



DFS TEST REPORT

FCC ID : UDX-600155010
Equipment : Catalyst Wireless 9162I Series Wi-Fi 6E Access Point
Brand Name : CISCO
Model Name : CW9162I-B, CW9162I-MR
Applicant : Cisco Systems, Inc.
170 West Tasman Drive, San Jose, CA 95134 USA
Manufacturer : Cisco Systems, Inc.
170 West Tasman Drive, San Jose, CA 95134 USA
Standard : 47 CFR FCC Part 15.407

The product was received on Mar. 03, 2022, and testing was started from Jun. 18, 2022 and completed on Jul. 06, 2022. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

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Appendix A. Test Photos

Photographs of EUT v01



TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A12 3 Ver1.1

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.3	FCC KDB 905462 7.8.1	DFS: UNII Detection Bandwidth Measurement	PASS	-
3.4	FCC KDB 905462 7.8.2.1	DFS: Initial Channel Availability Check Time	PASS	-
3.4	FCC KDB 905462 7.8.2.2	DFS: Radar Burst at the Beginning of the Channel Availability Check Time	PASS	-
3.4	FCC KDB 905462 7.8.2.3	DFS: Radar Burst at the End of the Channel Availability Check Time	PASS	-
3.5	FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Channel Move Time (CMT)	PASS	-
3.5	FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Channel Closing Transmission Time (CCTT)	PASS	-
3.5	FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Non-Occupancy Period (NOP)	PASS	-
3.6	FCC KDB 905462 7.8.4	DFS: Statistical Performance Check	PASS	-
3.1.4	FCC KDB 905462 8.1	User Access Restrictions	N/A	Manufacturer attestation NOT accessible to user

Note: Reference to Sporton Project No.: 230306-02

Declaration of Conformity:

1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to report "Measurement Uncertainty".

Comments and Explanations:

1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
2. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Vicky Huang

1 General Description

1.1 Information

1.1.1 RF General Information

Specification Items	Description	
Frequency Range	5250 MHz – 5350 MHz 5470 MHz – 5725 MHz	
Power Type	From Power Adapter or PoE	
Channel Bandwidth	20/40/80 MHz operating channel bandwidth	
Operating Mode	☒ Master	
	☐ Client with radar detection	
	☐ Client without radar detection	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☒ With TPC	☐ Without TPC
Weather Band (5600~5650MHz)	☒ With 5600~5650MHz	☐ Without 5600~5650MHz
Power-on cycle	For Mode 1: Band 2: 80MHz: Requires 122.029 seconds to complete its power-on cycle. Band 3: 80MHz: Requires 121.594 seconds to complete its power-on cycle. For Mode 2: 80MHz: Requires 197.971 seconds to complete its power-on cycle.	
Firmware Number	For Cisco FW: lot_Bld] Software, (ap1g6b), [build-Inx-026:/san2/BUILD/workspace/CM66_MFG_PrePi Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2022 by Cisco Systems, Inc. Compiled Mon May 2 17:25:45 PDT 2022 ROM: Bootstrap program is U-Boot boot loader BOOTLDR: U-Boot boot loader Version 2022042019 AP Running Image: 8.8.1.10 For Meraki FW: 29-202204211648-G8e22b695-L71158f39-jenkins-ihyoon-bestseller	
11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation. - VHT20, VHT40, VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation. - HEW20, HEW40, HEW80 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation. - EUT employ a TPC mechanism and TPC have the capability to operate at least 6 dB below highest RF output power.		

Note: The above information was declared by manufacturer.

**TPC Power Result
For Radio 1
1TX**

Mode	Min Power (dBm)	Max Power (dBm)	Min EIRP (dBm)	Max EIRP (dBm)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-
5.25-5.35GHz	17.16	23.16	18.83	24.83
5.47-5.725GHz	17.36	23.36	19.16	25.16
802.11ax HEW20_Nss1,(MCS0)_1TX	-	-	-	-
5.25-5.35GHz	17.53	23.53	19.20	25.20
5.47-5.725GHz	17.40	23.40	19.20	25.20
802.11ax HEW40_Nss1,(MCS0)_1TX	-	-	-	-
5.25-5.35GHz	17.60	23.60	19.27	25.27
5.47-5.725GHz	16.84	22.84	18.64	24.64
802.11ax HEW80_Nss1,(MCS0)_1TX	-	-	-	-
5.25-5.35GHz	15.77	21.77	17.44	23.44
5.47-5.725GHz	17.66	23.66	19.46	25.46

2TX

Mode	Min Power (dBm)	Max Power (dBm)	Min EIRP (dBm)	Max EIRP (dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-
5.25-5.35GHz	16.77	22.77	19.14	25.14
5.47-5.725GHz	16.80	22.80	18.62	24.62
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-
5.25-5.35GHz	17.41	23.41	19.78	25.78
5.47-5.725GHz	17.69	23.69	19.51	25.51
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-
5.25-5.35GHz	17.65	23.65	20.02	26.02
5.47-5.725GHz	17.57	23.57	19.39	25.39
802.11ax HEW80_Nss1,(MCS0)_2TX	-	-	-	-
5.25-5.35GHz	16.30	22.30	18.67	24.67
5.47-5.725GHz	17.68	23.68	19.50	25.50
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-
5.25-5.35GHz	17.41	23.41	21.48	27.48
5.47-5.725GHz	17.69	23.69	22.10	28.10
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-
5.25-5.35GHz	17.65	23.65	21.72	27.72
5.47-5.725GHz	17.57	23.57	21.98	27.98
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-	-	-	-
5.25-5.35GHz	16.30	22.30	20.37	26.37
5.47-5.725GHz	17.68	23.68	22.09	28.09

For Scanning Radio 3

Mode	Min Power (dBm)	Max Power (dBm)	Min EIRP (dBm)	Max EIRP (dBm)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-
5.25-5.35GHz	15.55	21.55	21.09	27.09
5.47-5.725GHz	15.20	21.20	20.74	26.74
802.11ax HEW20_Nss1,(MCS0)_1TX	-	-	-	-
5.25-5.35GHz	15.08	21.08	20.62	26.62
5.47-5.725GHz	15.11	21.11	20.65	26.65

Note: The manufacturer declared that TPC is applied to this equipment. The test result of TPC is equal to RF output power minus 6dBm which is recorded as a reference for the manufacturer.

1.1.2 Antenna Information

Ant.	Port								Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz (Radio 1)		WLAN 5GHz (Radio 1)		WLAN 6E (Radio 2)		WLAN 2.4GHz / WLAN 5GHz / WLAN 6GHz (Scanning Radio 3)	BT (Radio 4)					
	1TX	2TX	1TX	2TX	1TX	2TX							
1	1	2	1	2	-	-	-	-	WNC	95XEAJ15.G19	PIFA	I-PEX	Note 1
2	-	1	-	1	-	-	-	-	WNC	95XEAJ15.G20	PIFA	I-PEX	
3	-		-		1	2	-	-	WNC	95XEAJ15.G21	Dipole	I-PEX	
4	-		-		-	1	-	-	WNC	95XEAJ15.G22	Dipole	I-PEX	
5	-		-		-		-	1	WNC	95XEAJ15.G23	PIFA	I-PEX	
6	-		-		-		1	-	WNC	95XEAJ15.G24	PIFA	I-PEX	

Note 1:

Ant.	Antenna Gain (dBi)																
	WLAN 2.4GHz (Radio 1)	WLAN 5GHz (Radio 1)					WLAN 6GHz (Radio 2)				WLAN 2.4GHz (Scanning Radio 3)	WLAN 5GHz (Scanning Radio 3)	WLAN 6GHz (Scanning Radio 3)				BT (Radio 4)
		UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 4	UNII 5	UNII 6	UNII 7	UNII 8			UNII 1~UNII 3	UNII 5	UNII 6	UNII 7	
1	2.74	1.75	1.67	1.80	1.64	1.45	-	-	-	-	-	-	-	-	-	-	-
2	2.51	2.13	2.37	1.82	1.50	2.06	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	4.38	3.62	3.78	4.08	-	-	-	-	-	-	-
4	-	-	-	-	-	-	4.33	3.72	3.95	4.11	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.85
6	-	-	-	-	-	-	-	-	-	-	3.80	5.54	5.43	5.23	5.50	5.40	-

Ant.	Directional Gain (dBi)											
	WLAN 2.4GHz (Radio 1)		WLAN 5GHz (Radio 1)									
			UNII 1		UNII 2A		UNII 2C		UNII 3		UNII 4	
	2T1S	2T2S	2T1S	2T2S	2T1S	2T2S	2T1S	2T2S	2T1S	2T2S	2T1S	2T2S
1	5.12	2.74	4.19	2.13	4.07	2.37	4.41	1.82	4.08	1.64	3.96	2.06
2												

Note 2: The EUT has six antennas.

Note 3: The above information (excepting antenna gain of Radio 1 2.4GHz, 5GHz UNII 1~UNII 4) was declared by manufacturer.

Note 4: Radio 1 2.4GHz, 5GHz UNII 1~UNII 4: Maximum Directional Gain following KDB662911 D03.

**For Radio 1****For 2.4GHz:****For IEEE 802.11b/g/n/VHT/ax mode (1TX/2RX):**

Only Port 1 can be use as transmitting antenna.

Port 1, Port 2 can be used as receiving antennas.

Port 1, Port 2 could receive simultaneously.

For IEEE 802.11b/g/n/VHT/ax mode (2TX/2RX):

Port 1, Port 2 can be use as transmitting antenna.

Port 1, Port 2 could transmitting simultaneously.

Port 1, Port 2 can be used as receiving antennas.

Port 1, Port 2 could receive simultaneously.

For 5GHz UNII 1~UNII 4:**For IEEE 802.11a/n/ac/ax mode (1TX/2RX):**

Only Port 1 can be use as transmitting antenna.

Port 1, Port 2 can be used as receiving antennas.

Port 1, Port 2 could receive simultaneously.

For IEEE 802.11a/n/ac/ax mode (2TX/2RX):

Port 1, Port 2 can be use as transmitting antenna.

Port 1, Port 2 could transmitting simultaneously.

Port 1, Port 2 can be used as receiving antennas.

Port 1, Port 2 could receive simultaneously.

For Radio 2**For 6GHz UNII 5~UNII 8:****For IEEE 802.11ax mode (1TX/2RX):**

Only Port 1 can be use as transmitting antenna.

Port 1, Port 2 can be used as receiving antennas.

Port 1, Port 2 could receive simultaneously.

For IEEE 802.11ax mode (2TX/2RX):

Port 1, Port 2 can be use as transmitting antenna.

Port 1, Port 2 could transmitting simultaneously.

Port 1, Port 2 can be used as receiving antennas.

Port 1, Port 2 could receive simultaneously.

For Radio 4**Bluetooth (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

For Scanning Radio 3**For 2.4GHz:****For IEEE 802.11b/g/n/VHT/ax mode (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

For 5GHz UNII 1~UNII 4:**For IEEE 802.11a/n/ac/ax mode (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

For 6GHz UNII 5~UNII 8:**For IEEE 802.11ax mode (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

1.1.3 DFS Band Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144.

For 40MHz bandwidth systems, use Channel 54, 62, 102, 110, 118, 126, 134, 142.

For 80MHz bandwidth systems, use Channel 58, 106, 122, 138.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-

1.1.4 Table for Multiple Listing

Model Name	EUT No.	SW
CW9162I-B	1	Cisco
CW9162I-MR	2	Meraki

Note: The above information was declared by manufacturer.

1.1.5 Table for Radio function

Radio (R)	WLAN 2.4GHz	5GHz UNII 1~4	6GHz UNII 5~8	Bluetooth
R1	V	V	-	-
R2	-	-	V	-
R3 (Scanning radio)	V	V	V	-
R4	-	-	-	V

Note: The above information was declared by manufacturer.

1.2 Accessories

Accessories
Bracket*1

1.3 Support Equipment

For Mode 1:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	Lenovo	L440	N/A
B	Notebook	Lenovo	L490	N/A
C	WLAN module	Intel	AX210NGW	PD9AX210NG
D	Adapter	CISCO	MA-PWR-30W-US (MA-PWR-30W)	N/A

For Mode 2:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	Lenovo	L440	N/A
B	Notebook	Lenovo	L490	N/A
C	WLAN module	Intel	AX210NGW	PD9AX210NG
D	WLAN AP	BUFFALO	WZR-HP-G300NH2	FDI-09101896-0
E	Adapter	CISCO	MA-PWR-30W-US (MA-PWR-30W)	N/A

1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15.407
- ♦ FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02



1.5 Testing Location Information

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) TEL: 886-3-656-9065 FAX: 886-3-656-9085 Test site Designation No. TW3787 with FCC. Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
DFS (For Mode 1)	DF01-CB	Young Yang	24.7~26.3 / 65~69	Jul. 06, 2022
DFS (For Mode 2)	DF01-CB	Kevin Huang	24.4~26.2 / 66~69	Jun. 18, 2022~ Jun. 20, 2022

2 Test Configuration of EUT

2.1 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
IEEE Std.	Test Channel Freq. (MHz)
802.11ax (HEW20)	5300MHz, 5500 MHz
802.11ax (HEW40)	5310MHz, 5510 MHz
802.11ax (HEW80)	5290MHz, 5530 MHz

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Dynamic Frequency Selection (DFS)
Test Condition	Radiated measurement The EUT shall be configured to operate at the highest transmitter output power setting. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the lowest gain shall be used. The DFS radar test signals have been aligned to the direction corresponding to the EUT's maximum antenna gain.
Modulation Mode	802.11ax (HEW20), 802.11ax (HEW40), 802.11ax (HEW80)
1	R1-Cisco FW
2	R1-Meraki FW

Note1: The radio 3 doesn't need to execute DFS testing due to no data transmission.

Note2: The Adapter is for measurement only, would not be marketed.

Adapter information as below:

Power	Brand	Model
Adapter	CISCO	MA-PWR-30W-US (MA-PWR-30W)

According to the manufacturer's declaration, the console port is not used for end-users.

3 Dynamic Frequency Selection (DFS) Test Result

3.1 General DFS Information

3.1.1 DFS Parameters

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

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

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate Channel changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

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

Table D.2: Interference threshold values	
Maximum Transmit Power	Value (see note)
EIRP $\geq$ 200 mW	-64 dBm
EIRP < 200 mW and PSD < 10dBm/MHz	-62 dBm
EIRP < 200 mW and PSD $\geq$ 10dBm/MHz	-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 662911D01.

3.1.2 Applicability of DFS Requirements Prior to Use of a Channel

Requirement	DFS Operational mode		
	Master	Client without radar detection	Client with radar detection
<i>Non-Occupancy Period</i>	Yes	Not required	Yes
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Availability Check Time</i>	Yes	Not required	Not required
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

3.1.3 Applicability of DFS Requirements during Normal Operation

Requirement	DFS Operational mode		
	Master	Client without radar detection	Client with radar detection
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Closing Transmission Time</i>	Yes	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

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

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.



3.1.4 User Access Restrictions

User Access Restrictions

- ☒ DFS controls (hardware or software) related to radar detection are NOT accessible to the user. Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user.

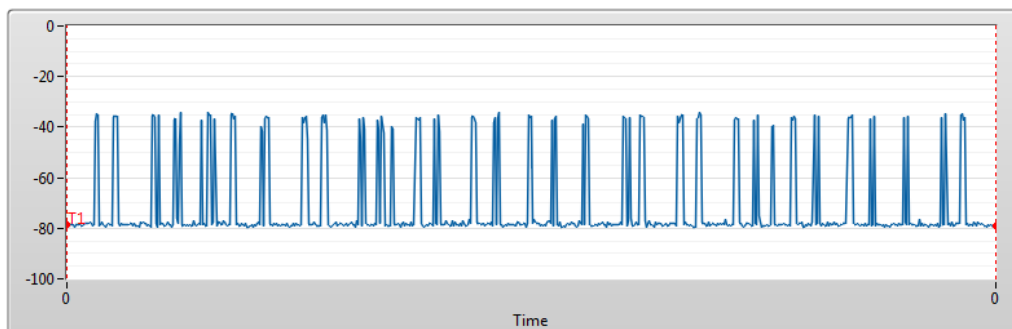
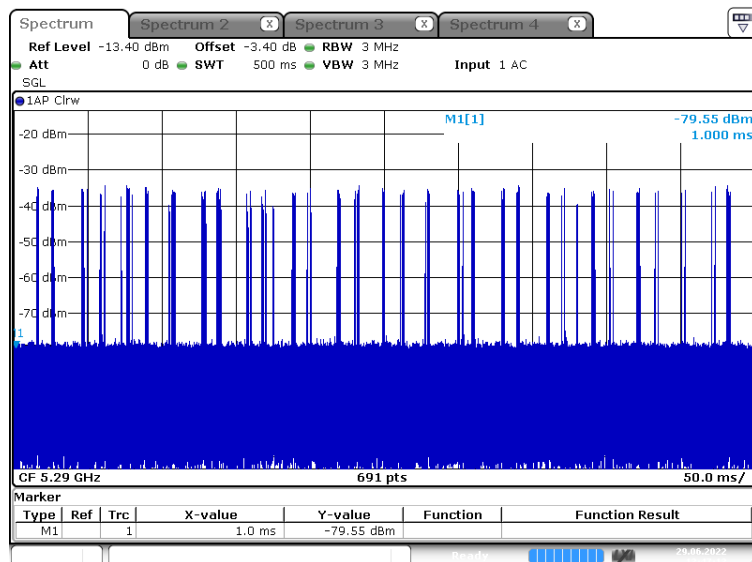
3.1.5 Channel Loading/Data Streaming

- ☐ The data file (MPEG-4) has been transmitting in a streaming mode.
- ☒ Software to ping the client is permitted to simulate data transfer with random ping intervals.
- ☒ Minimum channel loading of approximately 17%.
- ☐ Unicast protocol has been used.

