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CNAS L3163

CE DFS Test Report

Project No.	:	2310G131
Equipment	:	AX3000 Ceiling Mount Wi-Fi 6 Access Point with 2.5G Port
Brand Name	:	Cudy
Test Model	:	AP3000
Series Model	:	AP3000_P, AP3000P
Applicant	:	Shenzhen Cudy Technology Co., Ltd.
Address	:	Room A606, Gaoxinqi Industrial Park, Liuxianyi Road, Baoan District, Shenzhen, China
Manufacturer	:	Shenzhen Cudy Technology Co., Ltd.
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Factory	:	Shenzhen Cudy Technology Co., Ltd.
Address	:	Room A606, Gaoxinqi Industrial Park, Liuxianyi Road, Baoan District, Shenzhen, China
Date of Receipt	:	Oct. 26, 2023
Date of Test	:	Oct. 26, 2023 ~ Dec. 19, 2023
Issued Date	:	Dec. 27, 2023
Report Version	:	R00
Test Sample	:	Engineering Sample No.: SSL2023102616
Standard(s)	:	ETSI EN 301 893 V2.1.1 (2017-05)

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.(Dongguan).

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Declaration

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ETSP-3-2310G131	R00	Original Report.	Dec. 27, 2023	Valid

1. TEST FACILITY

The test facilities used to collect the test data in this report is **TR12** at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

2. TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Dynamic Frequency Selection (DFS)	23~25°C	57~60%	AC 230V/50Hz	Kirito Li

3. TEST METHODOLOGY AND RESULTS

Harmonised Standard ETSI EN 301 893					
Requirement			Requirement Conditionality		Observations
No	Description	Reference: Clause No	U/C	Condition	
1	DFS: Channel Availability Check	4.2.6.2.2	C	1)Not required for channels whose nominal bandwidth falls completely within the band 5 150 MHz to 5250 MHz. 2)Not required for Slave devices with a maximum transmit power of less than 200 mW e.i.r.p. 3)Not required at initial use of a channel for slave devices with a maximum transmit power of 200 mW e.i.r.p.	Pass
2	DFS: Off-Channel CAC - Radar Detection Threshold Level	4.2.6.2.3	C	1)Where implemented by the manufacturer. 2)Not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz. 3)Not required for slave devices with a maximum transmit power of less than 200 mW e.i.r.p. 4)Not required at initial use of a channel for Slave devices with a maximum transmit power of 200 mW e.i.r.p.	N/A
3	DFS: Off-Channel CAC - Detection Probability	4.2.6.2.3	C	1)Where implemented by the manufacturer. 2)Not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz. 3)Not required for slave devices with a maximum transmit power of less than 200 mW e.i.r.p. 4)Not required at initial use of a channel for Slave devices with a maximum transmit power of 200 mW e.i.r.p.	N/A
4	DFS: In service Monitoring	4.2.6.2.4	C	1)Not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz. 2)Not required for Slave devices with a maximum transmit power of less than 200 mW e.i.r.p.	Pass
5	DFS: Channel shutdown	4.2.6.2.5	C	Not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz.	Pass
6	DFS: Non-occupancy period	4.2.6.2.6	C	1)Not required for channels whose nominal bandwidth falls completely within the band 5 150 MHz to 5250 MHz. 2)Not required for Slave devices with a maximum transmit power of less than 200 mW e.i.r.p.	Pass
7	DFS: Uniform spreading	4.2.6.2.7	C	1)Not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz. 2)Not required for slave devices.	Pass **Note 1**

Note:

1.

Manufacturer Declare the Uniform Spreading
☒Each of the declared Channel Plans (combination of centre frequencies and for each of the centre frequencies, the declared nominal bandwidths) shall make use of at least 60 % of the spectrum available in the applicable sub-band(s).
☒Each of the Usable Channels shall be used with approximately equal probability. RLAN equipment for which the declared channel plan includes channels whose nominal bandwidth falls completely or partly within the band 5600 MHz to 5650 MHz may omit these channels from the list of Usable Channels at initial power up or at initial installation. Channels being used by other RLAN equipment may be omitted from the list of Usable Channels.

2. U/C Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).
3. “N/A” indicates that it does not apply to this device.

4. GENERAL INFORMATION

4.1 GENERAL DESCRIPTION OF EUT

Equipment	AX3000 Ceiling Mount Wi-Fi 6 Access Point with 2.5G Port
Brand Name	Cudy
Test Model	AP3000
Series Model	AP3000_P, AP3000P
Model Difference(s)	Only differ in model name. Model AP3000 with AC adapter. Model AP3000_P and AP3000P with PoE adapter.
Hardware Version	V1
Software Version	FW1.16.4
Power Source	1# DC voltage supplied from AC adapter. Model: TPA259-18120-EU 2# DC voltage supplied from PoE adapter. Model: RP023-4800320ZG
Power Rating	1# I/P: 100-240V~50/60Hz 0.6A O/P: 12V ⎓ 1.5A 2# I/P: 100-240V~50/60Hz 0.5A Max O/P: 48V ⎓ 0.32A
Operation Frequency Band(s)	5250 MHz ~ 5350 MHz 5470 MHz ~ 5725 MHz
Modulation Type	IEEE 802.11a/n/ac: OFDM IEEE 802.11ax: OFDMA
Bit Rate of Transmitter	IEEE 802.11a: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps IEEE 802.11ac: up to 1733.4 Mbps IEEE 802.11ax: up to 2402 Mbps
Operating Mode(s)	☒ Master ☐ Slave with radar detection ☐ Slave without radar detection

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20) IEEE 802.11ax(HE20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40) IEEE 802.11ax(HE40)		IEEE 802.11ac(VHT80) IEEE 802.11ax(HE80)	
Band 2		Band 2		Band 2	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270	58	5290
56	5280	62	5310		
60	5300				
64	5320				

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20) IEEE 802.11ax(HE20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40) IEEE 802.11ax(HE40)		IEEE 802.11ac(VHT80) IEEE 802.11ax(HE80)	
Band 3		Band 3		Band 3	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590		
112	5560	126	5630		
116	5580	134	5670		
120	5600				
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				

IEEE 802.11ac(VHT160) IEEE 802.11ax(HE160)	
Channel	Frequency (MHz)
50	5250
114	5570

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	5.27
2	N/A	N/A	PCB	N/A	5.69
3	N/A	N/A	PCB	N/A	4.68

Note:

1) The EUT supports MIMO. Physically, the EUT provides three completed transmitters and receivers (3T3R).
2) Beamforming Gain: 3 dBi.
3) The antenna gain and beamforming gain are provided by the manufacturer.
4) Any one of the three antennas is used as an intelligent switching antenna, and the antenna data stream is NSS2 when used.

4. The worst case for 3TX as follow:
Non Beamforming:

Operating Mode / TX Mode	3TX
IEEE 802.11a	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11n(HT20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11n(HT40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT80)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT160)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE80)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE160)	V (Ant. 1+Ant. 2+Ant. 3)

Beamforming:

Operating Mode / TX Mode	3TX
IEEE 802.11n(HT20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11n(HT40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT80)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ac(VHT160)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE80)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE160)	V (Ant. 1+Ant. 2+Ant. 3)

4.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test	Clause	Test channels		
		Lower sub-band (5150 MHz to 5350 MHz)		Higher sub-band 5470 MHz to 5725 MHz
		5150 MHz to 5250 MHz	5250 MHz to 5350 MHz	
Dynamic Frequency Selection (DFS)	5.4.8	N/A(see note 1)	C5	C6(see note 2)

C5,C6	One channel out of the declared channels for this frequency range. If more than one Nominal Channel Bandwidth has been declared for this sub-band, testing shall be performed using the lowest and highest Nominal Channel Bandwidth.

Note :

(1) Testing is not required for nominal channel bandwidths that fall completely within the frequency range 5150 MHz to 5250 MHz.

(2) Where the declared channel plan includes channels whose nominal channel bandwidth falls completely or partly within the 5600 MHz to 5650 MHz band, the tests for the Channel Availability Check (and where implemented, for the Off-Channel CAC) shall be performed on one of these channels in addition to a channel within the band 5470 MHz to 5600 MHz or 5650 MHz to 5725 MHz band.

(3) IEEE 802.11ax mode only supports full RU, so only the full RU is evaluated and measured inside report.

5. DYNAMIC FREQUENCY SELECTION (DFS)

5.1 GENERAL DFS INFORMATION

5.1.1 DFS PARAMETERS

Table D.1: DFS requirement values	
Parameter	**Value**
Channel Availability Check Time	60 seconds (see note 1)
Minimum Off-Channel CAC Time	6 minutes (see note 2)
Maximum Off-Channel CAC Time	4 hours (see note 2)
Channel Move Time	10 seconds
Channel Closing Transmission Time	1 second
Non-Occupancy Period	30 minutes

Note:	
(1)	For channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the Channel Availability Check Time shall be 10 minutes.
(2)	For channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the Off-Channel CAC Time shall be within the range 1 to 24 hours.

Table D.2: Radar Detection Threshold Levels	
e.i.r.p. Spectral Density (dBm/MHz)	**Value (see notes 1 and 2)**
10	-62 dBm

Note:	
(1)	This is the level at the input of the receiver of a RLAN device with a maximum e.i.r.p. density of 10dBm/MHz and assuming a 0 dBi receive antenna. For devices employing different e.i.r.p. spectral density and/or a different receive antenna gain G (dBi) the radar detection threshold level at the receiver input follows the following relationship: DFS Detection Threshold (dBm) = -62 + 10 - e.i.r.p. Spectral Density (dBm/MHz) + G (dBi), however the radar detection threshold level shall not be less than -64 dBm assuming a 0 dBi receive antenna gain.
(2)	Slave devices with a maximum e.i.r.p. of less than 23 dBm do not have to implement radar detection unless these devices are used in fixed outdoor point to point or fixed outdoor point to multipoint applications (see clause 4.2.6.1.3 of EN 301 893).

