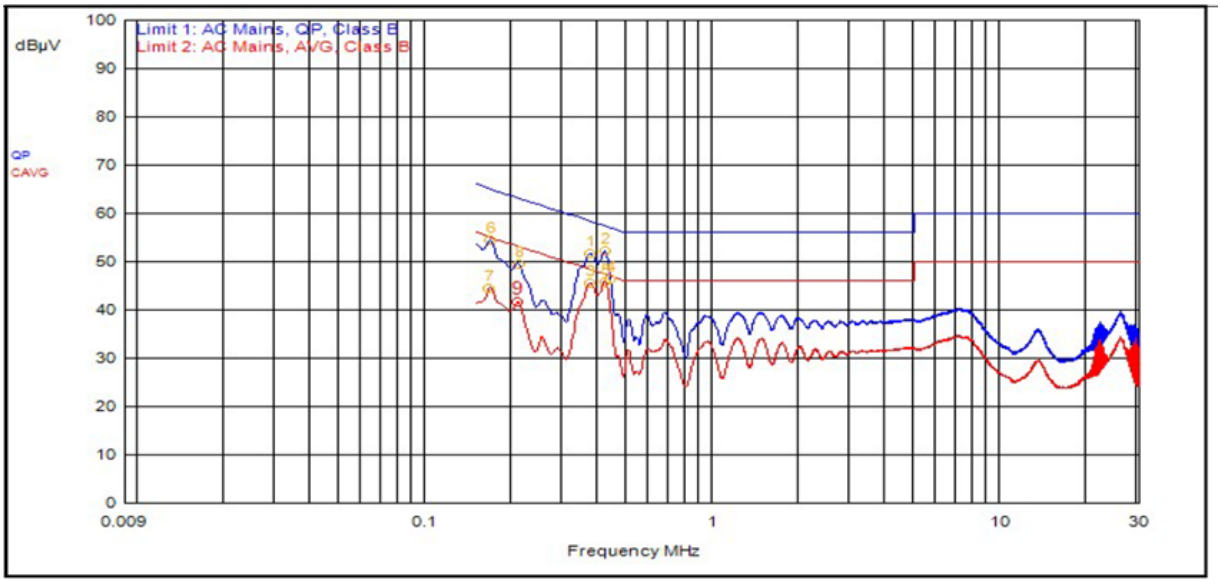
For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for NANT ≤ 4;
For PSD measurements when Nss=1: Array Gain = 10 log(NANT/NSS) dB + Antenna Gain (dBi). Or 6.02 dB + 6 dBi = 12.02 dBi.

Results

The EUT complied with the specification

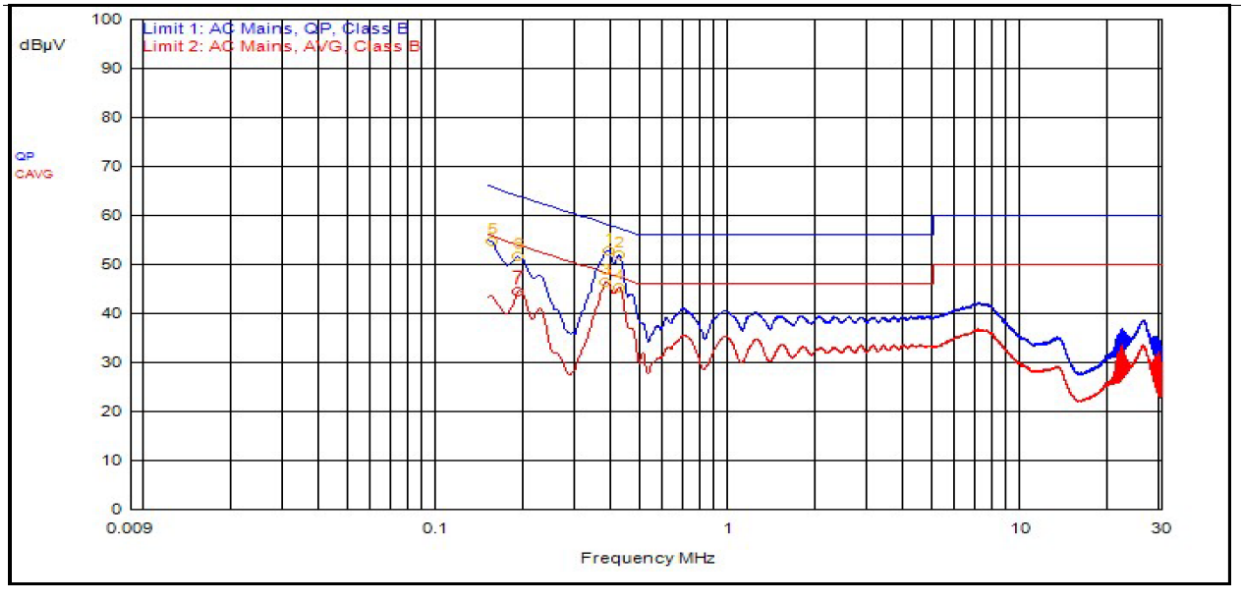
5.2 Conducted Emissions at Mains Ports Data

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
2	417,000kHz	12.39	0.00		QPeak	39.76	52.15	57.51	-5.36			
1	369,000kHz	12.37	0.00		QPeak	39.39	51.76	58.52	-6.77			
6	168,000kHz	12.35	0.00		QPeak	42.03	54.38	65.06	-10.68			
4	438,000kHz	12.40	0.00		QPeak	33.97	46.37	57.10	-10.73			
8	210,000kHz	12.37	0.00		QPeak	37.09	49.46	63.21	-13.75			
3	369,000kHz	12.37	0.00		C_AVG	33.20	45.57			48.52	-2.96	
5	417,000kHz	12.39	0.00		C_AVG	33.55	45.94			47.51	-1.56	
7	165,000kHz	12.36	0.00		C_AVG	31.95	44.31			55.21	-10.90	
9	207,000kHz	12.37	0.00		C_AVG	29.23	41.60			53.32	-11.72	

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	384,000kHz	12.39	0.00		QPeak	40.41	52.80	58.19	-5.40			
2	417,000kHz	12.40	0.00		QPeak	39.46	51.86	57.51	-5.65			
5	153,000kHz	12.37	0.00		QPeak	42.36	54.73	65.84	-11.11			
6	189,000kHz	12.41	0.00		QPeak	39.28	51.69	64.08	-12.39			
3	375,000kHz	12.39	0.00		C_AVG	33.92	46.31			48.39	-2.08	
4	417,000kHz	12.40	0.00		C_AVG	32.90	45.30			47.51	-2.21	
7	189,000kHz	12.41	0.00		C_AVG	32.07	44.48			54.08	-9.60	

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 662911 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)
OFDM 20	5260	17.50	22.30
OFDM 20	5280	18.00	22.50
OFDM 20	5320	17.50	22.60
HE20	5260	19.25	22.90
HE20	5280	19.25	22.50
HE20	5320	19.25	23.00
HE40	5270	38.25	43.20
HE40	5310	38.25	43.65
HE80	5290	77.50	86.50
HE160	5250	157.00	173.00

5.3.2 UNII-2C

Bandwidth	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
OFDM 20	5500	17.50	22.70
OFDM 20	5600	17.50	22.10
OFDM 20	5720	17.50	22.30
HE20	5500	19.25	22.90
HE20	5600	19.25	22.50
HE20	5720	19.25	22.50
HE40	5510	38.25	43.05
HE40	5590	38.25	42.45
HE40	5710	38.25	43.20
HE80	5530	78.50	92.00
HE80	5610	77.50	87.50
HE80	5690	77.50	89.00
HE160	5570	157.00	174.00

Result

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

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 662911 D01. Please see associated annex for details on instrument settings.

The maximum average RF conducted output power measured for this device was 23.84 dBm or 242.10 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 6 dBi.

5.4.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*
OFDM 20	5260	Mcs0 NSS4	17	21.78
OFDM 20	5280	Mcs0 NSS4	17	21.86
OFDM 20	5320	Mcs0 NSS4	17	22.44
HE20	5260	Mcs0 NSS4	18	22.84
HE20	5280	Mcs0 NSS4	18	22.95
HE20	5320	Mcs0 NSS4	18	23.47
HE40	5270	Mcs0 NSS4	19	23.73
HE40	5310	Mcs0 NSS4	18	23.39
HE40	5290	Mcs0 NSS4	19	23.78
HE80	5250	Mcs0 NSS4	19	23.84

5.4.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*
OFDM 20	5500	Mcs0 NSS4	18	22.53
OFDM 20	5600	Mcs0 NSS4	18	22.51
OFDM 20	5720	Mcs0 NSS4	18	22.53
HE20	5500	Mcs0 NSS4	18	22.63
HE20	5600	Mcs0 NSS4	18	22.67

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*
HE20	5720	Mcs0 NSS4	18	22.61
HE40	5510	Mcs0 NSS4	19	23.56
HE40	5590	Mcs0 NSS4	19	23.72
HE40	5710	Mcs0 NSS4	19	23.59
HE80	5530	Mcs0 NSS4	19	23.80
HE80	5610	Mcs0 NSS4	19	23.21
HE80	5690	Mcs0 NSS4	19	23.08
HE160	5570	Mcs0 NSS4	19	23.61

Result

In the configuration tested, the maximum average RF output power was less than 0.250 watt (24dB); 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 6 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

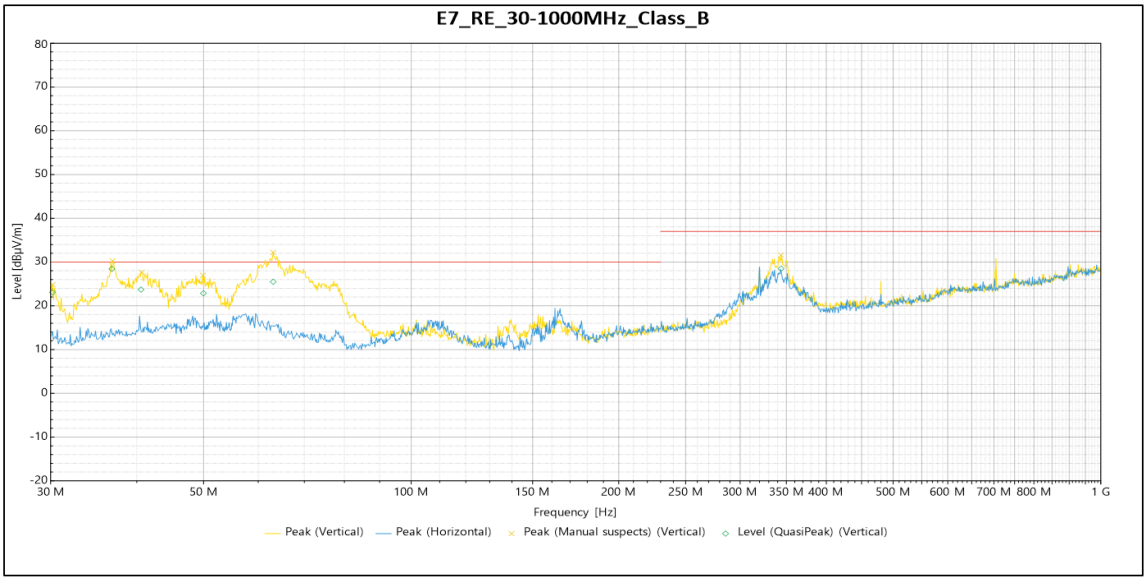
Conducted spurious emissions were below -27 dBm; therefore, the EUT complies with the specification. See Annex for results.