Note:

Cisco FW-17% Traffic

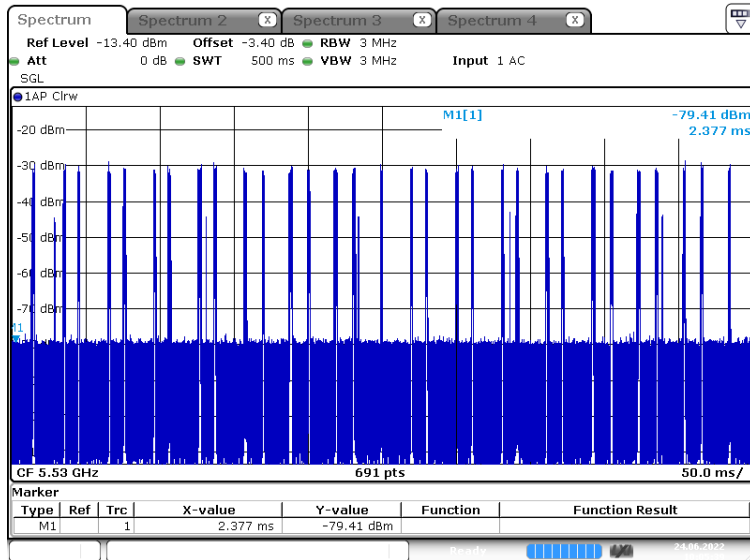
Radio 1-Band 2



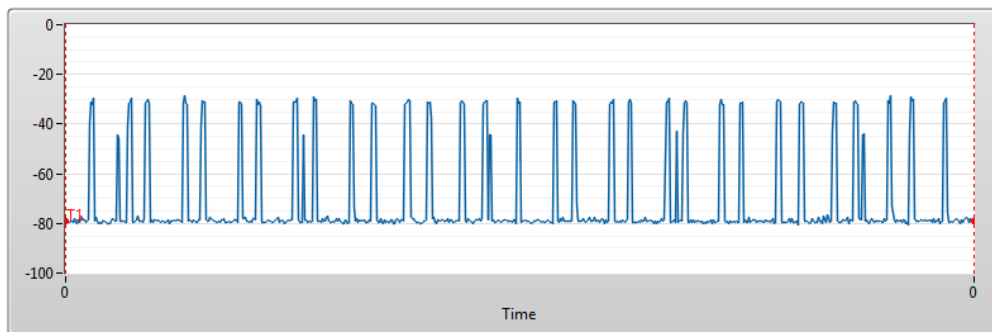
Sample Time	
724.64us	
All TX Time	
85.51ms	
All TX Sample	
118	
Duty Cycle	
0.170767	
T1[s]	T2[s]
0s	500ms
T3[s]	T4[s]
NaNs	NaNs



Radio 1-Band 3



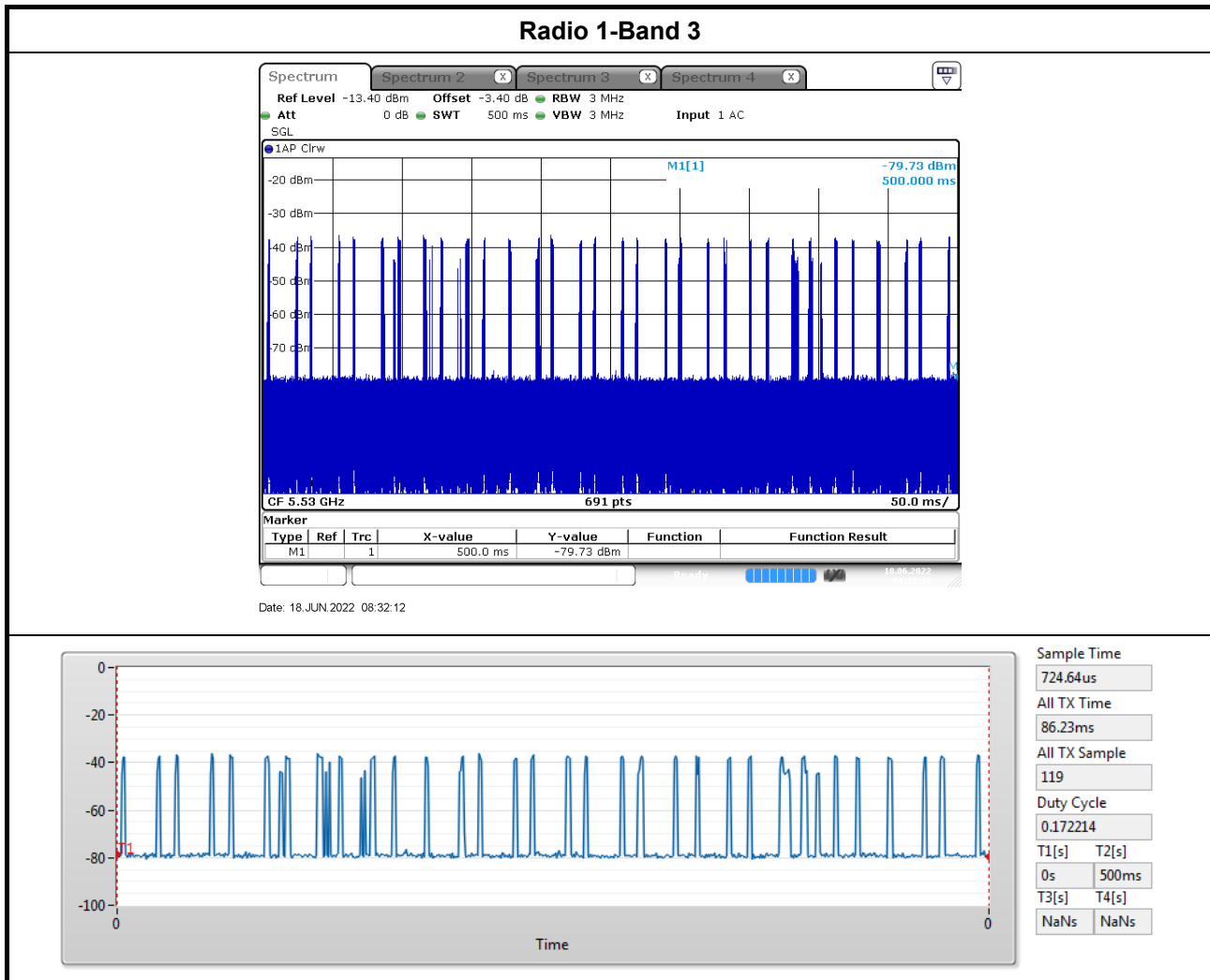
Date: 24 JUN 2022 10:05:40



Sample Time	
All TX Time	724.64us
All TX Sample	86.23ms
Duty Cycle	119
T1[s]	0.172214
T2[s]	0s
T3[s]	500ms
T4[s]	NaNs



Meraki FW-17% Traffic



3.2 Radar Test Waveform Calibration

3.2.1 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1A	1	15 unique PRI in KDB 905462 D02 Table 5a	$\text{Roundup}\left\{\left(\frac{1}{360}\right) \times \left(\frac{19 \times 10^6}{PRI}\right)\right\}$	60%	15
1B	1	15 unique PRI within 518-3066, Excluding 1A PRI		60%	15
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the short pulse radar types 1 through 4. If more than 30 waveforms are used for short pulse radar types 1 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

3.2.2 Long Pulse Radar Test Waveform

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

Each waveform is defined as follows:

- The transmission period for the Long Pulse Radar test signal is 12 seconds.
- There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst Count.
- Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
- The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
- Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a transmission period will have the same chirp width. The chirp is centered on the pulse. For

example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.

- ♦ If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
- ♦ The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst Count. Each interval is of length $(12,000,000 / \text{Burst Count})$ microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and $[(12,000,000 / \text{Burst Count}) - (\text{Total Burst Length}) + (\text{One Random PRI Interval})]$ microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

3.2.3 Frequency Hopping Radar Test Waveform

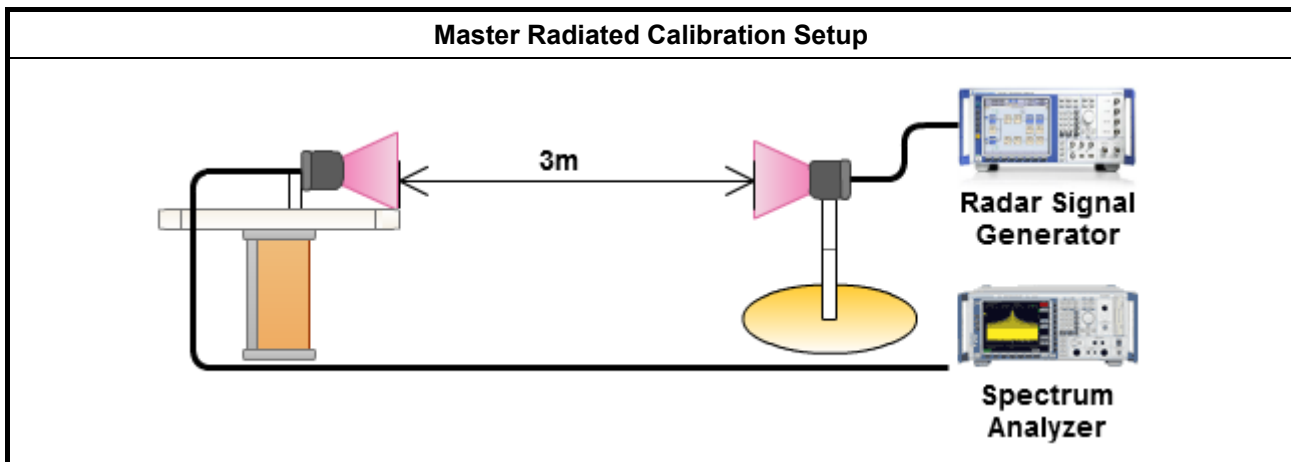
Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (ms)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

The FCC Type 6 waveform uses a static waveform with 100 bursts in the instruments ARB. In addition, the RF list mode is operated with a list containing 100 frequencies from a randomly generated list and it had be ensured that at least one of the random frequencies falls into the UNII Detection Bandwidth of the DUT. Each burst from the waveform file initiates a trigger pulse at the beginning that switches the RF list from one item to the next one.

3.2.4 DFS Threshold Level

DFS Threshold Level	
DFS Threshold level: -63 dBm	☐ at the antenna connector
	☒ in front of the antenna
The Interference Radar Detection Threshold Level is $-64 \text{ dBm} + 0 [\text{dBi}] + 1 \text{ dB} = -63 \text{ dBm}$. That had been taken into account the output power range and antenna gain.	

3.2.5 Calibration Setup



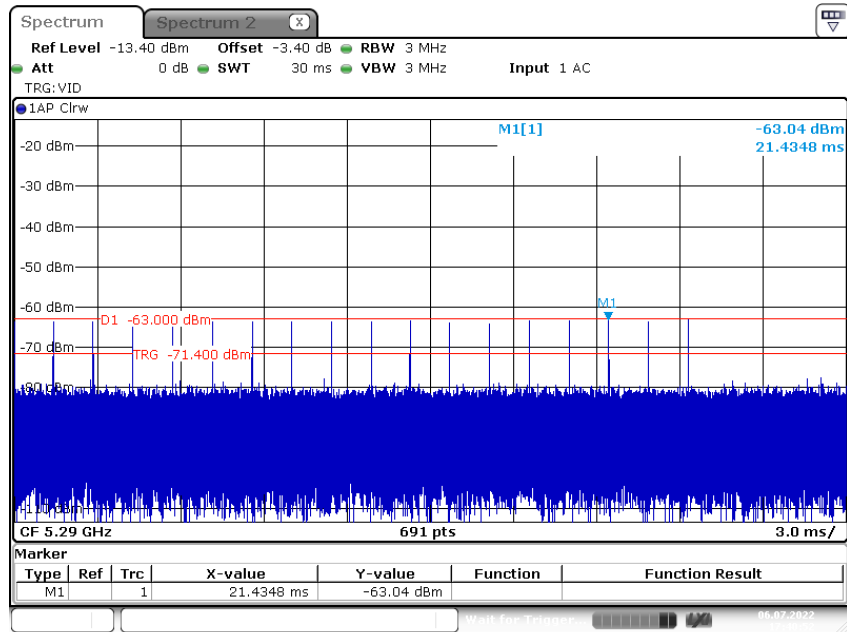


3.2.6 Radar Waveform calibration Plot

For Mode 1:

