DFS TEST REPORT

Equipment	:	AX3000 完整家庭 Mesh Wi-Fi 系統
Brand Name	:	tp-link
Model Name	:	Deco X60
Applicant	:	聯洲國際有限公司 新北市板橋區中山路一段 156 號 13 樓
Manufacturer	:	普聯技術有限公司 深圳市南山區深南路科技園工業廠房 24 棟南段 1,3,4,5 層，28 棟 1-4 層
Standard	:	LP0002 Section 5.7 (2020-07-01)

The product was received on Mar. 02, 2021, and testing was started from Mar. 29, 2021 and completed on Apr. 23, 2021. 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
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

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Appendix A. Test Photos

Photographs of EUT v01

History of this test report

Report No.	Version	Description	Issued Date
TZ122333	01	Initial issue of report	May 11, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.3	NCC LP0002 5.7.7.2 and FCC KDB 905462 7.8.1	DFS: UNII Detection Bandwidth Measurement	PASS	-
3.4	NCC LP0002 5.7.7.2 and FCC KDB 905462 7.8.2.1	DFS: Initial Channel Availability Check Time	PASS	-
3.4	NCC LP0002 5.7.7.2 and FCC KDB 905462 7.8.2.2	DFS: Radar Burst at the Beginning of the Channel Availability Check Time	PASS	-
3.4	NCC LP0002 5.7.7.2 and FCC KDB 905462 7.8.2.3	DFS: Radar Burst at the End of the Channel Availability Check Time	PASS	-
3.5	NCC LP0002 5.7.7.2 and FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Channel Move Time (CMT)	PASS	-
3.5	NCC LP0002 5.7.7.2 and FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Channel Closing Transmission Time (CCTT)	PASS	-
3.5	NCC LP0002 5.7.7.2 and FCC KDB 905462 7.8.3	DFS: In-Service Monitoring for Non-Occupancy Period (NOP)	PASS	-
3.6	NCC LP0002 5.7.7.2 and 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

Note1: Mesh mode, only Statistical Performance Check (Section 7.8.4) on one of the radar types is required to perform.
Note2: The test results of this report reference the Sporton Report No.: FZ122333-01. After evaluating, the test results comply with the test standard LP0002 (2020-07-01).

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
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: Wendy Pan

1 General Description

1.1 Information

1.1.1 RF General Information

Specification Items	Description	
Frequency Range	5250 MHz – 5350 MHz	
Power Type	From power adapter	
Channel Bandwidth	160 MHz operating channel bandwidth	
Operating Mode	☒ Master	
	☒ Mesh	
	☐ Client with radar detection	
	☐ Client without radar detection	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☒ With TPC	☐ Without TPC
Firmware Number	1.0.0 Build 20210315 Rel. 58881	

- VHT160 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- HEW160 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

Mode	Min Power (dBm)	Max Power (dBm)	Min EIRP (dBm)	Max EIRP (dBm)
802.11ax HEW160_Nss1,(MCS0)_4TX	-	-	-	-
5.25-5.35GHz	15.83	21.83	16.80	22.80

1.1.2 Antenna Information

Ant.	Port		Brand	Model Name	Type	Connector	Gain (dBi)	
	2.4GHz	5GHz					2.4GHz	5GHz
1	1	2	TP-Link	3101502756	PCB	I-PEX	1.93	0.90
2	2	1	TP-Link	3101502757	PCB	I-PEX	1.94	0.97
3	-	4	TP-Link	3101503632	PCB	I-PEX	-	0.97
4	-	3	TP-Link	3101503633	PCB	I-PEX	-	0.88

Note 1: The above information was declared by manufacturer.
Note 2:

For WLAN 2.4GHz, 11b/g/n/ax/VHT mode:

Port 1 and Port 2 could transmit/receive simultaneously.

For WLAN 5GHz, 11a/n/ac/ax mode (4TX/4RX):

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

1.1.3 Table for EUT Supports Functions

Function
AP Router
Mesh

1.1.4 DFS Band Carrier Frequencies

There is one bandwidth system: for 160MHz bandwidth system, use Channel 50

Frequency Band	Channel No.	Frequency
5250~5350 MHz Band 2	50	5250 MHz

1.2 Accessories

Accessories				
No.	**Equipment Name**	**Brand Name**	**Model Name**	**Rating**
1	Adapter	TP-Link	T120200-2B4	Input: 100-240V~ 50/60Hz, 0.8A Output: 12V, 2A

1.3 Support Equipment

<AP Router Mode>

Support Equipment					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
A	Notebook	DELL	E4300	N/A	Provided by Lab.
B	Notebook	DELL	E4300	N/A	Provided by Lab.
C	WLAN AP	ASUS	RT-AX88U	MSQ-RTAXHP00	Provided by Lab.

Item	Connection	Shielded	Length	Brand Name	Model Name	Remark
1	RJ-45 Cable	No	10m	Powersync	CLN5GBR9020	Provided by Lab.
2	RJ-45 to RS-232	N/A	1.5M	Z-TEK	ZC304	Provided by Lab.
3	Adapter	No	1.5	TP-Link	T120200-2B4	Provided by applicant.

<Mesh Mode>

Support Equipment					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
A	Notebook	DELL	E4300	N/A	Provided by Lab.
B	Notebook	DELL	E4300	N/A	Provided by Lab.
C	Notebook	DELL	E4300	N/A	Provided by Lab.
D	WLAN AP	tp-link	Deco X60	N/A	Provided by Lab.
E	WLAN AP	ASUS	RT-AX88U	MSQ-RTAXHP00	Provided by Lab.

Item	Connection	Shielded	Length	Brand Name	Model Name	Remark
1	RJ-45 Cable	No	10m	Powersync	CLN5GBR9020	Provided by Lab.
2	RJ-45 to RS-232	N/A	1.5M	Z-TEK	ZC304	Provided by Lab.
3	Adapter	No	1.5	TP-Link	T120200-2B4	Provided by applicant.

1.4 Applicable Standards

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

- LP0002 Section 5.7 (2020-07-01)
- 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	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)	
(TAF: 3787)	TEL: 886-3-656-9065	FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.	
	Conformity Assessment Body Identifier (CABID) TW3785 with ISED.	

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
<AP Router Mode>				
DFS	DF01-CB	Mason Chen	20.3-21.2 / 60-64	Mar. 29, 2021~ Apr. 16, 2021
<Mesh Mode>				
DFS	DF01-CB	Mason Chen	23.8-25.6 / 59-64	Mar. 29, 2021~ Apr. 23, 2021

2 Test Configuration of EUT

2.1 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
IEEE Std.	**Test Channel Freq. (MHz)**
802.11ax (HEW160)	5250 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 (HEW160)
1	AP Master Mode
2	Mesh Mode (Only Statistical Performance Check (Section 7.8.4) on one of the radar types)

Note: The applicant declared that the accessories of this case were for measurement only and it would not be marketed. The accessories will be provided and inspected by the laboratory (or the applicant).

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 ≥ 200 mW	-64 dBm
EIRP < 200 mW and PSD < 10dBm/MHz	-62 dBm
EIRP < 200 mW and PSD >= 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
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

3.1.3 Applicability of DFS Requirements during Normal Operation

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

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	$Roundup\left\{\left(\frac{1}{360}\right)\times\left(\frac{19\times10^6}{PRI}\right)\right\}$	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 / 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 / Burst Count) – (Total Burst Length) + (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

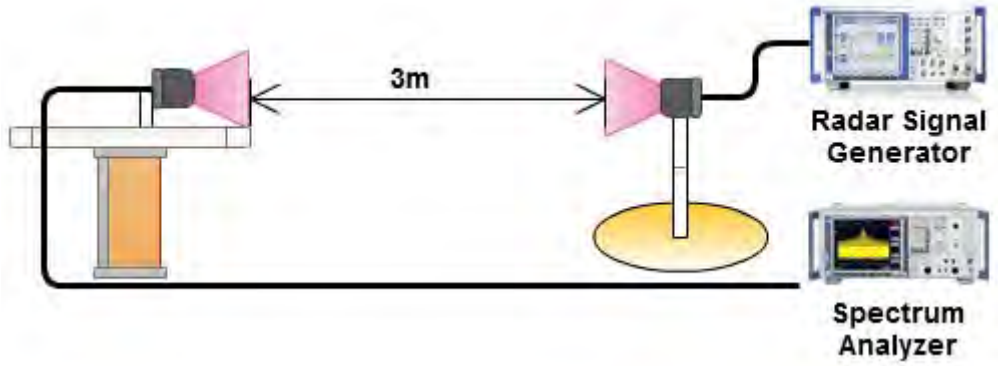
The FCC Type 6 waveform uses a static waveform with 100 bursts in the instruments ARB. In addition, the RF list mode is operated with a list containing 100 frequencies from a randomly generated list and it had be ensured that at least one of the random frequencies falls into the UNII Detection Bandwidth 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 is *-64 dBm + 0 [dBi] + 1 dB* = -63 dBm. That had been taken into account the output power range and antenna gain.	