Table D.3: Parameters of the reference DFS test signal		
Pulse width W [µs]	**Pulse repetition frequency PRF [PPS]**	**Pulses per burst [PPB]**
1	700	18

Table D.4: Parameters of radar test signals						
Radar test signal # (note 1 to 3)	**Pulse width W [µs]**		**Pulse repetition frequency PRF [PPS]**		**Number of different PRFs**	**Pulses per burst for each PRF [PPB]** (note 5)
	Min	**Max**	**Min**	**Max**		
1	0.5	5	200	1000	1	10 (note 6)
2	0.5	15	200	1600	1	15 (note 6)
3	0.5	15	2300	4000	1	25
4	20	30	2000	4000	1	20
5	0.5	2	300	400	2/3	10 (note 6)
6	0.5	2	400	1200	2/3	15 (note 6)

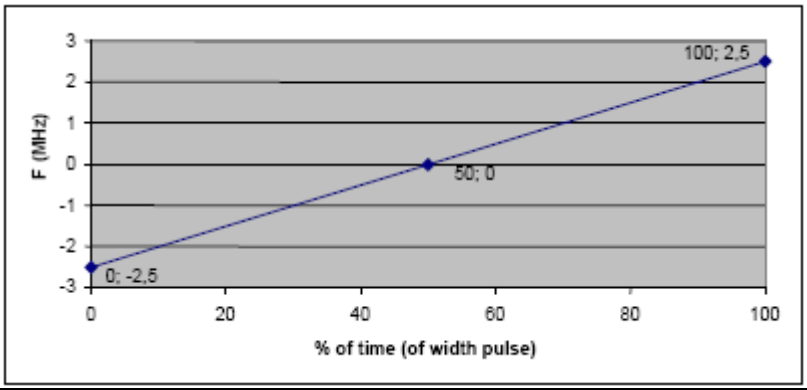
Note:	
(1)	Radar test signals #1 to #4 are constant PRF based signals. See figure D.1. These radar test signals are intended to simulate also radars using a packet based Staggered PRF. See figure D.2.
(2)	Radar test signal #4 is a modulated radar test signal. The modulation to be used is a chirp modulation with a ±2,5 MHz frequency deviation which is described below. 
(3)	Radar test signals #5 and #6 are single pulse based Staggered PRF radar test signals using 2 or 3 different PRF values. For radar test signal #5, the difference between the PRF values chosen shall be between 20 PPS and 50 PPS. For radar test signal #6, the difference between the PRF values chosen shall be between 80 PPS and 400 PPS. See figure D.3.
(4)	Apart for the Off-Channel CAC testing, the radar test signals above shall only contain a single burst of pulses. See figure D.1, figure D.3 and figure D.4. For the Off-Channel CAC testing, repetitive bursts shall be used for the total duration of the test. See figure D.2 and figure D.5. See also clause 4.2.6.2.3, clause 5.4.8.2.1.4.2 and clause 5.4.8.2.1.4.3.
(5)	The total number of pulses in a burst is equal to the number of pulses for a single PRF multiplied by the number of different PRFs used.
(6)	For the CAC and Off-Channel CAC requirements, the minimum number of pulses (for each PRF) for any of the radar test signals to be detected in the band 5 600 MHz to 5 650 MHz shall be 18.

Table D.5: Detection probability		
Parameter	**Detection Probability (P_d)**	
	Channels whose nominal bandwidth falls partly or completely within the 5600 MHz to 5650 MHz band	**Other channels**
CAC, Off-Channel CAC	99,99 %	60 %
In-Service Monitoring	60 %	60 %

Note:	
(1)	P_d gives the probability of detection per simulated radar burst and represents a minimum level of detection performance under defined conditions. Therefore P_d does not represent the overall detection probability for any particular radar under real life conditions.

5.1.2 RADAR TEST SIGNAL FIGURE

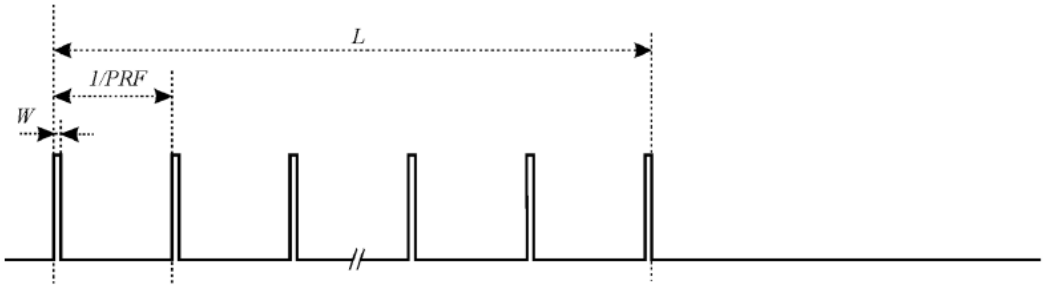


Figure D.1: General structure of a single burst/constant PRF based radar test signal

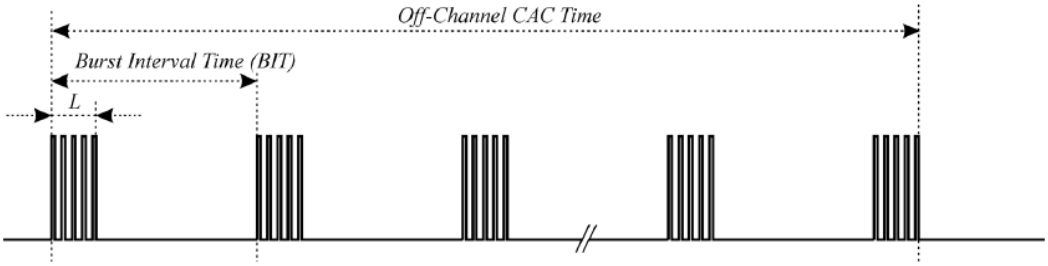


Figure D.2: General structure of a multiple burst/constant PRF based radar test signal

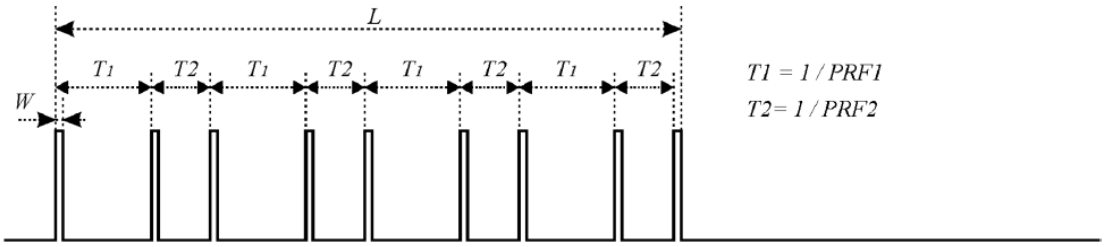


Figure D.3: General structure of a single burst/single pulse based staggered PRF radar test signal

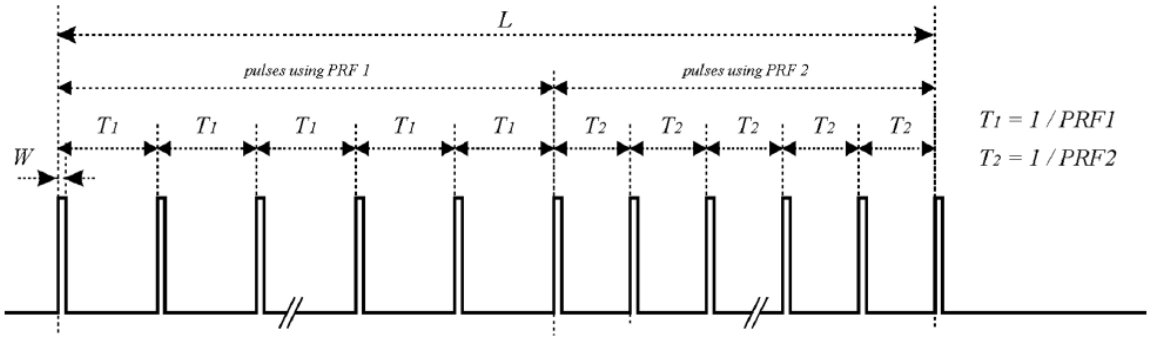


Figure D.4: General structure of a single burst/packet based staggered PRF radar test signal

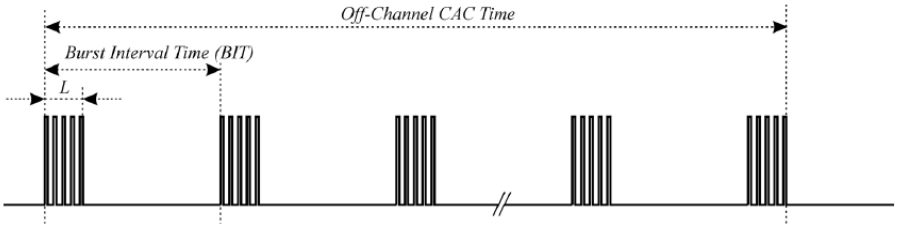


Figure D.5: General structure of a multiple burst/packet based staggered PRF based radar test signal

5.1.3 DFS TECHNICAL REQUIREMENTS SPECIFICATIONS

Requirement	DFS Operational mode		
	Master	Slave without radar detection (see table D.2, note2)	Slave with radar Detection (see table D.2, note2)
Channel Availability Check	√	Not required	√(note2)
Off-Channel CAC (note 1)	√	Not required	√(note2)
In-Service Monitoring	√	Not required	√
Channel Shutdown	√	√	√
Non-Occupancy Period	√	Not required	√
Uniform Spreading	√	Not required	Not required

Note:
(1) Where implemented by the manufacturer.
(2) A slave with radar detection is not required to perform a CAC or Off-Channel CAC at initial use of the channel but only after the slave has detected a radar signal on the Operating Channel by In-Service Monitoring and the Non-Occupancy Period resulting from this detection has elapsed.

5.1.4 DFS THESHOLD LEVEL

DFS Threshold Level	
DFS Threshold level: -64.00 dBm	☒ at the antenna connector
	☐ in front of the antenna

Note:
(1) DFS Detection Threshold (dBm) = -62 + 10 - Spectral Power Density e.i.r.p. (dBm/MHz) + G (dBi)

Spectral Power Density e.i.r.p.=16.99 dBm/MHz, Antenna gain is 4.68 dBi.

(2) However, the DFS threshold level shall not be lower than -64 dBm assuming a 0 dBi receive antenna gain. 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.

5.2 CHANNEL AVAILABLITY CHECK (CAC)

5.2.1 LIMIT OF CHANNEL AVAILABILITY CHECK

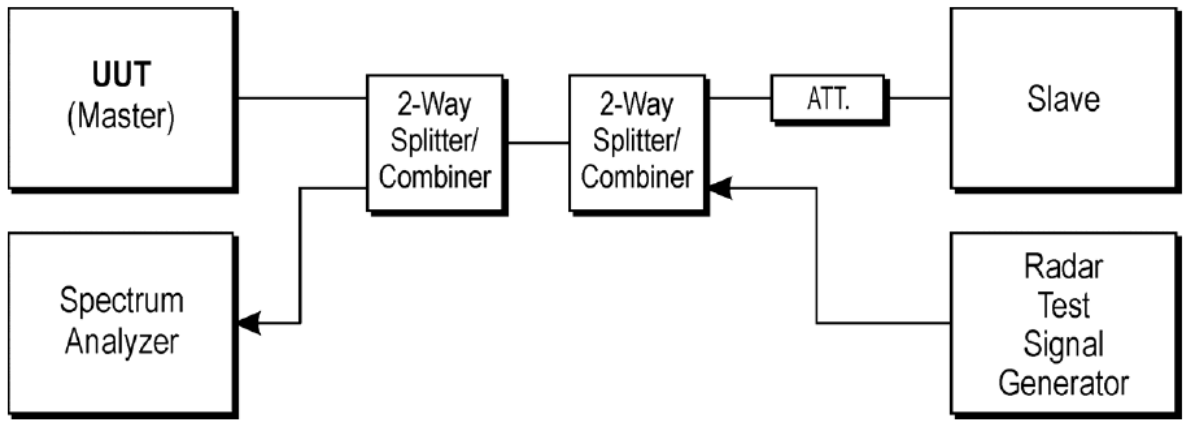
Channel Availability Check (CAC)	
1	The Channel Availability Check shall be performed during a continuous period in time (Channel Availability Check Time) which shall not be less than the value defined in table D.1.
2	During the Channel Availability Check, the RLAN shall be capable of detecting any of the radar test signals that fall within the ranges given by table D.4 with a level equal to the Radar Detection Threshold defined in table D.2.
3	The minimum required detection probability is defined in table D.5.