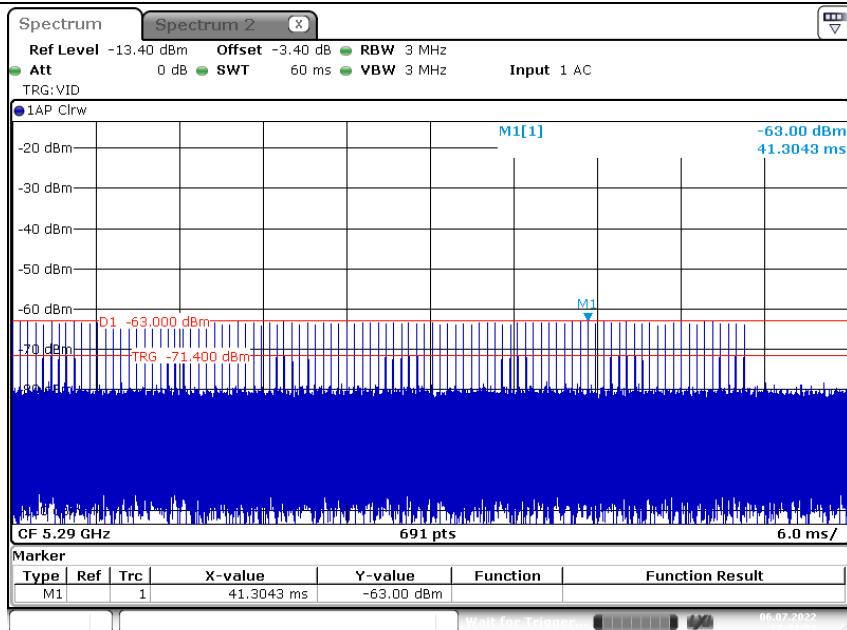
Test Frequency: 5290 MHz

Radar #0 DFS detection threshold level



Date: 6 JUL 2022 17:40:53

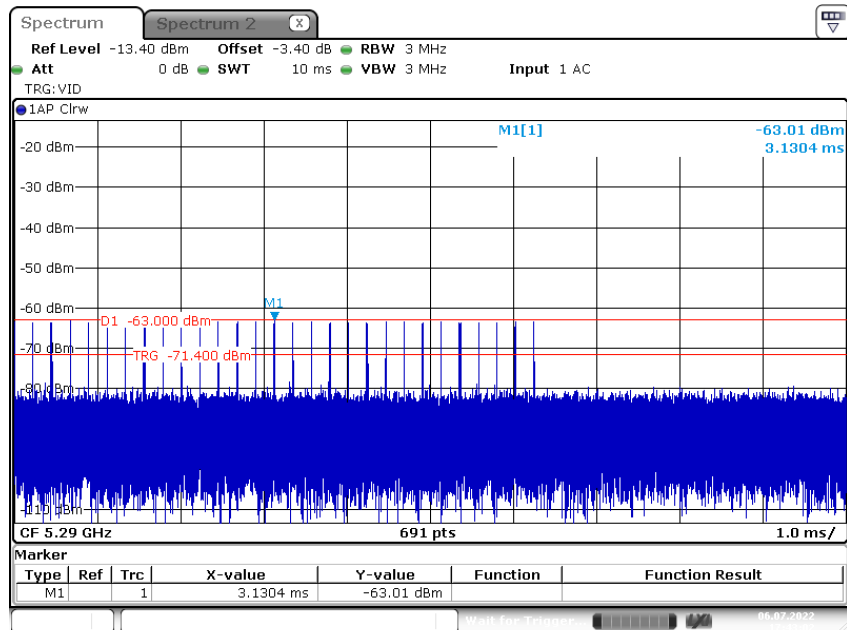
Radar #1 DFS detection threshold level



Date: 6 JUL 2022 17:42:00

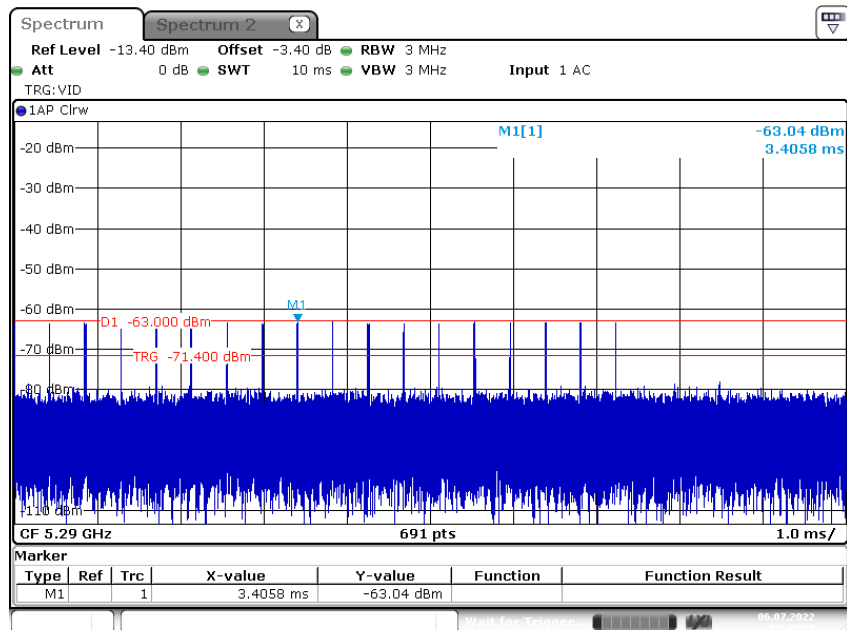


Radar #2 DFS detection threshold level

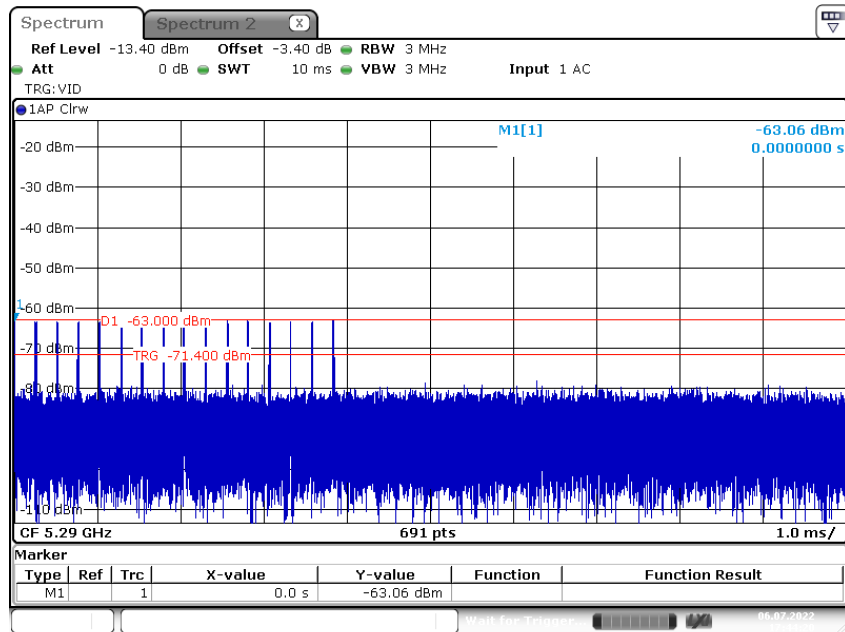


Date: 6 JUL 2022 17:43:02

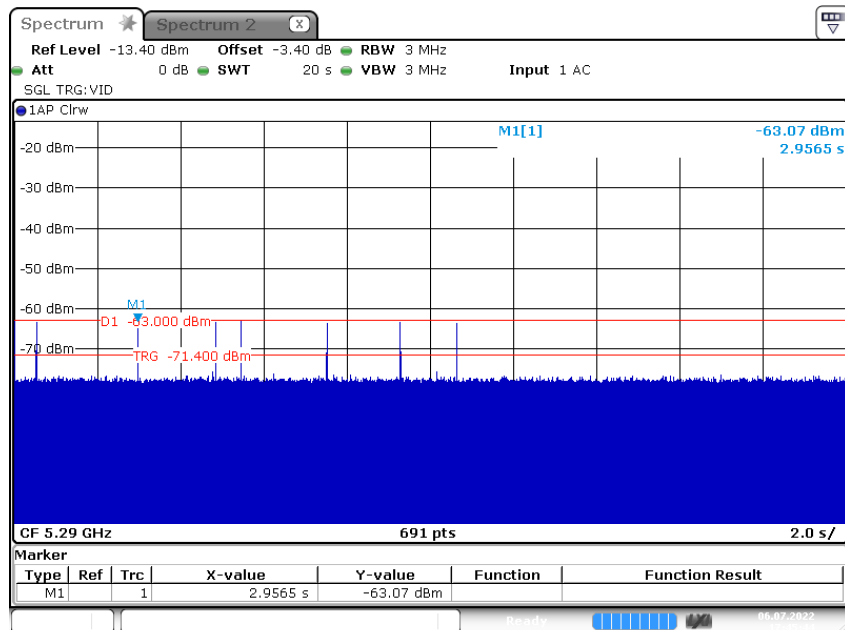
Radar #3 DFS detection threshold level



Date: 6 JUL 2022 17:43:34

**Radar #4 DFS detection threshold level**

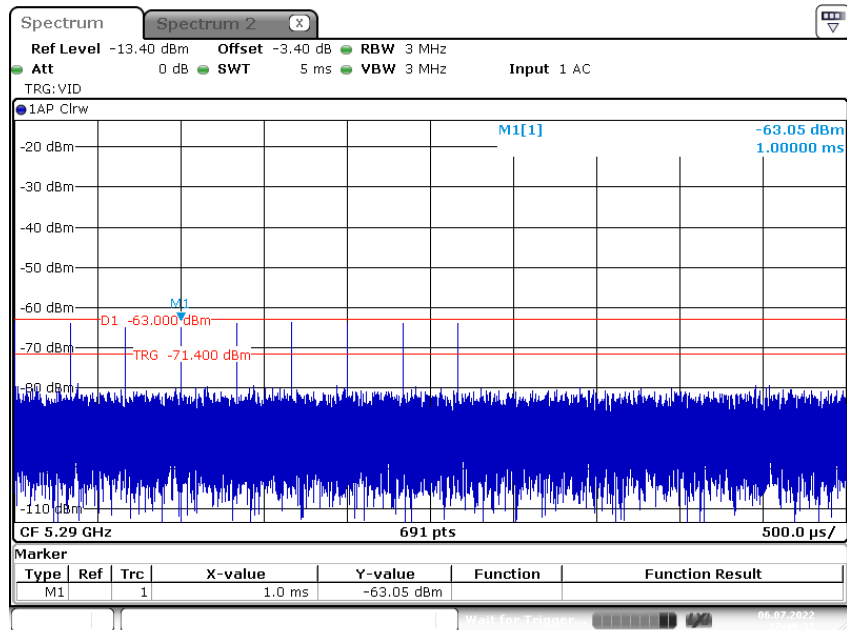
Date: 6 JUL 2022 17:44:20

Radar #5 DFS detection threshold level

Date: 6 JUL 2022 17:45:45



Radar #6 DFS detection threshold level

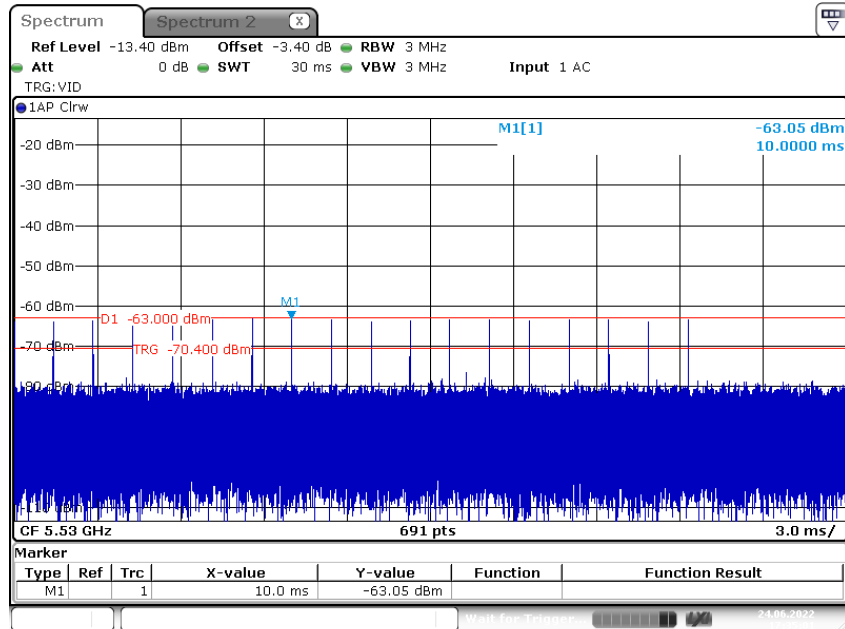


Date: 6 JUL 2022 17:49:37



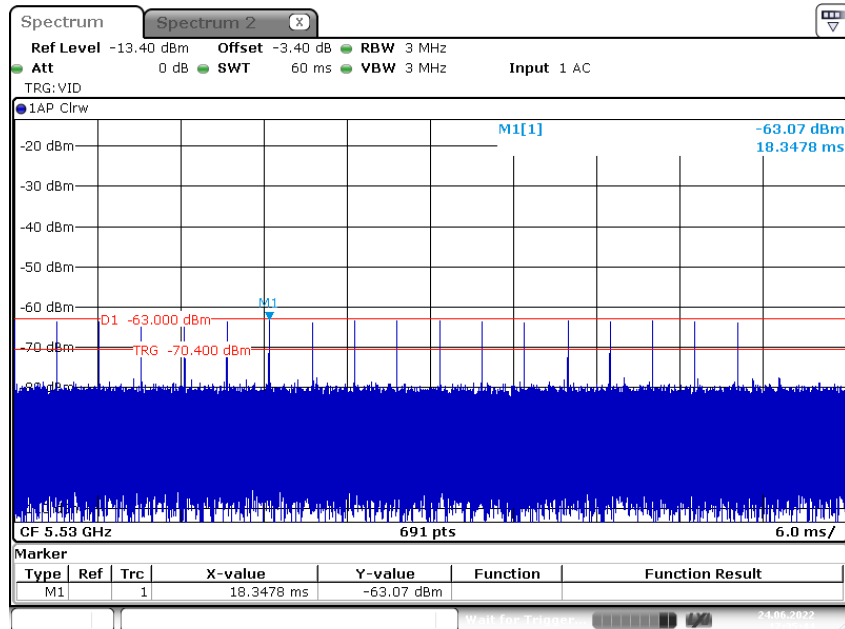
Test Frequency: 5530 MHz

Radar #0 DFS detection threshold level



Date: 24.JUN.2022 17:35:01

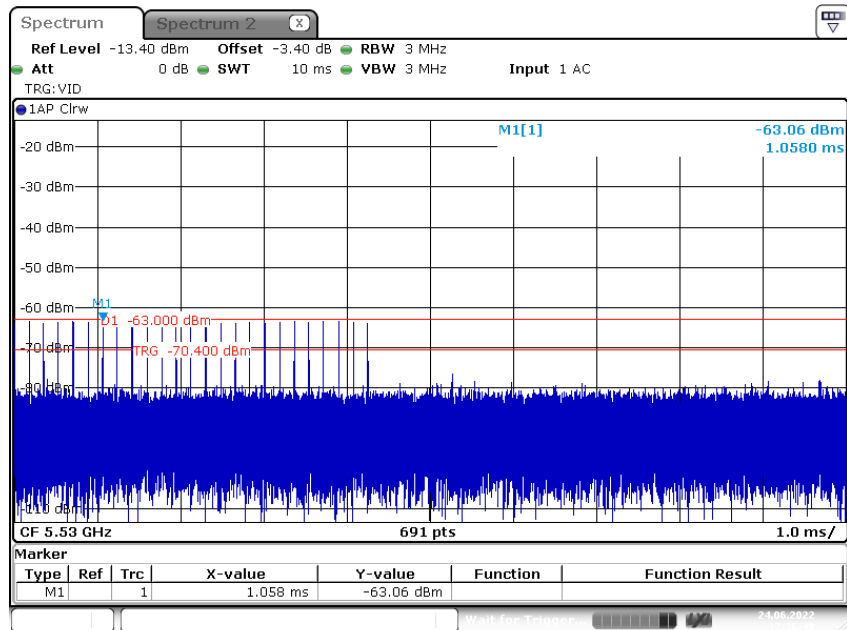
Radar #1 DFS detection threshold level



Date: 24.JUN.2022 17:35:45

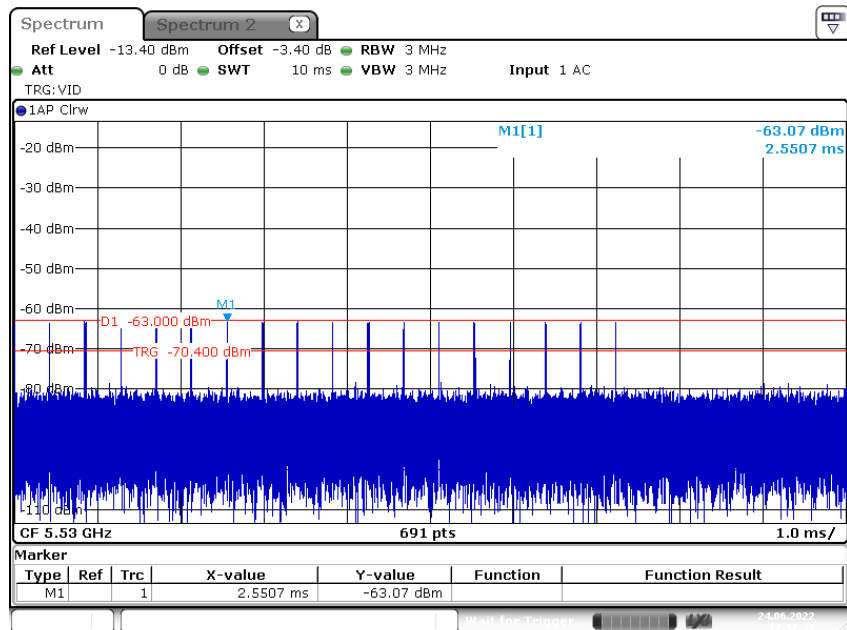


Radar #2 DFS detection threshold level

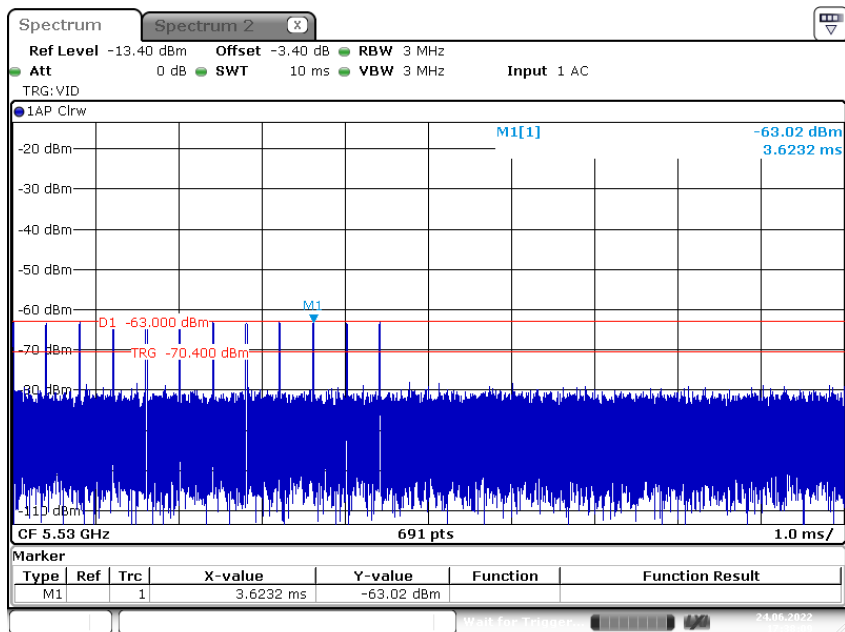


Date: 24 JUN 2022 17:36:48

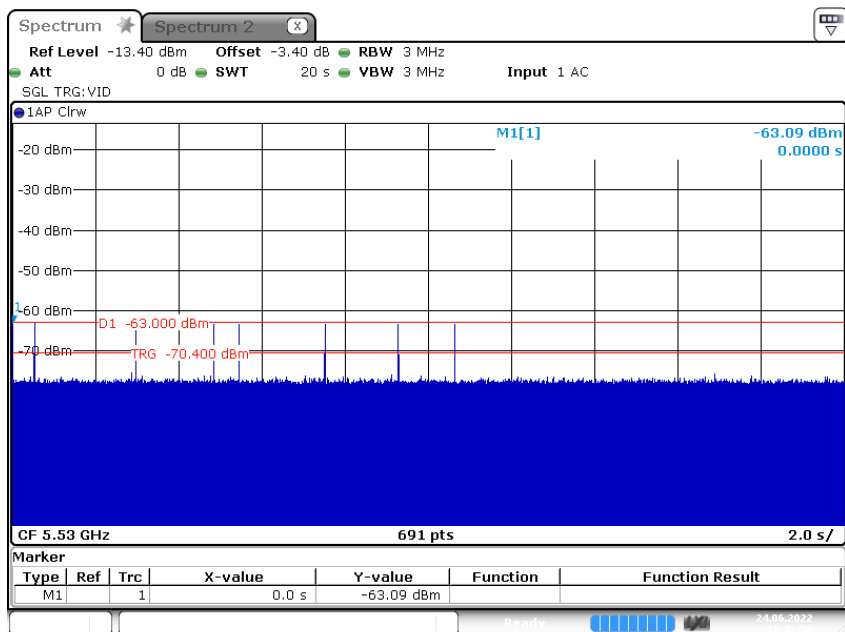
Radar #3 DFS detection threshold level



Date: 24 JUN 2022 17:37:33

**Radar #4 DFS detection threshold level**

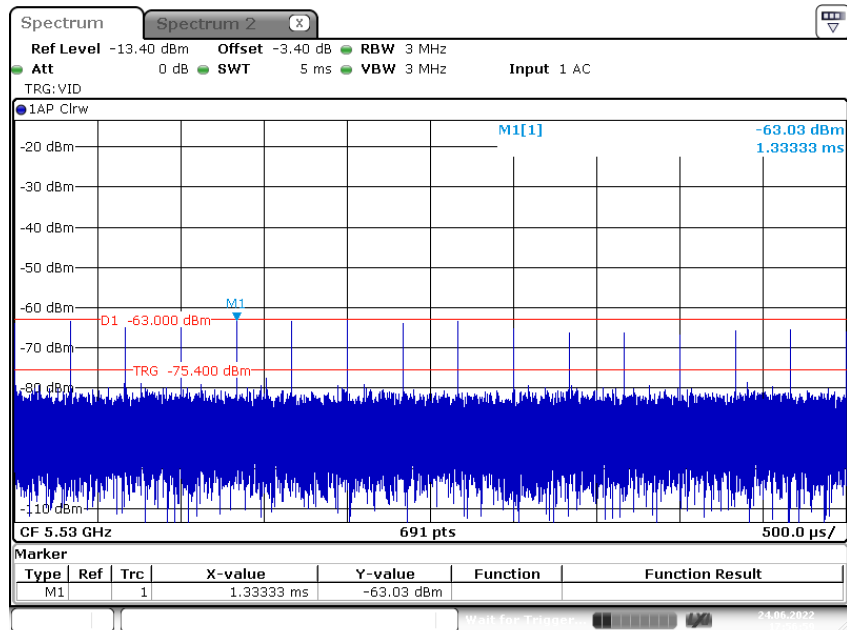
Date: 24. JUN. 2022 17:38:09

Radar #5 DFS detection threshold level

Date: 24. JUN. 2022 17:42:50



Radar #6 DFS detection threshold level



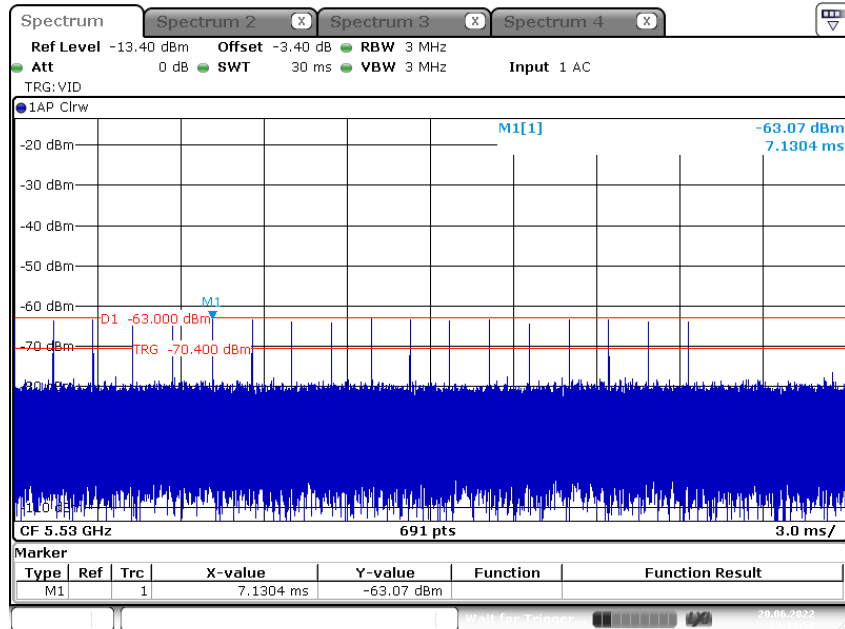
Date: 24 JUN 2022 17:56:59



For Mode 2:

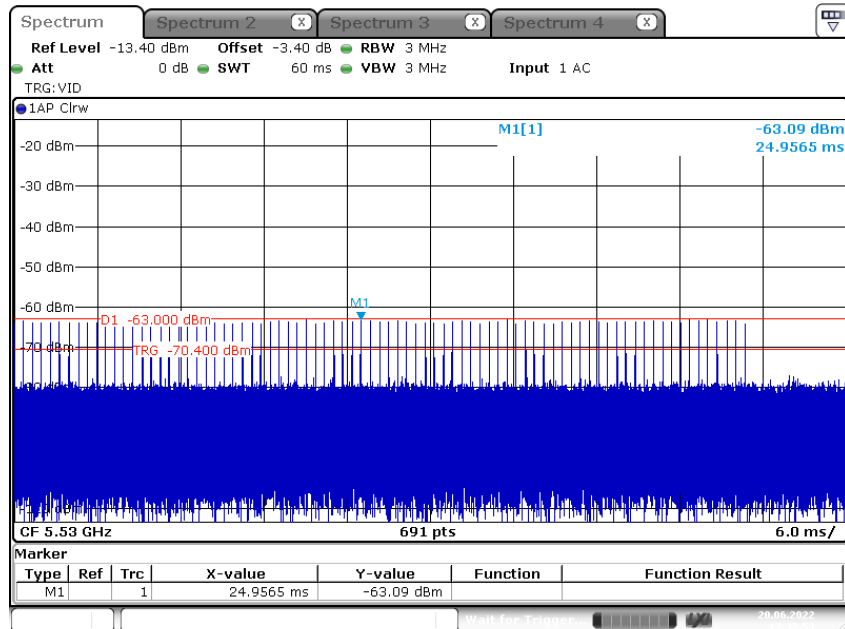
Test Frequency: 5530 MHz

Radar #0 DFS detection threshold level

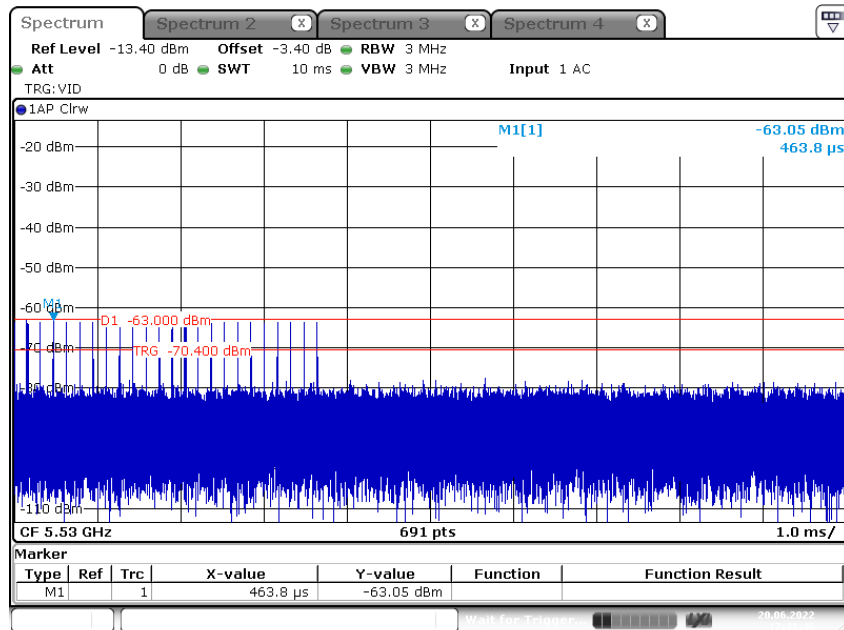


Date: 20.JUN.2022 17:44:50

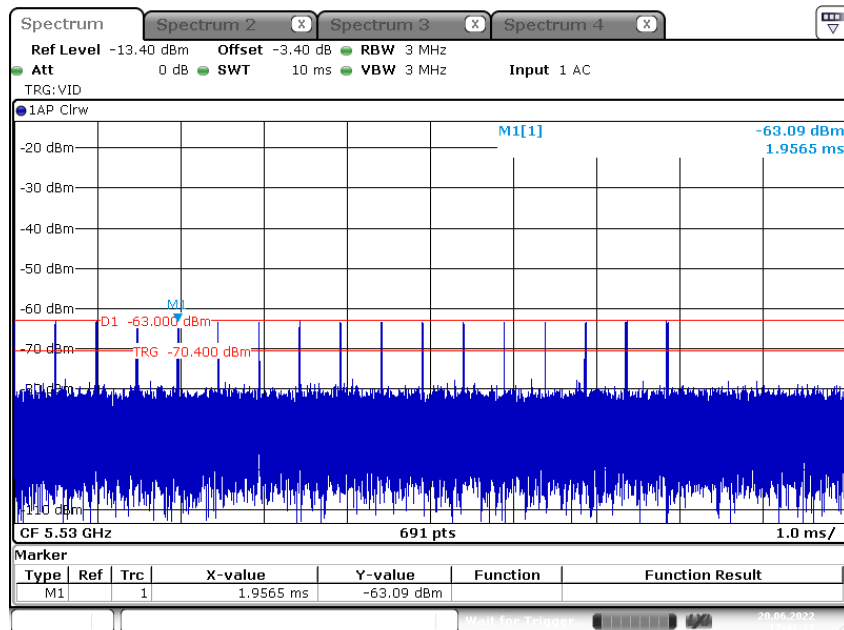
Radar #1 DFS detection threshold level



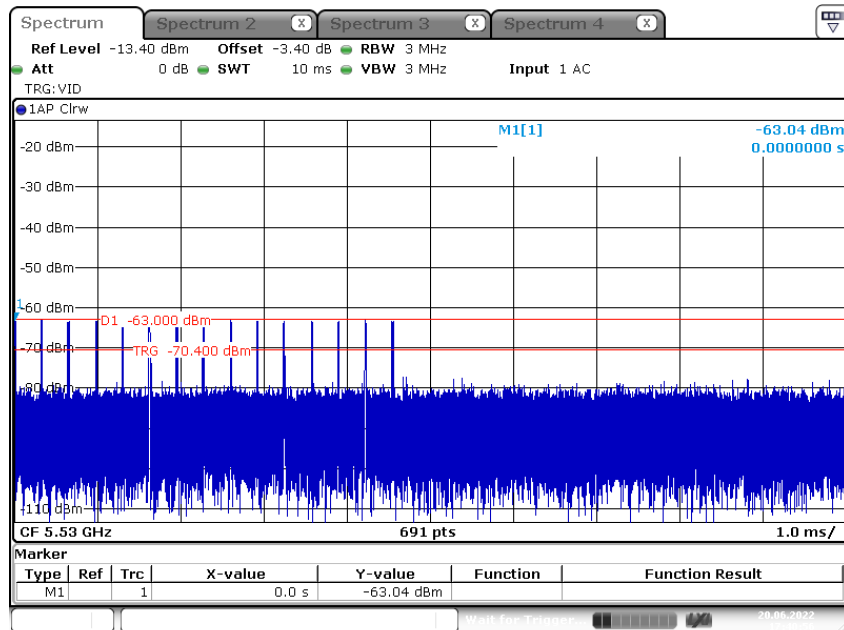
Date: 20.JUN.2022 17:42:53

**Radar #2 DFS detection threshold level**

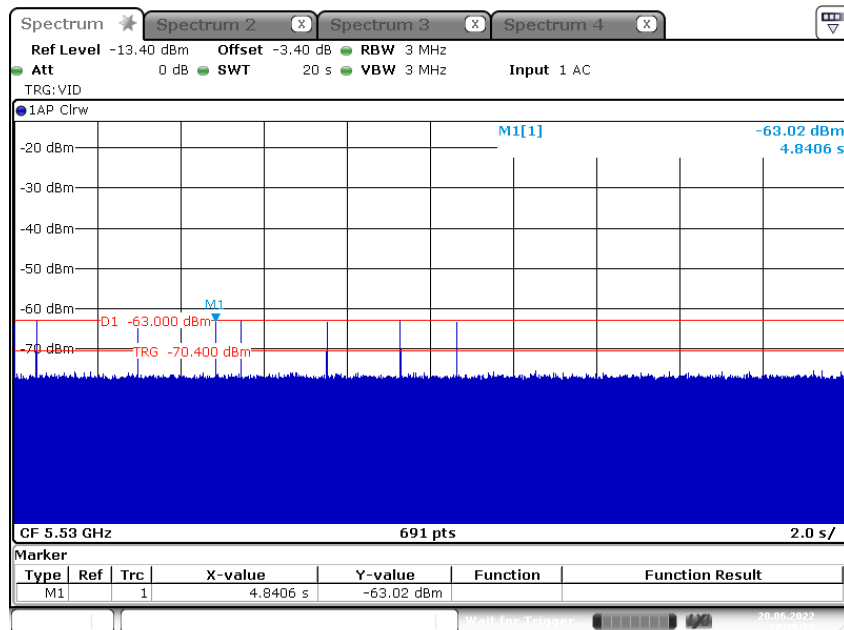
Date: 20. JUN. 2022 17:41:46

Radar #3 DFS detection threshold level

Date: 20. JUN. 2022 17:41:17

**Radar #4 DFS detection threshold level**

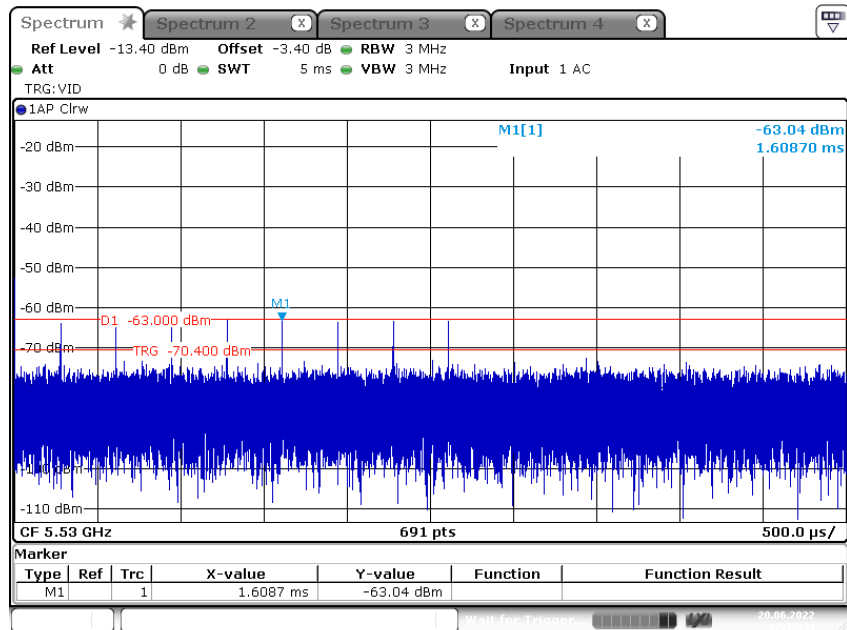
Date: 20. JUN. 2022 17:40:56

Radar #5 DFS detection threshold level

Date: 20. JUN. 2022 17:39:17



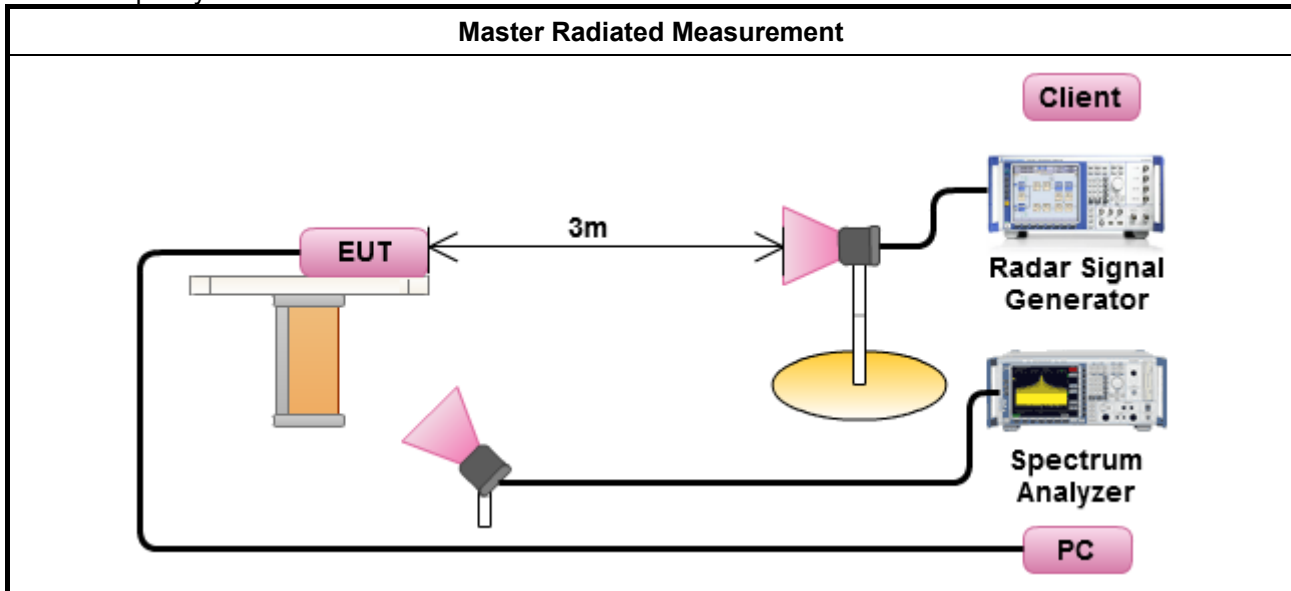
Radar #6 DFS detection threshold level



Date: 20. JUN. 2022 17:35:34

3.2.7 Test Setup

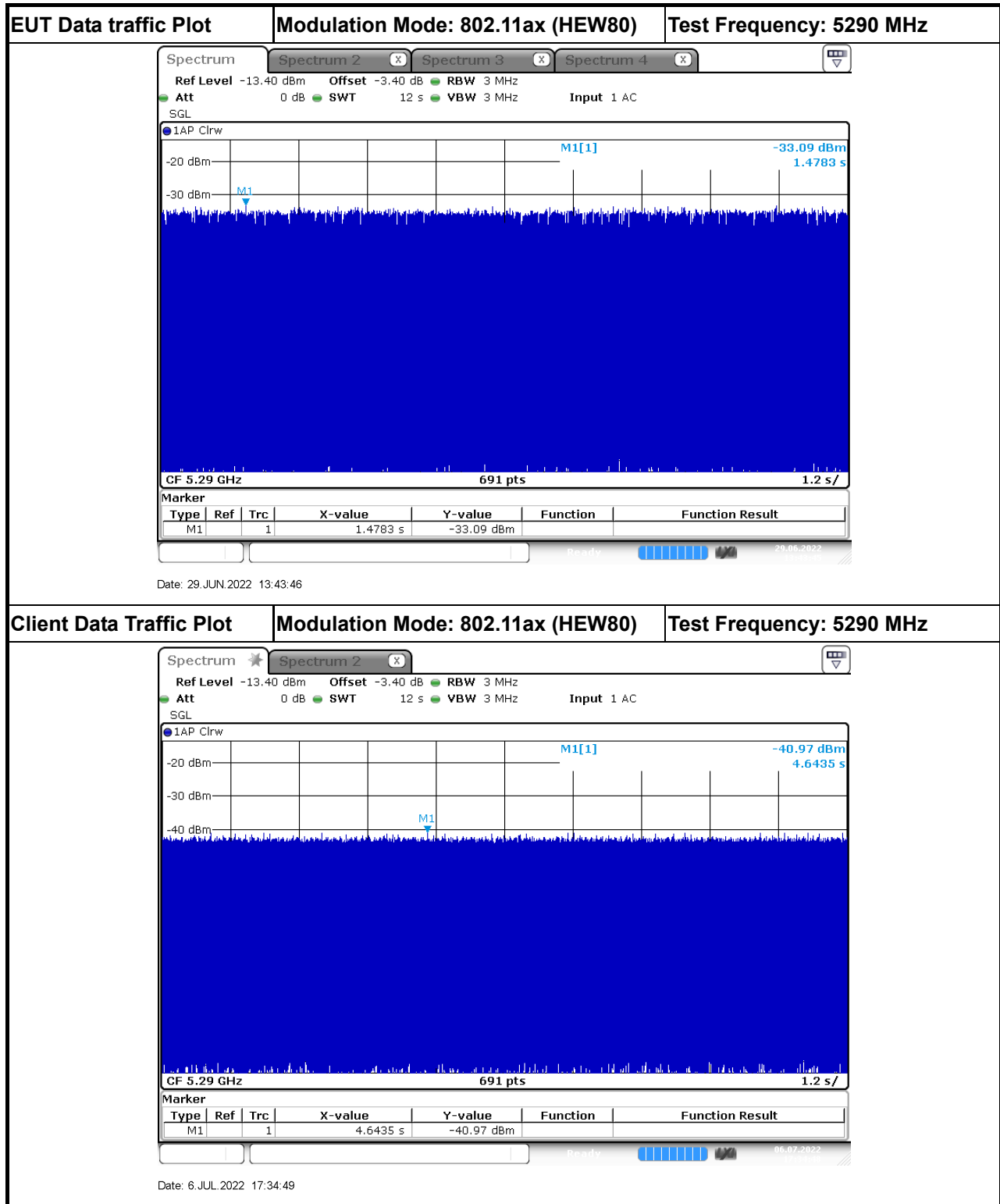
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move.