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.

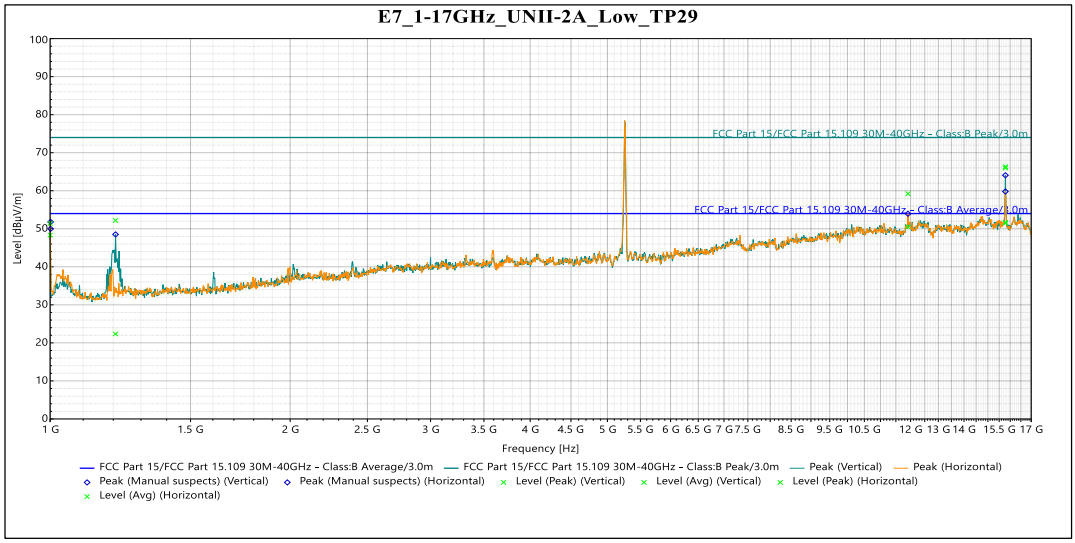
5.5.3 UNII-2A



QuasiPeak

Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
30.18 MHz	23.082	30	-6.918	188	1.048	Vertical	-16.017
36.804 MHz	28.443	30	-1.557	92	1.043	Vertical	-14.791
40.572 MHz	23.712	30	-6.288	122	2.344	Vertical	-13.478
49.964 MHz	22.859	30	-7.141	322	2.392	Vertical	-12.202
63.085 MHz	25.502	30	-4.498	341	3.518	Vertical	-14.826
343.85 MHz	28.495	37	-8.505	65	4.006	Vertical	-10.869
No significant emissions	-	-	-	-	-	Horizontal	-

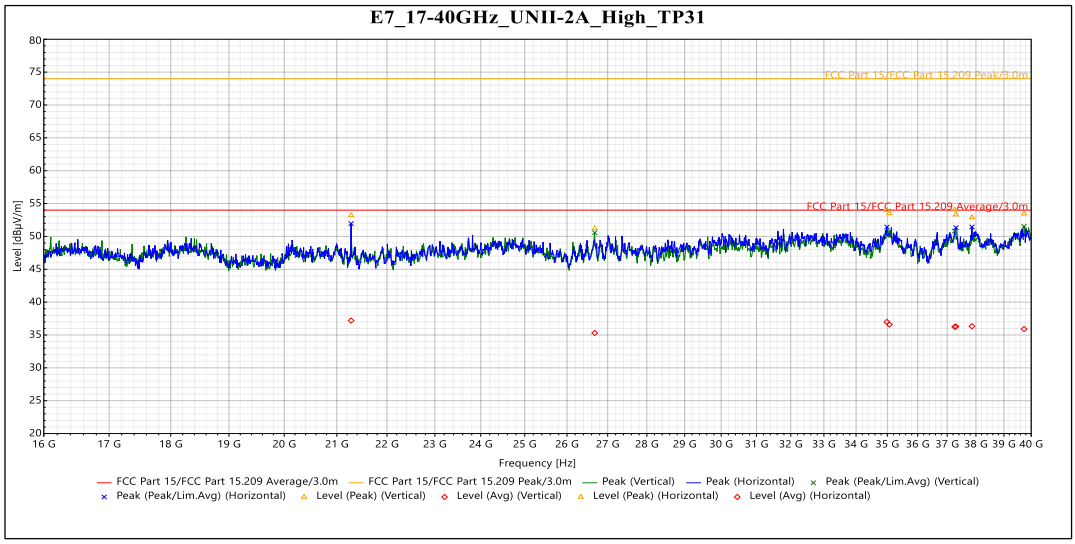
Graph 1: Radiated Emissions within 30MHz - 1GHz



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW (Hz)	Meas.Time (s)	Correction (dB)
999.52 MHz	Peak	32.482	74	-41.518	162	4	Vertical	5	1 M	0	-9.174

Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW (Hz)	Meas.Time (s)	Correction (dB)
1.208 GHz	Peak	52.196	74	-21.804	1	1.881	Vertical	5	1 M	0	-8.201
15.781 GHz	Peak	65.97	74	-8.03	187	1.81	Vertical	5	1 M	0	15.521
999.52 MHz	AVG	11.545	54	-42.455	162	4	Vertical	5	1 M	0	-9.174
1.208 GHz	AVG	22.35	54	-31.65	1	1.881	Vertical	5	1 M	0	-8.201
15.781 GHz	AVG	51.664	54	-2.336	187	1.81	Vertical	5	1 M	0	15.521
1.0002 GHz	Peak	51.432	74	-22.568	168	1.532	Horizontal	5	1 M	0	-9.173
11.91 GHz	Peak	59.227	74	-14.773	28	1.63	Horizontal	5	1 M	0	16.544
15.78 GHz	Peak	66.326	74	-7.674	48	2.346	Horizontal	5	1 M	0	15.53
1.0002 GHz	AVG	48.327	54	-5.673	168	1.532	Horizontal	5	1 M	0	-9.173
11.91 GHz	AVG	50.49	54	-3.51	28	1.63	Horizontal	5	1 M	0	16.544
15.78 GHz	AVG	51.487	54	-2.513	48	2.346	Horizontal	5	1 M	0	15.53

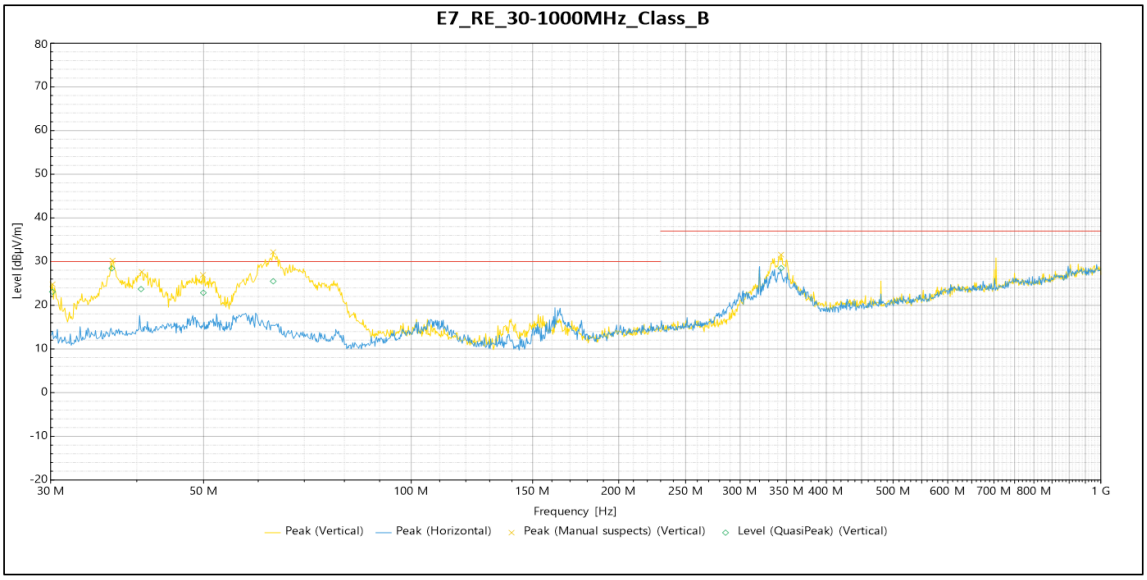
Graph 2: Radiated emissions within the frequency range 1 GHz – 16 GHz



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Meas. Time (s)	RBW (Hz)	Meas.Time (s)	Correction (dB)
26.678 GHz	Peak	51.222	74	-22.778	274	Vertical	5	1 M	0	1.803
35.066 GHz	Peak	53.539	74	-20.461	359	Vertical	5	1 M	0	3.205
37.258 GHz	Peak	54.067	74	-19.933	91	Vertical	5	1 M	0	4.315
39.735 GHz	Peak	53.445	74	-20.555	62	Vertical	5	1 M	0	2.852
26.678 GHz	AVG	35.313	54	-18.687	274	Vertical	5	1 M	0	1.803
35.066 GHz	AVG	36.593	54	-17.407	359	Vertical	5	1 M	0	3.205
37.258 GHz	AVG	36.234	54	-17.766	91	Vertical	5	1 M	0	4.315
39.735 GHz	AVG	35.909	54	-18.091	62	Vertical	5	1 M	0	2.852
21.28 GHz	Peak	53.201	74	-20.799	304	Horizontal	5	1 M	0	-1.372
34.989 GHz	Peak	53.967	74	-20.033	194	Horizontal	5	1 M	0	3.641
37.302 GHz	Peak	53.312	74	-20.688	219	Horizontal	5	1 M	0	3.936
37.86 GHz	Peak	52.888	74	-21.112	71	Horizontal	5	1 M	0	3.731
21.28 GHz	AVG	37.204	54	-16.796	304	Horizontal	5	1 M	0	-1.372
34.989 GHz	AVG	36.976	54	-17.024	194	Horizontal	5	1 M	0	3.641
37.302 GHz	AVG	36.302	54	-17.698	219	Horizontal	5	1 M	0	3.936
37.86 GHz	AVG	36.33	54	-17.67	71	Horizontal	5	1 M	0	3.731