3.2.5 Calibration Setup

Master Radiated Calibration Setup

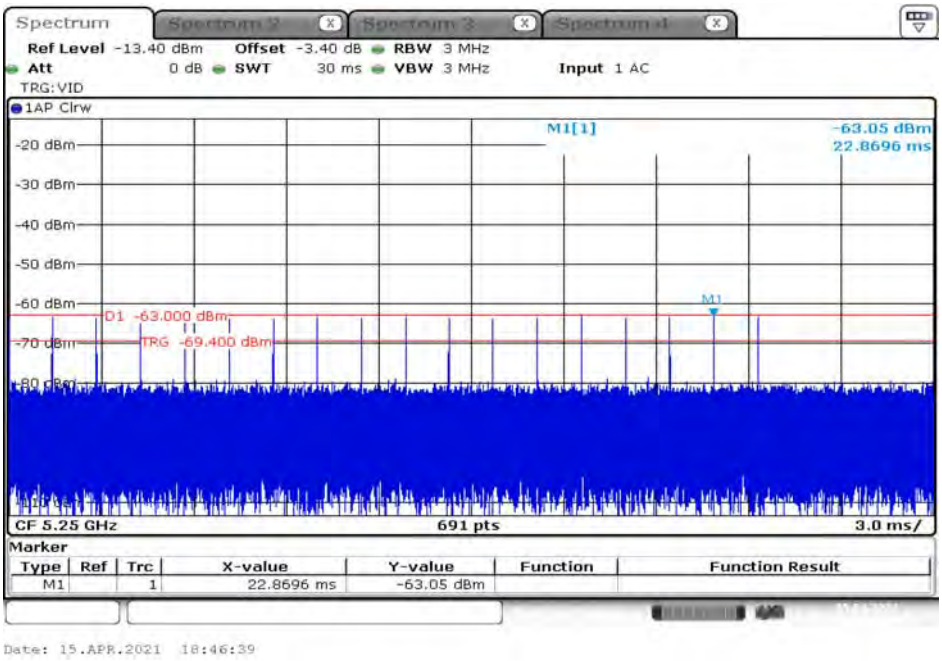


3.2.6 Radar Waveform calibration Plot

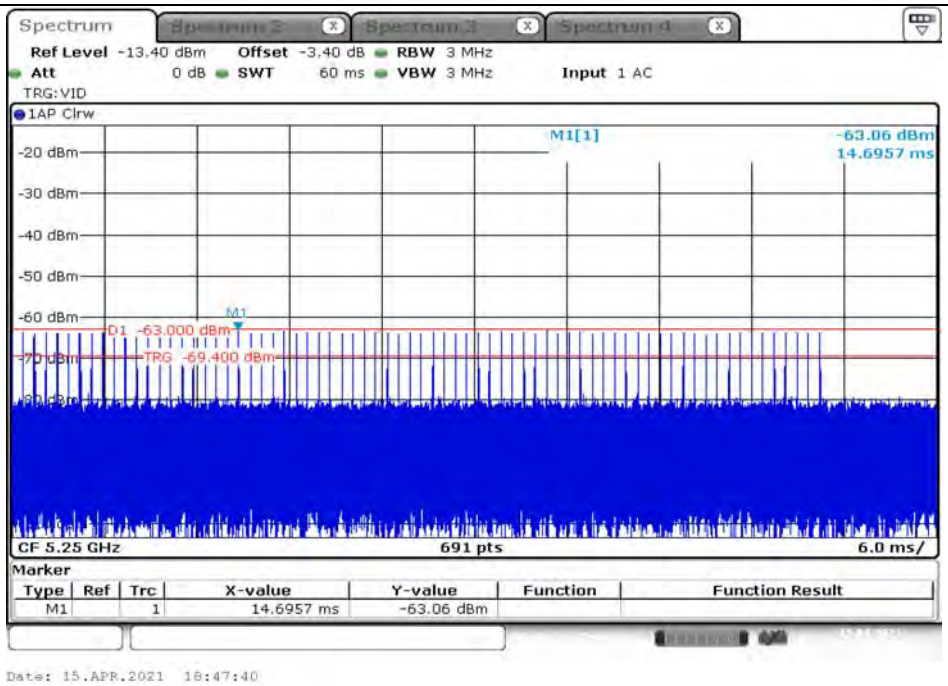
<AP Router Mode>

Test Frequency: 5250 MHz

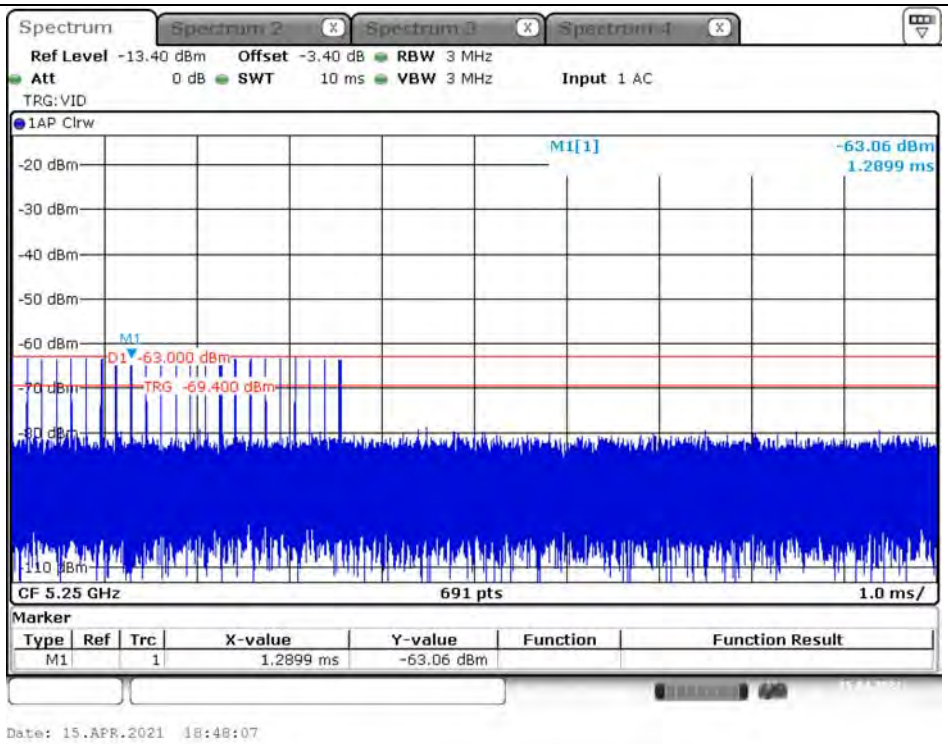
Radar #0 DFS detection threshold level



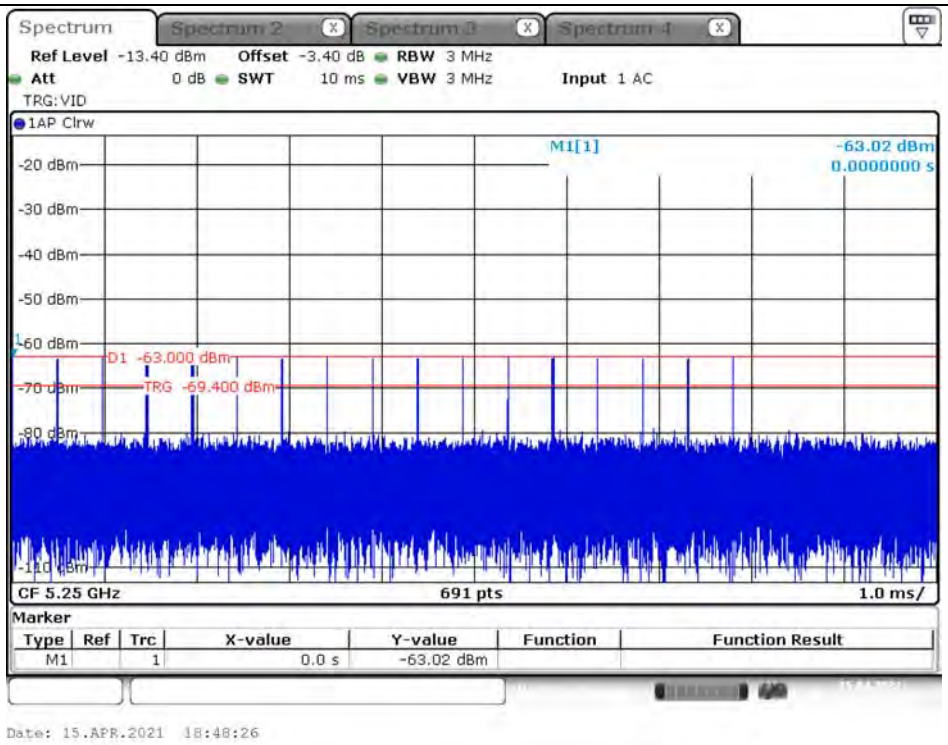
Radar #1 DFS detection threshold level



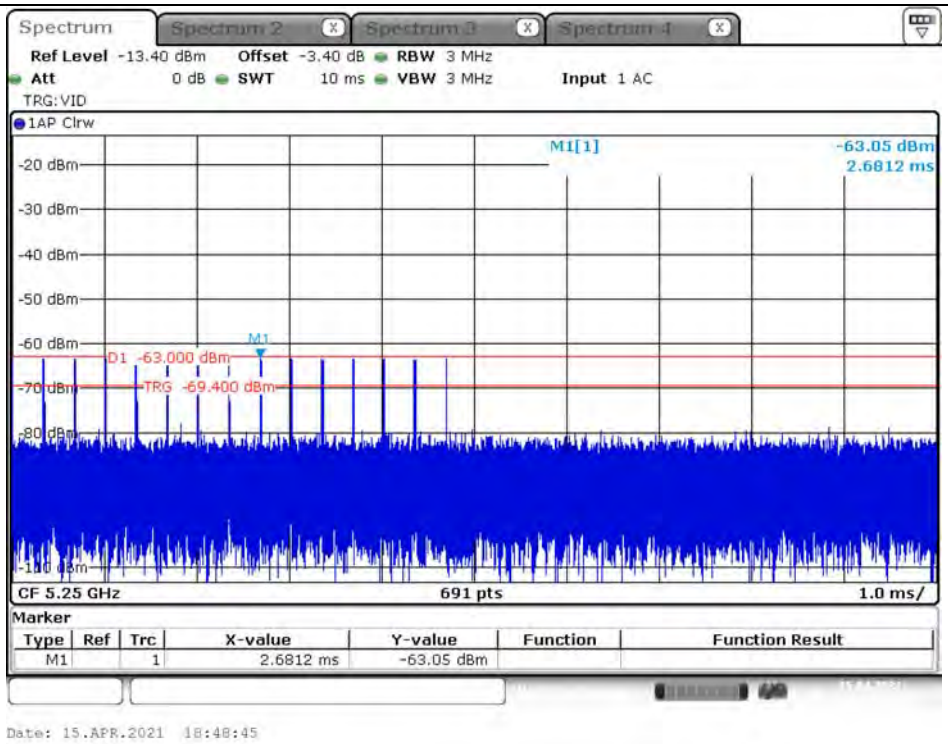
Radar #2 DFS detection threshold level