5.2.2 TEST PROCEDURES

Channel Availability Check Time: Method of measurement: Refer as EN 301 893, clause 5.4.8.2.1.2.
Interference Detection Threshold during the Channel Availability Check: Method of measurement: Refer as EN 301 893, clause 5.4.8.2.1.3.

5.2.3 TEST SETUP

Master Measurement



5.2.4 TEST RESULTS

Please refer to the Appendix A.

5.3 IN-SERVICE MONITORING

5.3.1 LIMIT OF IN-SERVICE MONITORING

In-Service Monitoring	
1	The In-Service Monitoring shall be used to monitor an Operating Channel.
2	The In-Service-Monitoring shall start immediately after the RLAN device has started transmissions on a channel.
3	During the In-Service Monitoring, the RLAN device shall be capable of detecting any of the radar test signals that fall within the ranges given by table D.4 with a level equal to the Radar Detection Threshold defined in table D.2.
4	The minimum required detection probability is defined in table D.5.

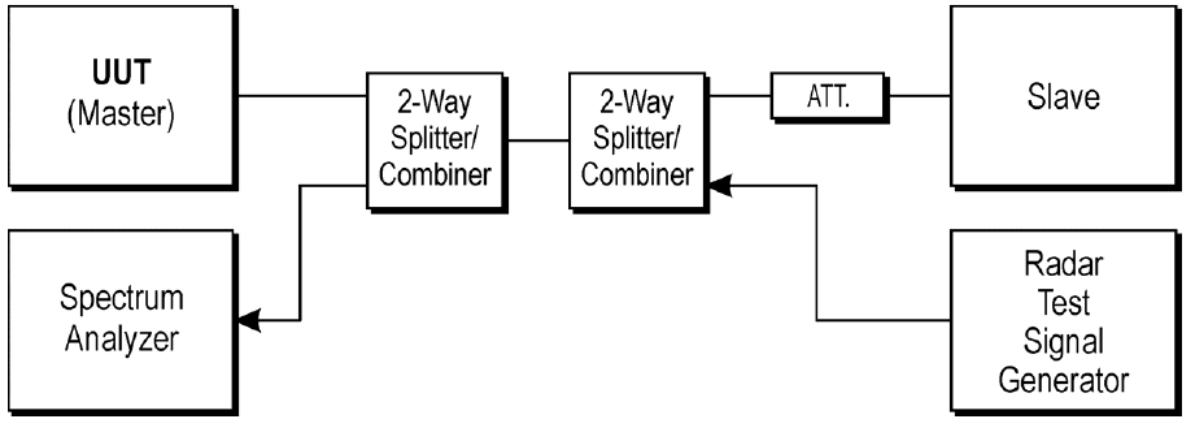
5.3.2 TEST PROCEDURES

Interference Detection Threshold during In-Service Monitoring:

Method of measurement: Refer as EN 301 893, clause 5.4.8.2.1.5

5.3.3 TEST SETUP

Master Measurement



5.3.4 TEST RESULTS

Please refer to the Appendix B.

5.4 CHANNEL SHUTDOWN AND NON-OCCUPANCY PERIOD

5.4.1 LIMIT OF CHANNEL SHUTDOWN AND NON-OCCUPANCY PERIOD

Channel Shutdown	
1	The Channel Move Time shall not exceed the limit defined in table D.1.
2	The Channel Closing Transmission Time shall not exceed the limit defined in table D.1.

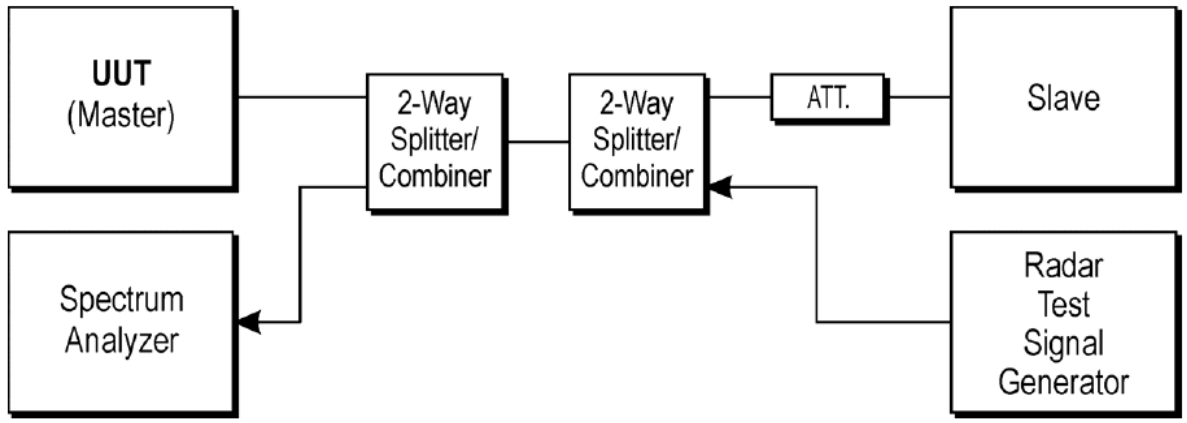
Non-Occupancy Period	
1	The Non-Occupancy Period shall not be less than the value defined in table D.1.

5.4.2 TEST PROCEDURES

Channel Shutdown and Non-Occupancy Period:
Method of measurement: Refer as EN 301 893, clause 5.4.8.2.1.6

5.4.3 TEST SETUP

Master Measurement

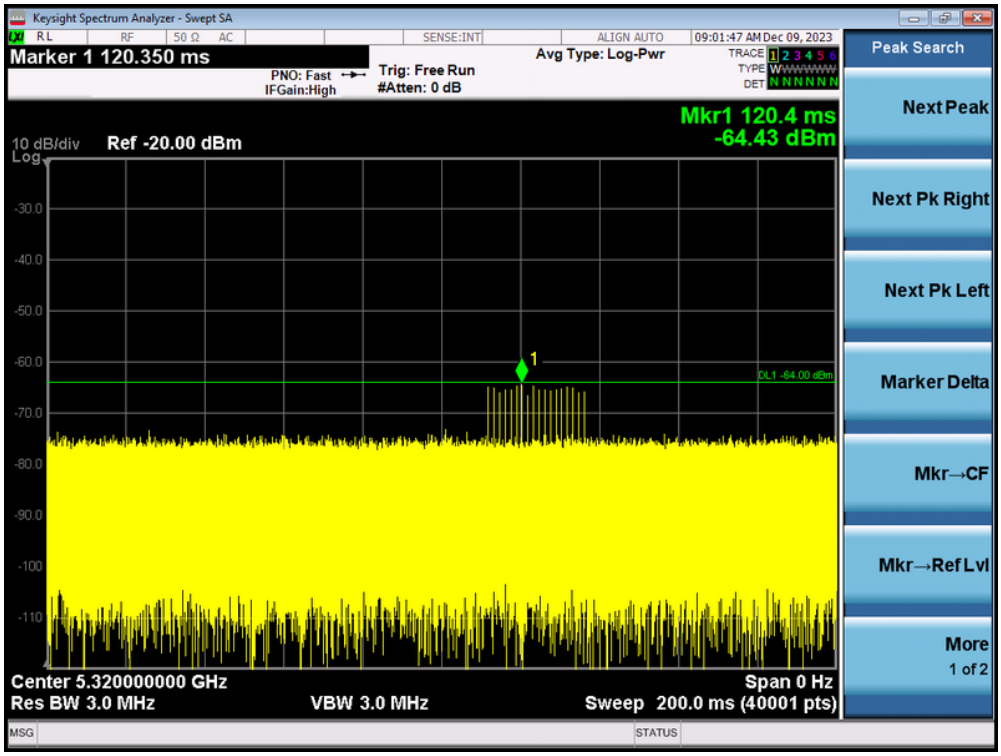


5.4.4 TEST RESULTS

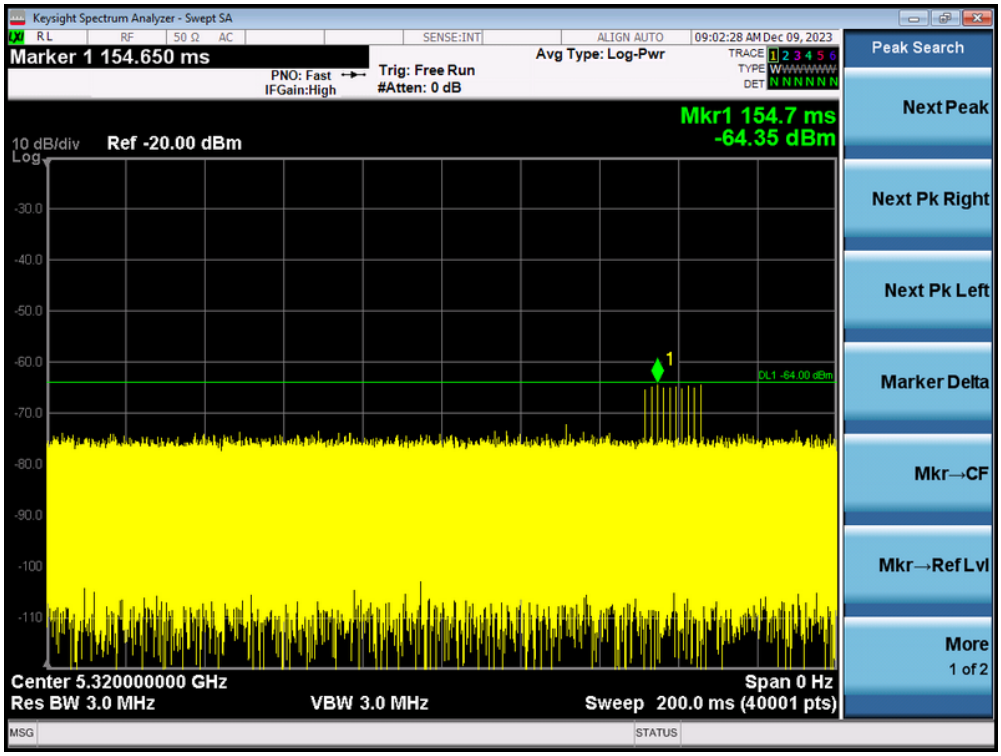
Please refer to the Appendix C.