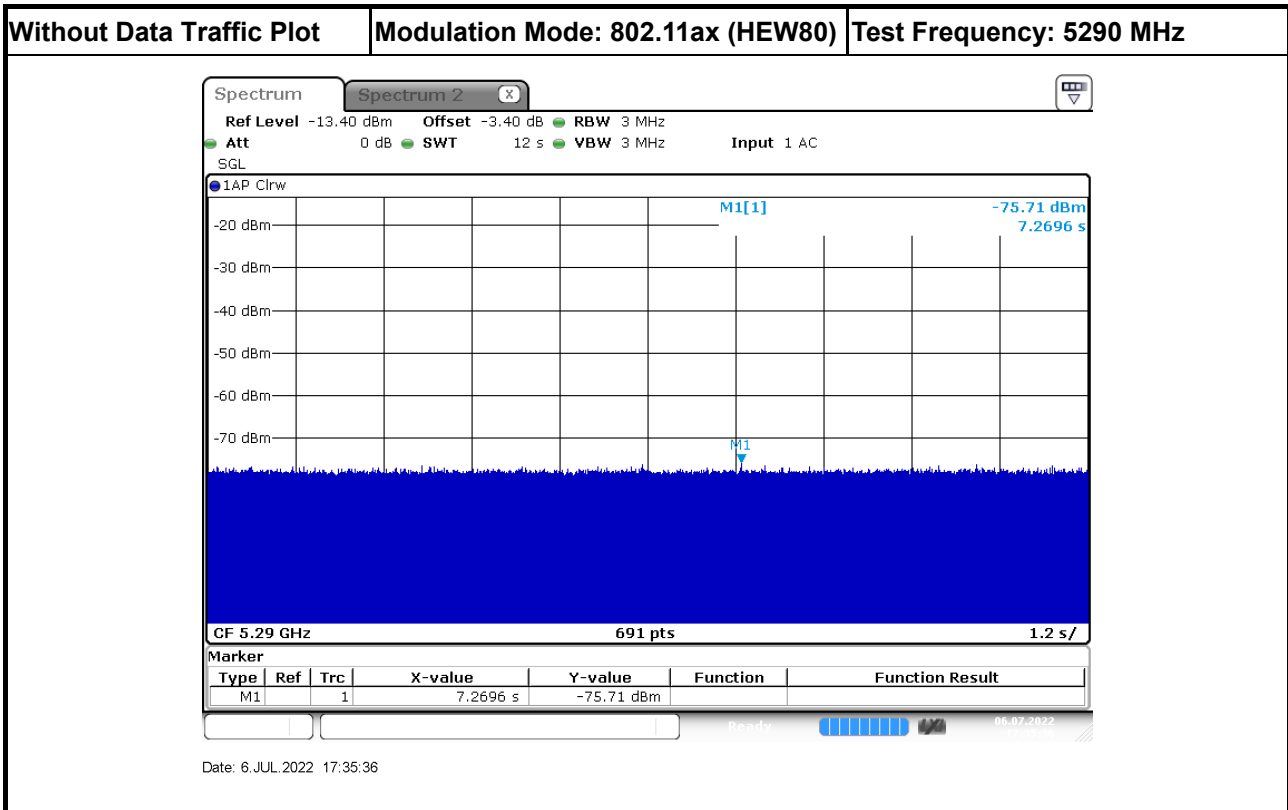


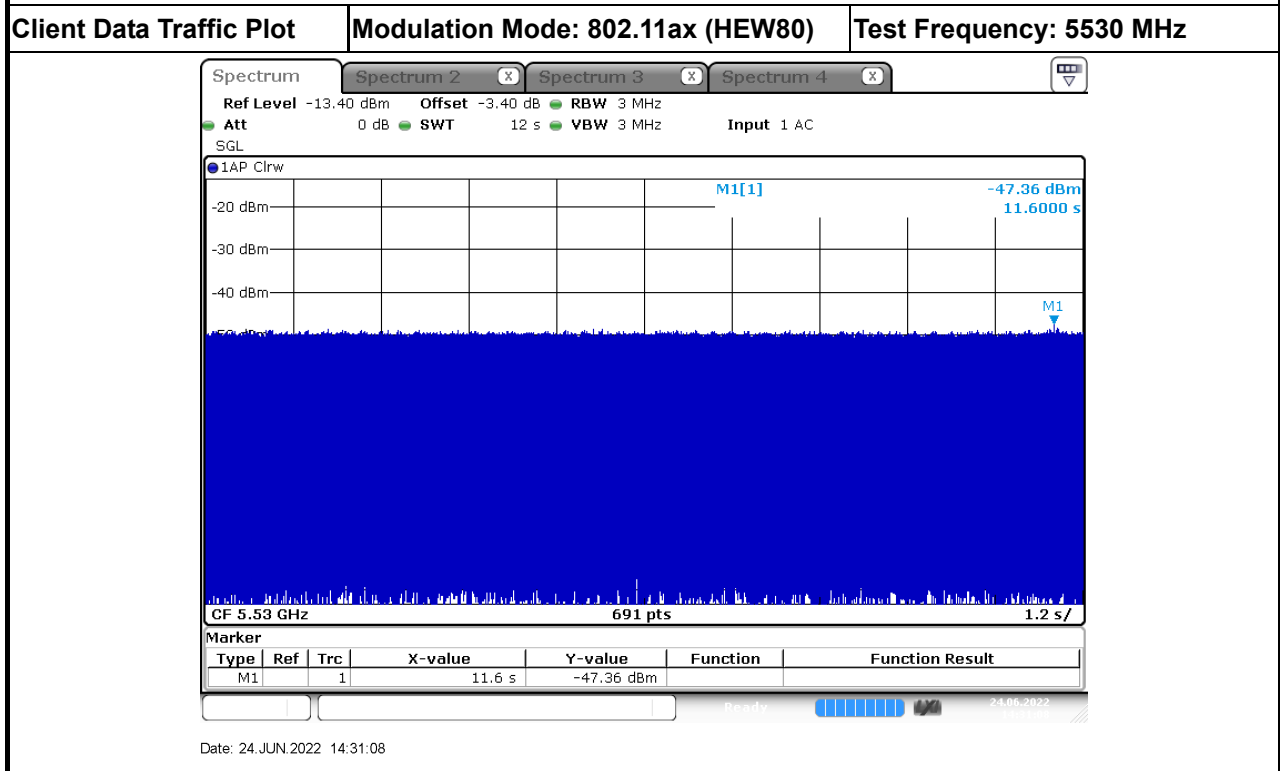


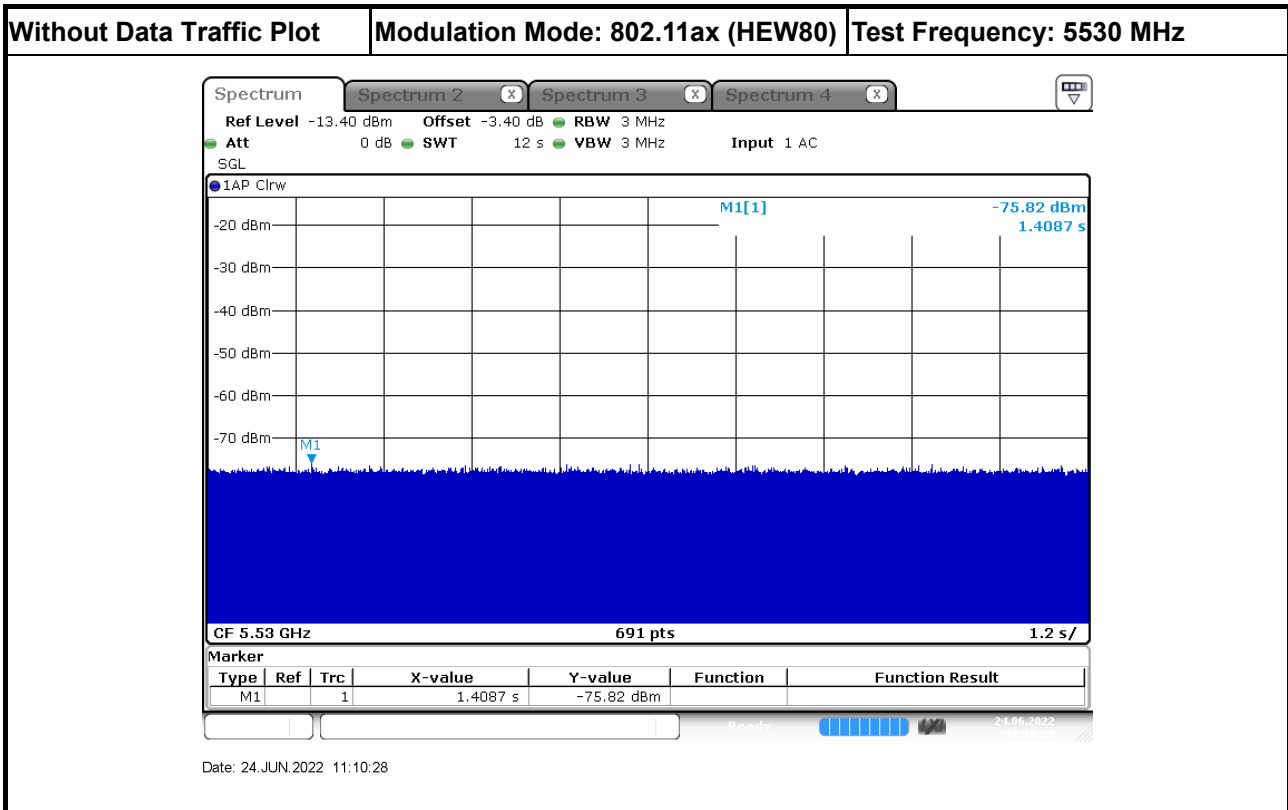
3.2.8 Data traffic Plot

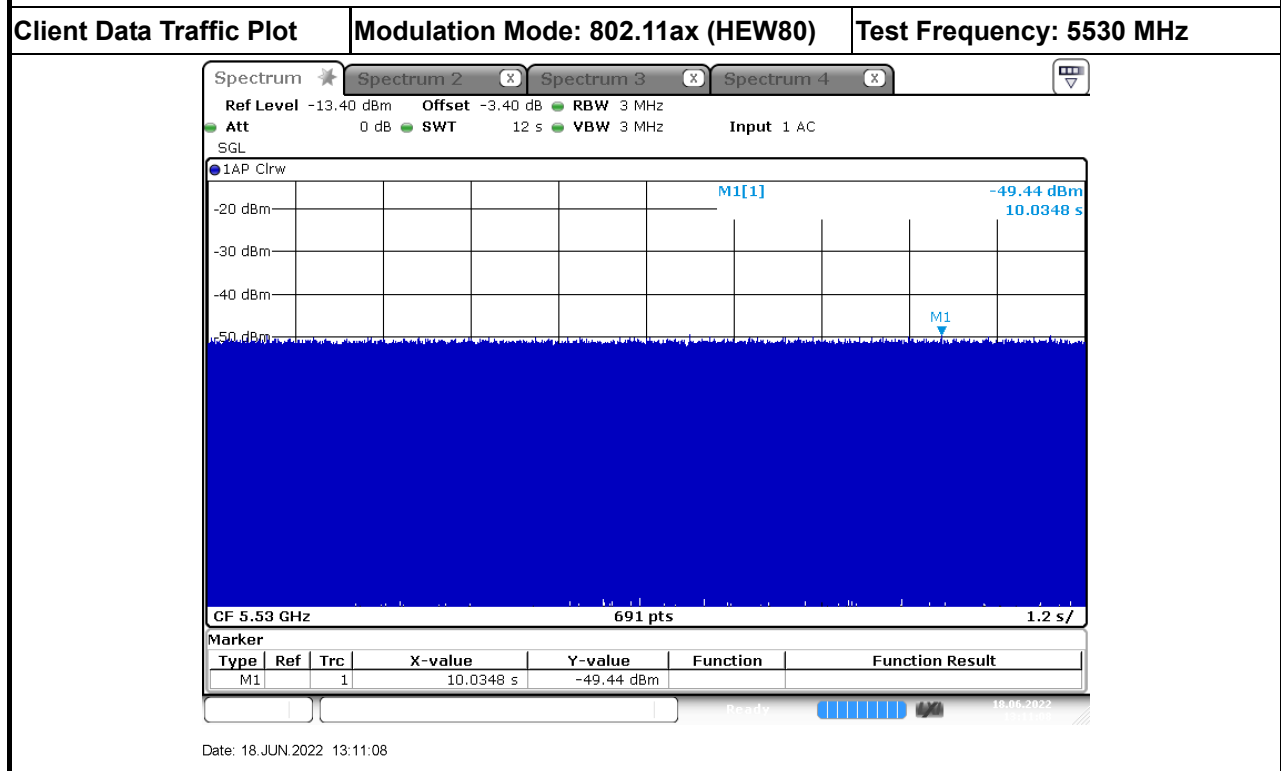
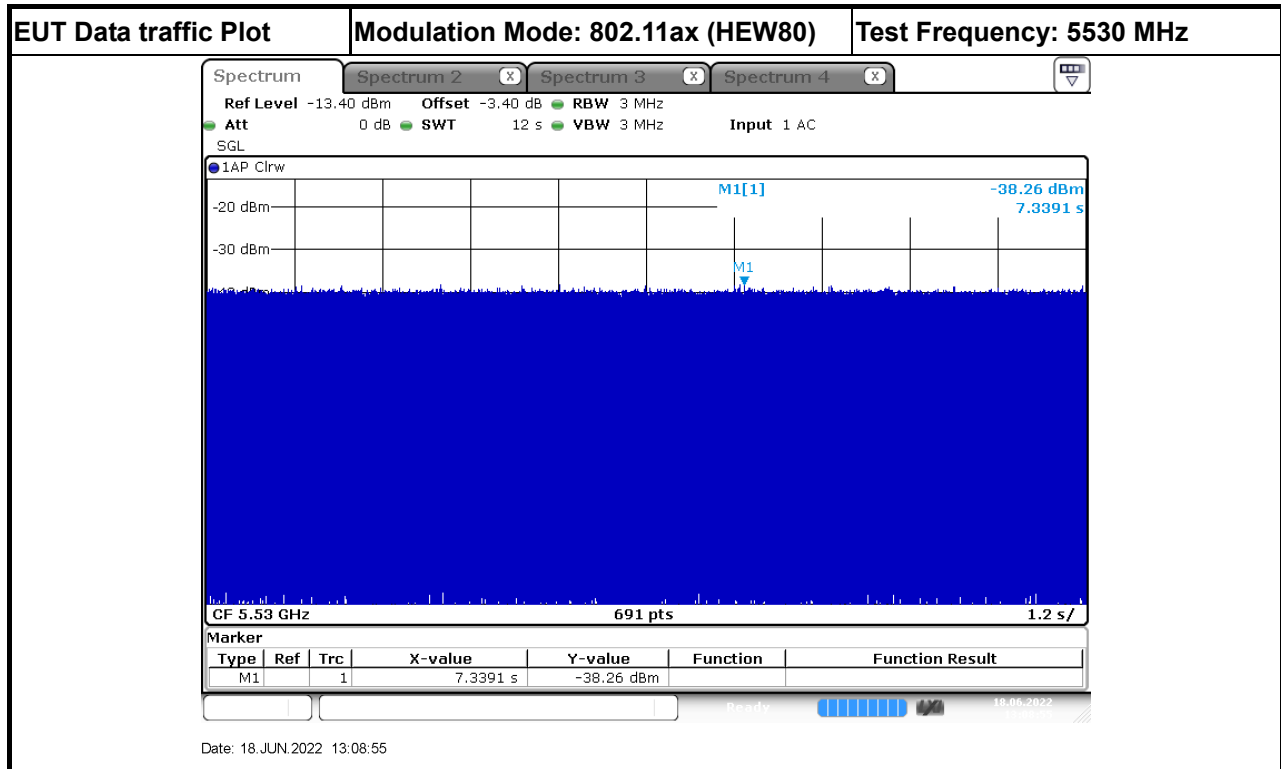
For Mode 1:

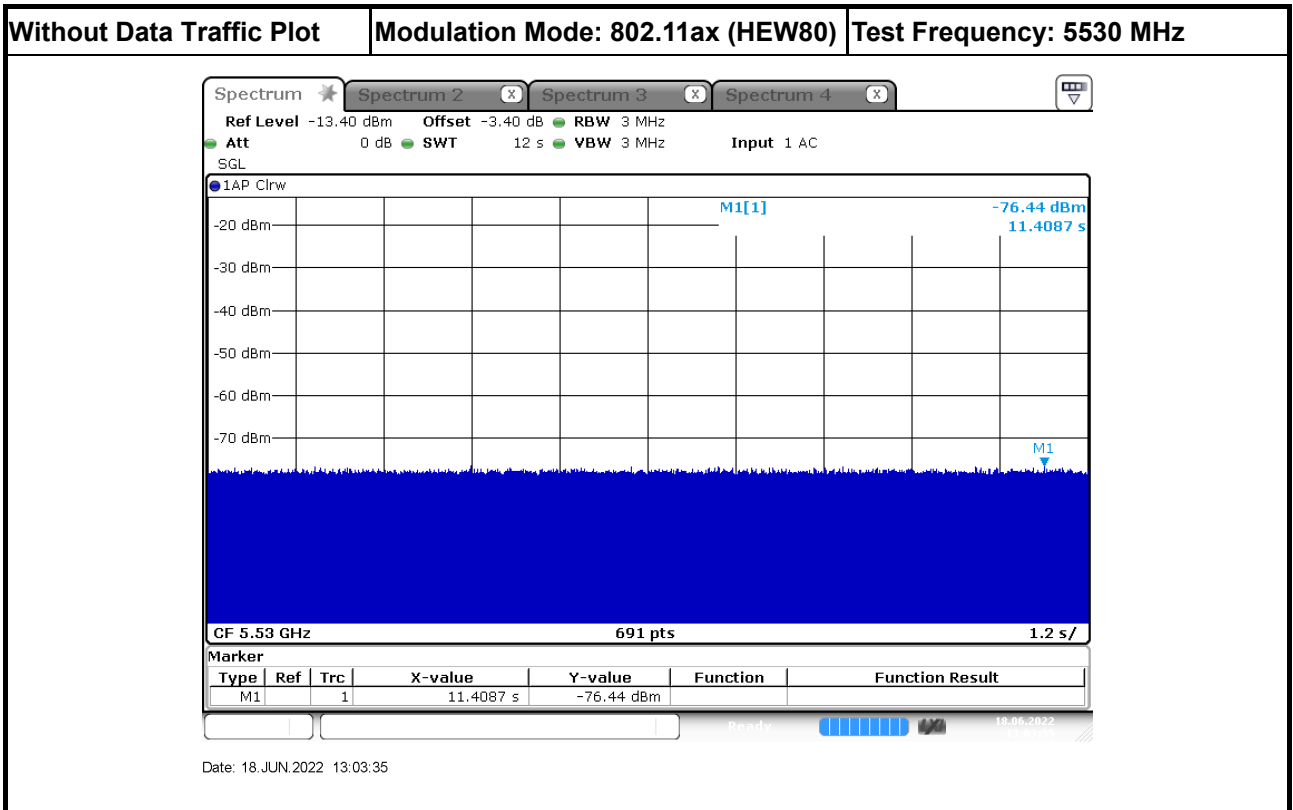








**For Mode 2:**



3.3 UNII Detection Bandwidth

3.3.1 UNII Detection Bandwidth Limit

For Mode 1

Channel Bandwidth (MHz)	Frequency (MHz)	99% Occupied Bandwidth (MHz)	UNII Detection Bandwidth Min. Limit (MHz)
20	5300 MHz	17.800	18.000
	5500 MHz	17.800	18.000
40	5310 MHz	36.613	37.000
	5510 MHz	36.034	37.000
80	5290 MHz	74.095	75.000
	5530 MHz	76.989	77.000

UNII Detection Bandwidth is minimum 100% of the 99% power bandwidth. A single radar Burst is generated for a minimum of 10 trials, and the response of the UUT is noted. The UUT must detect the Radar Waveform 90% or more of the time.

For Mode 2

Channel Bandwidth (MHz)	Frequency (MHz)	99% Occupied Bandwidth (MHz)	UNII Detection Bandwidth Min. Limit (MHz)
20	5500 MHz	19.102	19.200
40	5510 MHz	37.192	38.000
80	5530 MHz	76.410	77.000

UNII Detection Bandwidth is minimum 100% of the 99% power bandwidth. A single radar Burst is generated for a minimum of 10 trials, and the response of the UUT is noted. The UUT must detect the Radar Waveform 90% or more of the time.

3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
☒	During the U-NII Detection Bandwidth detection test, radar type 0 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic. The EUT is set up as a standalone device (no associated Client and no traffic). The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted as F_H . The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted as F_L . UNII Detection Bandwidth = $F_H - F_L$.