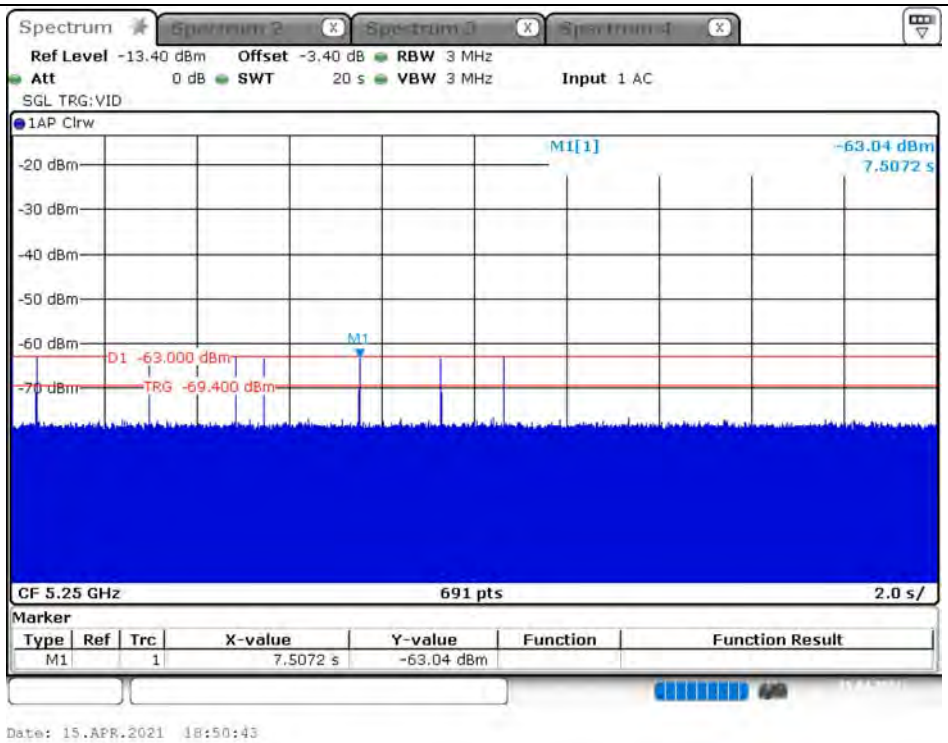
Radar #3 DFS detection threshold level



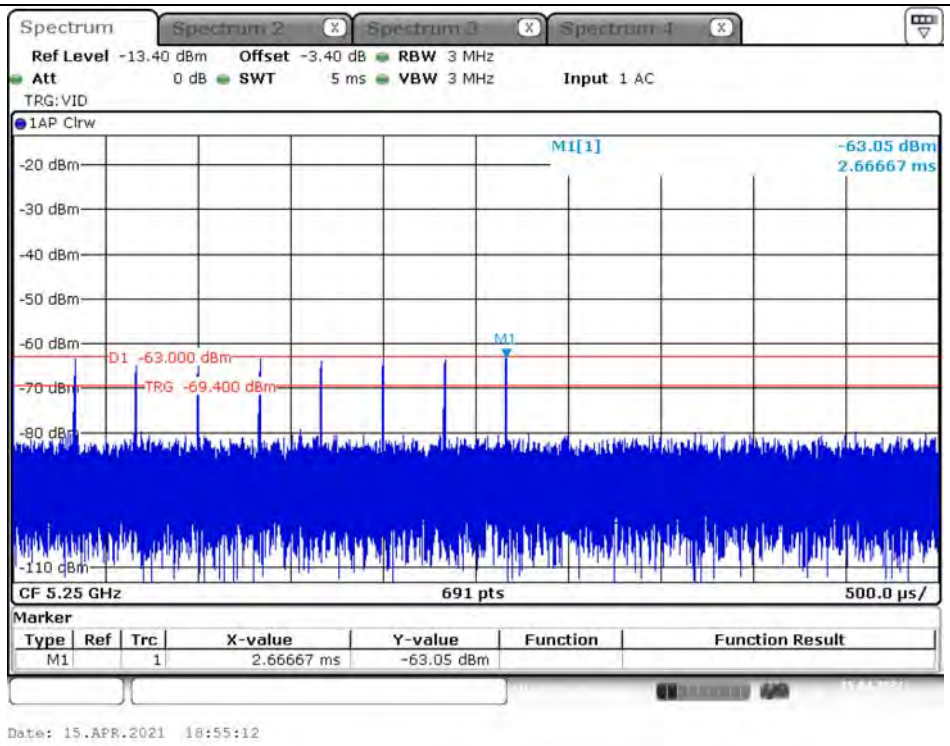
Radar #4 DFS detection threshold level



Radar #5 DFS detection threshold level

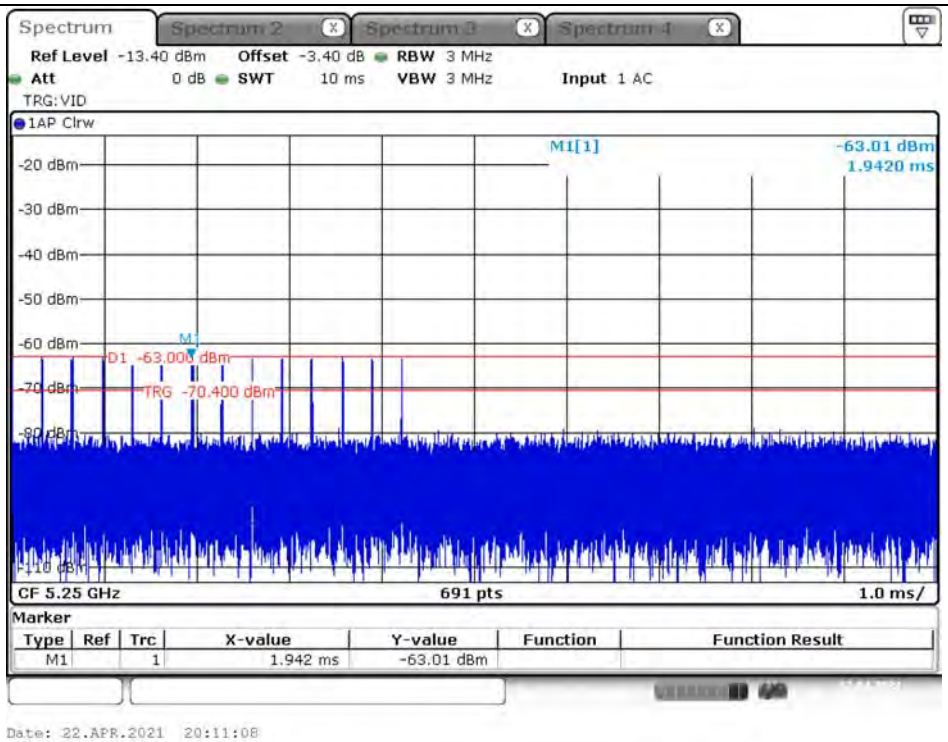


Radar #6 DFS detection threshold level



<Mesh Mode>

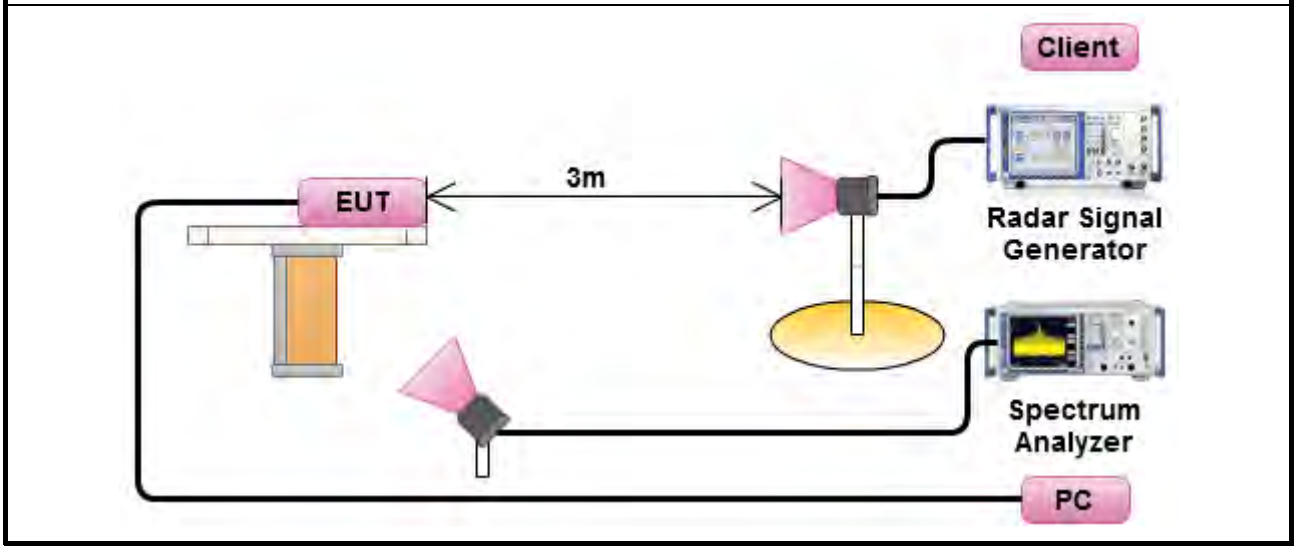
Radar #4 DFS detection threshold level



3.2.7 Test Setup

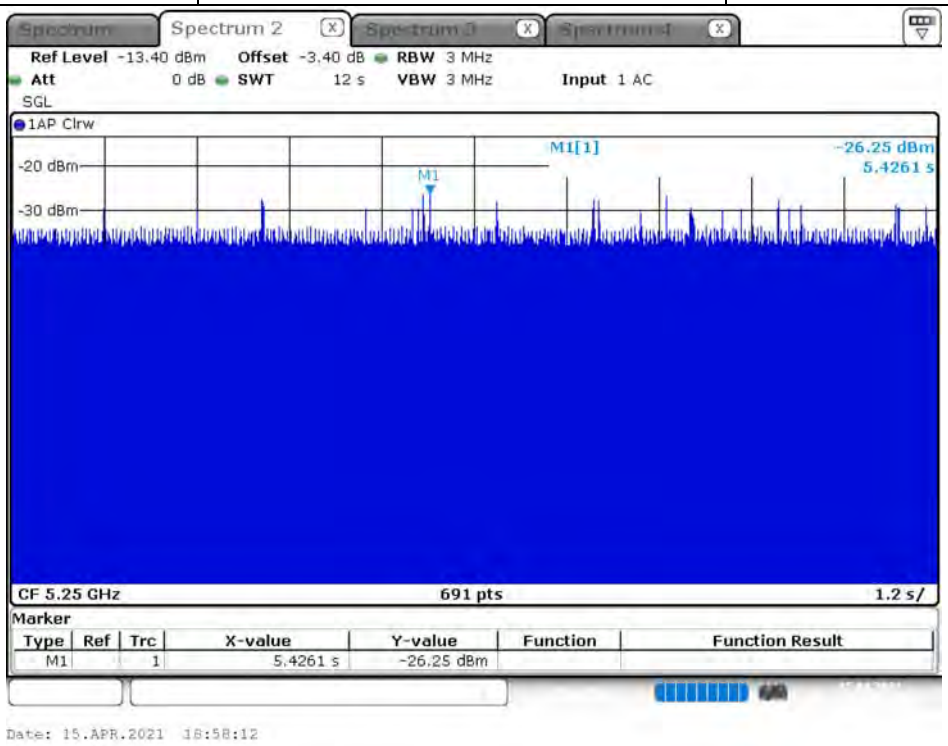
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move.