6. DFS DETECTION THRESHOLD

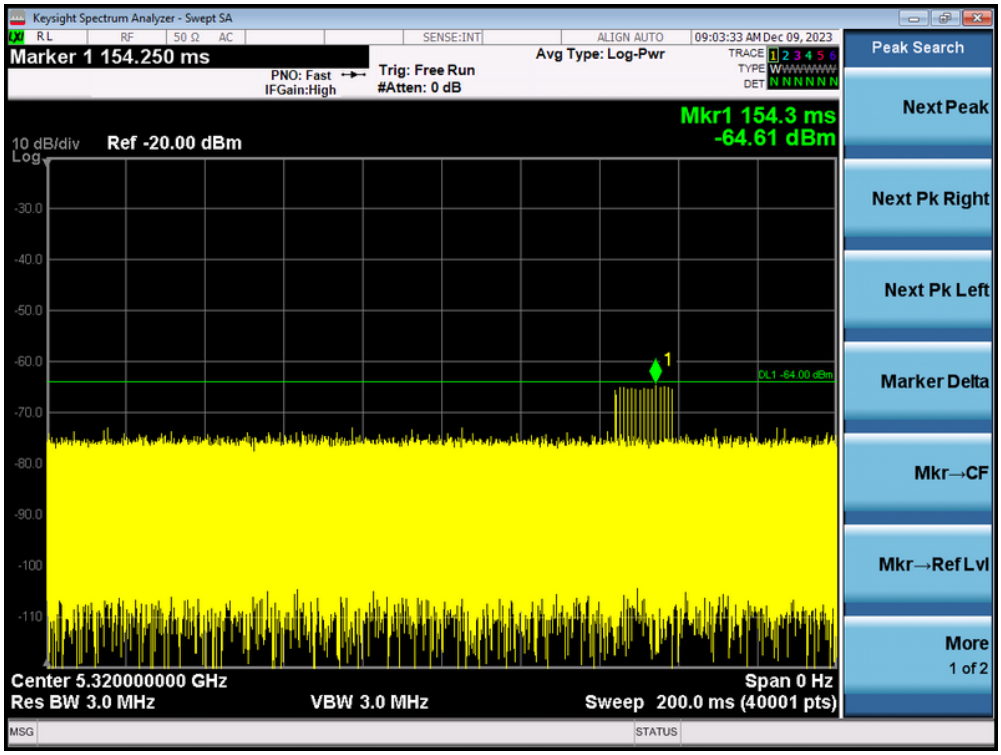
Radar Signal Reference



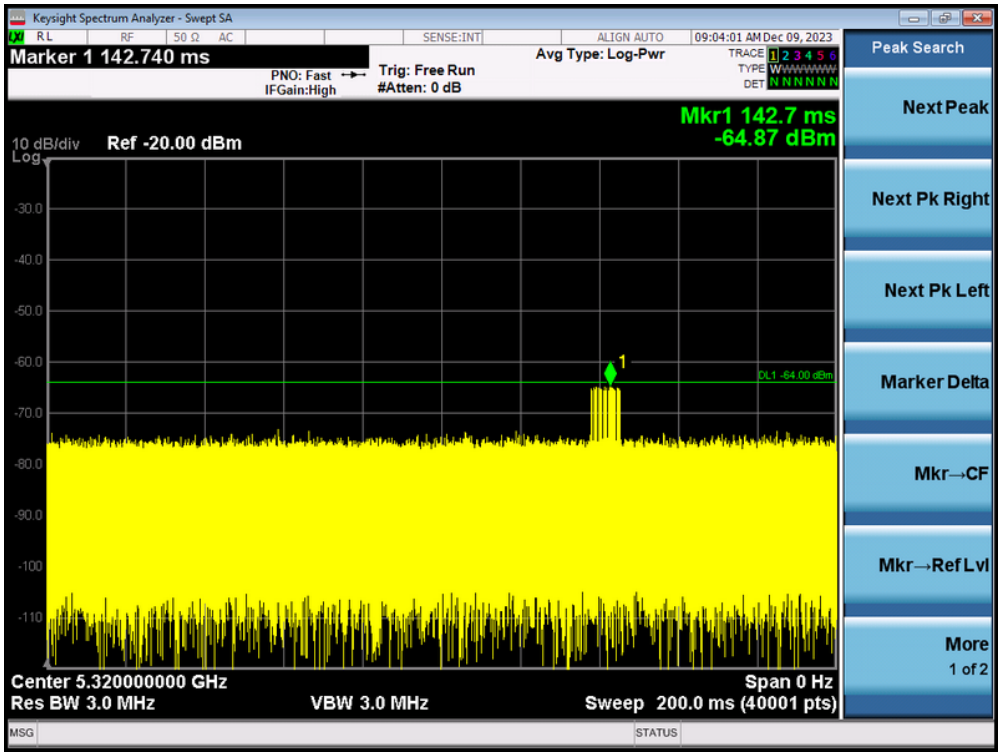
Radar Signal 1



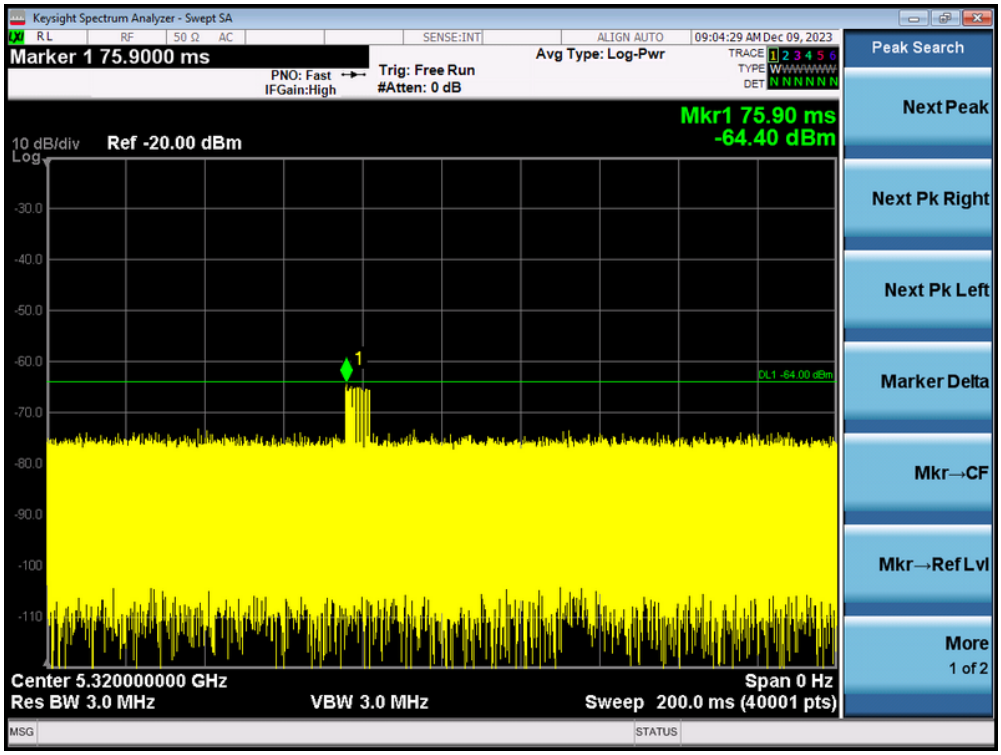
Radar Signal 2



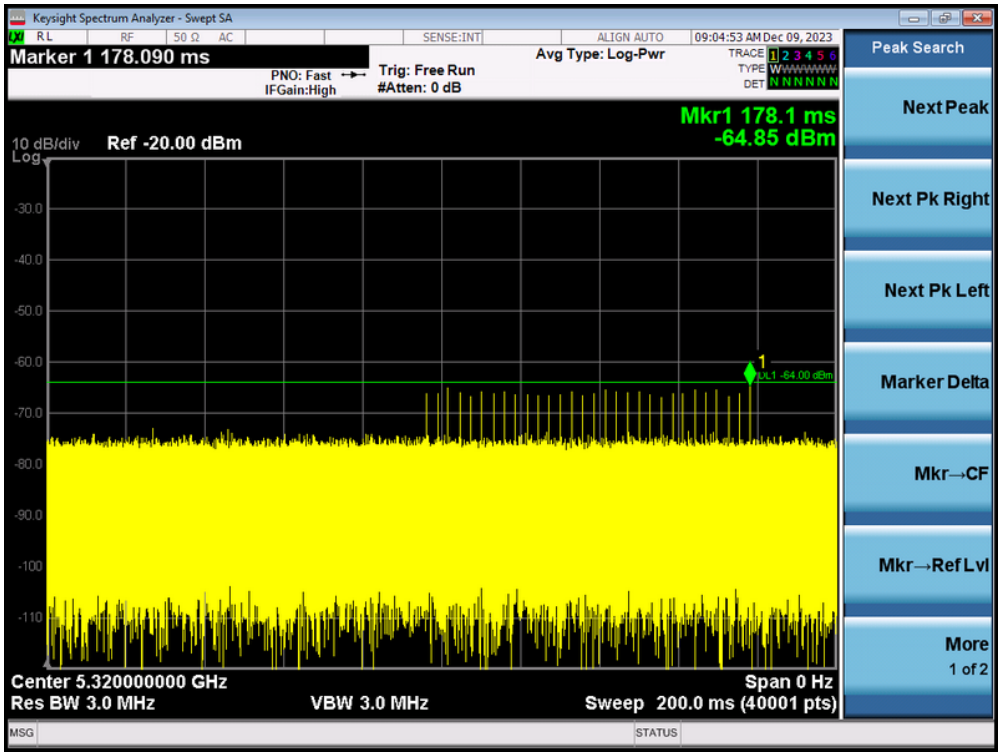
Radar Signal 3



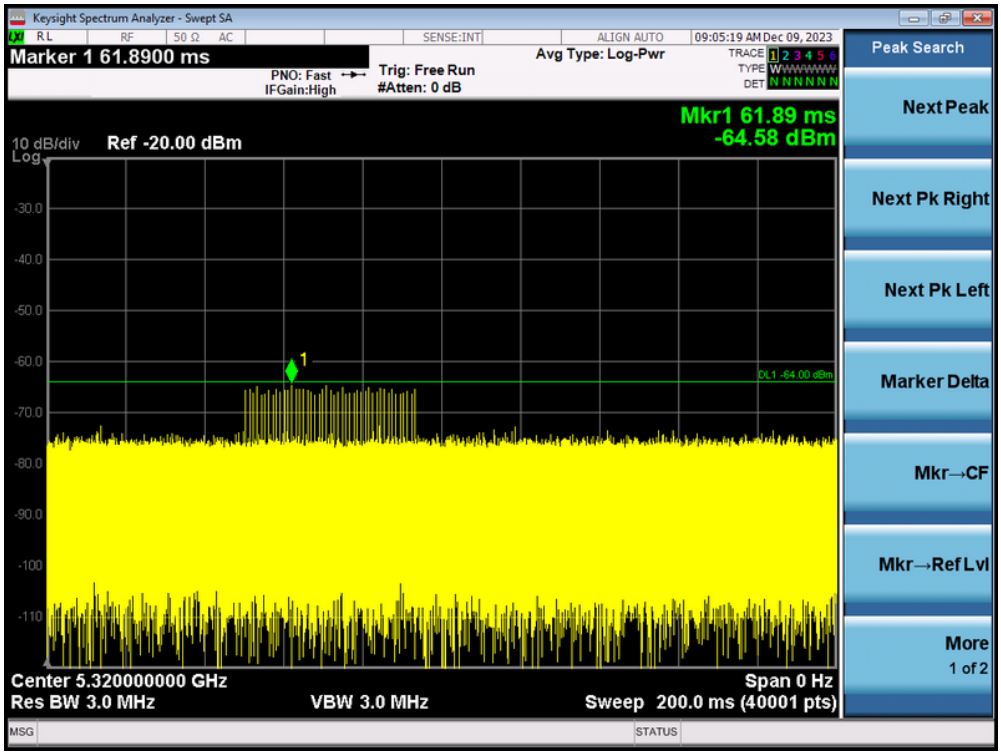
Radar Signal 4



Radar Signal 5



Radar Signal 6



7. RADAR TEST WAVEFORMS

Radar Signal Reference								
Trial ID	**Radar Type**	**Pulse Width (μs)**	**Number of Different PRFs**	**Pulse Repetition Frequency (PPS)**	**Pulses per Burst for Each PRF (PPB)**	**Number of Bursts**	**Chirp BW (MHz)**	**Waveform Length (μs)**
0	Reference	1	1	700	18	1	0	25714.8

Radar Signal 1								
Trial ID	**Radar Type**	**Pulse Width (μs)**	**Number of Different PRFs**	**Pulse Repetition Frequency (PPS)**	**Pulses per Burst for Each PRF (PPB)***	**Number of Bursts**	**Chirp BW (MHz)**	**Waveform Length (μs)**
0	Type 1	3	1	645	10	1	0	15504
1	Type 1	0.6	1	230	10	1	0	43478
2	Type 1	1.7	1	421	10	1	0	23753
3	Type 1	4.7	1	945	10	1	0	10582
4	Type 1	3.7	1	774	10	1	0	12920
5	Type 1	2.6	1	580	10	1	0	17241
6	Type 1	2.9	1	635	10	1	0	15748
7	Type 1	2.1	1	494	10	1	0	20243
8	Type 1	2.9	1	627	10	1	0	15949
9	Type 1	0.7	1	251	10	1	0	39841
10	Type 1	3.7	1	772	10	1	0	12953
11	Type 1	4.5	1	909	10	1	0	11001
12	Type 1	3	1	641	10	1	0	15601
13	Type 1	1.9	1	451	10	1	0	22173
14	Type 1	4.4	1	896	10	1	0	11161
15	Type 1	2.7	1	599	10	1	0	16694
16	Type 1	5	1	989	10	1	0	10111
17	Type 1	2.1	1	478	10	1	0	20921
18	Type 1	2.6	1	578	10	1	0	17301
19	Type 1	1.9	1	454	10	1	0	22026

*Note:

(1) When testing CAC and Off-Channel CAC in the band 5600 MHz to 5650 MHz, the minimum number of pulses (for each PRF) of the radar test signal will be changed to 18.

Radar Signal 2								
Trial ID	**Radar Type**	**Pulse Width (μs)**	**Number of Different PRFs**	**Pulse Repetition Frequency (PPS)**	**Pulses per Burst for Each PRF (PPB)***	**Number of Bursts**	**Chirp BW (MHz)**	**Waveform Length (μs)**
0	Type 2	8.6	1	978	15	1	0	15337.5
1	Type 2	1	1	253	15	1	0	59289
2	Type 2	4.5	1	586	15	1	0	25597.5
3	Type 2	14	1	1503	15	1	0	9979.5
4	Type 2	10.9	1	1204	15	1	0	12459
5	Type 2	7.4	1	864	15	1	0	17361
6	Type 2	8.4	1	961	15	1	0	15609
7	Type 2	5.8	1	714	15	1	0	21009
8	Type 2	8.2	1	948	15	1	0	15823.5
9	Type 2	1.4	1	290	15	1	0	51724.5
10	Type 2	10.9	1	1200	15	1	0	12499.5
11	Type 2	13.4	1	1440	15	1	0	10416
12	Type 2	8.5	1	972	15	1	0	15432
13	Type 2	5	1	640	15	1	0	23437.5
14	Type 2	13.1	1	1417	15	1	0	10585.5
15	Type 2	7.7	1	899	15	1	0	16684.5
16	Type 2	14.8	1	1581	15	1	0	9487.5
17	Type 2	5.5	1	687	15	1	0	21834
18	Type 2	7.3	1	861	15	1	0	17421
19	Type 2	5.1	1	645	15	1	0	23256

*Note:

(1) When testing CAC and Off-Channel CAC in the band 5600 MHz to 5650 MHz, the minimum number of pulses (for each PRF) of the radar test signal will be changed to 18.

Radar Signal 3								