Graph 3: Radiated Emissions within the frequency range 16 GHz – 40 GHz

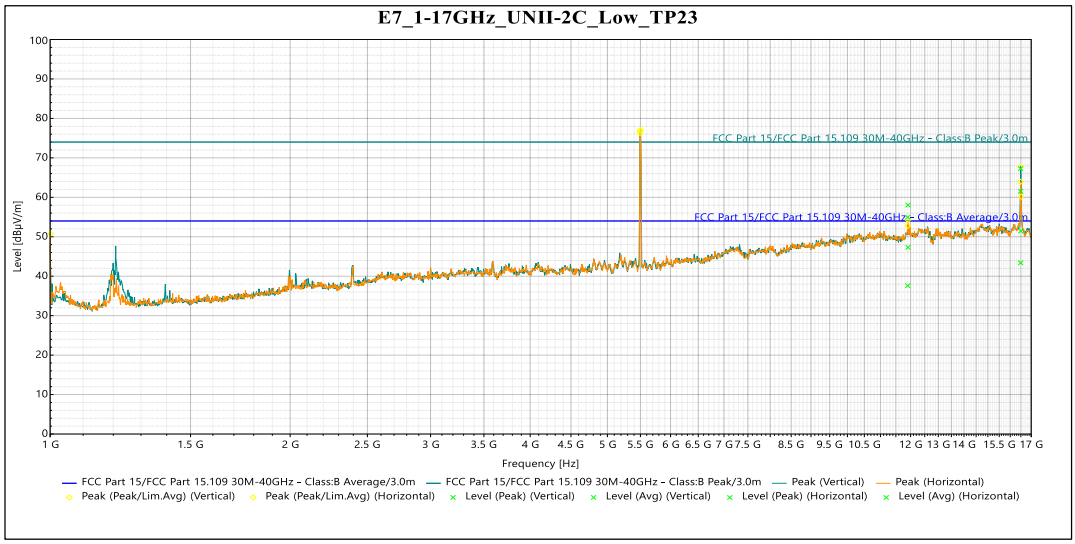
5.5.4 UNII-2C



QuasiPeak

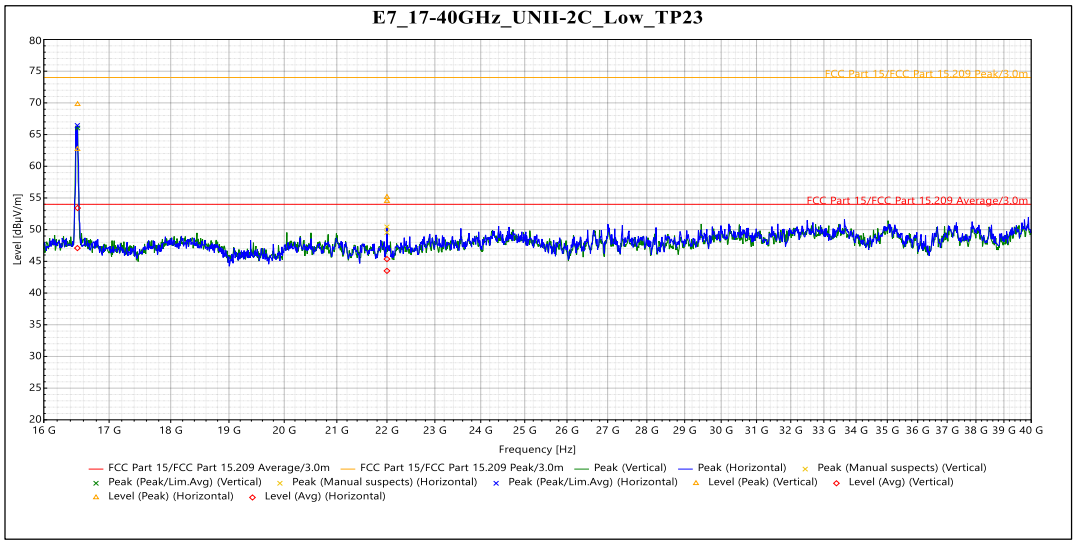
Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
30.18 MHz	23.082	30	-6.918	188	1.048	Vertical	-16.017
36.804 MHz	28.443	30	-1.557	92	1.043	Vertical	-14.791
40.572 MHz	23.712	30	-6.288	122	2.344	Vertical	-13.478
49.964 MHz	22.859	30	-7.141	322	2.392	Vertical	-12.202
63.085 MHz	25.502	30	-4.498	341	3.518	Vertical	-14.826
343.85 MHz	28.495	37	-8.505	65	4.006	Vertical	-10.869
No significant emissions	-	-	-	-	-	Horizontal	-

Graph 4: Radiated Emissions within 30MHz - 1GHz



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Meas. Time (s)	RBW (Hz)	Meas.Time (s)	Correction (dB)
11.901 GHz	Peak	54.953	74	-19.047	345	3.81	Vertical	5	1 M	0	16.556
16.49 GHz	Peak	67.263	74	-6.737	34	3.458	Vertical	5	1 M	0	18.27
11.901 GHz	AVG	37.587	54	-16.413	345	3.81	Vertical	5	1 M	0	16.556
16.49 GHz	AVG	51.453	54	-2.547	34	3.458	Vertical	5	1 M	0	18.27
999.55 MHz	Peak	37.681	74	-36.319	259	2.232	Horizontal	5	1 M	0	-9.174
11.91 GHz	Peak	58.02	74	-15.98	14	1.627	Horizontal	5	1 M	0	16.544
16.487 GHz	Peak	61.508	74	-12.492	38	2.71	Horizontal	5	1 M	0	18.268
999.55 MHz	AVG	11.958	54	-42.042	259	2.232	Horizontal	5	1 M	0	-9.174
11.91 GHz	AVG	47.313	54	-6.687	14	1.627	Horizontal	5	1 M	0	16.544
16.487 GHz	AVG	43.39	54	-10.61	38	2.71	Horizontal	5	1 M	0	18.268

Graph 5: 1Radiated Emissions within the frequency range 1 GHz – 16 GHz



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Meas. Time (s)	RBW (Hz)	Meas.Time (s)	Correction (dB)
16.51 GHz	Peak	69.782	74	-4.218	33	Vertical	5	1 M	0	0.286
22 GHz	Peak	54.496	74	-19.504	1	Vertical	5	1 M	0	-0.764
16.51 GHz	AVG	53.406	54	-0.594	33	Vertical	5	1 M	0	0.286
22 GHz	AVG	43.502	54	-10.498	1	Vertical	5	1 M	0	-0.764
16.507 GHz	Peak	62.688	74	-11.312	27	Horizontal	5	1 M	0	0.299
22 GHz	Peak	55.138	74	-18.862	21	Horizontal	5	1 M	0	-0.764
16.507 GHz	AVG	47.086	54	-6.914	27	Horizontal	5	1 M	0	0.299
22 GHz	AVG	45.359	54	-8.641	21	Horizontal	5	1 M	0	-0.764

Graph 6: Radiated Emissions within the frequency range 16 GHz – 40 GHz

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 662911 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 6 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 6 dBi + Array gain of 6.02 dB which is a total of 12.02 dBi. The limit was reduced to 4.98 dB for NSS-1 mode by subtracting the amount the direction gain exceeds 6dB (6.02 dB).

Results of this testing are summarized.

5.6.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
OFDM 20	5500	Mcs0_Nss4	17	21.78	9.88
OFDM 20	5600	Mcs0_Nss4	17	21.86	10.21
OFDM 20	5720	Mcs0_Nss4	17	22.44	10.84
HE20	5500	Mcs0_Nss4	18	22.84	10.32
HE20	5600	Mcs0_Nss4	18	22.95	10.45
HE20	5720	Mcs0_Nss4	18	23.47	10.99
HE40	5510	Mcs0_Nss4	19	23.73	8.32
HE40	5590	Mcs0_Nss4	18	23.39	7.98
HE40	5710	Mcs0_Nss4	19	23.78	5.36
HE80	5530	Mcs0_Nss4	19	23.84	2.58

NSS-1 Mode *

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
OFDM 20	5500	Mcs0_Nss1	12	16.78	4.88
OFDM 20	5600	Mcs0_Nss1	11	15.86	4.21
OFDM 20	5720	Mcs0_Nss1	11	16.44	4.84
HE20	5500	Mcs0_Nss1	12	16.84	4.32
HE20	5600	Mcs0_Nss1	12	16.95	4.45
HE20	5720	Mcs0_Nss1	12	17.47	4.99
HE40	5510	Mcs0_Nss1	15	19.73	4.32
HE40	5590	Mcs0_Nss1	15	20.39	4.98
HE40	5710	Mcs0_Nss1	18	22.78	4.36
HE80	5530	Mcs0_Nss4	19	23.84	2.58

*Mathematically reduced based on measurement of 1 TP = 1 dB.

5.6.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
OFDM 20	5500	Mcs0_Nss4	18	22.53	10.53
OFDM 20	5600	Mcs0_Nss4	18	22.51	10.93
OFDM 20	5720	Mcs0_Nss4	18	22.53	10.76
HE20	5500	Mcs0_Nss4	18	22.63	10.07
HE20	5600	Mcs0_Nss4	18	22.67	10.46
HE20	5720	Mcs0_Nss4	18	22.61	10.32
HE40	5510	Mcs0_Nss4	19	23.56	8.45
HE40	5590	Mcs0_Nss4	19	23.72	8.45
HE40	5710	Mcs0_Nss4	19	23.59	8.33
HE80	5530	Mcs0_Nss4	19	23.80	5.47
HE80	5610	Mcs0_Nss4	19	23.21	5.20
HE80	5690	Mcs0_Nss4	19	23.08	5.26
HE160	5570	Mcs0_Nss4	19	23.61	2.59

NSS-1 Mode *

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
OFDM 20	5500	Mcs0_Nss1	12	16.53	4.53
OFDM 20	5600	Mcs0_Nss1	12	16.51	4.93
OFDM 20	5720	Mcs0_Nss1	12	16.53	4.76
HE20	5500	Mcs0_Nss1	12	16.63	4.07
HE20	5600	Mcs0_Nss1	12	16.67	4.46
HE20	5720	Mcs0_Nss1	12	16.61	4.32
HE40	5510	Mcs0_Nss1	15	19.56	4.45
HE40	5590	Mcs0_Nss1	15	19.72	4.45
HE40	5710	Mcs0_Nss1	15	19.59	4.33
HE80	5530	Mcs0_Nss1	18	22.80	4.47

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured PSD
HE80	5610	Mcs0_Nss1	18	22.21	4.20
HE80	5690	Mcs0_Nss1	18	22.08	4.26
HE160	5570	Mcs0_Nss1	19	23.61	2.59

*Mathematically reduced based on measurement of 1 TP = 1 dB.

Result

The maximum average power spectral density was less than the limit of 11 dBm, and 4.98 dBm for NSS-1 mode, therefore, the EUT complies with the specification.

5.7 DFS Requirement

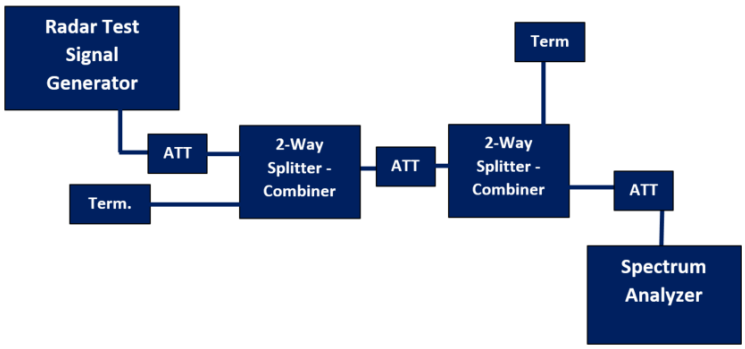
This product is a master with radar detection. The outcome of the required DFS tests is located in this section. DFS testing was performed following the test procedures as outlined in KDB 905462.