Master Radiated Measurement

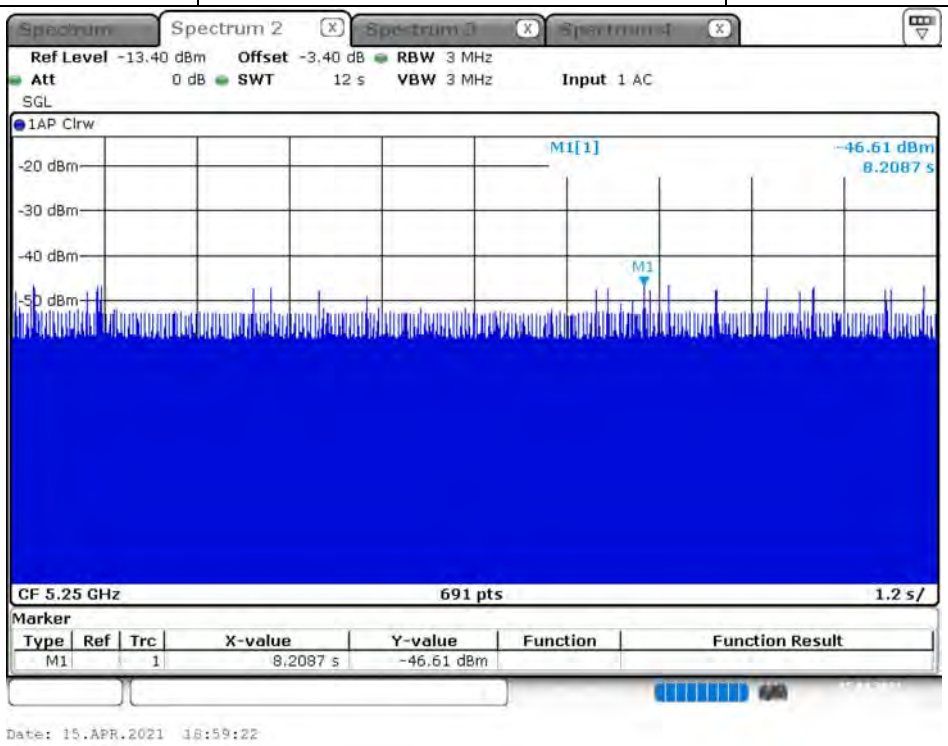


3.2.8 Data traffic Plot

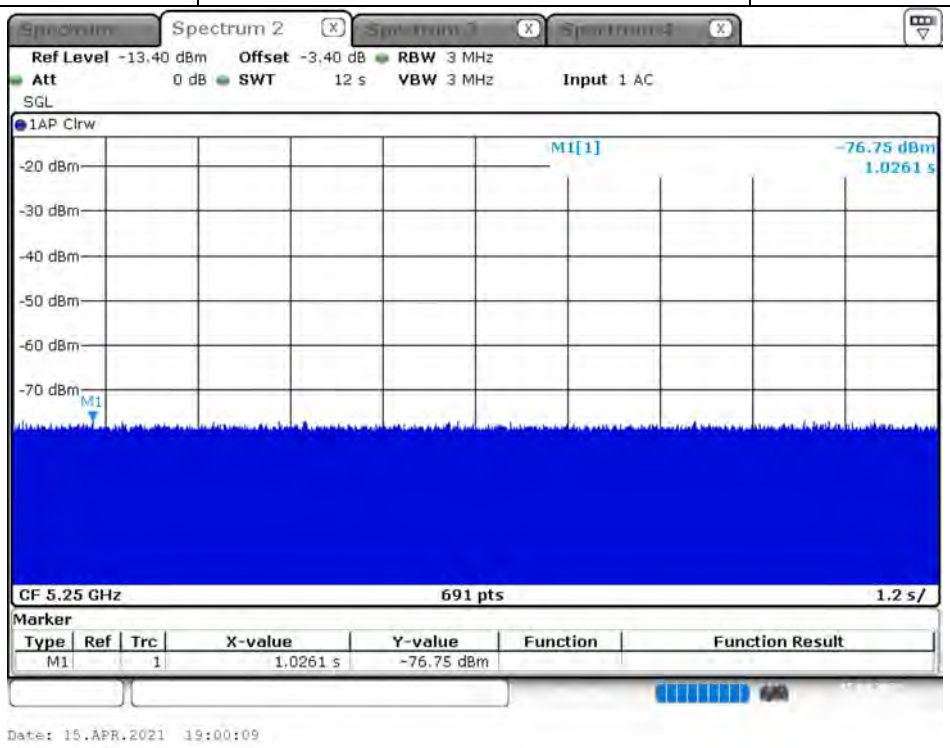
EUT Data traffic Plot	Modulation Mode: 802.11ax (HEW160)	Test Frequency: 5250 MHz



Client Data Traffic Plot	Modulation Mode: 802.11ax (HEW160)	Test Frequency: 5250 MHz



Without Data Traffic Plot	Modulation Mode: 802.11ax (HEW160)	Test Frequency: 5250 MHz



3.3 UNII Detection Bandwidth

3.3.1 UNII Detection Bandwidth Limit

Channel Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	UNII Detection Bandwidth Min. Limit (MHz)
160	74.674	75
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

EUT Frequency=5250 MHz											
Channel Bandwidth (MHz)	**160**										
Radar Frequency (MHz)	**DFS Detection Trials (1=Detection, 0= No Detection)**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**
5249	0	0	0	0	0	0	0	0	0	0	0
5250 (FL)	1	1	1	1	1	1	1	0	1	1	90
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	1	1	0	90
5331	0	0	0	0	0	0	0	0	0	0	0
Radar Type 0-Detection Bandwidth (MHz) = (FH-FL) = (5530MHz-5250MHz)=											80
UNII Detection Bandwidth Min. Limit (MHz) =											75
Test Result											**Complied**

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.

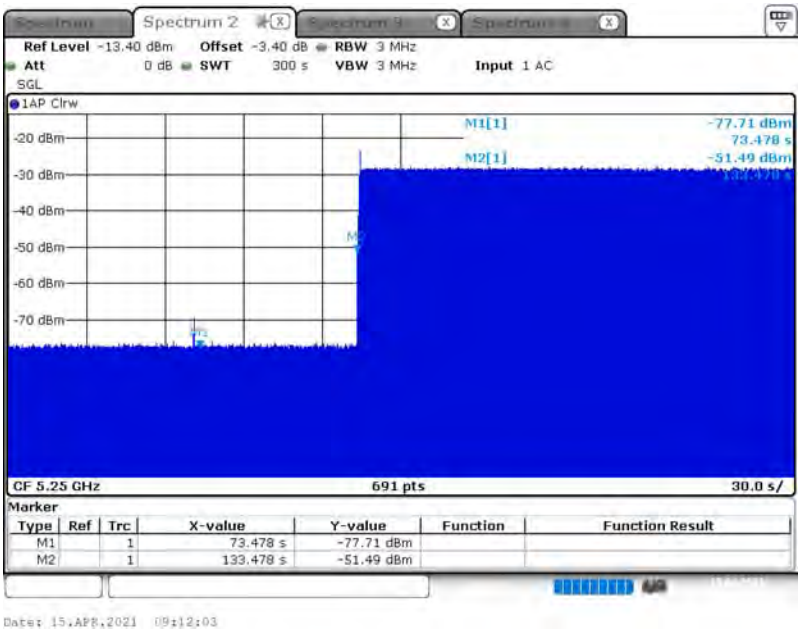
3.4.3 Test Procedures

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

Modulation Mode	Freq.	Radar Test Signal
802.11ax (HEW160)	5250 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 (73.478 sec). The initial CAC time of the EUT is indicated by marker 1 (73.478 sec). Initial beacons/data transmissions are indicated by marker 2 (133.478sec).

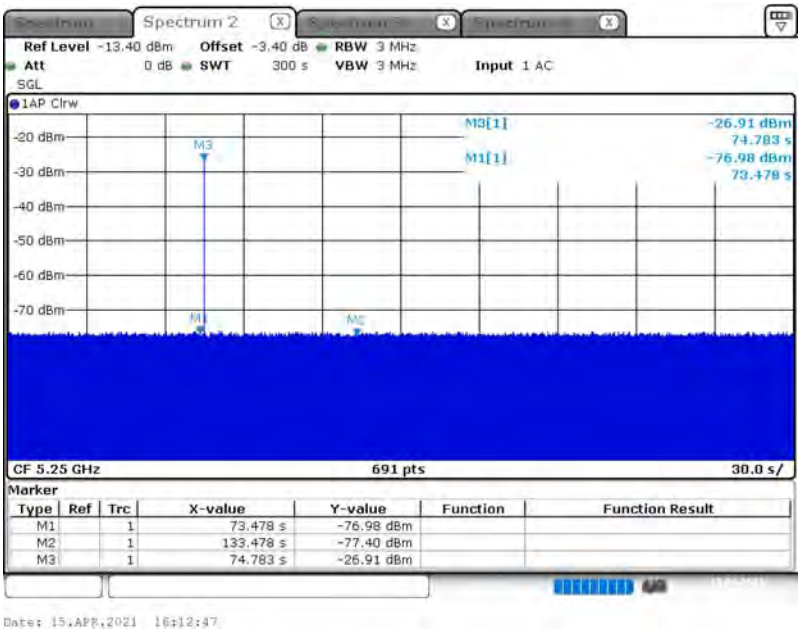


Test Result	Complied

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

Modulation Mode	Freq.	Radar Test Signal
802.11ax (HEW160)	5250 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 225.217 seconds after the radar Burst has been generated. Verify that during the 300 seconds measurement window no EUT transmissions occurred.