Trial ID	**Radar Type**	**Pulse Width (µs)**	**Number of Different PRFs**	**Pulse Repetition Frequency (PPS)**	**Pulses per Burst for Each PRF (PPB)**	**Number of Bursts**	**Chirp BW (MHz)**	**Waveform Length (µs)**
0	Type 3	8.6	1	3245	25	1	0	7705
1	Type 3	1	1	2365	25	1	0	10570
2	Type 3	4.5	1	2769	25	1	0	9027.5
3	Type 3	14	1	3882	25	1	0	6440
4	Type 3	10.9	1	3519	25	1	0	7105
5	Type 3	7.4	1	3107	25	1	0	8047.5
6	Type 3	8.4	1	3224	25	1	0	7755
7	Type 3	5.8	1	2924	25	1	0	8550
8	Type 3	8.2	1	3208	25	1	0	7792.5
9	Type 3	1.4	1	2410	25	1	0	10372.5
10	Type 3	10.9	1	3514	25	1	0	7115
11	Type 3	13.4	1	3806	25	1	0	6567.5
12	Type 3	8.5	1	3238	25	1	0	7720
13	Type 3	5	1	2834	25	1	0	8822.5
14	Type 3	13.1	1	3778	25	1	0	6617.5
15	Type 3	7.7	1	3149	25	1	0	7940
16	Type 3	14.8	1	3977	25	1	0	6285
17	Type 3	5.5	1	2892	25	1	0	8645
18	Type 3	7.3	1	3103	25	1	0	8057.5
19	Type 3	5.1	1	2840	25	1	0	8802.5

Radar Signal 4								
Trial ID	**Radar Type**	**Pulse Width (µs)**	**Number of Different PRFs**	**Pulse Repetition Frequency (PPS)**	**Pulses per Burst for Each PRF (PPB)**	**Number of Bursts**	**Chirp BW (MHz)**	**Waveform Length (µs)**
0	Type 4	25.6	1	3112	20	1	5	6426
1	Type 4	20.3	1	2076	20	1	5	9634
2	Type 4	22.7	1	2552	20	1	5	7836
3	Type 4	29.3	1	3861	20	1	5	5180
4	Type 4	27.2	1	3433	20	1	5	5826
5	Type 4	24.7	1	2949	20	1	5	6782
6	Type 4	25.4	1	3087	20	1	5	6478
7	Type 4	23.7	1	2734	20	1	5	7316
8	Type 4	25.3	1	3068	20	1	5	6518
9	Type 4	20.6	1	2129	20	1	5	9394
10	Type 4	27.2	1	3428	20	1	5	5834
11	Type 4	28.9	1	3771	20	1	5	5304
12	Type 4	25.5	1	3103	20	1	5	6446
13	Type 4	23.1	1	2628	20	1	5	7610
14	Type 4	28.7	1	3738	20	1	5	5350
15	Type 4	25	1	2999	20	1	5	6668
16	Type 4	29.9	1	3973	20	1	5	5034
17	Type 4	23.5	1	2696	20	1	5	7418
18	Type 4	24.7	1	2944	20	1	5	6794
19	Type 4	23.2	1	2636	20	1	5	7588

Radar Signal 5										
Trial ID	Radar Type	Pulse Width (μs)	Number of Different PRFs	Pulse Repetition Frequency (PPS)			Pulses per Burst for Each PRF (PPB)*	Number of Bursts	Chirp BW (MHz)	Waveform Length (μs)
				PRF-1	PRF-2	PRF-3				
0	Type 5	1.4	3	356	377	329	10	1	0	85010
1	Type 5	0.5	2	303	331	-	10	1	0	63214
2	Type 5	0.9	2	327	375	-	10	1	0	57248
3	Type 5	2	3	393	351	373	10	1	0	80745
4	Type 5	1.7	3	372	394	352	10	1	0	80672
5	Type 5	1.3	2	347	383	-	10	1	0	54928
6	Type 5	1.4	3	354	376	334	10	1	0	84785
7	Type 5	1.1	2	337	384	-	10	1	0	55716
8	Type 5	1.4	3	353	382	332	10	1	0	84627
9	Type 5	0.6	2	306	352	-	10	1	0	61089
10	Type 5	1.7	3	372	322	352	10	1	0	86347
11	Type 5	2	3	389	349	369	10	1	0	81460
12	Type 5	1.4	3	355	384	334	10	1	0	84151
13	Type 5	1	2	331	360	-	10	1	0	57989
14	Type 5	1.9	3	387	337	358	10	1	0	83447
15	Type 5	1.3	2	350	382	-	10	1	0	54749
16	Type 5	2	3	399	378	353	10	1	0	79847
17	Type 5	1	2	335	383	-	10	1	0	55961
18	Type 5	1.3	2	347	378	-	10	1	0	55273
19	Type 5	1	2	332	376	-	10	1	0	56716

*Note:
(1) When testing CAC and Off-Channel CAC in the band 5600 MHz to 5650 MHz, the minimum number of pulses (for each PRF) of the radar test signal will be changed to 18.