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

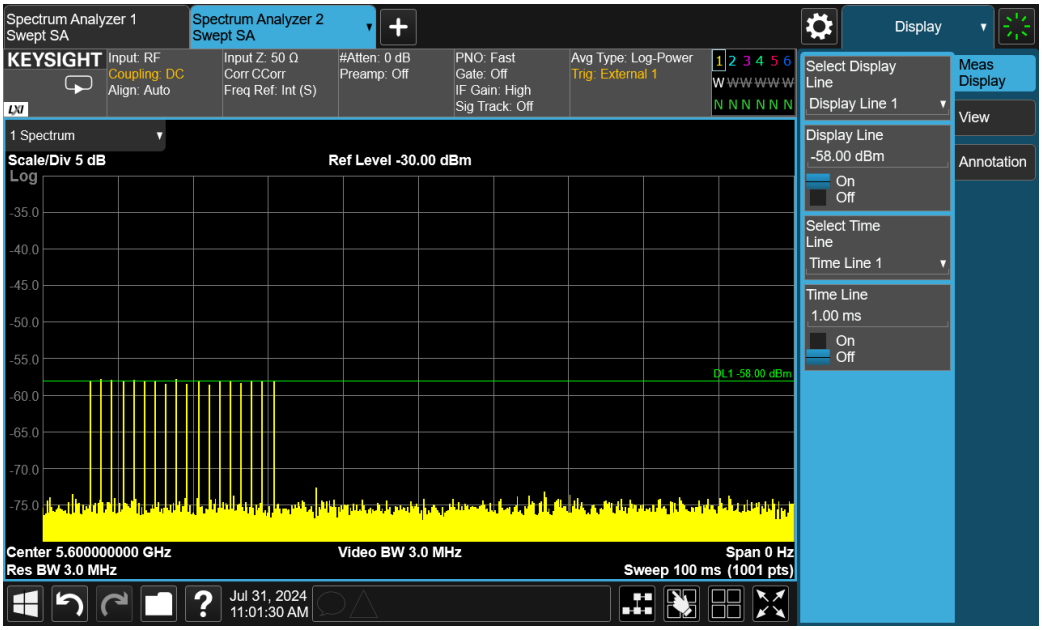
Information	Status	
Possible Antenna/s	Integral 6dBi	
Antenna used for test	Integral 6dBi	
Operating mode	Master	
If Client	FCC ID of Master device used for verification	
Port used for testing	J1	
EIRP range	> 200 milliwatts	
Impedance of port	50 ohms	
Channel loading technique	Data transfer was enacted to achieve a minimum channel loading of approximately 17%	
Antenna measurement technique	See note 1	
Time of power-on cycle	59s	
Detection threshold level	-58 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

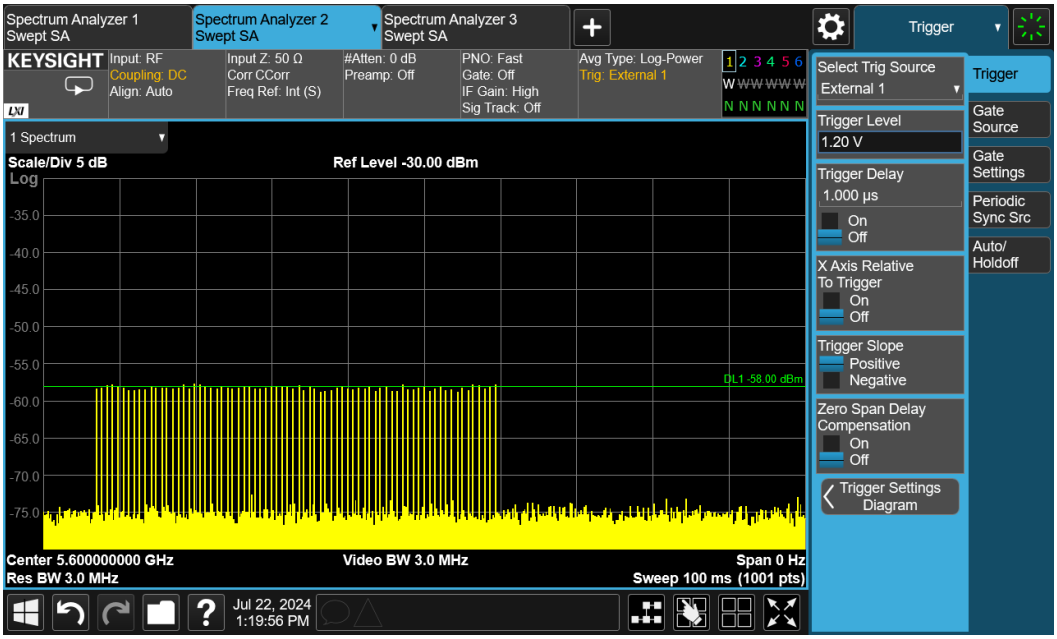
Requirement	Operational Mode	
	Master or Client Client Without Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not Required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not Required



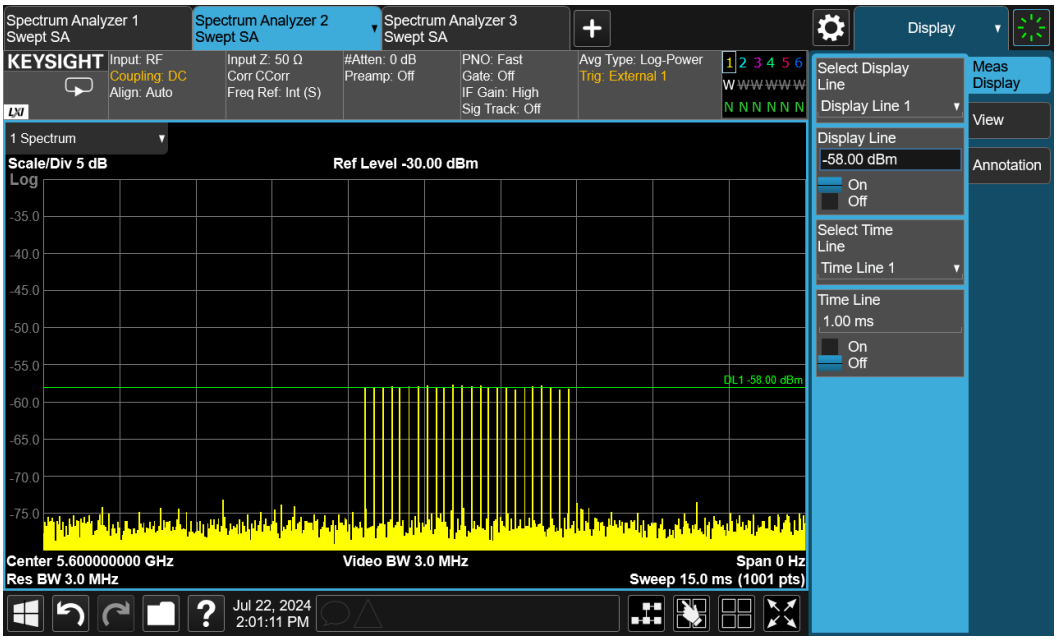
Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a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