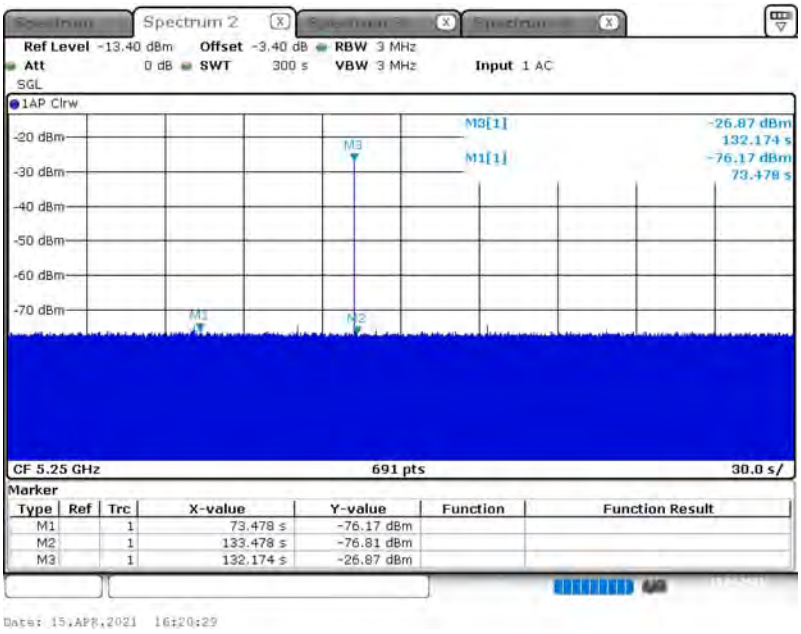


Test Result	Complied

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

Modulation Mode	Freq.	Radar Test Signal
802.11ax (HEW160)	5250 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 167.826 seconds after the radar Burst has been generated. Verify that during the 300 seconds measurement window no EUT transmissions occurred.



Test Result	Complied

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

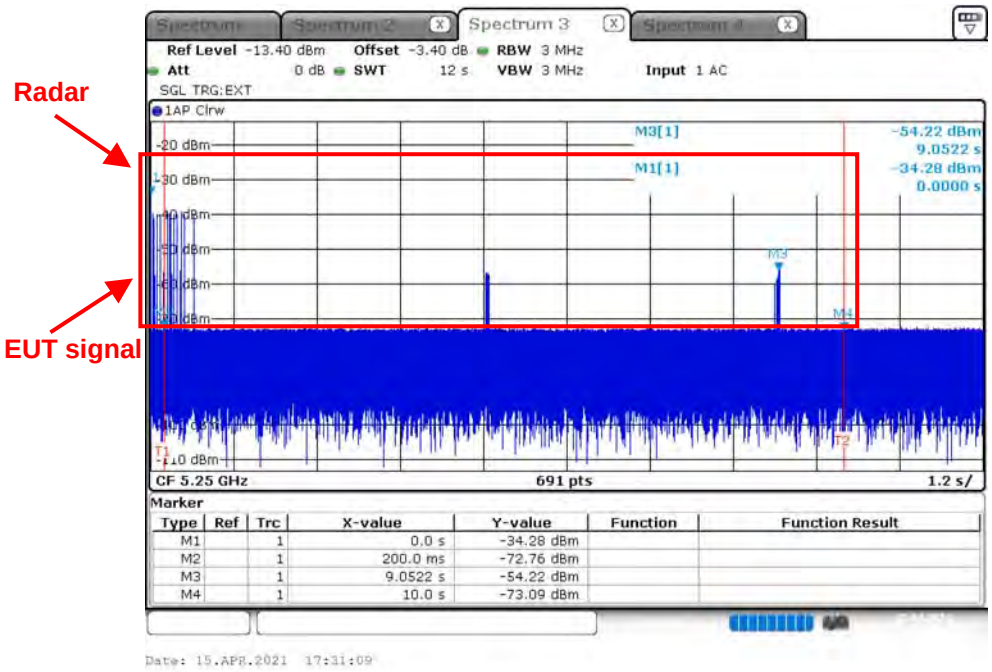
	Test Method
☒	Verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the 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. 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

Modulation Mode: 802.11ax (HEW160)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	**5250 MHz**	-
Channel Move Time (sec.)	9.052	< 10s

Modulation Mode	Freq.	Radar Type
802.11ax (HEW160)	5250 MHz	0



3.5.5 Test Result of Channel Closing Transmission Time

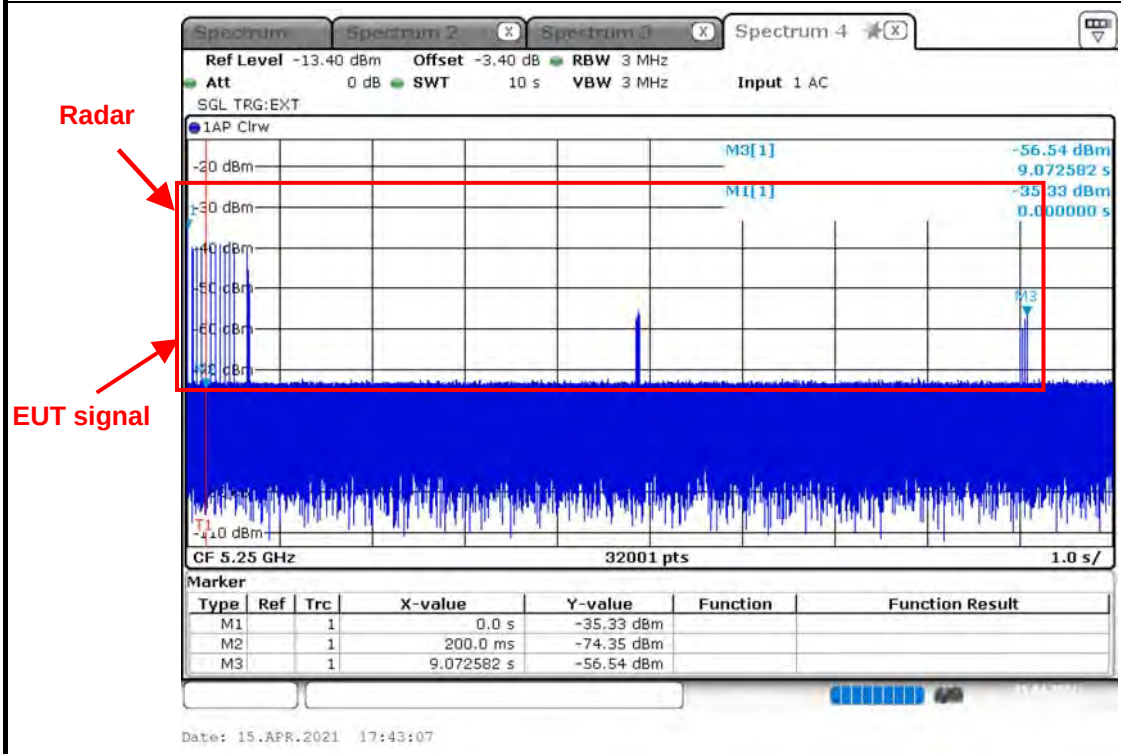
Modulation Mode: 802.11ax (HEW160)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	**5250 MHz**	-
Channel Closing Transmission Time (ms) (Note)	29.380	＜ 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.

Modulation Mode	Freq.	Radar Type
802.11ax (HEW160)	5250 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 (0.313 ms)= S (10000 ms) / B (32000)
C (29.380 ms) = N (94) X Dwell (0.313 ms)

3.5.6 Test Result of Non-Occupancy Period

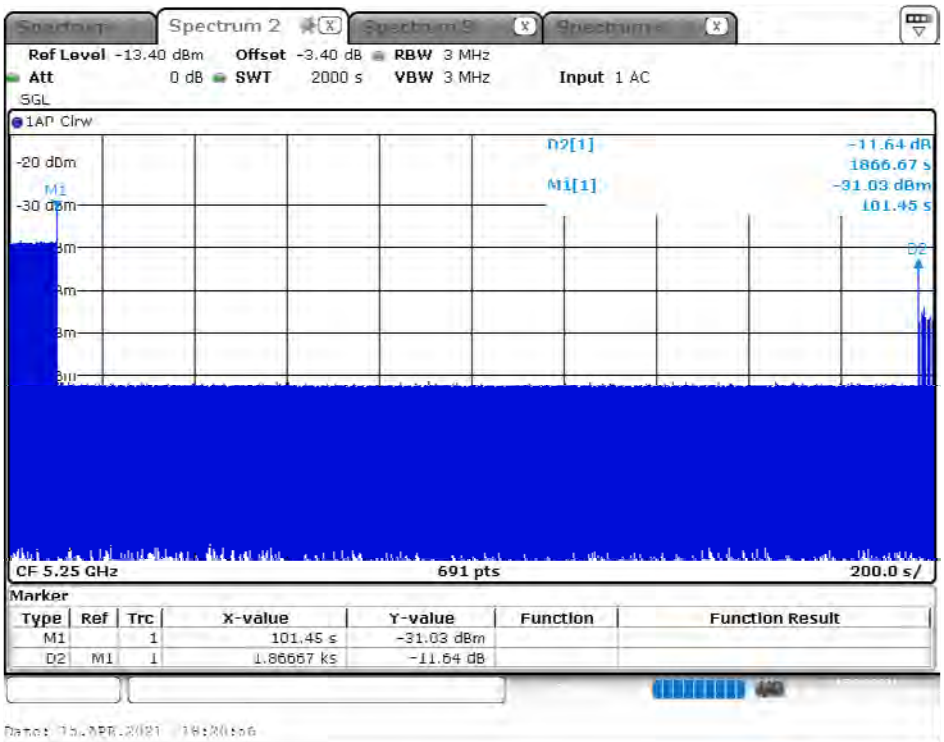
Modulation Mode: 802.11ax (HEW160)

Parameter	Test Result	Limit
	Type 0	
Test Channel (MHz)	**5250 MHz**	-
Non-Occupancy Period (min.)	≧30	≧ 30 min

Modulation Mode	Freq.
802.11ax (HEW160)	5250 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.