Radar Signal 6										
Trial ID	Radar Type	Pulse Width (μs)	Number of Different PRFs	Pulse Repetition Frequency (PPS)			Pulses per Burst for Each PRF (PPB)*	Number of Bursts	Chirp BW (MHz)	Waveform Length (μs)
				PRF-1	PRF-2	PRF-3				
0	Type 6	1.4	3	845	1103	1195	15	1	0	43902
1	Type 6	0.5	2	430	598	-	15	1	0	59967
2	Type 6	0.9	2	621	999	-	15	1	0	39169.5
3	Type 6	2	3	1145	835	1057	15	1	0	45256.5
4	Type 6	1.7	3	974	720	817	15	1	0	54594
5	Type 6	1.3	2	780	1031	-	15	1	0	33780
6	Type 6	1.4	3	835	935	626	15	1	0	57967.5
7	Type 6	1.1	2	694	1058	-	15	1	0	35791.5
8	Type 6	1.4	3	827	1084	924	15	1	0	48210
9	Type 6	0.6	2	451	809	-	15	1	0	51801
10	Type 6	1.7	3	972	732	1128	15	1	0	49221
11	Type 6	2	3	1109	918	1199	15	1	0	42375
12	Type 6	1.4	3	841	1023	727	15	1	0	53131.5
13	Type 6	1	2	651	830	-	15	1	0	41113.5
14	Type 6	1.9	3	1096	705	937	15	1	0	50970
15	Type 6	1.3	2	799	1003	-	15	1	0	33729
16	Type 6	2	3	1189	1097	795	15	1	0	45157.5
17	Type 6	1	2	678	1049	-	15	1	0	36423
18	Type 6	1.3	2	778	973	-	15	1	0	34695
19	Type 6	1	2	654	988	-	15	1	0	38118

*Note:
(1) When testing CAC and Off-Channel CAC in the band 5600 MHz to 5650 MHz, the minimum number of pulses (for each PRF) of the radar test signal will be changed to 18.

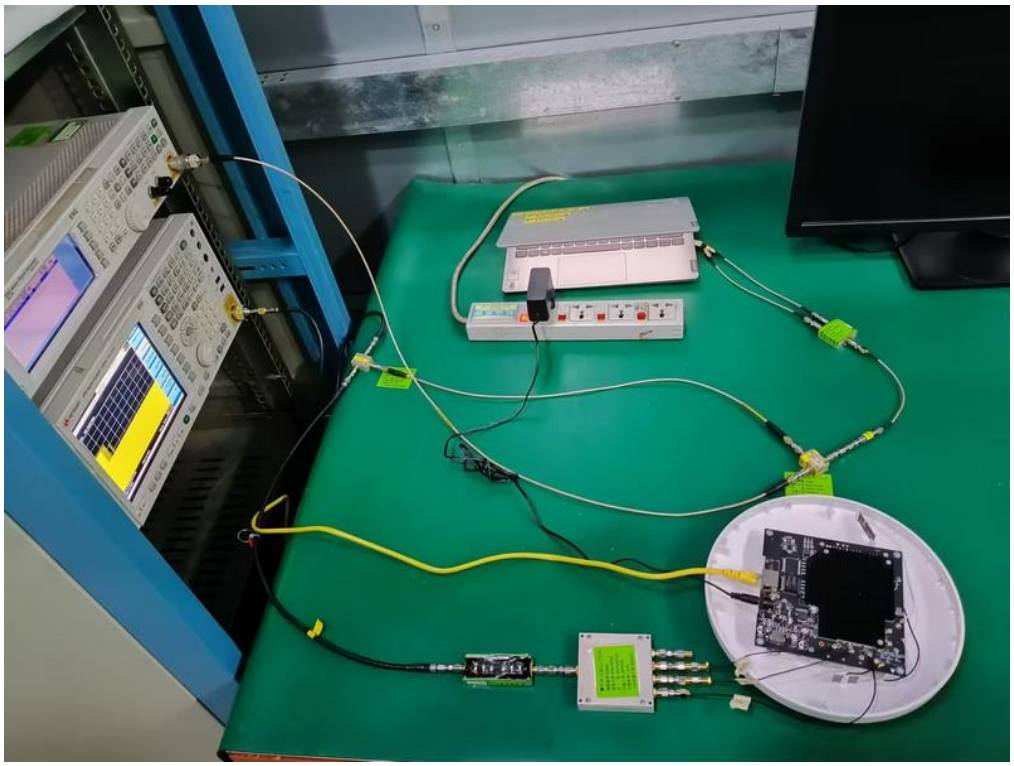
8. MEASUREMENT INSTRUMENTS LIST

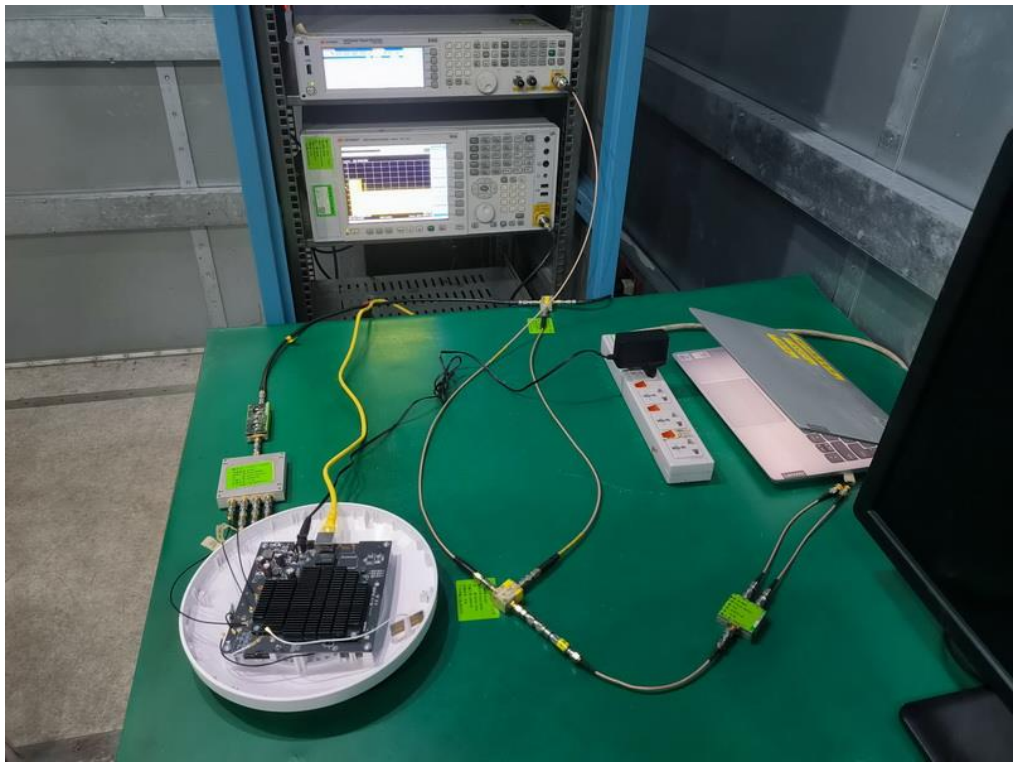
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY54430251	Jun. 16, 2024
2	Power Splitter	Mini-Circuits	ZFRSC-183-S+	SFG32801811-1	Jun. 16, 2024
3	Attenuator	STI	STI01-0201-01	N/A	Jan. 07, 2024
4	Power Splitter	Mini-Circuits	ZFRSC-123-S+	331000910-1	Jan. 07, 2024
5	Power Splitter	Mini-Circuits	ZN4PD-642W-S+	SN224901449	Jan. 07, 2024
6	EXG-B RF Vector Signal Generator	Keysight	N5172B	MY53051637	Jan. 07, 2024
7	Power Splitter	N/A	N/A	SZ201504604	Jan. 07, 2024
8	Notebook	Lenovo	XIAOXIN PRO 13 2020	N/A	N/A
9	Measurement Software	Keysight	N7607C Signal studio V2.4.0.0	N/A	N/A

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

9. EUT TEST PHOTO

DFS Test Photos





APPENDIX A - CHANNEL AVAILABILITY CHECK

Test Mode:	IEEE 802.11a

Test Frequency	Radar Test Signal	Timing of radar burst (within the 60 sec/10 min CAC time)	DFS triggered (Yes/No)
C5 within 5250 MHz to 5350 MHz **5320MHz** (see note 1)	See EN 301 893, table D.3	Within 0 to 2 second window	Yes
		Within 58 to 60 second window	Yes
C6 within 5470 MHz to 5725 MHz **5700MHz** (see note 1)	See EN 301893, table D.3	Within 0 to 2 second window	Yes
		Within 58 to 60 second window	Yes
C6' within 5600 MHz to 5650 MHz **5620MHz** (see note 1)	See EN 301 893, table D.3	Within 0 to 2 second window	Yes
		Within 598 to 600 second window	Yes

Note:

(1) According to EN 301 893, DFS testing shall be performed on one channel within the range 5250 MHz to 5350 MHz and one channel within 5470 MHz to 5725 MHz range. The choice of the channel is at the discretion of the test laboratory. Where the declared channel plan includes channels whose nominal bandwidth falls completely or partly within the 5600 MHz to 5650 MHz band, the tests for the Channel Availability Check shall be performed on one of these channels in addition to a channel within the band 5470 MHz to 5600 MHz or 5650 MHz to 5725 MHz band.

Test Mode:	IEEE 802.11a

Test Frequency	Radar Test Signal (#)	Nr of times triggered (# out of 20)	Detection Probability
C5 within 5250 MHz to 5350 MHz **5320MHz** (see note 2)	1	20	100%
	2	19	95%
	3	20	100%
	4	20	100%
	5	18	90%
	6	20	100%
C6 within 5470 MHz to 5725 MHz **5700MHz** (see note 2)	1	18	90%
	2	20	100%
	3	19	95%
	4	20	100%
	5	20	100%
	6	18	90%
C6' within 5600 MHz to 5650 MHz **5620MHz** (see note 3)	1	20	100%
	2	20	100%
	5	20	100%
	6	20	100%

Note:

(1) Although testing has to be repeated 20 times, only one timing plot or analyzer screen capture from a successful DFS trigger is necessary.

(2) According to EN 301 893, clause 5.4.8.2.1.3,Step e) shall be performed 20 times, each time a different radar test signal shall be generated from options provided in table D.4.

(3) According to EN 301 893, clause 5.4.8.2.1.3,Step g) shall be performed 20 times, each time a different radar test signal shall be generated from options provided in table D.4 (**except signals #3 and #4**).