3.3.4 Test Result of UNII Detection Bandwidth

For Mode 1:

EUT Frequency=5300 MHz											
Channel Bandwidth (MHz)	20										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5290	0	0	0	0	0	0	0	0	0	0	0
5291(FL)	1	1	1	0	1	1	1	1	1	1	90
5292	1	1	1	1	1	1	1	1	1	1	100
5293	1	1	1	1	1	1	1	1	1	1	100
5294	1	1	1	1	1	1	1	1	1	1	100
5295	1	1	1	1	1	1	1	1	1	1	100
5300	1	1	1	1	1	1	1	1	1	1	100
5305	1	1	1	1	1	1	1	1	1	1	100
5306	1	1	1	1	1	1	1	1	1	1	100
5307	1	1	1	1	1	1	1	1	1	1	100
5308	1	1	1	1	1	1	1	1	1	1	100
5309(FH)	1	1	1	1	1	1	0	1	1	1	90
5310	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5309MHz-5291MHz)=											18
UNII Detection Bandwidth Min. Limit (MHz) =											18
Test Result											PASS



EUT Frequency=5500 MHz											
Channel Bandwidth (MHz)	20										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5490	0	0	0	0	0	0	0	0	0	0	0
5491(FL)	1	0	1	1	1	1	1	1	1	1	90
5492	1	1	1	1	1	1	1	1	1	1	100
5493	1	1	1	1	1	1	1	1	1	1	100
5494	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
5506	1	1	1	1	1	1	1	1	1	1	100
5507	1	1	1	1	1	1	1	1	1	1	100
5508	1	1	1	1	1	1	1	1	1	1	100
5509(FH)	1	1	1	0	1	1	1	1	1	1	90
5510	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5509MHz-5491MHz)=											18
UNII Detection Bandwidth Min. Limit (MHz) =											18
Test Result											PASS



EUT Frequency=5310 MHz											
Channel Bandwidth (MHz)	40										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5290	0	0	0	0	0	0	0	0	0	0	0
5291	0	0	0	0	0	0	0	0	0	0	0
5292(FL)	1	1	1	1	1	1	0	1	1	1	90
5293	1	1	1	1	1	1	1	1	1	1	100
5294	1	1	1	1	1	1	1	1	1	1	100
5295	1	1	1	1	1	1	1	1	1	1	100
5300	1	1	1	1	1	1	1	1	1	1	100
5305	1	1	1	1	1	1	1	1	1	1	100
5310	1	1	1	1	1	1	1	1	1	1	100
5315	1	1	1	1	1	1	1	1	1	1	100
5320	1	1	1	1	1	1	1	1	1	1	100
5325	1	1	1	1	1	1	1	1	1	1	100
5326	1	1	1	1	1	1	1	1	1	1	100
5327	1	1	1	1	1	1	1	1	1	1	100
5328	1	1	1	1	1	1	1	1	1	1	100
5329(FH)	1	1	1	0	1	1	1	1	1	1	90
5330	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5329MHz-5292MHz)=											37
UNII Detection Bandwidth Min. Limit (MHz) =											37
Test Result											PASS

EUT Frequency=5510 MHz											
Channel Bandwidth (MHz)	40										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5490	0	0	0	0	0	0	0	0	0	0	0
5491(FL)	1	1	1	1	1	1	0	1	1	1	90
5492	1	1	1	1	1	1	1	1	1	1	100
5493	1	1	1	1	1	1	1	1	1	1	100
5494	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
5526	1	1	1	1	1	1	1	1	1	1	100
5527	1	1	1	1	1	1	1	1	1	1	100
5528(FH)	1	1	1	1	1	1	0	1	1	1	90
5529	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5528MHz-5491MHz)=											37
UNII Detection Bandwidth Min. Limit (MHz) =											37
Test Result											PASS



EUT Frequency=5290 MHz											
Channel Bandwidth (MHz)	80										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5249	0	0	0	0	0	0	0	0	0	0	0
5250(FL)	1	1	0	1	1	1	1	1	1	1	90
5251	1	1	1	1	1	1	1	1	1	1	100
5252	1	1	1	1	1	1	1	1	1	1	100
5253	1	1	1	1	1	1	1	1	1	1	100
5254	1	1	1	1	1	1	1	1	1	1	100
5255	1	1	1	1	1	1	1	1	1	1	100
5260	1	1	1	1	1	1	1	1	1	1	100
5265	1	1	1	1	1	1	1	1	1	1	100
5270	1	1	1	1	1	1	1	1	1	1	100
5275	1	1	1	1	1	1	1	1	1	1	100
5280	1	1	1	1	1	1	1	1	1	1	100
5285	1	1	1	1	1	1	1	1	1	1	100
5290	1	1	1	1	1	1	1	1	1	1	100
5295	1	1	1	1	1	1	1	1	1	1	100
5300	1	1	1	1	1	1	1	1	1	1	100
5305	1	1	1	1	1	1	1	1	1	1	100
5310	1	1	1	1	1	1	1	1	1	1	100
5315	1	1	1	1	1	1	1	1	1	1	100
5320	1	1	1	1	1	1	1	1	1	1	100
5325	1	1	1	1	1	1	1	1	1	1	100
5326	1	1	1	1	1	1	1	1	1	1	100
5327	1	1	1	1	1	1	1	1	1	1	100
5328	1	1	1	1	1	1	1	1	1	1	100
5329	1	1	1	1	1	1	1	1	1	1	100
5330(FH)	1	1	1	1	1	1	1	0	1	1	90
5531	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5330MHz-5250MHz)=											80
UNII Detection Bandwidth Min. Limit (MHz) =											75
Test Result											PASS



EUT Frequency=5530 MHz											
Channel Bandwidth (MHz)	80										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5491	0	0	0	0	0	0	0	0	0	0	0
5492(FL)	1	1	1	1	1	0	1	1	1	1	90
5493	1	1	1	1	1	1	1	1	1	1	100
5494	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
5566	1	1	1	1	1	1	1	1	1	1	100
5567	1	1	1	1	1	1	1	1	1	1	100
5568	1	1	1	1	1	1	1	1	1	1	100
5569(FH)	0	1	1	1	1	1	1	1	1	1	90
5570	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5569MHz-5492MHz)=											77
UNII Detection Bandwidth Min. Limit (MHz) =											77
Test Result											PASS



For Mode 2:

EUT Frequency=5500 MHz											
Channel Bandwidth (MHz)	20										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5490	0	0	0	0	0	0	0	0	0	0	0
5490.6(FL)	1	1	1	1	0	1	1	1	1	1	90
5491	1	1	1	1	1	1	1	1	1	1	100
5492	1	1	1	1	1	1	1	1	1	1	100
5493	1	1	1	1	1	1	1	1	1	1	100
5494	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
5506	1	1	1	1	1	1	1	1	1	1	100
5507	1	1	1	1	1	1	1	1	1	1	100
5508	1	1	1	1	1	1	1	1	1	1	100
5509	1	1	1	1	1	1	1	1	1	1	100
5510(FH)	1	1	1	0	1	1	1	1	1	1	90
5511	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5510MHz-5490.6MHz)=											19.4
UNII Detection Bandwidth Min. Limit (MHz) =											19.2
Test Result											PASS



EUT Frequency=5510 MHz											
Channel Bandwidth (MHz)	40										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5490	0	0	0	0	0	0	0	0	0	0	0
5491(FL)	1	1	1	1	1	1	1	1	1	1	100
5492	1	1	1	1	1	1	1	1	1	1	100
5493	1	1	1	1	1	1	1	1	1	1	100
5494	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
5526	1	1	1	1	1	1	1	1	1	1	100
5527	1	1	1	1	1	1	1	1	1	1	100
5528	1	1	1	1	1	1	1	1	1	1	100
5529(FH)	1	1	1	1	1	1	1	1	1	0	90
5530	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5530MHz-5491MHz)=											38
UNII Detection Bandwidth Min. Limit (MHz) =											38
Test Result											PASS



EUT Frequency=5530 MHz											
Channel Bandwidth (MHz)	80										
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5489	0	0	0	0	0	0	0	0	0	0	0
5490(FL)	1	1	1	1	0	1	1	1	1	1	90
5491	1	1	1	1	1	1	1	1	1	1	100
5492	1	1	1	1	1	1	1	1	1	1	100
5493	1	1	1	1	1	1	1	1	1	1	100
5494	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
5566	1	1	1	1	1	1	1	1	1	1	100
5567	1	1	1	1	1	1	1	1	1	1	100
5568	1	1	1	1	1	1	1	1	1	1	100
5569	1	1	1	1	1	1	1	1	1	1	100
5570(FH)	1	1	1	1	1	1	0	1	1	1	90
5571	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5570MHz-5490MHz)=											80
UNII Detection Bandwidth Min. Limit (MHz) =											77
Test Result											PASS

3.4 Channel Availability Check (CAC)

3.4.1 Channel Availability Check Limit

Channel Availability Check Limit	
☒	The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute (60 sec) on the intended operating frequency.

3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

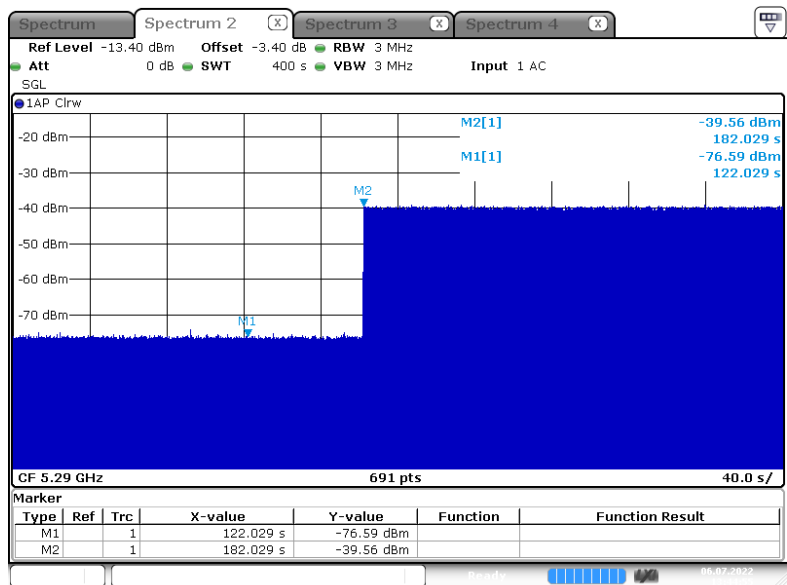
Test Method	
☒	For Initial Channel Availability Check Time. The EUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the UNII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms.
☒	For Radar Burst at the Beginning of the Channel Availability Check Time. To verify successful radar detection on the selected Channel during a period equal to the Beginning of the Channel Availability Check Time.
☒	For Radar Burst at the End of the Channel Availability Check Time. To verify successful radar detection on the selected Channel during a period equal to the End of the Channel Availability Check Time.

3.4.4 Test Result of Initial Channel Availability Check Time

For Mode 1:

Modulation Mode	Freq.	Radar Test Signal
802.11ax (HEW80)	5290 MHz	N/A

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (122.029 sec). The initial CAC time of the EUT is indicated by marker 1 (122.029 sec). Initial beacons/data transmissions are indicated by marker 2 (182.029 sec).



Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1			1	122.029 s	-76.59 dBm		
M2			1	182.029 s	-39.56 dBm		

Date: 6 JUL 2022 13:44:55

Test Result	PASS
--------------------	-------------



Modulation Mode	Freq.	Radar Test Signal
802.11ax (HEW80)	5530 MHz	N/A

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (121.594 sec). The initial CAC time of the EUT is indicated by marker 1 (121.594 sec). Initial beacons/data transmissions are indicated by marker 2 (181.594 sec).

Spectrum

Spectrum 2

Spectrum 3

Spectrum 4

Ref Level -13.40 dBm

Offset -3.40 dB

RBW 3 MHz

Att 0 dB

SWT 350 s

VBW 3 MHz

Input 1 AC

SGL

IAP Clrw

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

M2[1]

M1[1]

M2

M1

-44.78 dBm

-76.83 dBm

181.594 s

121.594 s

CF 5.53 GHz

691 pts

35.0 s/

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	121.594 s	-76.83 dBm		
M2		1	181.594 s	-44.78 dBm		

Date: 24 JUN.2022 11:52:06

Test Result	PASS
-------------	------

For Mode 2:

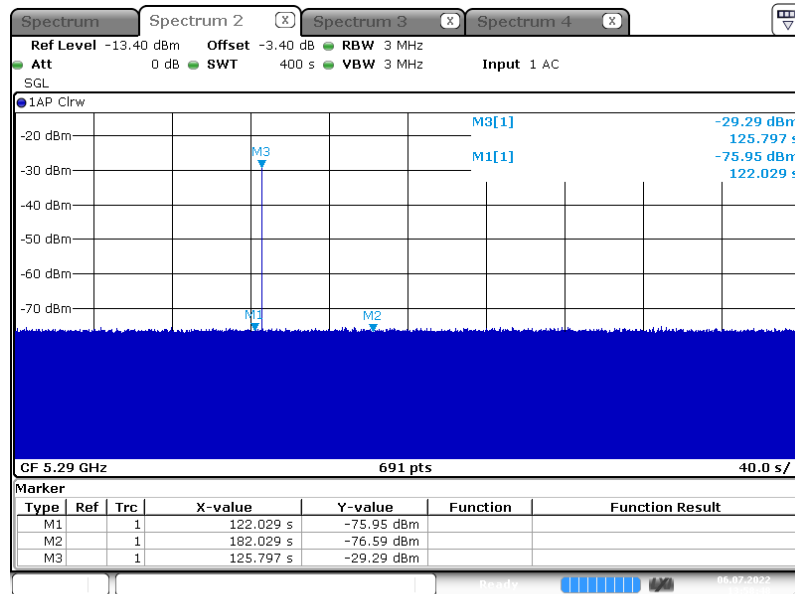
Modulation Mode	Freq.	Radar Test Signal																					
802.11ax (HEW80)	5530 MHz	N/A																					
The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (197.971 sec). The initial CAC time of the EUT is indicated by marker 1 (197.971 sec). Initial beacons/data transmissions are indicated by marker 2 (257.971 sec).																							
Spectrum Spectrum 2 Spectrum 3 Spectrum 4 Ref Level -13.40 dBm Offset -3.40 dB RBW 3 MHz Att 0 dB SWT 500 s VBW 3 MHz Input 1 AC SGL LAP ClrW -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm M2 M2[1] M1[1] -28.72 dBm 257.971 s -77.01 dBm 197.971 s CF 5.53 GHz 691 pts 50.0 s/ Marker <table><thead><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-value</th><th>Y-value</th><th>Function</th><th>Function Result</th></tr></thead><tbody><tr><td>M1</td><td></td><td>1</td><td>197.971 s</td><td>-77.01 dBm</td><td></td><td></td></tr><tr><td>M2</td><td></td><td>1</td><td>257.971 s</td><td>-28.72 dBm</td><td></td><td></td></tr></tbody></table>			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1		1	197.971 s	-77.01 dBm			M2		1	257.971 s	-28.72 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																	
M1		1	197.971 s	-77.01 dBm																			
M2		1	257.971 s	-28.72 dBm																			
Date: 18 JUN.2022 10:37:07																							
Test Result	PASS																						

3.4.5 Test Result of Radar Burst at the Beginning of the Channel Availability Check Time

For Mode 1:

Modulation Mode	Freq. (MHz)	Radar Type Signal
802.11ax (HEW80)	5290 MHz	0

Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 125.797 seconds after the radar Burst has been generated. Verify that during the 400 seconds measurement window no EUT transmissions occurred.



Date: 6 JUL 2022 13:58:48

Test Result	PASS
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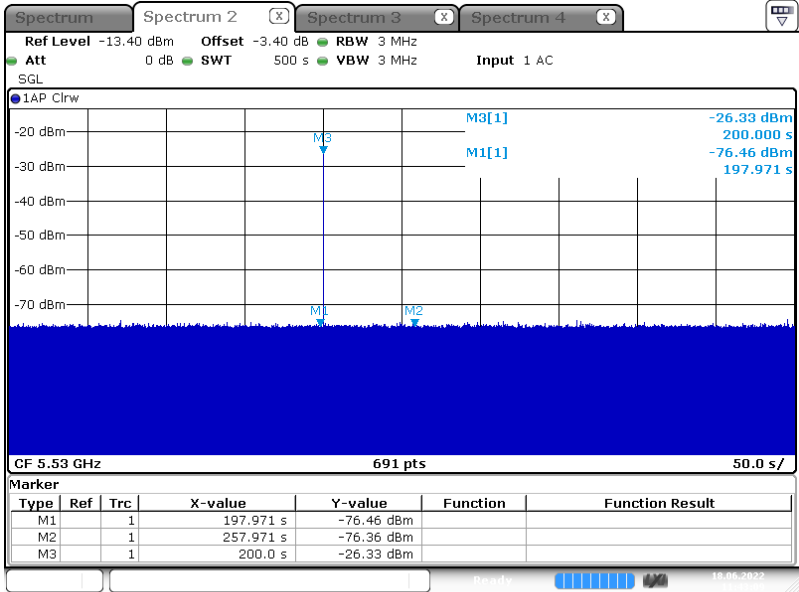
Modulation Mode	Freq. (MHz)	Radar Type Signal																																			
802.11ax (HEW80)	5530 MHz	0																																			
Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 123.261 seconds after the radar Burst has been generated. Verify that during the 350 seconds measurement window no EUT transmissions occurred.																																					
Spectrum Spectrum 2 Spectrum 3 Spectrum 4 Ref Level -13.40 dBm Offset -3.40 dB RBW 3 MHz Att 0 dB SWT 350 s VBW 3 MHz Input 1 AC SGL 1AP Clrw -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm M3 M1 M2 M3[1] M1[1] -26.39 dBm 123.261 s -75.95 dBm 121.594 s CF 5.53 GHz 691 pts 35.0 s/ <table><tr><th colspan="7">Marker</th></tr><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-value</th><th>Y-value</th><th>Function</th><th>Function Result</th></tr><tr><td>M1</td><td></td><td>1</td><td>121.594 s</td><td>-75.95 dBm</td><td></td><td></td></tr><tr><td>M2</td><td></td><td>1</td><td>181.594 s</td><td>-75.38 dBm</td><td></td><td></td></tr><tr><td>M3</td><td></td><td>1</td><td>123.261 s</td><td>-26.39 dBm</td><td></td><td></td></tr></table> Records 24.06.2022 Date: 24 JUN 2022 14:16:09			Marker							Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1		1	121.594 s	-75.95 dBm			M2		1	181.594 s	-75.38 dBm			M3		1	123.261 s	-26.39 dBm		
Marker																																					
Type	Ref	Trc	X-value	Y-value	Function	Function Result																															
M1		1	121.594 s	-75.95 dBm																																	
M2		1	181.594 s	-75.38 dBm																																	
M3		1	123.261 s	-26.39 dBm																																	
Test Result	PASS																																				



For Mode 2:

Modulation Mode	Freq. (MHz)	Radar Type Signal
802.11ax (HEW80)	5530 MHz	0

Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 200 seconds after the radar Burst has been generated. Verify that during the 500 seconds measurement window no EUT transmissions occurred.



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	197.971 s	-76.46 dBm		
M2		1	257.971 s	-76.36 dBm		
M3		1	200.0 s	-26.33 dBm		

Date: 18 JUN 2022 11:43:09

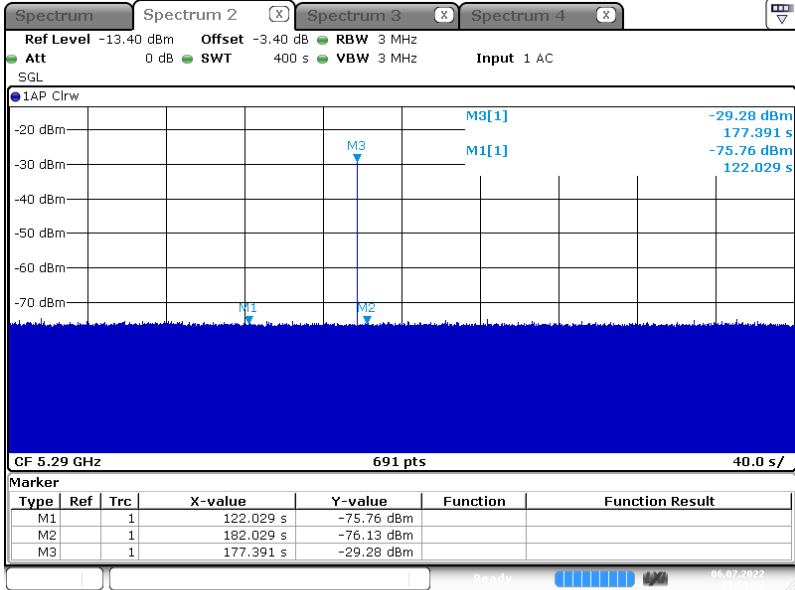
Test Result	PASS
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3.4.6 Test Result of Radar Burst at the End of the Channel Availability Check Time

For Mode 1:

Modulation Mode	Freq. (MHz)	Radar Type Signal
802.11ax (HEW80)	5290 MHz	0

Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 177.391 seconds after the radar Burst has been generated. Verify that during the 400 seconds measurement window no EUT transmissions occurred.