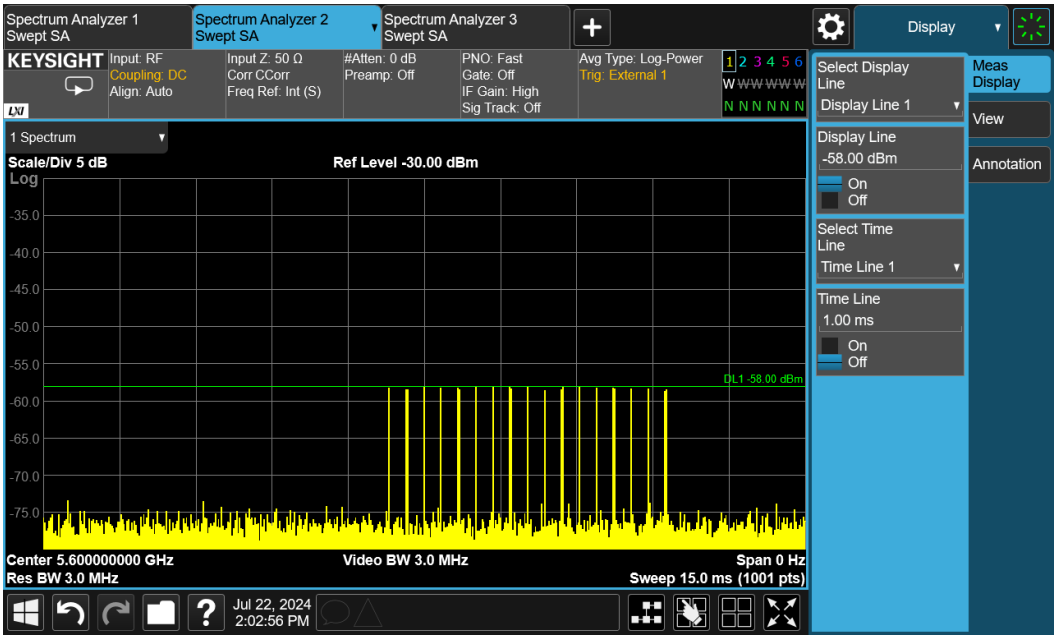
Plot 1: Radar Level 0



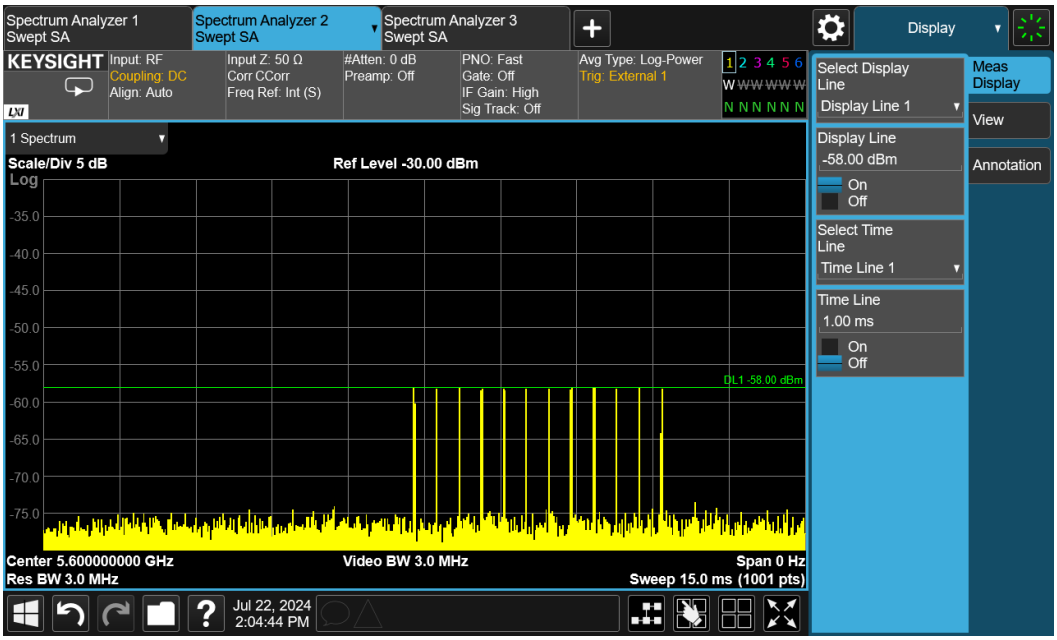
Plot 2: Radar Level 1



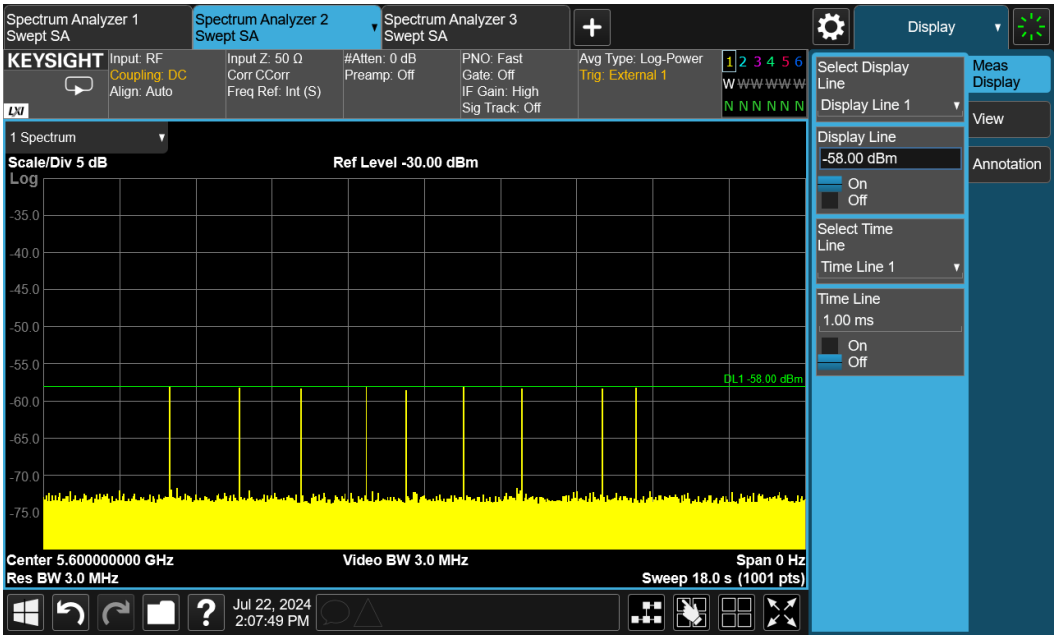
Plot 3: Radar Level 2



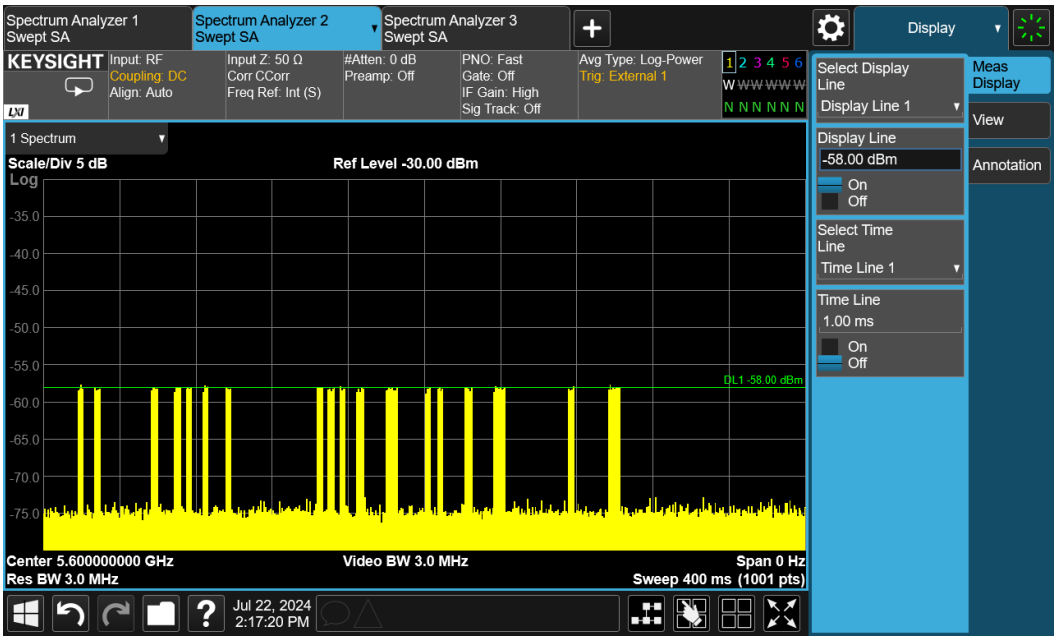
Plot 4: Radar Level 3



Plot 5: Radar Level 4



Plot 6: Radar Level 5



Plot 7: Radar Level 6

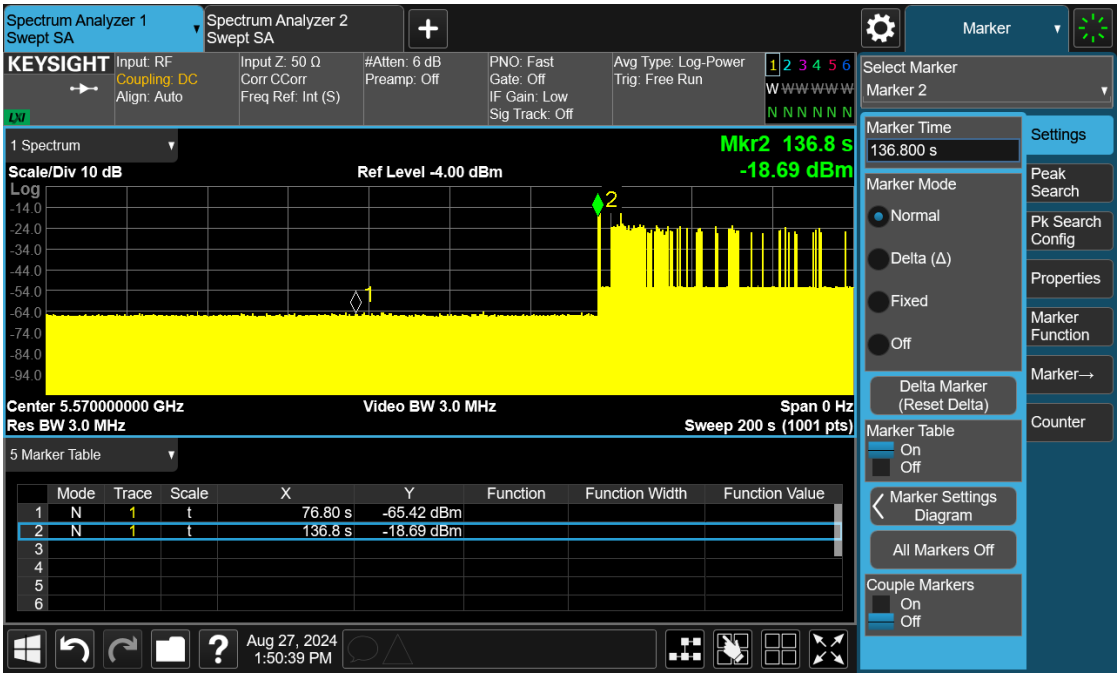
5.7.1 Channel Availability Check (CAC)

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.

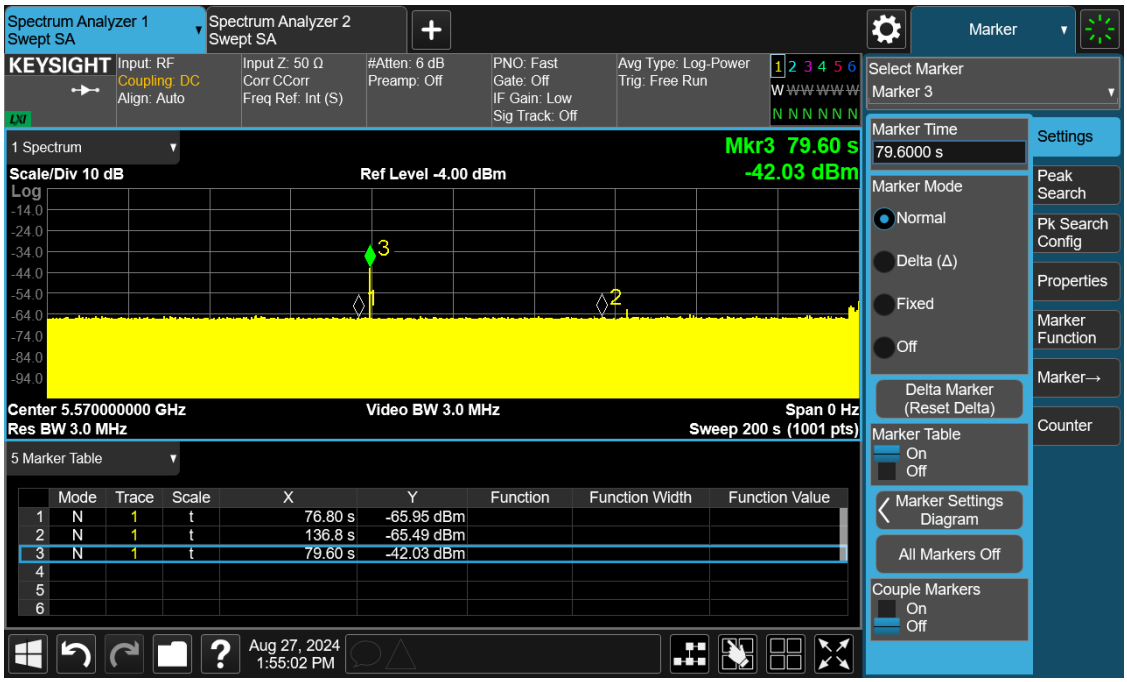
For radar burst at the beginning of the CAC. To verify successful radar detection on the selected channel during a period equal to the beginning of the CAC time, visual indication on the EUT of successful detection of the radar burst will be recorded and reported. Observation of the radar burst is show 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.

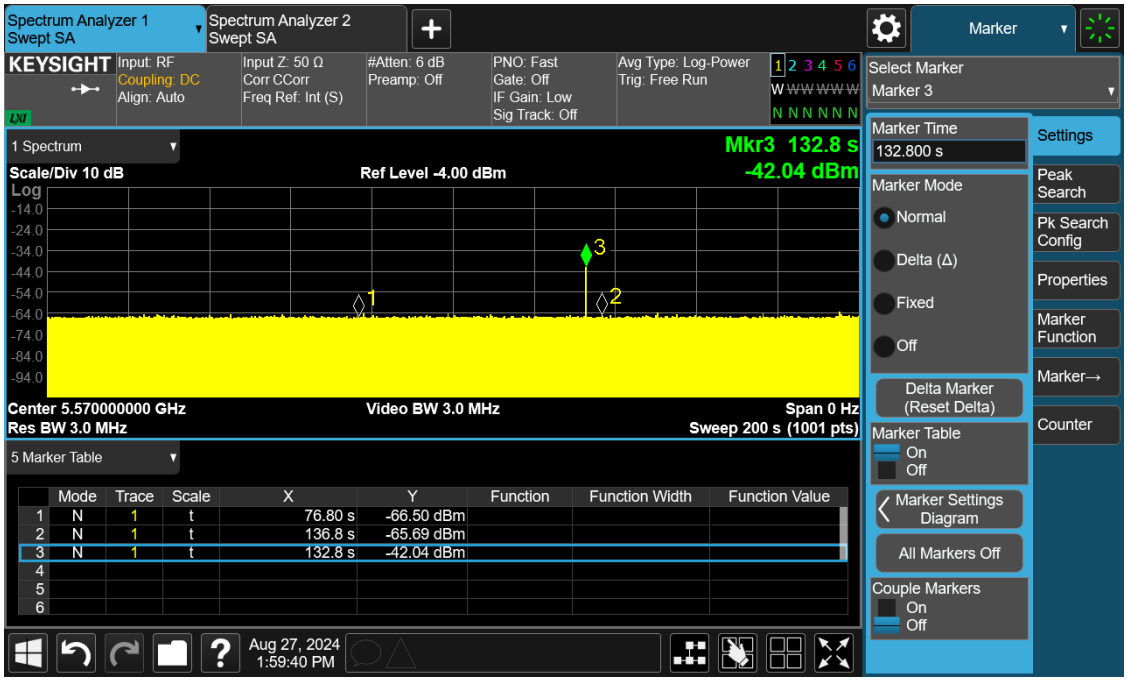
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the channel within the channel closing transmission time and channel move time, and does not transmit on a channel during the non-occupancy period after the detection and channel move.