C5 (Within 0 to 2 second window)



C5 (Within 58 to 60 second window)



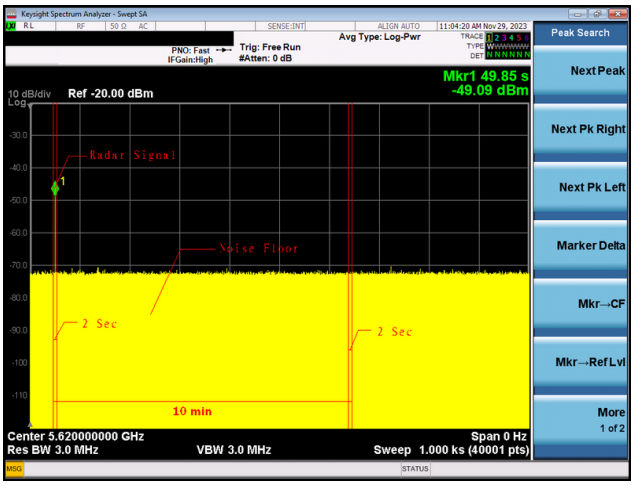
C6 (Within 0 to 2 second window)



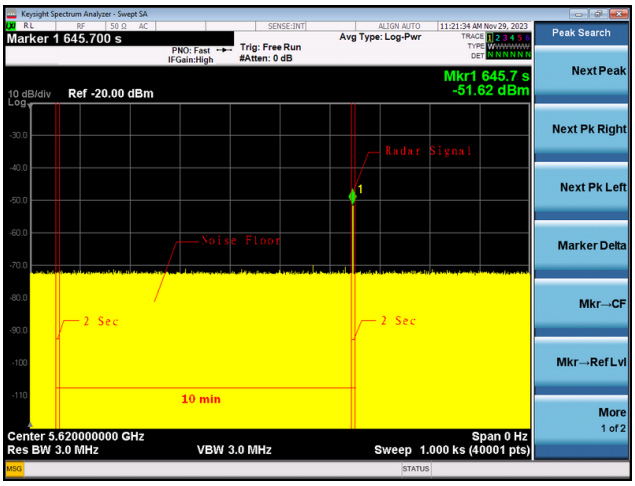
C6 (Within 58 to 60 second window)



C6' (Within 0 to 2 second window)



C6' (Within 598 to 600 second window)



Test Mode:	IEEE 802.11ax(HE160)

Test Frequency	Radar Test Signal	Timing of radar burst (within the 60 sec/10 min CAC time)	DFS triggered (Yes/No)
C5 within 5250 MHz to 5350 MHz **5250MHz** (see note 1)	See EN 301 893, table D.3	Within 0 to 2 second window	Yes
		Within 58 to 60 second window	Yes
C6' within 5600 MHz to 5650 MHz **5570MHz** (see note 1)	See EN 301 893, table D.3	Within 0 to 2 second window	Yes
		Within 598 to 600 second window	Yes

Note:

(1) According to EN 301 893, DFS testing shall be performed on one channel within the range 5250 MHz to 5350 MHz and one channel within 5470 MHz to 5725 MHz range. The choice of the channel is at the discretion of the test laboratory. Where the declared channel plan includes channels whose nominal bandwidth falls completely or partly within the 5600 MHz to 5650 MHz band, the tests for the Channel Availability Check shall be performed on one of these channels in addition to a channel within the band 5470 MHz to 5600 MHz or 5650 MHz to 5725 MHz band.

Test Mode:	IEEE 802.11ax(HE160)

Test Frequency	Radar Test Signal (#)	Nr of times triggered (# out of 20)	Detection Probability
C5 within 5250 MHz to 5350 MHz **5250MHz** (see note 2)	1	20	100%
	2	20	100%
	3	20	100%
	4	20	100%
	5	18	90%
	6	18	90%
C6' within 5600 MHz to 5650 MHz **5570MHz** (see note 3)	1	20	100%
	2	20	100%
	5	20	100%
	6	20	100%

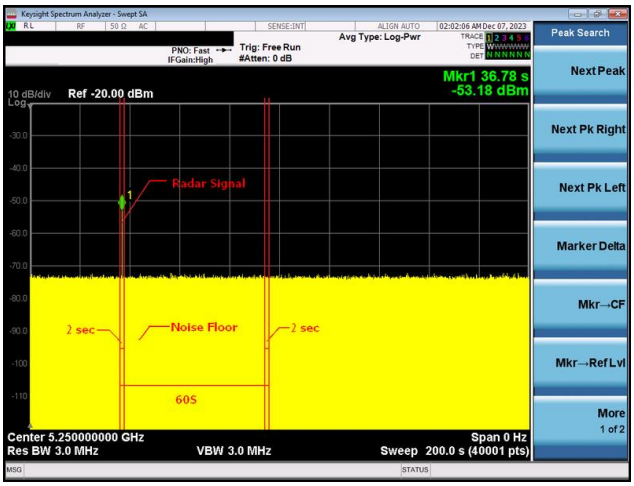
Note:

(1) Although testing has to be repeated 20 times, only one timing plot or analyzer screen capture from a successful DFS trigger is necessary.

(2) According to EN 301 893, clause 5.4.8.2.1.3,Step e) shall be performed 20 times, each time a different radar test signal shall be generated from options provided in table D.4.

(3) According to EN 301 893, clause 5.4.8.2.1.3,Step g) shall be performed 20 times, each time a different radar test signal shall be generated from options provided in table D.4 (**except signals #3 and #4**).

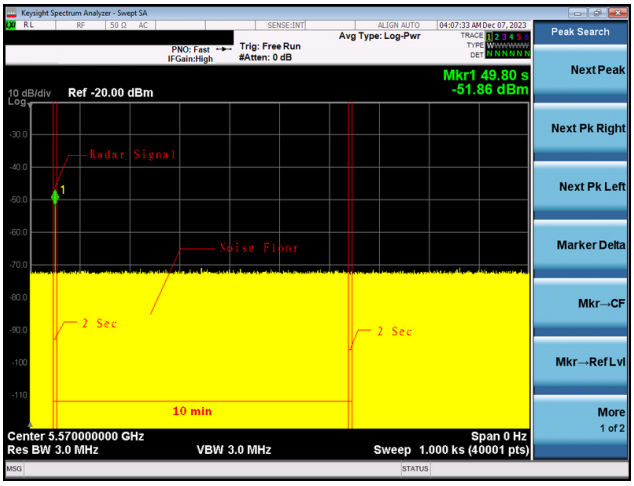
C5 (Within 0 to 2 second window)



C5 (Within 58 to 60 second window)



C6' (Within 0 to 2 second window)



C6' (Within 598 to 600 second window)



APPENDIX B - IN-SERVICE MONITORING

Test Mode:	IEEE 802.11a

Test Frequency	Radar Test Signal (#)	Nr of times triggered (# out of 20)	Detection Probability
C5 within 5250 MHz to 5350 MHz **5320MHz**	1	20	100%
	2	20	100%
	3	20	100%
	4	19	95%
	5	20	100%
	6	20	100%
C6 within 5470 MHz to 5725 MHz **5700MHz**	1	20	100%
	2	20	100%
	3	19	95%
	4	19	95%
	5	19	95%
	6	18	90%

Note:

(1) Although testing has to be repeated 20 times, only one timing plot or analyzer screen capture from a successful DFS trigger is necessary.

Test Mode:	IEEE 802.11ax(HE160)

Test Frequency	Radar Test Signal (#)	Nr of times triggered (# out of 20)	Detection Probability
C5 within 5250 MHz to 5350 MHz **5250MHz**	1	19	95%
	2	18	90%
	3	20	100%
	4	18	90%
	5	19	95%
	6	18	90%
C6 within 5470 MHz to 5725 MHz **5570MHz**	1	20	100%
	2	20	100%
	3	20	100%
	4	20	100%
	5	20	100%
	6	20	100%

Note:

(1) Although testing has to be repeated 20 times, only one timing plot or analyzer screen capture from a successful DFS trigger is necessary.

APPENDIX C - CHANNEL SHUTDOWN AND NON-OCCUPANCY PERIOD

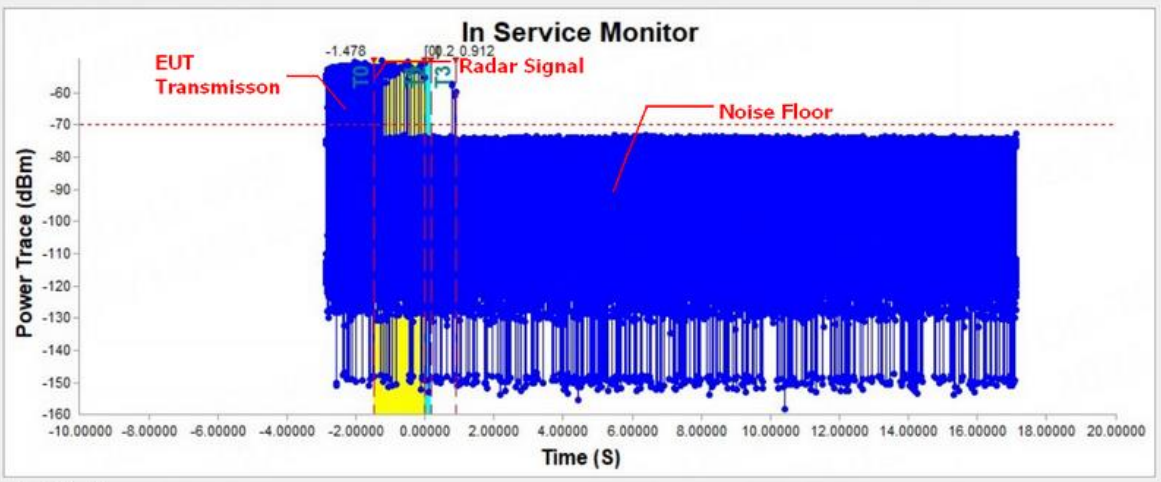
Test Mode:	IEEE 802.11a

Test Frequency	Radar Test Signal	Channel Closing Transmission Time (s)	Channel Move Time (s)	Non-Occupancy Period (min) (see note 1)
C5 within 5250 MHz to 5350 MHz **5320MHz**	See EN 301 893, table D.3	<1	<10	>30
C6 within 5470 MHz to 5725 MHz **5700MHz**	See EN 301 893, table D.3	<1	<10	>30