CF 5.29 GHz 691 pts 40.0 s/

Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1			1	122.029 s	-75.76 dBm		
M2			1	182.029 s	-76.13 dBm		
M3			1	177.391 s	-29.28 dBm		

Date: 6 JUL 2022 13:51:53

Test Result	PASS
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Modulation Mode	Freq. (MHz)	Radar Type Signal
802.11ax (HEW80)	5530 MHz	0
Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 180.072 seconds after the radar Burst has been generated. Verify that during the 350 seconds measurement window no EUT transmissions occurred.		
Date: 24 JUN 2022 14:22:28		
Test Result	PASS	

**For Mode 2:**

Modulation Mode	Freq.	Radar Test Signal																												
802.11ax (HEW80)	5530 MHz	0																												
Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 255.797 seconds after the radar Burst has been generated. Verify that during the 500 seconds measurement window no EUT transmissions occurred.																														
Spectrum Spectrum 2 Spectrum 3 Spectrum 4 Ref Level -13.40 dBm Offset -3.40 dB RBW 3 MHz Att 0 dB SWT 500 s VBW 3 MHz Input 1 AC SGL 1AP Clrw -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm M3 M1 M2 M3[1] -26.37 dBm M1[1] -76.34 dBm 255.797 s 197.971 s CF 5.53 GHz 691 pts 50.0 s/ Marker <table><tr><th>Type</th><th>Ref</th><th>Trc</th><th>X-value</th><th>Y-value</th><th>Function</th><th>Function Result</th></tr><tr><td>M1</td><td></td><td>1</td><td>197.971 s</td><td>-76.34 dBm</td><td></td><td></td></tr><tr><td>M2</td><td></td><td>1</td><td>255.797 s</td><td>-76.02 dBm</td><td></td><td></td></tr><tr><td>M3</td><td></td><td>1</td><td>255.797 s</td><td>-26.37 dBm</td><td></td><td></td></tr></table> Date: 18 JUN 2022 11:52:56			Type	Ref	Trc	X-value	Y-value	Function	Function Result	M1		1	197.971 s	-76.34 dBm			M2		1	255.797 s	-76.02 dBm			M3		1	255.797 s	-26.37 dBm		
Type	Ref	Trc	X-value	Y-value	Function	Function Result																								
M1		1	197.971 s	-76.34 dBm																										
M2		1	255.797 s	-76.02 dBm																										
M3		1	255.797 s	-26.37 dBm																										
Test Result	PASS																													

3.5 In-service Monitoring

3.5.1 In-service Monitoring Limit

In-service Monitoring Limit	
Channel Move Time	10 sec
Channel Closing Transmission Time	200 ms + an aggregate of 60 ms over remaining 10 sec periods.
Non-occupancy period	Minimum 30 minutes

3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method	
☒	Verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time limits.
☒	Verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. One 12 sec plot needs to be reported for the Short Pulse Radar Types 0 sec plot. And zoom-in a 60 ms plot verified channel closing time for the aggregate transmission time starting from 200ms after the end of the radar signal to the completion of the channel move.
☒	Verified during In-Service Monitoring; Non-Occupancy Period. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Non-Occupancy Period). Compare the Non-Occupancy Period limits.

3.5.4 Test Result of Channel Move Time

For Mode 1:

Modulation Mode: 802.11ax (HEW80)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5290 MHz	-
Channel Move Time (sec.)	0.460	< 10s

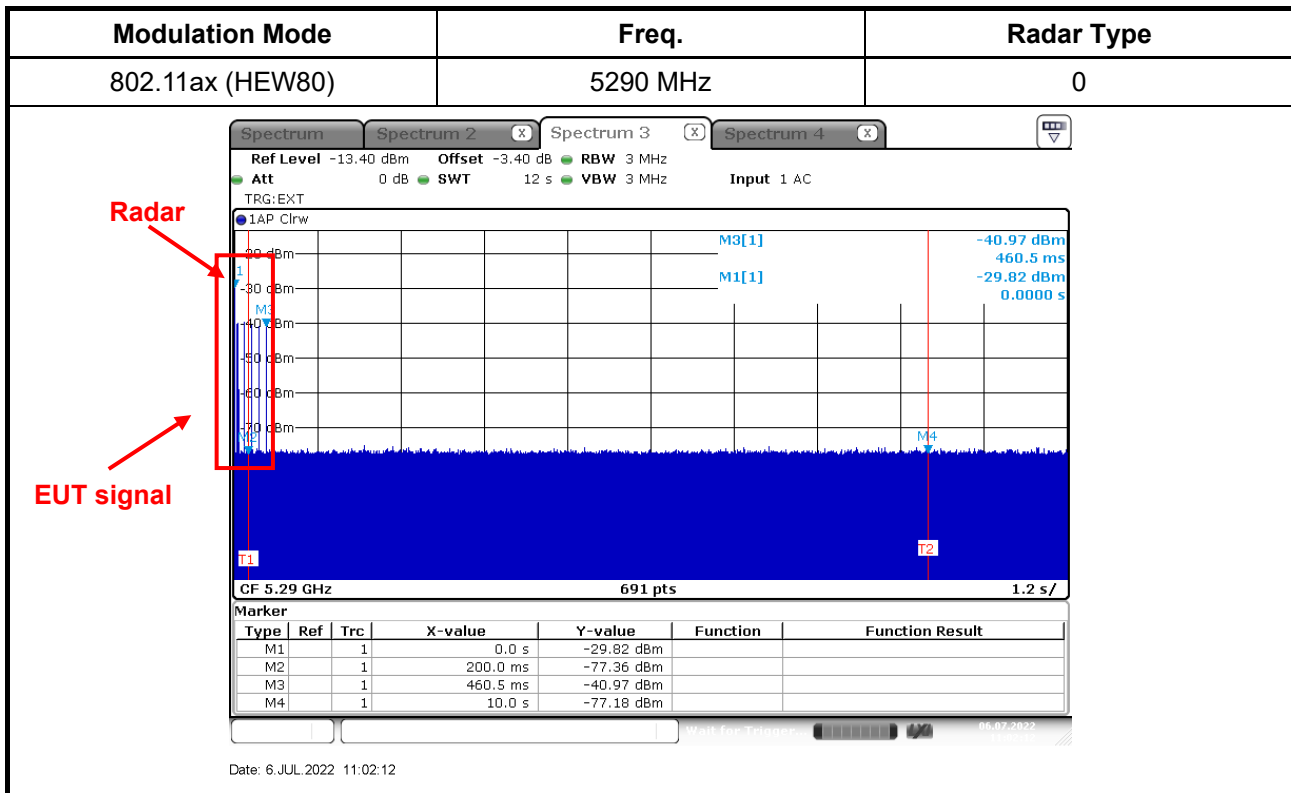
Modulation Mode: 802.11ax (HEW80)

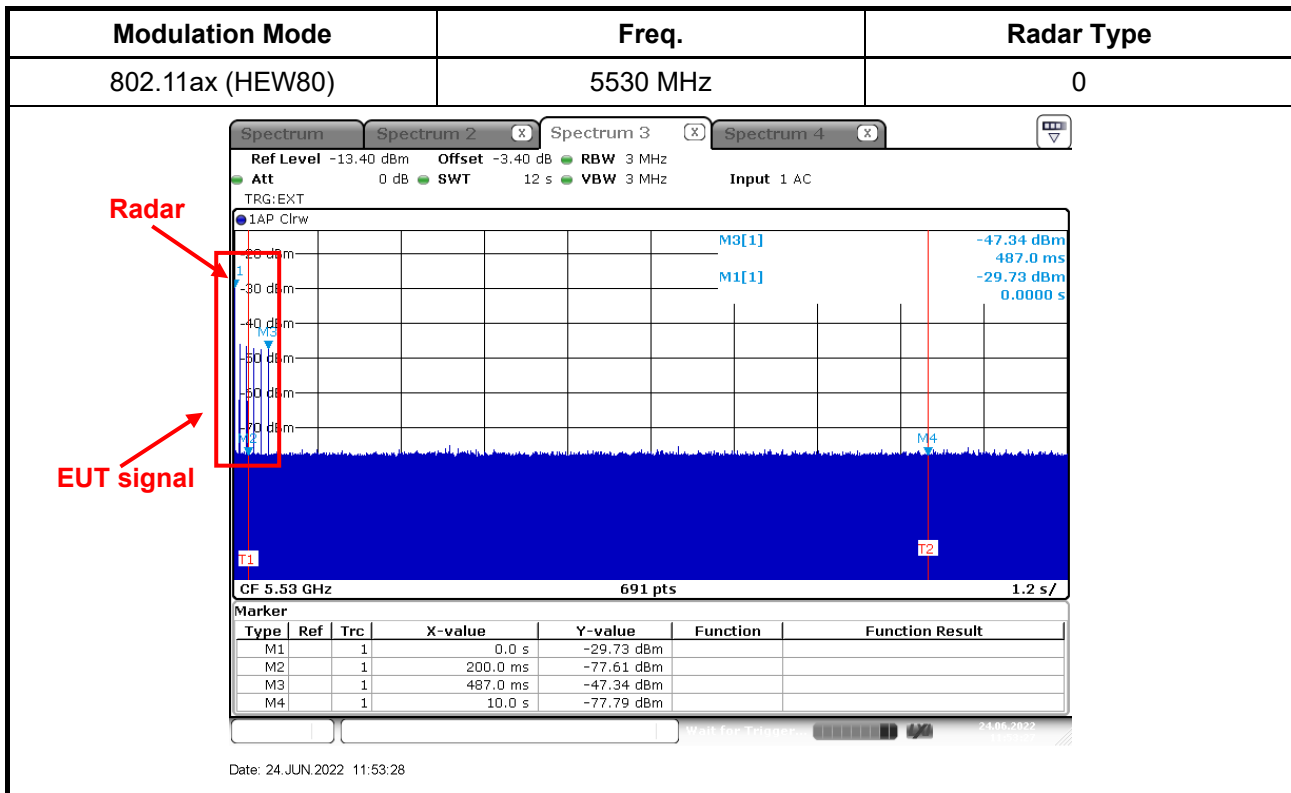
Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5530 MHz	-
Channel Move Time (sec.)	0.487	< 10s

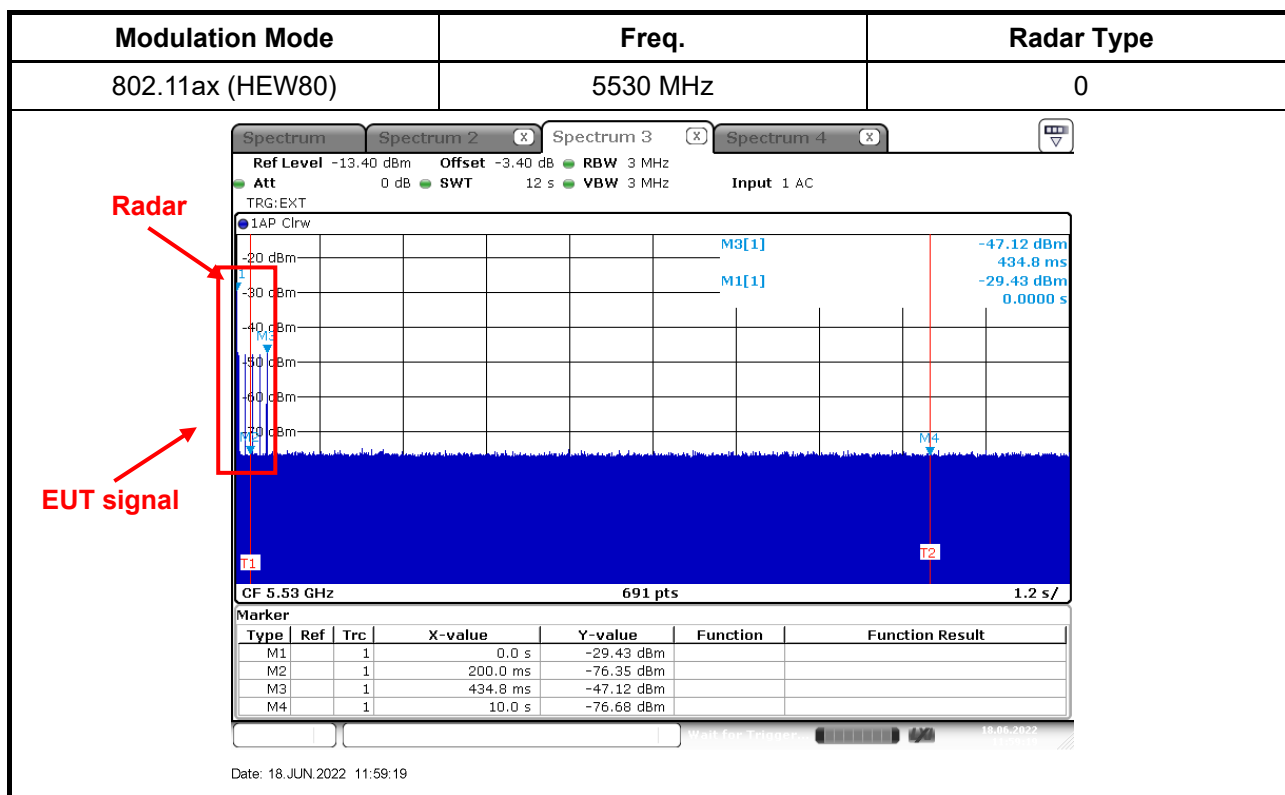
For Mode 2:

Modulation Mode: 802.11ax (HEW80)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5530 MHz	-
Channel Move Time (sec.)	0.434	< 10s

For Mode 1:




For Mode 2:


3.5.5 Test Result of Channel Closing Transmission Time

For Mode 1:

Modulation Mode: 802.11ax (HEW80)

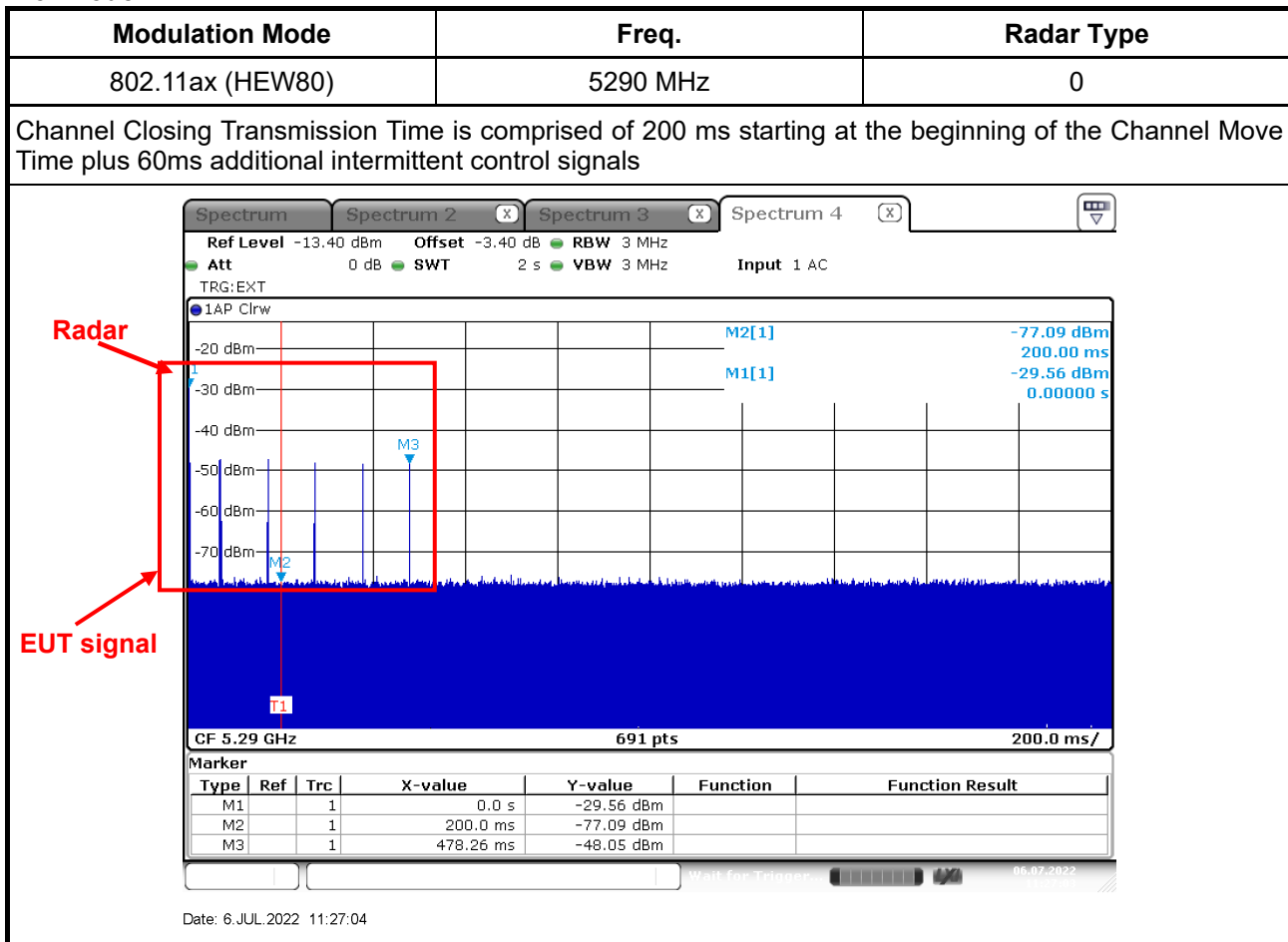
Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5290 MHz	-
Channel Closing Transmission Time (ms) (Note)	23.190	< 60ms

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5530 MHz	-
Channel Closing Transmission Time (ms) (Note)	11.590	< 60ms

For Mode 2:

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5530 MHz	-
Channel Closing Transmission Time (ms) (Note)	14.490	< 60ms

Note: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 seconds period. The aggregate duration of control signals will not count quiet periods in between transmissions.

**For Mode 1:**

Dwell is the dwell time per spectrum analyzer sampling bin.