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:

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

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

<AP Router Mode>

Modulation Mode: 802.11ax (HEW160)

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	5302	1	1930.5	518	1
2	5344	23	326.2	3066	1
3	5477	19	1139.0	878	0
4	5530	12	1355.0	738	1
5	5437	4	1730.1	578	1
6	5371	8	1519.8	658	1
7	5434	15	1253.1	798	1
8	5361	6	1618.1	618	1
9	5462	14	1285.3	778	1
10	5364	3	1792.1	558	0
11	5428	13	1319.3	758	1
12	5396	9	1474.9	678	1
13	5350	7	1567.4	638	1
14	5516	17	1193.3	838	0
15	5491	10	1432.7	698	1
16	5435	-	1692.0	591	1
17	5456	-	328.1	3048	1
18	5325	-	373.4	2678	1
19	5289	-	574.4	1741	1
20	5362	-	1216.5	822	1
21	5425	-	801.3	1248	1
22	5393	-	488.5	2047	1
23	5367	-	956.0	1046	0
24	5478	-	517.6	1932	1
25	5399	-	1422.5	703	1
26	5420	-	542.0	1845	1
27	5478	-	741.3	1349	1
28	5380	-	881.8	1134	0
29	5250	-	427.4	2340	1
30	5282	-	628.9	1590	1
Detection Percentage (%)					83.333
Limit					60%
Test Result					**Complied**

Type 2 Radar Statistical Performance

Trial #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5313	2.6	221	23	1
2	5261	4.6	198	27	1
3	5328	1.1	184	29	1
4	5250	4.8	203	24	1
5	5287	2.4	162	25	1
6	5286	3.4	204	28	1
7	5306	2.3	170	27	0
8	5313	3.5	184	23	1
9	5288	4.9	150	27	1
10	5319	4.6	211	29	1
11	5268	2.9	158	23	1
12	5278	2.6	226	27	1
13	5285	1.6	204	26	1
14	5272	3.9	181	25	1
15	5283	4.6	202	24	1
16	5269	4.1	194	27	1
17	5324	2.3	193	28	1
18	5321	3.9	173	29	1
19	5305	4.3	188	23	1
20	5299	1.5	215	26	1
21	5259	4.9	227	27	1
22	5327	1.1	199	23	1
23	5299	4.5	155	29	1
24	5257	4.0	190	27	0
25	5255	2.4	151	23	1
26	5257	2.5	180	28	1
27	5283	2.5	228	23	1
28	5276	2.5	203	25	1
29	5304	1.5	188	25	1
30	5303	1.9	217	24	1
Detection Percentage (%)					93.333
Limit					60%
Test Result					**Complied**

Type 3 Radar Statistical Performance

Trial #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5287	8.0	205	16	1
2	5304	6.7	382	18	1
3	5305	8.6	418	16	0
4	5250	9.4	351	17	1
5	5327	7.4	383	18	1
6	5275	9.8	232	16	0
7	5318	9.1	377	17	1
8	5277	9.6	457	16	1
9	5308	8.0	471	18	1
10	5297	9.0	304	18	1
11	5328	8.0	316	17	0
12	5290	9.8	325	16	1
13	5303	8.0	409	17	1
14	5272	9.9	200	17	1
15	5309	8.8	458	16	1
16	5298	8.0	232	18	1
17	5284	8.3	250	16	1
18	5268	8.7	270	16	1
19	5287	7.7	350	17	0
20	5312	7.1	230	16	1
21	5275	7.3	416	18	1
22	5300	7.6	498	18	0
23	5270	7.3	286	17	1
24	5276	7.3	287	16	1
25	5295	7.5	462	17	1
26	5276	6.2	300	17	1
27	5252	6.4	323	18	1
28	5298	7.1	420	16	0
29	5279	7.2	395	18	1
30	5280	8.4	377	16	1
Detection Percentage (%)					80.000
Limit					60%
Test Result					**Complied**

Type 4 Radar Statistical Performance

Trial #	*Test Freq. (MHz)*	*Pulse Width (us)*	*PRI (us)*	*Pulses / Burst*	*1=Detection 0=No Detection*
1	5256	18.0	242	15	0
2	5292	19.9	279	12	1
3	5304	12.9	487	14	1
4	5318	15.0	452	13	0
5	5271	16.3	230	12	1
6	5297	19.8	238	13	0
7	5324	18.2	420	16	1
8	5279	16.3	452	15	1
9	5275	14.2	495	12	0
10	5308	17.8	228	16	1
11	5260	19.1	211	16	1
12	5296	18.4	283	15	0
13	5284	11.8	411	12	1
14	5290	14.2	284	13	1
15	5274	13.9	202	12	0
16	5281	17.8	340	14	1
17	5290	15.6	290	16	1
18	5253	14.6	250	16	1
19	5272	14.4	484	15	0
20	5275	18.9	387	13	1
21	5302	11.1	348	15	1
22	5323	13.8	291	16	0
23	5304	14.3	295	12	1
24	5263	12.5	300	12	1
25	5283	12.5	322	14	1
26	5261	12.5	383	13	0
27	5297	15.7	322	16	1
28	5309	19.8	469	13	1
29	5250	18.6	406	15	1
30	5312	15.9	238	14	0
Detection Percentage (%)					66.667
Limit					60%
Test Result					**Complied**

Total Type 1~4 Radar Statistical Performance

Radar Type #	Detection Percentage (%)
1	83.333
2	93.333
3	80.000
4	66.667
Aggregate (Radar Types 1-4)	80.833
Limit	80%
Test Result	**Complied**

Type 5 Radar Statistical Performance

Center Freq. (MHz)	Low Edge (MHz)	High Edge (MHz)	VSG Freq. (MHz)	Detection
5250	5250	5330		
Trial	Chirp	Offset		
1	5	2	5250.0	1
2	20	8	5250.0	1
3	7	2.8	5250.0	1
4	8	3.2	5250.0	1
5	9	3.6	5250.0	1
6	10	4	5250.0	1
7	11	4.4	5250.0	1
8	12	4.8	5250.0	1
9	13	5.2	5250.0	1
10	14	5.6	5250.0	1
11	15	6	5256.0	0
12	16	6.4	5256.4	1
13	17	6.8	5256.8	1
14	20	8	5258.0	0
15	19	7.6	5257.6	0
16	18	7.2	5257.2	1
17	17	6.8	5256.8	1
18	16	6.4	5256.4	1
19	15	6	5256.0	1
20	14	5.6	5255.6	1
21	13	5.2	5324.8	1
22	12	4.8	5325.2	1
23	11	4.4	5325.6	1
24	10	4	5326.0	1
25	9	3.6	5326.4	1
26	8	3.2	5326.8	1
27	18	7.2	5322.8	1
28	19	7.6	5322.4	1
29	20	8	5322.0	1
30	5	2	5328.0	1
Total				27
Detection Percentage (%)				90%
Limit				80%
Test Result				**Complied**