Plot 8: DUT Turn On



Plot 9: Beginning



Plot 10: End

5.7.2 In-service Monitoring

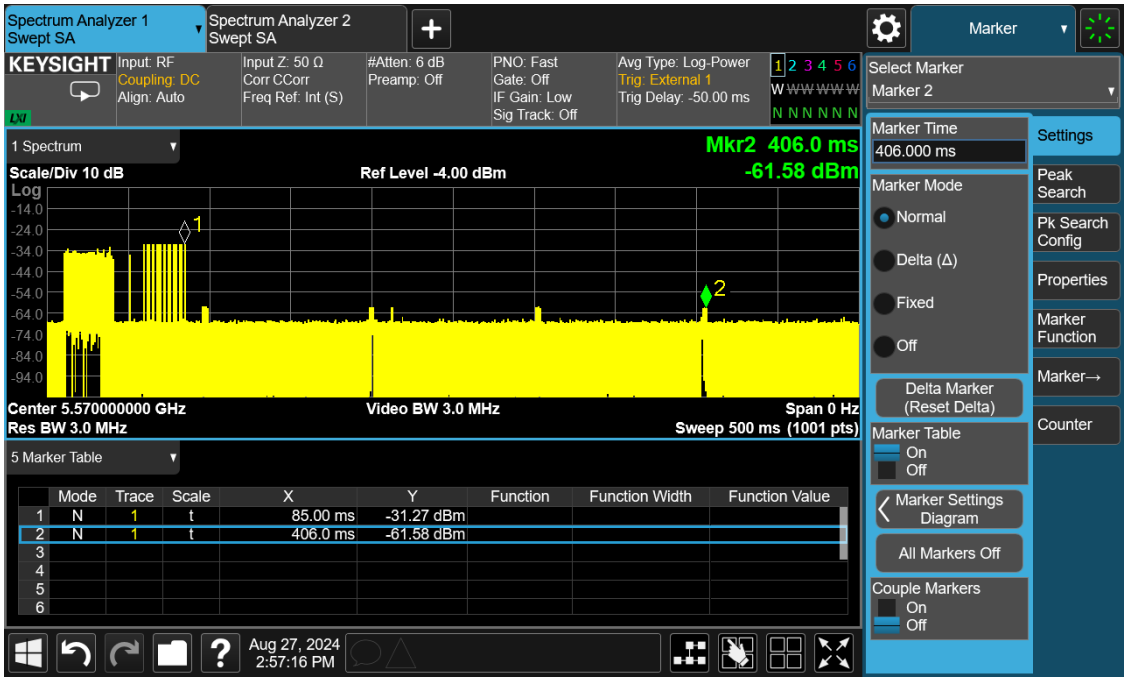
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 ms + aggregate of 60 ms over remaining 10 second period
Non-occupancy period	Minimum 30 minutes

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.

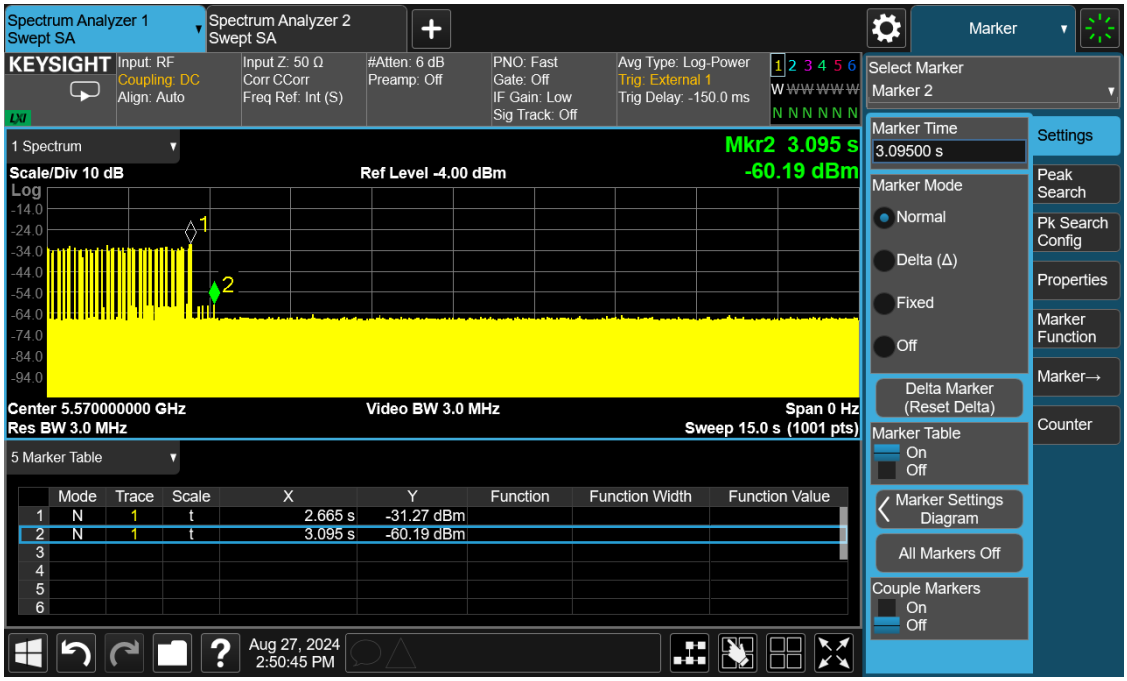
During the 30 minutes observation time, the EUT did not make any transmissions on a channel after a radar signal was detected.

Please see plots below.

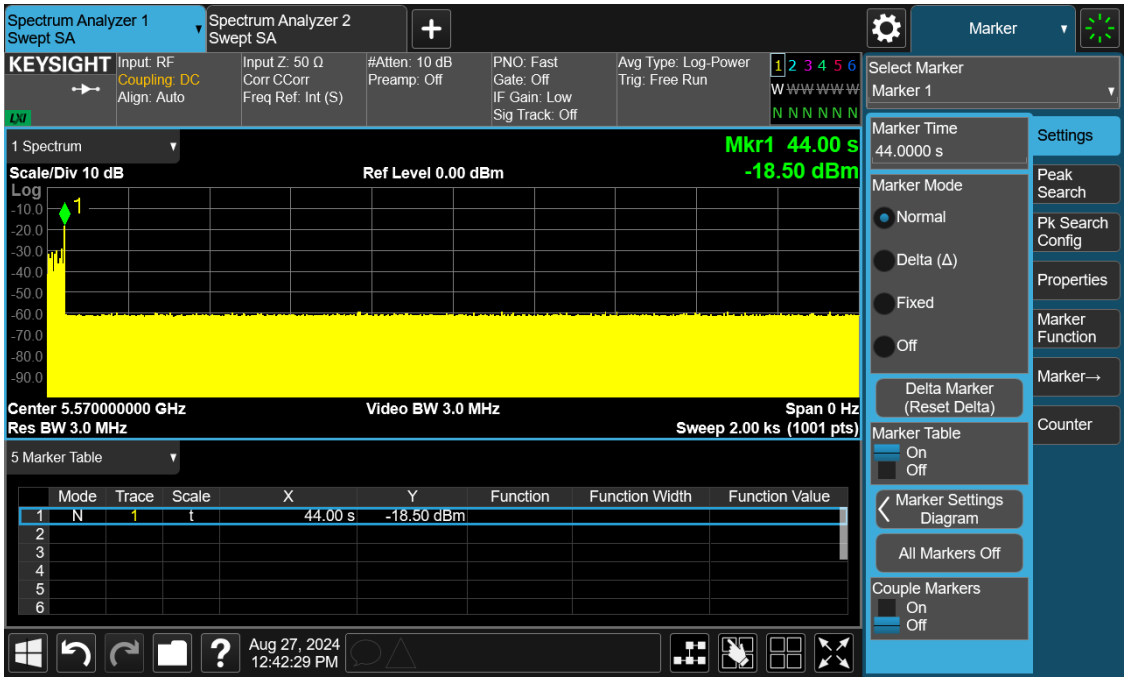
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the channel within the channel closing transmission time and channel move time, and does not transmit on a channel during the non-occupancy period after the detection and channel move.



Plot 11: Channel Close (400 ms)



Plot 12: Channel Move



Plot 13: Non-Occupancy

5.7.3 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	
5590	0	0	0	0	0	0	0	0	0	0	0
5591	0	0	0	0	0	0	0	0	0	0	0
5592	1	1	1	1	1	1	1	1	1	1	100
5593	1	1	1	1	1	1	1	1	1	1	100
5594	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
5610	1	1	1	1	1	1	1	1	1	1	100
5611	0	0	0	0	0	0	0	0	0	0	0
5615	0	0	0	0	0	0	0	0	0	0	0
Parameter											Value
U-NII 99% Transmission Power Bandwidth:											17.32
Lowest frequency with at least 90% detection (F_L):											5592
Highest frequency with at least 90% detection (F_H):											5610
Detection Bandwidth (F_H - F_L):											18
Detection Bandwidth percentage of 99% Transmission Power Bandwidth:											104%

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	
5570	1	1	1	1	1	1	1	1	1	1	100
5575	1	1	1	1	1	1	1	1	1	1	100
5580	1	1	1	1	1	1	1	1	1	1	100
5585	1	1	1	1	1	1	1	1	1	1	100
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
5610	1	1	1	1	1	1	1	1	1	1	100
Parameter											Value
U-NII 99% Transmission Power Bandwidth:											38.25
Lowest frequency with at least 90% detection (F_L):											5570
Highest frequency with at least 90% detection (F_H):											5610
Detection Bandwidth (F_H - F_L):											40
Detection Bandwidth percentage of 99% Transmission Power Bandwidth:											105%

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	
5570	1	1	1	1	1	1	1	1	1	1	100
5575	1	1	1	1	1	1	1	1	1	1	100
5580	1	1	1	1	1	1	1	1	1	1	100
5585	1	1	1	1	1	1	1	1	1	1	100
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
5610	1	1	1	1	1	1	1	1	1	1	100
5615	1	1	1	1	1	1	1	1	1	1	100
5620	1	1	1	1	1	1	1	1	1	1	100
5625	1	1	1	1	1	1	1	1	1	1	100
5630	1	1	1	1	1	1	1	1	0	1	90
5635	1	1	1	1	1	1	1	1	1	1	100
5640	1	1	1	1	1	1	1	1	1	1	100
5645	1	1	1	1	1	1	1	1	1	1	100
5650	1	1	1	1	1	1	1	1	1	1	100
Parameter											Value
U-NII 99% Transmission Power Bandwidth:											77.5
Lowest frequency with at least 90% detection (F_L):											5570
Highest frequency with at least 90% detection (F_H):											5650
Detection Bandwidth (F_H - F_L):											80
Detection Bandwidth percentage of 99% Transmission Power Bandwidth:											103%