S is the sweep time

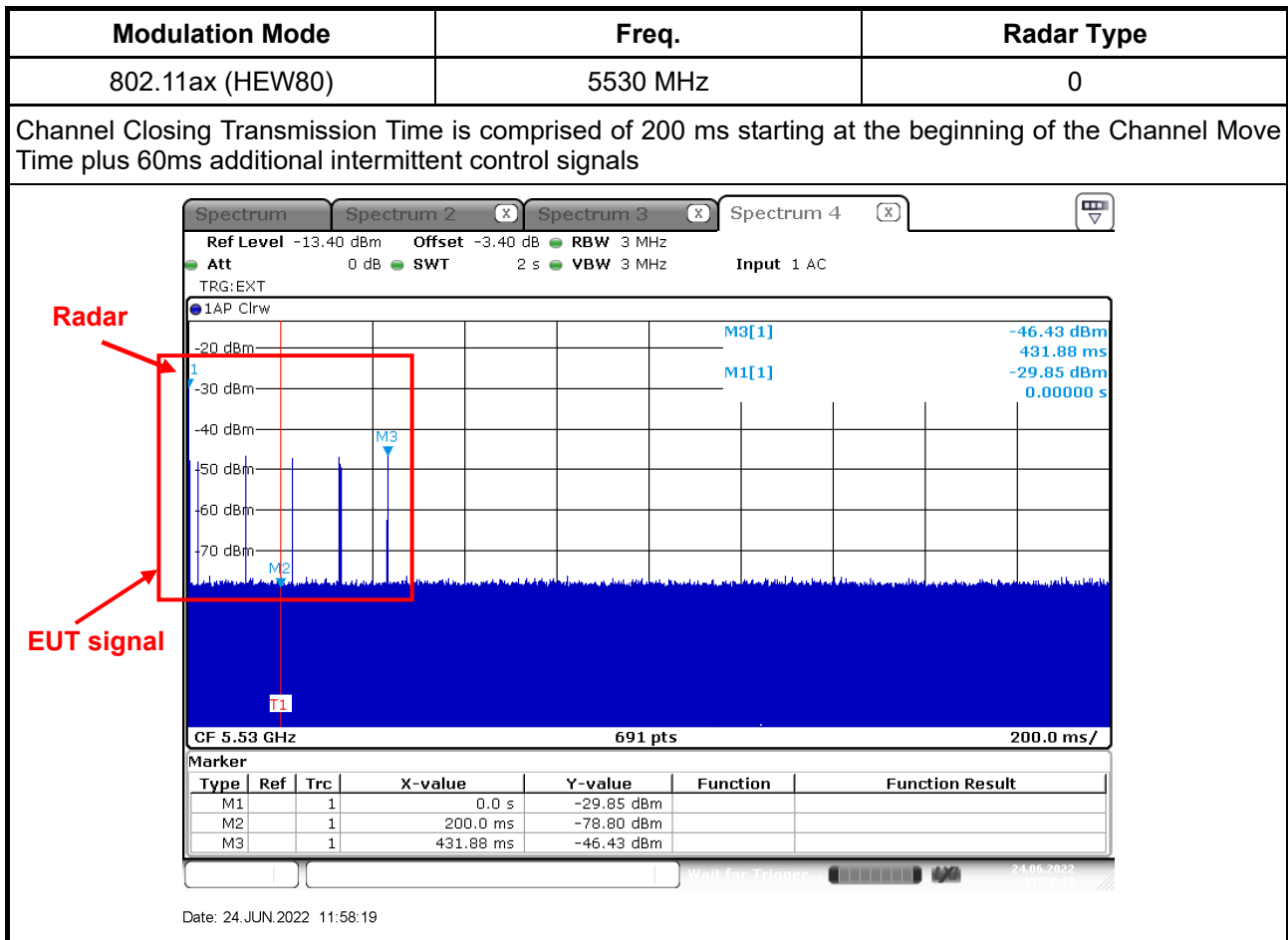
B is the number of spectrum analyzer sampling bins

C is the intermittent control signals of Channel Closing Transmission Time

N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission

Dwell (2.900 ms)= S (2000 ms) / B (690)

C (23.190 ms) = N (8) X Dwell (2.900 ms)



Dwell is the dwell time per spectrum analyzer sampling bin.

S is the sweep time

B is the number of spectrum analyzer sampling bins

C is the intermittent control signals of Channel Closing Transmission Time

N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission

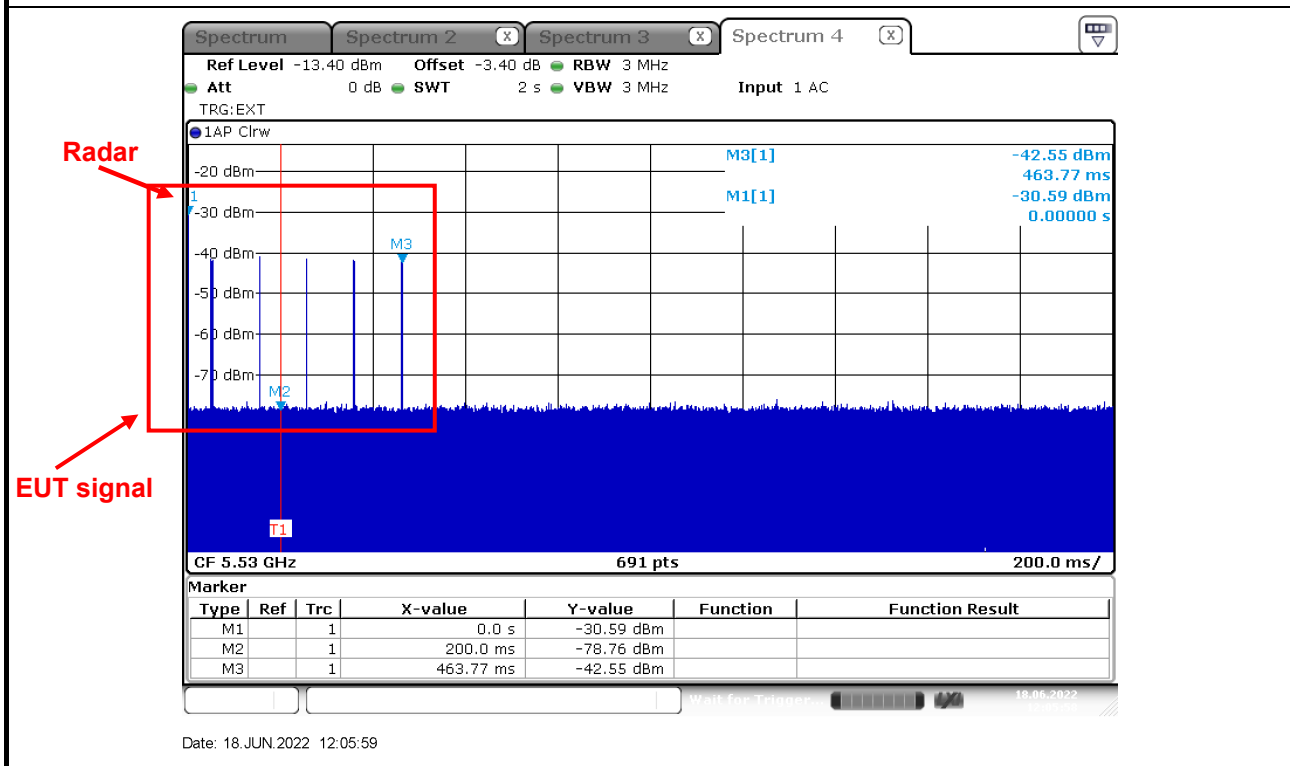
Dwell (2.900 ms) = S (2000 ms) / B (690)

C (11.590 ms) = N (4) X Dwell (2.900 ms)

**For Mode 2:**

Modulation Mode	Freq.	Radar Type
802.11ax (HEW80)	5530 MHz	0

Channel Closing Transmission Time is comprised of 200 ms starting at the beginning of the Channel Move Time plus 60ms additional intermittent control signals



Dwell is the dwell time per spectrum analyzer sampling bin.

S is the sweep time

B is the number of spectrum analyzer sampling bins

C is the intermittent control signals of Channel Closing Transmission Time

N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission

Dwell (2.900 ms)= S (2000 ms) / B (690)

C (14.490 ms) = N (5) X Dwell (2.900 ms)

3.5.6 Test Result of Non-Occupancy Period

For Mode 1:

Modulation Mode: 802.11ax (HEW80)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5290 MHz	-
Non-Occupancy Period (min.)	≥ 30	≥ 30 min

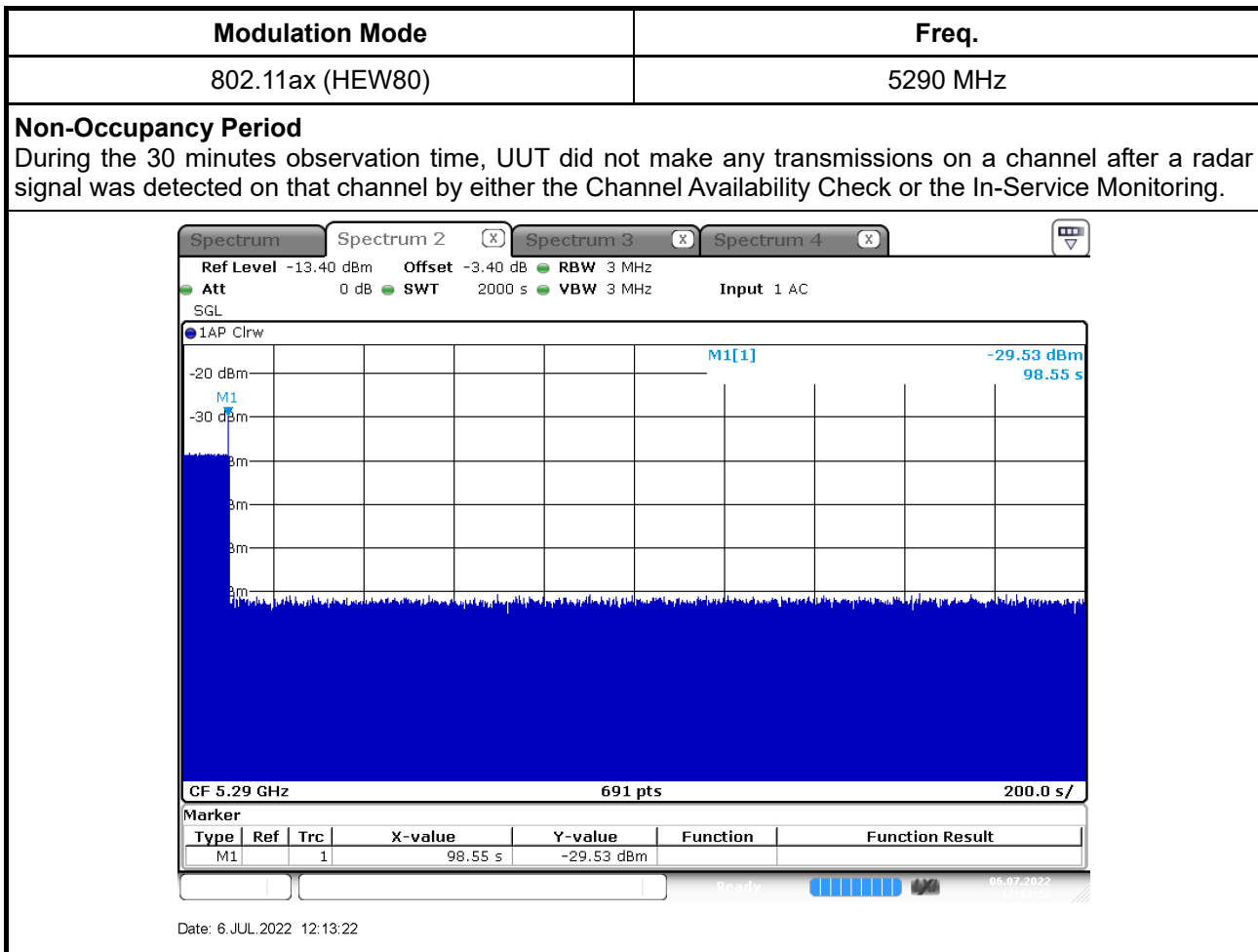
Modulation Mode: 802.11ax (HEW80)

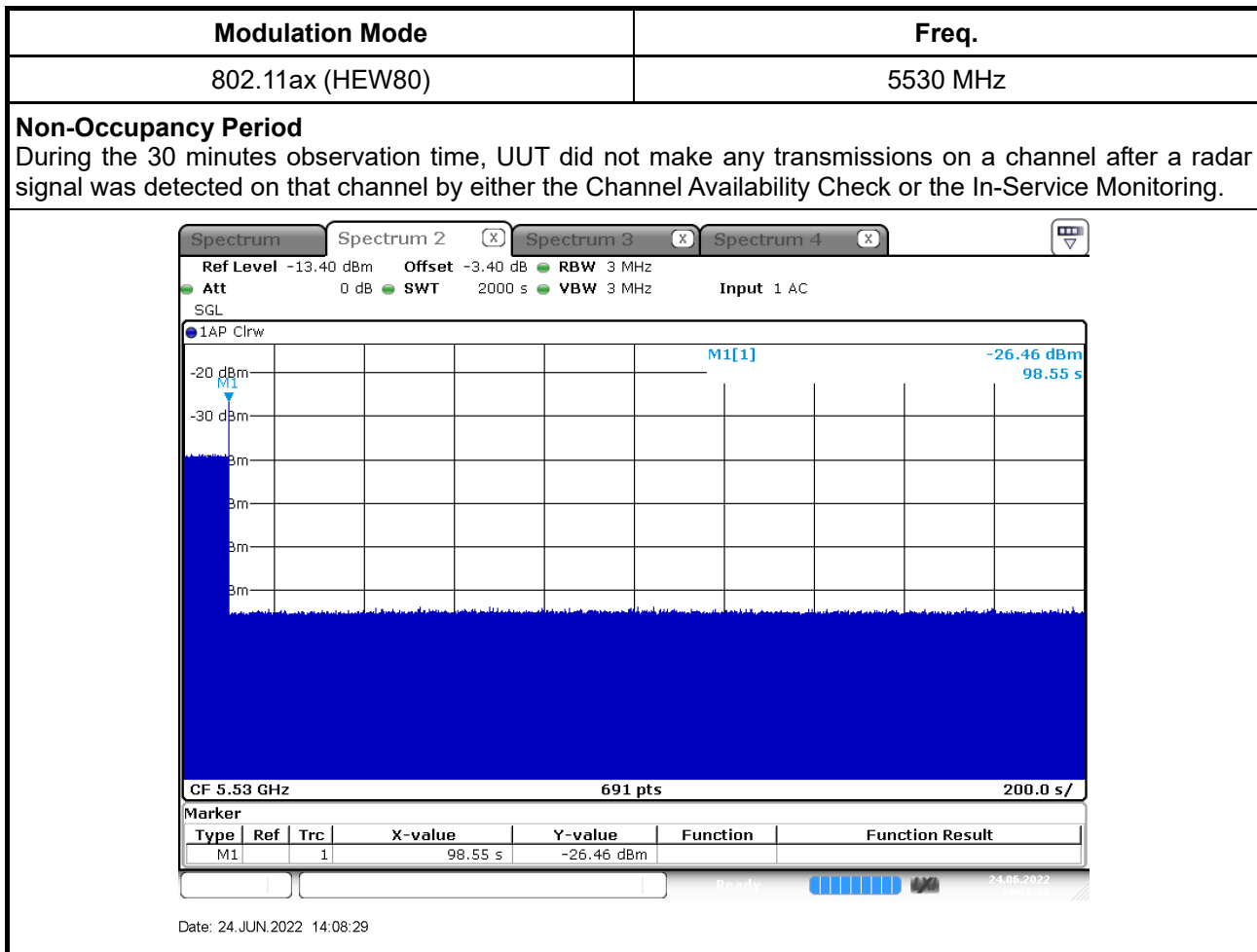
Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5530 MHz	-
Non-Occupancy Period (min.)	≥ 30	≥ 30 min

For Mode 2:

Modulation Mode: 802.11ax (HEW80)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	5530 MHz	-
Non-Occupancy Period (min.)	≥ 30	≥ 30 min

**For Mode 1:**

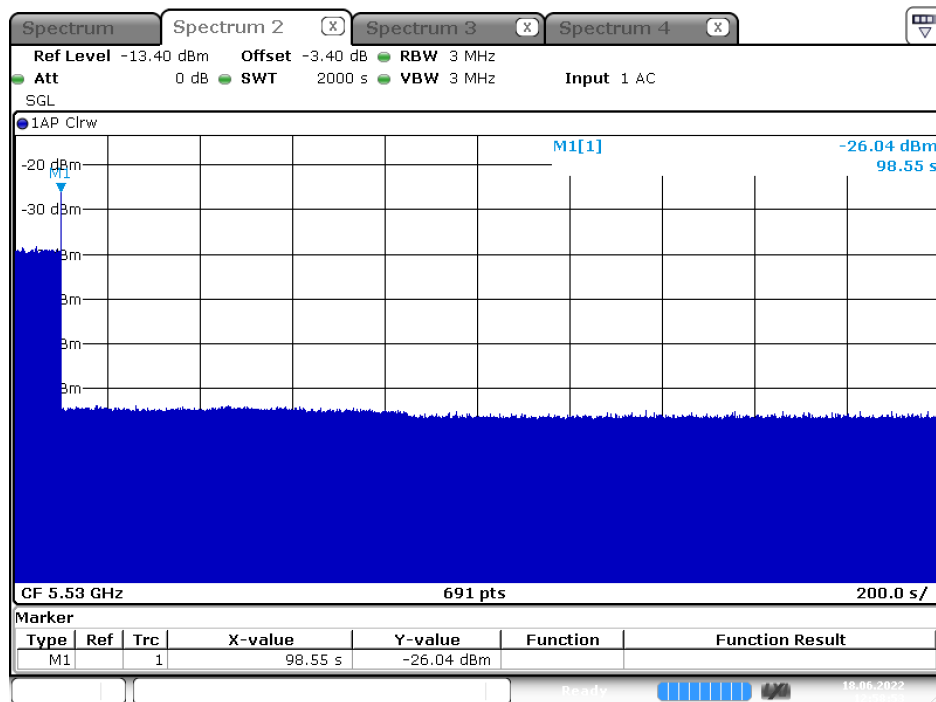


**For Mode 2:**

Modulation Mode	Freq.
802.11ax (HEW80)	5530 MHz

Non-Occupancy Period

During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the In-Service Monitoring.



Date: 18 JUN.2022 12:58:53

3.6 Statistical Performance Check

3.6.1 Statistical Performance Check Limit

Radar Type	Minimum Percentage of Successful Detection (Pd)	Minimum Trials
1	60%	30
2	60%	30
3	60%	30
4	60%	30
Aggregate (Radar Types 1-4)	80%	120
5	80%	30
6	70%	30

The percentage of successful detection is calculated by:

$$\frac{\text{TotalWaveformDetections}}{\text{TotalWaveformTrials}} \times 100 = \text{Probability of Detection Radar Waveform}$$

In addition an aggregate minimum percentage of successful detection across all Short Pulse Radar Types 1-4 is required and is calculated as follows:

$$\frac{Pd1 + Pd2 + Pd3 + Pd4}{4}$$

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method
☒ For Statistical Performance Check test. Demonstrating a minimum channel loading of approximately 17% or greater of the test. Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 1-4 and 6 to ensure detection occurs. Then Observe the transmissions of the UUT 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.

**3.6.4 Test Result of Statistical Performance Check**

For Mode 1:

For Band 2:

Modulation Mode: 802.11ax (HEW20)

Type 1 Radar Statistical Performance

Trial #	Test Freq. (MHz)	Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulse Per Second)	PRI (us)	1=Detection 0=No Detection
1	5307	1	1930.5	518	1
2	5308	23	326.2	3066	1
3	5307	19	1139.0	878	1
4	5298	12	1355.0	738	1
5	5305	4	1730.1	578	1
6	5298	8	1519.8	658	1
7	5304	15	1253.1	798	1
8	5304	6	1618.1	618	1
9	5301	14	1285.3	778	1
10	5299	3	1792.1	558	1
11	5305	13	1319.3	758	1
12	5300	9	1474.9	678	1
13	5303	7	1567.4	638	1
14	5291	17	1193.3	838	1
15	5308	10	1432.7	698	1
16	5300	-	1692.0	591	1
17	5309	-	328.1	3048	1
18	5297	-	373.4	2678	1
19	5308	-	574.4	1741	1
20	5300	-	1216.5	822	1
21	5295	-	801.3	1248	1
22	5306	-	488.5	2047	1
23	5303	-	956.0	1046	1
24	5305	-	517.6	1932	0
25	5299	-	1422.5	703	1
26	5299	-	542.0	1845	1
27	5304	-	741.3	1349	1
28	5302	-	881.8	1134	1
29	5292	-	427.4	2340	1
30	5295	-	628.9	1590	1
Detection Percentage (%)					96.667
Limit					60%
Test Result					PASS