Trial Number			1			
Number of Bursts in Trial			8			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	62.1	5	-	-	1091
2	2	56	5	1729	-	133
3	2	91.3	5	1230	-	1057
4	3	50.7	5	1762	1616	1442
5	2	92.6	5	1723	-	544
6	2	87.3	5	1302	-	1089
7	2	59.5	5	1291	-	1374
8	2	52.2	5	1653	-	1237
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			2			
Number of Bursts in Trial			9			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	3	90	20	1007	1326	30
2	2	73.7	20	1785	-	979
3	1	78.1	20	-	-	683
4	2	92.4	20	1281	-	950
5	1	61.2	20	-	-	612
6	3	67.2	20	1525	1870	17
7	1	78.5	20	-	-	429
8	2	60.3	20	1931	-	936
9	3	92.9	20	1403	1476	548
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			3			
Number of Bursts in Trial			10			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	3	63.4	7	1574	1607	801
2	1	98	7	-	-	966
3	1	58.7	7	-	-	185
4	1	88	7	-	-	1012
5	3	79.5	7	1562	1370	943
6	3	57.1	7	1900	1188	686
7	2	64.4	7	1090	-	599
8	1	78.7	7	-	-	1089
9	1	69.3	7	-	-	188
10	3	55.3	7	1375	1691	933
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			4			
Number of Bursts in Trial			11			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	74.3	8	1642	-	24
2	1	83.1	8	-	-	985
3	2	59.5	8	1680	-	988
4	2	59.8	8	1786	-	800
5	2	77.6	8	1617	-	339
6	2	79.9	8	1553	-	1040
7	1	56	8	-	-	544
8	3	71.4	8	1406	1927	452
9	1	97.4	8	-	-	204
10	2	98.3	8	1037	-	926
11	1	63.6	8	-	-	1052
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			5			
Number of Bursts in Trial			12			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	50	9	-	-	557
2	2	62.5	9	1731	-	567
3	2	55.4	9	1070	-	460
4	1	65.7	9	-	-	4
5	2	58	9	1512	-	64
6	2	60.9	9	1230	-	650
7	3	89.6	9	1598	1738	235
8	3	84.4	9	1271	1617	873
9	3	72.3	9	1498	1321	901
10	1	58.9	9	-	-	663
11	2	74.8	9	1584	-	919
12	1	71.8	9	-	-	375
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			6			
Number of Bursts in Trial			13			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	88.1	10	1257	-	846
2	1	58.7	10	-	-	725
3	2	97.1	10	1037	-	30
4	3	83.1	10	1029	1106	490
5	1	62.1	10	-	-	262
6	2	71.4	10	1058	-	283
7	2	86.3	10	1867	-	49
8	3	77.3	10	1418	1876	634
9	1	78.9	10	-	-	304
10	3	79.2	10	1055	1572	564
11	3	52	10	1582	1836	852
12	3	56.5	10	1195	1542	525
13	3	100	10	1638	1729	750
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			7			
Number of Bursts in Trial			14			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	92.7	11	1208	-	231
2	2	81.3	11	1144	-	804
3	2	60.4	11	1555	-	34
4	2	62.1	11	1320	-	427
5	1	50	11	-	-	577
6	3	65.9	11	1020	1365	3
7	2	73.8	11	1308	-	51
8	2	74.3	11	1143	-	360
9	1	62.9	11	-	-	394
10	2	74.8	11	1404	-	317
11	2	69.7	11	1309	-	532
12	2	69.8	11	1688	-	339
13	2	77.4	11	1857	-	381
14	1	55.1	11	-	-	426
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			8			
Number of Bursts in Trial			15			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	91.7	12	-	-	776
2	2	90	12	1196	-	187
3	3	92.3	12	1486	1853	448
4	2	66.8	12	1545	-	702
5	1	64	12	-	-	403
6	3	95.4	12	1123	1473	230
7	3	66.8	12	1867	1401	604
8	3	67.7	12	1472	1397	38
9	1	68.2	12	-	-	735
10	2	82.2	12	1297	-	610
11	1	92.1	12	-	-	618
12	2	57	12	1764	-	705
13	2	58.5	12	1310	-	22
14	3	85.5	12	1630	1447	641
15	2	82.2	12	1371	-	109
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			9			
Number of Bursts in Trial			16			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	74.4	13	1707	-	442
2	2	63.6	13	1725	-	280
3	2	71.3	13	1704	-	459
4	3	77.6	13	1063	1405	197
5	3	65.2	13	1731	1294	101
6	3	55.1	13	1109	1549	17
7	2	96.8	13	1034	-	131
8	3	80.8	13	1533	1051	365
9	1	60.4	13	-	-	222
10	2	61.8	13	1312	-	371
11	2	71.3	13	1657	-	33
12	2	98.1	13	1024	-	291
13	1	57.9	13	-	-	188
14	1	91.8	13	-	-	163
15	2	56.7	13	1259	-	426
16	2	89.7	13	1690	-	606
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			10			
Number of Bursts in Trial			17			
Chirp Center Frequency			5250			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	74.4	14	1107	-	462
2	1	87.6	14	-	-	653
3	2	61.7	14	1741	-	457
4	2	57.5	14	1566	-	388
5	2	66.1	14	1855	-	63
6	3	70.1	14	1044	1012	136
7	1	66.4	14	-	-	343
8	1	59.2	14	-	-	349
9	2	88.3	14	1240	-	362
10	1	64.7	14	-	-	221
11	2	73	14	1703	-	144
12	2	81.7	14	1450	-	671
13	3	70.1	14	1741	1278	320
14	1	63.6	14	-	-	196
15	1	58.7	14	-	-	413
16	2	65.9	14	1478	-	170
17	1	72.7	14	-	-	564
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			11			
Number of Bursts in Trial			18			
Chirp Center Frequency			5256			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	72.1	15	1193	-	130
2	3	76.3	15	1484	1390	114
3	1	86.1	15	-	-	14
4	1	73.2	15	-	-	604
5	1	81.2	15	-	-	548
6	2	99.5	15	1398	-	173
7	1	93.9	15	-	-	262
8	2	75.9	15	1921	-	38
9	3	79.2	15	1100	1429	84
10	3	77	15	1166	1799	610
11	1	91.8	15	-	-	339
12	3	56.8	15	1330	1556	580
13	2	83.1	15	1556	-	295
14	2	63	15	1552	-	156
15	1	65.7	15	-	-	439
16	1	64.5	15	-	-	188
17	1	88.5	15	-	-	419
18	1	60.6	15	-	-	205
Detection Check (1=Detection; 0=No Detection)						0

Trial Number			12			
Number of Bursts in Trial			19			
Chirp Center Frequency			5256			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	90.5	16	1299	-	381
2	2	88.4	16	1418	-	327
3	2	53.7	16	1055	-	536
4	1	80.5	16	-	-	285
5	1	50.4	16	-	-	398
6	2	61.2	16	1749	-	439
7	2	78.8	16	1065	-	129
8	3	75	16	1748	1820	325
9	2	96.7	16	1254	-	440
10	3	76.3	16	1848	1106	397
11	1	73.3	16	-	-	232
12	2	92.4	16	1317	-	91
13	2	92.4	16	1854	-	256
14	3	64.4	16	1240	1634	582
15	2	67.3	16	1473	-	117
16	2	84.1	16	1795	-	202
17	1	80.9	16	-	-	135
18	1	74.6	16	-	-	396
19	2	97.6	16	1805	-	615
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			13			
Number of Bursts in Trial			20			
Chirp Center Frequency			5257			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	66.1	17	1417	-	388
2	2	86.7	17	1693	-	348
3	2	70.5	17	1263	-	215
4	2	78	17	1446	-	28
5	2	66	17	1185	-	585
6	2	80.6	17	1855	-	65
7	1	95.5	17	-	-	92
8	1	98.8	17	-	-	68
9	3	64.3	17	1641	1108	517
10	1	75.1	17	-	-	121
11	2	72.6	17	1499	-	448
12	1	60.3	17	-	-	567
13	2	54.9	17	1056	-	245
14	2	98.8	17	1023	-	584
15	2	60.9	17	1243	-	579
16	2	62.7	17	1226	-	464
17	1	80.1	17	-	-	89
18	2	70.9	17	1711	-	153
19	1	90.7	17	-	-	282
20	1	98.9	17	-	-	71
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			14			
Number of Bursts in Trial			8			
Chirp Center Frequency			5258			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	67.5	20	1542	-	947
2	3	83.6	20	1272	1696	124
3	2	93.2	20	1877	-	701
4	1	55.6	20	-	-	1123
5	3	84.2	20	1733	1619	756
6	3	69.1	20	1612	1071	1
7	2	66.9	20	1905	-	7
8	3	86.8	20	1697	1621	1082
Detection Check (1=Detection; 0=No Detection)						0

Trial Number			15			
Number of Bursts in Trial			9			
Chirp Center Frequency			5258			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	62.2	19	1571	-	949
2	2	85	19	1669	-	189
3	2	64.5	19	1505	-	176
4	2	50.4	19	1325	-	538
5	2	66.1	19	1483	-	908
6	2	71.2	19	1110	-	1017
7	3	53.7	19	1445	1677	492
8	3	62.5	19	1596	1341	349
9	3	62	19	1929	1221	1105
Detection Check (1=Detection; 0=No Detection)						0