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	
5490	1	1	1	1	1	1	1	1	1	1	100
5495	1	1	1	1	1	1	1	1	1	1	100
5500	1	1	1	1	1	1	1	1	1	1	100
5505	1	1	1	1	1	1	1	1	1	1	100
5510	1	1	1	1	1	1	1	1	1	1	100
5515	1	1	1	1	1	1	1	1	1	1	100
5520	1	1	1	1	1	1	1	1	1	1	100
5525	1	1	1	1	1	1	1	1	1	1	100
5530	1	1	1	1	1	1	1	1	1	1	100
5535	1	1	1	1	1	1	1	1	1	1	100
5540	1	1	1	1	1	1	1	1	1	1	100
5545	1	1	1	1	1	1	1	1	1	1	100
5550	1	1	1	1	1	1	1	1	1	1	100
5555	1	1	1	1	1	1	1	1	1	1	100
5560	1	1	1	1	1	1	1	1	1	1	100
5565	1	1	1	1	1	1	1	1	1	1	100
5570	1	1	1	1	1	1	1	1	1	1	100
5575	1	1	1	1	1	1	1	1	1	1	100
5580	1	1	1	1	1	1	1	1	1	1	100
5585	1	1	1	1	1	1	1	1	1	1	100
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
5610	1	1	1	1	1	1	1	1	1	1	100
5615	1	1	1	1	1	1	1	1	1	1	100
5620	1	1	1	1	1	1	1	1	1	1	100
5625	1	1	1	1	1	1	1	1	1	1	100
5630	1	1	1	1	1	1	1	1	1	1	100
5635	1	1	1	1	1	1	1	1	1	1	100
5640	1	1	1	1	1	1	1	1	1	1	100
5645	1	1	1	1	1	1	1	1	1	1	100
5650	1	1	1	1	1	1	1	1	1	1	100
Parameter											Value
U-NII 99% Transmission Power Bandwidth:											157
Lowest frequency with at least 90% detection (F_L):											5490
Highest frequency with at least 90% detection (F_H):											5650
Detection Bandwidth (F_H - F_L):											160
Detection Bandwidth percentage of 99% Transmission Power Bandwidth:											102%

5.7.4 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	28	30	93%
Type 2	23	30	76%
Type 3	26	30	86%
Type 4	22	30	77%
Type 5	29	30	96%
Type 6	30	30	100%
Aggregate 1-4	99	120	83%

FCC 905462 D02 New Rules v02

Tester:
Test Lab:
Date:
Device:
Serial:
Firmware:
Manufacturer:
Test:

RADAR TYPE 1

Rohde & Schwarz
K350 Pulse Sequencer DFS

Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	18	1	2967	y
2	32	1	1687	y
3	20	1	2700	y
4	21	1	2595	y
5	30	1	1792	y
6	18	1	3065	y
7	24	1	2206	n
8	33	1	1606	y
9	40	1	1320	y
10	34	1	1590	y
11	74	1	715	y
12	54	1	986	y
13	23	1	2373	y
14	20	1	2670	y
15	28	1	1903	y
16	87	1	610	y
17	31	1	1732	y
18	73	1	723	y
19	23	1	2295	y
20	45	1	1173	y
21	19	1	2788	y
22	18	1	2935	y
23	25	1	2133	y
24	31	1	1753	n
25	102	1	521	y
26	32	1	1658	y
27	100	1	530	y
28	27	1	1990	y
29	55	1	961	y
30	76	1	699	y
				28/30: 93.3%

FCC 905462 D02 New Rules v02

Tester:
Test Lab:
Date:
Device:
Serial:
Firmware:
Manufacturer:
Test:

RADAR TYPE 2

Rohde & Schwarz
K350 Pulse Sequencer DFS

Trial #	Number of Pulses per Burst	Pulse Width (µsec)	PRI (µs)	Detection (yes/no)
1	25	2	156	n
2	24	4.7	155	y
3	27	1.9	186	n
4	27	1.8	226	y
5	28	1.9	181	n
6	25	4.2	220	y
7	29	1.8	215	y
8	25	2.7	182	y
9	28	1	186	y
10	25	1.5	196	y
11	23	4.2	177	n
12	24	3.6	174	y
13	28	4.2	226	n
14	27	2	165	y
15	25	1.9	226	y
16	27	1	165	y
17	24	1.7	173	y
18	28	4.1	212	y
19	27	3.9	229	y
20	24	1.5	155	y
21	25	3.4	157	y
22	27	1.8	203	n
23	25	4.9	182	y
24	27	1.3	153	n
25	29	2.9	175	y
26	29	2.5	213	y
27	29	4	195	y
28	28	3.2	162	y
29	29	2.7	222	y
30	28	3.5	154	y
				23/30: 76.7%

FCC 905462 D02 New Rules v02

Tester:
Test Lab:
Date:
Device:
Serial:
Firmware:
Manufacturer:
Test:

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	228	n
2	17	7.1	489	y
3	17	8.9	385	y
4	16	7.7	389	y
5	17	9.2	409	y
6	18	6.7	367	y
7	17	6.4	316	y
8	17	8.8	440	y
9	17	6.2	256	y
10	18	9.1	249	y
11	18	6.1	480	y
12	16	8	384	y
13	17	8.1	449	y
14	17	7.4	360	y
15	18	8.5	443	n
16	17	8.4	392	n
17	18	7	322	y
18	17	8.6	297	y
19	18	9	360	n
20	17	6.8	385	y
21	17	6.9	373	y
22	17	6.6	213	y
23	16	7.5	337	y
24	16	8	257	y
25	17	8.6	216	y
26	17	6.8	314	y
27	17	7.6	294	y
28	17	7.4	339	y
29	16	6.2	338	y
30	17	6	220	y
				26/30: 86.7%

FCC 905462 D02 New Rules v02

Tester:
Test Lab:
Date:
Device:
Serial:
Firmware:
Manufacturer:
Test:

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	13.1	410	n
2	12	16	295	y
3	15	18.5	485	y
4	13	11.6	487	y
5	16	13.3	402	y
6	12	11.7	358	y
7	15	13.5	399	n
8	13	13.1	303	y
9	16	11.2	270	n
10	15	14.5	358	y
11	16	18.6	496	y
12	15	14.7	471	n
13	13	13.6	219	y
14	12	17.2	291	y
15	16	13	490	y
16	13	13.1	427	n
17	15	13.2	437	y
18	14	12.7	309	y
19	13	13.8	473	y
20	12	19.5	450	n
21	13	18	414	y
22	16	14.6	345	n
23	14	16.3	458	y
24	14	17	494	y
25	13	17	352	y
26	14	19.3	229	y
27	15	12.9	312	n
28	14	12.6	207	y
29	15	15.5	400	y
30	15	15.5	326	y
				22/30: 73.3%

FCC 905462 D02 New Rules v02

Tester:	Set according to DUT:
Test Lab:	Fc : 5500
Date:	
Device:	Fobl : 5491
Serial:	
Firmware:	Fobh : 5509
Manufacturer:	
Test:	

TYPE 5

Rohde & Schwarz
K350 Pulse Sequencer DFS

Trial #	Detection (yes/no)	Chirp Width (MHz)	Subset	Fc
1	y	14	1	5500
2	y	10	1	5500
3	y	12	1	5500
4	y	12	1	5500
5	y	16	1	5500
6	y	5	1	5500
7	y	6	1	5500
8	y	7	1	5500
9	y	7	1	5500
10	y	5	1	5500
11	y	6	2	5493.4
12	y	11	2	5495.4
13	y	13	2	5496.2
14	y	17	2	5497.8
15	y	9	2	5494.6
16	y	16	2	5497.4
17	y	18	2	5498.2
18	y	12	2	5495.8
19	y	13	2	5496.2
20	y	11	2	5495.4
21	y	8	3	5505.8
22	y	15	3	5503
23	y	10	3	5505
24	y	10	3	5505
25	y	7	3	5506.2
26	y	16	3	5502.6
27	y	13	3	5503.8
28	y	12	3	5504.2
29	n	6	3	5506.6
30	y	17	3	5502.2
	29/30: 96.7%			

FCC 905462 D02 New Rules v02	
Tester:	
Test Lab:	
Date:	
Device:	
Serial:	
Firmware:	
Manufacturer:	
Test:	

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%

40 MHz

Summary

Type	Detections	Trials	Detection Probability
Type 1	29	30	97%
Type 2	24	30	80%
Type 3	23	30	77%
Type 4	23	30	77%
Type 5	30	30	100%
Type 6	30	30	100%
Aggregate 1-4	99	120	83%

RADAR TYPE 1				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Number of Pulses per Burst**	**Pulse Width (µsec)**	**PRI (µs)**	**Detection (yes/no)**
1	22	1	2442	y
2	19	1	2901	y
3	19	1	2890	y
4	19	1	2786	y
5	41	1	1311	y
6	27	1	1979	y
7	40	1	1345	y
8	41	1	1313	y
9	95	1	557	y
10	29	1	1847	y
11	78	1	680	y
12	24	1	2220	y
13	82	1	646	y
14	48	1	1100	n
15	27	1	2010	y
16	41	1	1315	y
17	47	1	1139	y
18	27	1	1993	y
19	68	1	783	y
20	44	1	1225	y
21	47	1	1145	y
22	27	1	1980	y
23	18	1	2952	y
24	47	1	1138	y
25	31	1	1717	y
26	19	1	2841	y
27	42	1	1267	y
28	23	1	2394	y
29	38	1	1388	y
30	32	1	1682	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	29	1	151	n
2	29	1.4	175	y
3	24	2.1	160	y
4	24	4.6	200	n
5	26	2.1	196	y
6	24	1.5	193	y
7	29	3	159	y
8	27	4.4	161	y
9	25	3.1	194	y
10	28	1.9	179	y
11	26	3.5	208	y
12	29	4	223	n
13	28	2.8	169	y
14	23	3.3	183	n
15	24	1.6	228	y
16	26	2.7	211	n
17	28	4.2	208	y
18	29	3.6	203	y
19	28	4	157	y
20	27	4.5	168	y
21	26	2.9	158	n
22	27	1.8	196	y
23	24	1.6	200	y
24	25	4.1	150	y
25	27	2.7	180	y
26	26	2.2	177	y
27	23	3.8	157	y
28	26	4	184	y
29	23	1.4	200	y
30	29	2.1	175	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	6.4	412	y
2	18	9	452	y
3	16	6.8	375	y
4	17	8.4	214	y
5	18	8.9	443	y
6	17	6.1	430	n
7	18	6.7	296	y
8	17	8.3	205	y
9	16	9.7	394	y
10	18	7.3	423	n
11	17	7.4	482	y
12	18	9	302	y
13	17	7.3	306	y
14	16	9	441	y
15	17	7.9	311	y
16	17	8.6	439	y
17	17	6.4	327	y
18	18	6.7	431	n
19	18	8.6	355	y
20	17	6	256	y
21	16	9.2	474	y
22	16	7	252	y
23	17	6.7	433	n
24	18	7.4	325	n
25	16	7.9	292	n
26	17	6.7	418	y
27	17	9.5	339	y
28	16	6.6	234	n
29	16	9.7	222	y
30	16	8.4	464	y
				23/30: 76.7%

RADAR TYPE 4				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Number of Pulses per Burst**	**Pulse Width (µsec)**	**PRI (µs)**	**Detection (yes/no)**
1	15	11.6	274	y
2	13	11.3	255	y
3	12	11.6	430	y
4	14	18	312	y
5	12	18.1	469	n
6	14	17.7	230	y
7	16	18.1	486	y
8	14	11.4	207	y
9	14	12.7	203	y
10	15	14.2	205	y
11	14	17.6	291	y
12	15	12.3	203	n
13	12	17.3	448	y
14	14	19.8	207	y
15	14	13.7	230	y
16	13	15.2	352	n
17	13	13.3	311	y
18	14	11.6	461	n
19	15	14.7	433	n
20	13	18	332	y
21	12	16.4	269	y
22	14	17	414	y
23	13	11.2	367	y
24	16	12.2	239	y
25	14	11.7	399	n
26	15	18.5	429	y
27	13	14.7	431	n
28	15	16.1	448	y
29	16	11.3	468	y
30	13	13.2	344	y
				23/30: 76.7%