Trial Number			16			
Number of Bursts in Trial			10			
Chirp Center Frequency			5257			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	80.5	18	1910	-	284
2	2	64.2	18	1661	-	751
3	2	90.1	18	1041	-	491
4	2	69.8	18	1495	-	107
5	1	73.1	18	-	-	490
6	3	77.2	18	1418	1145	1155
7	3	52.6	18	1732	1787	772
8	2	71.4	18	1562	-	121
9	2	89.8	18	1491	-	89
10	2	76.4	18	1355	-	615
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			17			
Number of Bursts in Trial			11			
Chirp Center Frequency			5257			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	51.2	17	1236	-	740
2	1	71.7	17	-	-	941
3	2	74.7	17	1164	-	370
4	2	50.9	17	1919	-	371
5	2	65.2	17	1206	-	1033
6	2	98	17	1182	-	346
7	2	58.7	17	1612	-	639
8	1	63.8	17	-	-	1056
9	3	86.3	17	1545	1065	205
10	1	94.4	17	-	-	753
11	3	88.5	17	1699	1319	58
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			18			
Number of Bursts in Trial			12			
Chirp Center Frequency			5256			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	88.7	16	1405	-	448
2	3	90.2	16	1544	1235	621
3	1	96.5	16	-	-	512
4	2	80.5	16	1090	-	321
5	2	63.7	16	1268	-	798
6	1	53.4	16	-	-	809
7	2	52.3	16	1043	-	301
8	3	54.7	16	1701	1104	796
9	3	75.6	16	1923	1729	669
10	2	59.2	16	1244	-	369
11	1	56.3	16	-	-	51
12	2	87.8	16	1608	-	733
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			19			
Number of Bursts in Trial			13			
Chirp Center Frequency			5256			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	68.2	15	1104	-	229
2	2	58.4	15	1627	-	488
3	3	74.7	15	1861	1015	137
4	2	58.2	15	1593	-	520
5	1	51.6	15	-	-	799
6	2	94.7	15	1469	-	43
7	2	70.7	15	1091	-	126
8	2	82.9	15	1472	-	607
9	3	62.7	15	1168	1453	527
10	2	63.1	15	1529	-	143
11	1	96.1	15	-	-	176
12	2	57	15	1457	-	882
13	3	95.6	15	1707	1501	214
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			20			
Number of Bursts in Trial			14			
Chirp Center Frequency			5511			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	95.7	14	-	-	117
2	1	93.1	14	-	-	720
3	1	55.8	14	-	-	297
4	1	76.7	14	-	-	284
5	2	68	14	1686	-	472
6	3	94.1	14	1796	1393	264
7	2	53.9	14	1293	-	525
8	1	99.3	14	-	-	155
9	2	73.3	14	1458	-	65
10	2	93.3	14	1196	-	451
11	3	55.8	14	1895	1034	243
12	1	66.4	14	-	-	228
13	2	65.6	14	1732	-	746
14	2	76.5	14	1187	-	522
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			21			
Number of Bursts in Trial			15			
Chirp Center Frequency			5325			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	85.1	13	-	-	565
2	2	72.5	13	1648	-	211
3	1	67.5	13	-	-	348
4	2	56.1	13	1360	-	156
5	1	71.1	13	-	-	718
6	2	93.1	13	1391	-	400
7	1	56.5	13	-	-	482
8	1	63.8	13	-	-	703
9	2	67.4	13	1727	-	780
10	1	52.3	13	-	-	102
11	3	62.4	13	1228	1715	304
12	2	53.3	13	1630	-	57
13	2	83.1	13	1205	-	768
14	2	93.7	13	1085	-	461
15	2	90.7	13	1297	-	746
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			22			
Number of Bursts in Trial			16			
Chirp Center Frequency			5325			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	98.8	12	1439	-	95
2	1	54.5	12	-	-	676
3	2	80.5	12	1360	-	8
4	2	55.9	12	1906	-	373
5	2	72.1	12	1623	-	254
6	2	84.4	12	1604	-	480
7	1	78.5	12	-	-	663
8	1	88	12	-	-	314
9	2	74.7	12	1157	-	596
10	2	97.1	12	1673	-	264
11	1	81.6	12	-	-	740
12	1	83.6	12	-	-	163
13	3	87.6	12	1757	1322	628
14	2	58.5	12	1372	-	132
15	3	91.8	12	1767	1183	106
16	2	58.8	12	1432	-	659
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			23			
Number of Bursts in Trial			17			
Chirp Center Frequency			5326			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	96	11	-	-	284
2	2	92.5	11	1241	-	488
3	2	89.5	11	1347	-	76
4	2	74.8	11	1607	-	688
5	2	60.6	11	1523	-	28
6	2	71.5	11	1659	-	383
7	2	71.1	11	1454	-	182
8	1	98.7	11	-	-	20
9	2	85.1	11	1770	-	576
10	2	89.2	11	1086	-	410
11	2	60.7	11	1101	-	458
12	2	75.2	11	1719	-	348
13	2	75.7	11	1799	-	481
14	3	56.7	11	1132	1884	587
15	2	65	11	1885	-	480
16	2	64.6	11	1910	-	195
17	3	69.9	11	1410	1190	396
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			24			
Number of Bursts in Trial			18			
Chirp Center Frequency			5326			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	3	83.8	10	1290	1021	536
2	2	66.9	10	1112	-	44
3	3	91	10	1220	1504	611
4	2	86.1	10	1678	-	456
5	3	65.5	10	1928	1222	330
6	1	62.6	10	-	-	297
7	3	68.7	10	1505	1200	351
8	3	59.2	10	1452	1114	230
9	1	73.9	10	-	-	222
10	1	77.2	10	-	-	57
11	2	96.4	10	1357	-	399
12	2	99.9	10	1173	-	299
13	2	99.9	10	1520	-	464
14	1	86.7	10	-	-	294
15	1	92.6	10	-	-	653
16	1	77.1	10	-	-	550
17	2	81.1	10	1664	-	566
18	3	68.4	10	1536	1309	580
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			25			
Number of Bursts in Trial			19			
Chirp Center Frequency			5326			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	3	68.2	9	1723	1868	471
2	3	83.7	9	1711	1405	368
3	2	69.7	9	1781	-	425
4	1	59.7	9	-	-	440
5	2	96.7	9	1484	-	123
6	2	95.8	9	1319	-	261
7	3	71.3	9	1095	1354	332
8	3	53.2	9	1527	1427	427
9	2	69.5	9	1771	-	397
10	3	63.9	9	1075	1447	67
11	2	93.4	9	1783	-	174
12	2	77.3	9	1564	-	17
13	2	73.1	9	1294	-	216
14	1	77.4	9	-	-	292
15	3	57.2	9	1722	1886	619
16	2	68.7	9	1629	-	233
17	1	60.8	9	-	-	226
18	3	69.7	9	1128	1224	599
19	1	62.2	9	-	-	433
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			26			
Number of Bursts in Trial			20			
Chirp Center Frequency			5327			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	80.5	8	-	-	90
2	3	62.6	8	1406	1343	319
3	3	85.6	8	1190	1529	384
4	2	83.9	8	1208	-	567
5	2	92.4	8	1488	-	234
6	2	54	8	1529	-	535
7	3	81.3	8	1501	1812	325
8	1	98.5	8	-	-	532
9	1	85.8	8	-	-	272
10	2	84.7	8	1593	-	182
11	2	83.3	8	1705	-	134
12	2	79.8	8	1567	-	286
13	1	77.9	8	-	-	368
14	3	98.4	8	1510	1569	290
15	2	79.9	8	1588	-	231
16	3	78	8	1140	1353	353
17	3	55.2	8	1700	1327	53
18	3	71.9	8	1081	1224	44
19	1	62	8	-	-	298
20	3	70.5	8	1888	1442	529
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			27			
Number of Bursts in Trial			8			
Chirp Center Frequency			5323			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	2	69.1	18	1076	-	1436
2	2	62.1	18	1688	-	22
3	2	94.8	18	1891	-	897
4	1	75.8	18	-	-	1186
5	2	65.4	18	1713	-	589
6	2	97.7	18	1292	-	614
7	3	98.1	18	1670	1711	506
8	2	85.4	18	1672	-	776
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			28			
Number of Bursts in Trial			9			
Chirp Center Frequency			5322			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	3	82	19	1233	1713	679
2	3	87.7	19	1554	1123	473
3	2	98.9	19	1518	-	869
4	1	55	19	-	-	719
5	1	93.6	19	-	-	902
6	2	58.7	19	1641	-	1243
7	2	88.7	19	1387	-	410
8	1	60.3	19	-	-	1154
9	1	97.7	19	-	-	512
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			29			
Number of Bursts in Trial			10			
Chirp Center Frequency			5322			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	1	69.6	20	-	-	1131
2	1	74.5	20	-	-	290
3	1	60.9	20	-	-	895
4	1	74.6	20	-	-	202
5	2	99.3	20	1501	-	139
6	2	95.3	20	1065	-	854
7	2	91.9	20	1722	-	219
8	2	51	20	1285	-	57
9	2	87.7	20	1747	-	141
10	1	87.2	20	-	-	596
Detection Check (1=Detection; 0=No Detection)						1

Trial Number			30			
Number of Bursts in Trial			11			
Chirp Center Frequency			5328			
Burst	No. of Pulses	Pulse Width (us)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (us)	Pulse 2-to-3 Spacing (us)	Starting Location Within Interval (ms)
1	3	59.9	5	1901	1196	935
2	2	77.1	5	1590	-	1038
3	2	62.7	5	1227	-	690
4	1	77.1	5	-	-	547
5	3	99.8	5	1798	1790	551
6	2	61.5	5	1135	-	876
7	2	77.5	5	1583	-	448
8	2	57.3	5	1890	-	736
9	2	53.5	5	1757	-	362
10	1	66.6	5	-	-	836
11	3	80.7	5	1811	1289	410
Detection Check (1=Detection; 0=No Detection)						1

Type 6 Radar Statistical Performance

Trial #	Test Freq. (MHz)	Pulses / Hop	Pulse Width (us)	PRI (us)	1=Detection 0=No Detection
1	5570	9	1	333	1
2	5570	9	1	333	1
3	5570	9	1	333	1
4	5570	9	1	333	1
5	5570	9	1	333	1
6	5570	9	1	333	1
7	5570	9	1	333	1
8	5570	9	1	333	1
9	5570	9	1	333	1
10	5570	9	1	333	1
11	5570	9	1	333	1
12	5570	9	1	333	1
13	5570	9	1	333	1
14	5570	9	1	333	1
15	5570	9	1	333	1
16	5570	9	1	333	1
17	5570	9	1	333	1
18	5570	9	1	333	1
19	5570	9	1	333	1
20	5570	9	1	333	1
21	5570	9	1	333	1
22	5570	9	1	333	1
23	5570	9	1	333	1
24	5570	9	1	333	1
25	5570	9	1	333	1
26	5570	9	1	333	1
27	5570	9	1	333	1
28	5570	9	1	333	1
29	5570	9	1	333	1
30	5570	9	1	333	1
Detection Percentage (%)					100.000
Limit					70%
Test Result					**Complied**

<Mesh Mode>

Type 4 Radar Statistical Performance

Trial #	Test Freq. (MHz)	Pulses / Hop	Pulse Width (us)	PRI (us)	1=Detection 0=No Detection
1	5324	18.0	242	15	1
2	5291	19.9	279	12	1
3	5286	12.9	487	14	1
4	5324	15.0	452	13	1
5	5313	16.3	230	12	1
6	5327	19.8	238	13	1
7	5260	18.2	420	16	0
8	5259	16.3	452	15	1
9	5267	14.2	495	12	1
10	5290	17.8	228	16	0
11	5271	19.1	211	16	1
12	5250	18.4	283	15	0
13	5321	11.8	411	12	1
14	5257	14.2	284	13	1
15	5265	13.9	202	12	0
16	5250	17.8	340	14	1
17	5323	15.6	290	16	0
18	5306	14.6	250	16	1
19	5292	14.4	484	15	1
20	5263	18.9	387	13	0
21	5257	11.1	348	15	1
22	5311	13.8	291	16	1
23	5269	14.3	295	12	1
24	5284	12.5	300	12	1
25	5311	12.5	322	14	0
26	5309	12.5	383	13	1
27	5330	15.7	322	16	1
28	5296	19.8	469	13	0
29	5256	18.6	406	15	1
30	5271	15.9	238	14	1
Detection Percentage (%)					73.333
Limit					70%
Test Result					**Complied**

4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101026	9kHz~40GHz	Dec. 01, 2020	Nov. 30, 2021	Radiated (DF01-CB)
ESG Signal generator	Agilent	E4438C	MY49072778	250kHz-6GHz	Aug. 24, 2020	Aug. 23, 2021	Radiated (DF01-CB)
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	Jul. 08, 2020	Jul. 07, 2021	Radiated (DF01-CB)
VEKTOR SIGNAL GENERATOR	R&S	SMW200A	109426	100KHz- 7.5GHz	Dec. 23, 2020	Dec. 22, 2021	Radiated (DF01-CB)
RF Power Divider	STI	2 Way	DV-2way -05	1GHz ~ 8GHz	Mar. 01, 2021	Feb. 28, 2022	Radiated (DF01-CB)
RF Power Divider	STI	2 Way	DV-2way -06	1GHz ~ 8GHz	Mar. 01, 2021	Feb. 28, 2022	Radiated (DF01-CB)
RF Power Divider	MTJ	4 Way	DFS-01-DV-01	1GHz ~ 6GHz	Oct. 05, 2020	Oct. 04, 2021	Radiated (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-57	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Radiated (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-58	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Radiated (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-59	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Radiated (DF01-CB)

Note: Calibration Interval of instruments listed above is one year.

5 Measurement Uncertainty

Test Items	Uncertainty	Remark
Radiated Emission	3.4 dB	Confidence levels of 95%

Appendix A. Test Photos

1. Photographs of Dynamic Frequency Selection Test Configuration

<AP Router Mode>

FRONT VIEW

CLOSE-UP VIEW

<Mesh Mode>

FRONT VIEW

CLOSE-UP VIEW

————THE END————