TYPE 5	Rohde & Schwarz K350 Pulse Sequencer DFS			
Trial #	**Detection (yes/no)**	**Chirp Width (MHz)**	**Subset**	**Fc**
1	y	13	1	5500
2	y	15	1	5500
3	y	17	1	5500
4	y	11	1	5500
5	y	18	1	5500
6	y	11	1	5500
7	y	8	1	5500
8	y	17	1	5500
9	y	7	1	5500
10	y	16	1	5500
11	y	10	2	5495
12	y	14	2	5496.6
13	y	5	2	5493
14	y	18	2	5498.2
15	y	6	2	5493.4
16	y	6	2	5493.4
17	y	17	2	5497.8
18	y	8	2	5494.2
19	y	6	2	5493.4
20	y	15	2	5497
21	y	6	3	5506.6
22	y	5	3	5507
23	y	10	3	5505
24	y	13	3	5503.8
25	y	9	3	5505.4
26	y	10	3	5505
27	y	13	3	5503.8
28	y	16	3	5502.6
29	y	15	3	5503
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	y
26	y
27	y
28	y
29	y
30	y
	30/30: 100%

80 MHz

Summary			
Type	**Detections**	**Trials**	**Detection Probability**
Type 1	25	30	83%
Type 2	27	30	90%
Type 3	25	30	83%
Type 4	27	30	90%
Type 5	29	30	97%
Type 6	30	30	100%
Aggregate 1-4	104	120	87%

RADAR TYPE 1				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Number of Pulses per Burst**	**Pulse Width (µsec)**	**PRI (µs)**	**Detection (yes/no)**
1	26	1	2058	y
2	37	1	1449	y
3	41	1	1307	y
4	26	1	2070	y
5	24	1	2244	n
6	47	1	1123	y
7	63	1	842	y
8	76	1	702	y
9	21	1	2521	y
10	28	1	1922	y
11	36	1	1489	n
12	22	1	2458	y
13	20	1	2719	y
14	46	1	1171	y
15	26	1	2067	y
16	20	1	2692	y
17	21	1	2588	y
18	18	1	2936	n
19	55	1	966	y
20	22	1	2448	y
21	54	1	980	y
22	69	1	770	y
23	52	1	1028	y
24	62	1	861	y
25	19	1	2872	y
26	48	1	1111	n
27	39	1	1386	y
28	27	1	1994	y
29	25	1	2162	y
30	19	1	2827	n
				25/30: 83.3%

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	210	y
2	26	4.8	172	y
3	27	4.8	180	y
4	26	3.9	156	y
5	28	2.1	173	y
6	27	2.9	198	y
7	25	1.9	163	y
8	28	3.7	197	y
9	23	1.8	163	y
10	24	4.8	159	y
11	24	1.8	210	y
12	24	1.8	176	y
13	24	3.9	200	n
14	23	4.9	150	y
15	24	1.5	222	y
16	27	3.5	185	y
17	27	1	204	y
18	29	4.6	162	n
19	27	4.8	160	y
20	25	4.9	165	y
21	28	1.8	221	y
22	24	1	151	y
23	27	1.8	227	y
24	25	3.9	218	y
25	24	4.2	177	y
26	24	3.5	170	y
27	29	2.1	158	y
28	28	4.4	196	y
29	24	4.9	222	n
30	27	2.8	218	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	8.3	427	y
2	18	6.2	249	y
3	18	7.6	267	n
4	17	9.5	433	n
5	17	7.2	357	n
6	17	8.1	299	y
7	17	8.1	493	y
8	17	9.6	334	y
9	18	8.2	327	n
10	17	9.1	423	y
11	17	9.5	241	y
12	16	9.6	244	y
13	18	6.7	306	y
14	18	8.3	298	y
15	17	6.4	220	y
16	17	6.1	235	y
17	16	9.6	340	y
18	17	9	230	y
19	17	6.7	498	y
20	17	9.1	254	y
21	17	7.9	279	y
22	16	9.5	310	y
23	17	9.2	259	y
24	17	9.8	479	y
25	16	6.2	343	n
26	17	7.9	485	y
27	17	6.5	375	y
28	17	7.1	243	y
29	18	7.5	292	y
30	16	9	465	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	14	497	y
2	15	16.2	417	y
3	13	12.8	258	y
4	15	19.9	336	y
5	12	14.3	474	y
6	13	19.1	293	y
7	15	19	369	y
8	13	14.6	355	y
9	14	17.7	229	y
10	12	19.4	444	y
11	13	15.2	243	y
12	15	19.2	358	y
13	14	19.5	383	n
14	13	13.9	349	y
15	12	15.8	446	y
16	12	12.8	225	y
17	15	13.4	422	y
18	14	11.6	396	y
19	13	18.4	369	n
20	15	18.1	287	y
21	16	12.7	498	y
22	13	18.4	362	y
23	14	12.5	444	n
24	13	15.1	270	y
25	14	16.2	301	y
26	16	14.1	349	y
27	16	14.5	464	y
28	13	16.1	350	y
29	15	14.3	401	y
30	13	15.3	241	y
				27/30: 90%

TYPE 5	Rohde & Schwarz K350 Pulse Sequencer DFS			
Trial #	**Detection (yes/no)**	**Chirp Width (MHz)**	**Subset**	**Fc**
1	y	10	1	5500
2	y	12	1	5500
3	y	6	1	5500
4	y	9	1	5500
5	y	17	1	5500
6	y	5	1	5500
7	y	17	1	5500
8	y	6	1	5500
9	y	8	1	5500
10	y	6	1	5500
11	y	19	2	5498.6
12	y	14	2	5496.6
13	y	5	2	5493
14	n	18	2	5498.2
15	y	11	2	5495.4
16	y	5	2	5493
17	y	8	2	5494.2
18	y	18	2	5498.2
19	y	5	2	5493
20	y	10	2	5495
21	y	16	3	5502.6
22	y	16	3	5502.6
23	y	10	3	5505
24	y	15	3	5503
25	y	14	3	5503.4
26	y	19	3	5501.4
27	y	19	3	5501.4
28	y	5	3	5507
29	y	15	3	5503
30	y	18	3	5501.8
	29/30: 96.7%			

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	27	30	90%
Type 2	30	30	100%
Type 3	29	30	97%
Type 4	28	30	93%
Type 5	30	30	100%
Type 6	30	30	100%
Aggregate 1-4	114	120	95%

RADAR TYPE 1				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Number of Pulses per Burst**	**Pulse Width (µsec)**	**PRI (µs)**	**Detection (yes/no)**
1	29	1	1838	y
2	19	1	2924	y
3	66	1	805	y
4	19	1	2794	y
5	20	1	2756	y
6	19	1	2819	y
7	25	1	2119	y
8	85	1	625	y
9	19	1	2881	y
10	60	1	882	y
11	47	1	1137	y
12	40	1	1344	y
13	36	1	1497	y
14	64	1	827	y
15	36	1	1479	n
16	19	1	2860	n
17	25	1	2145	y
18	28	1	1925	n
19	41	1	1293	y
20	28	1	1904	y
21	25	1	2153	y
22	23	1	2365	y
23	75	1	707	y
24	56	1	943	y
25	29	1	1824	y
26	26	1	2041	y
27	22	1	2396	y
28	72	1	735	y
29	18	1	2990	y
30	19	1	2839	y
				27/30: 90%

RADAR TYPE 2				Rohde & Schwarz K350 Pulse Sequencer DFS
Trial #	**Number of Pulses per Burst**	**Pulse Width (µsec)**	**PRI (µs)**	**Detection (yes/no)**
1	24	2.3	175	y
2	27	3.2	210	y
3	26	2.6	172	y
4	28	2.2	208	y
5	26	3.7	218	y
6	24	2.1	212	y
7	25	4.7	228	y
8	29	2.2	218	y
9	24	4.1	222	y
10	25	1.4	187	y
11	27	2	184	y
12	23	4.8	158	y
13	25	2.1	151	y
14	27	2.7	224	y
15	26	2.7	153	y
16	29	1.2	214	y
17	28	1	227	y
18	28	1	171	y
19	26	1.9	177	y
20	24	1.6	154	y
21	29	2.1	154	y
22	27	2.8	160	y
23	27	1	191	y
24	27	3.4	162	y
25	23	1.8	203	y
26	27	1.5	152	y
27	27	1.6	175	y
28	24	1.9	226	y
29	27	3	155	y
30	26	1.9	186	y
				30/30: 100%

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	8.8	441	y
2	17	8.8	457	y
3	16	9.1	208	y
4	17	8.3	404	y
5	16	8.3	301	y
6	17	9.1	453	y
7	17	9.9	470	y
8	16	8.9	485	y
9	18	8.9	240	y
10	17	8.6	253	n
11	16	8	388	y
12	16	7.6	317	y
13	17	6.9	377	y
14	18	6.7	447	y
15	17	8.7	260	y
16	16	6	299	y
17	16	7.4	279	y
18	16	8.4	340	y
19	16	8.8	247	y
20	17	6.7	340	y
21	16	7	216	y
22	18	7.1	368	y
23	17	7.7	313	y
24	17	6.3	327	y
25	17	9	306	y
26	17	8.7	427	y
27	18	9.9	288	y
28	17	8.1	431	y
29	18	7.7	444	y
30	17	9.9	339	y
				29/30: 96.7%

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	11.2	289	y
2	12	15.9	426	n
3	13	11.6	239	y
4	14	11.7	217	y
5	14	14.8	261	n
6	14	11.5	389	y
7	14	16.6	388	y
8	15	16	415	y
9	16	18.6	481	y
10	16	16.4	323	y
11	14	17.1	388	y
12	15	15.7	312	y
13	15	12.6	218	y
14	16	14.8	294	y
15	14	18.5	253	y
16	16	12.7	254	y
17	13	13	313	y
18	15	15	259	y
19	15	12.1	314	y
20	13	11.9	247	y
21	14	18.2	358	y
22	16	12.8	292	y
23	15	16.2	221	y
24	14	14.7	316	y
25	16	13.3	414	y
26	12	18.7	265	y
27	14	16.5	418	y
28	15	16.3	332	y
29	13	13.1	309	y
30	13	18.9	301	y
				28/30: 93.3%

TYPE 5	Rohde & Schwarz K350 Pulse Sequencer DFS			
Trial #	**Detection (yes/no)**	**Chirp Width (MHz)**	**Subset**	**Fc**
1	y	14	1	5500
2	y	11	1	5500
3	y	14	1	5500
4	y	6	1	5500
5	y	11	1	5500
6	y	10	1	5500
7	y	19	1	5500
8	y	9	1	5500
9	y	15	1	5500
10	y	13	1	5500
11	y	19	2	5498.6
12	y	7	2	5493.8
13	y	6	2	5493.4
14	y	19	2	5498.6
15	y	10	2	5495
16	y	9	2	5494.6
17	y	7	2	5493.8
18	y	11	2	5495.4
19	y	11	2	5495.4
20	y	16	2	5497.4
21	y	5	3	5507
22	y	6	3	5506.6
23	y	10	3	5505
24	y	13	3	5503.8
25	y	8	3	5505.8
26	y	6	3	5506.6
27	y	12	3	5504.2
28	y	8	3	5505.8
29	y	6	3	5506.6
30	y	10	3	5505
	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%

-- End of Test Report --