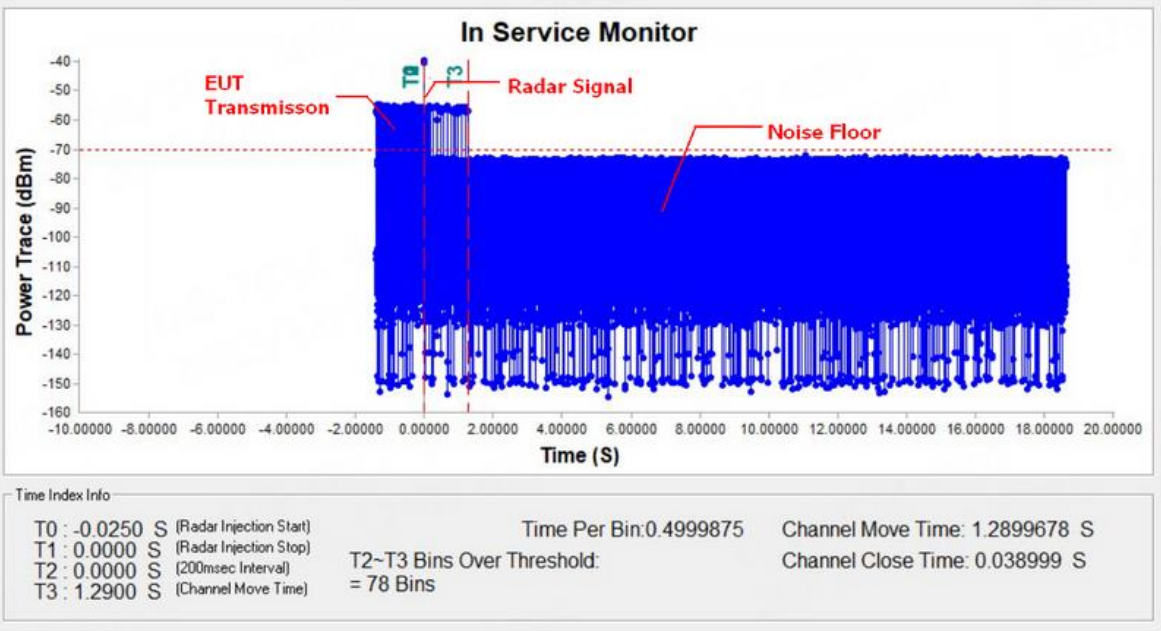
Note:

(1) The Non-Occupancy Period (NOP) is only applicable on a Master device or a Slave device with a Radar Interference Detection function. There is no need to verify the NOP for a period longer than 30 minutes which is the minimum time required. If the NOP is shorter than 30 minutes, indicate the exact time, if the NOP is longer than 30 minutes just mention '>30' as the result.

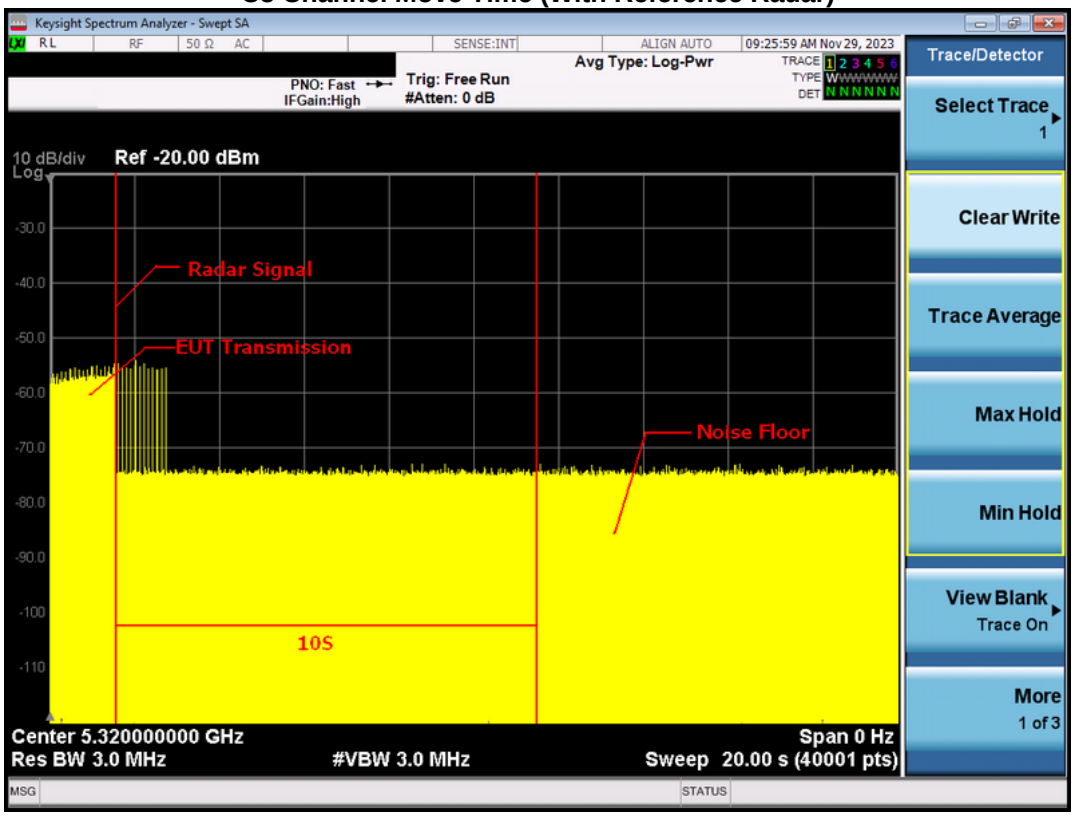
C5 Channel Closing Transmission Time (With Reference Radar)



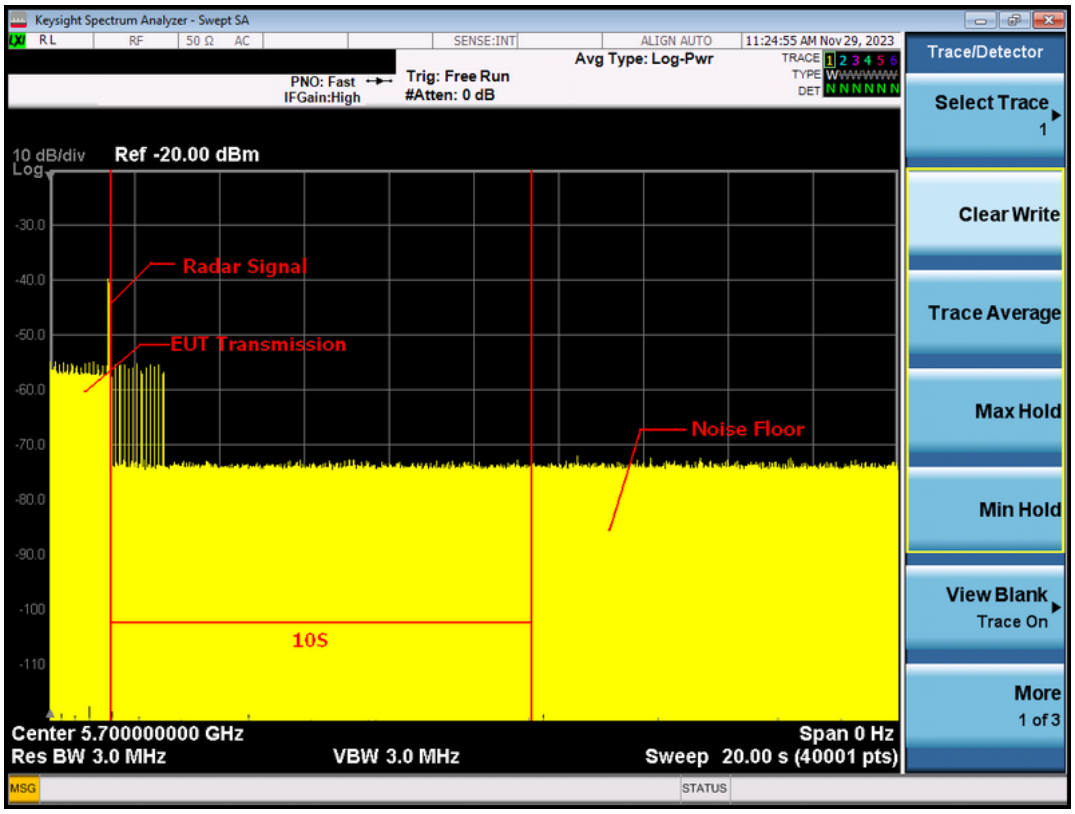
C6 Channel Closing Transmission Time (With Reference Radar)



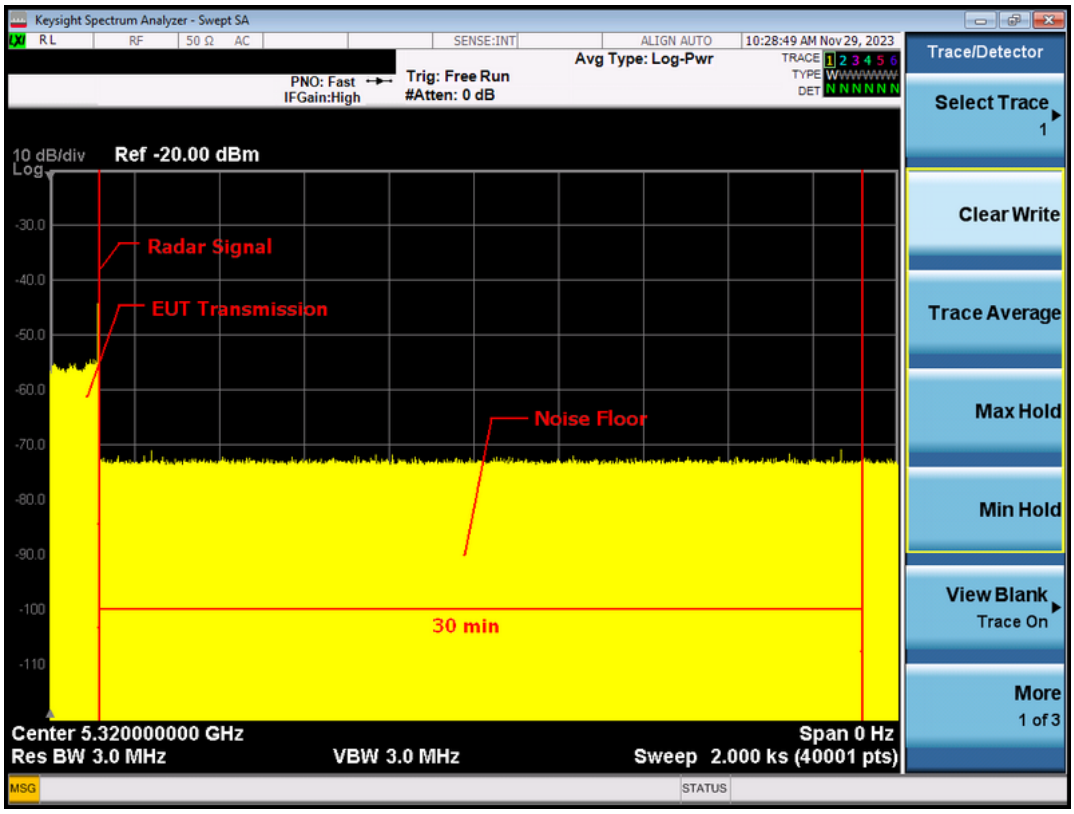
C5 Channel Move Time (With Reference Radar)



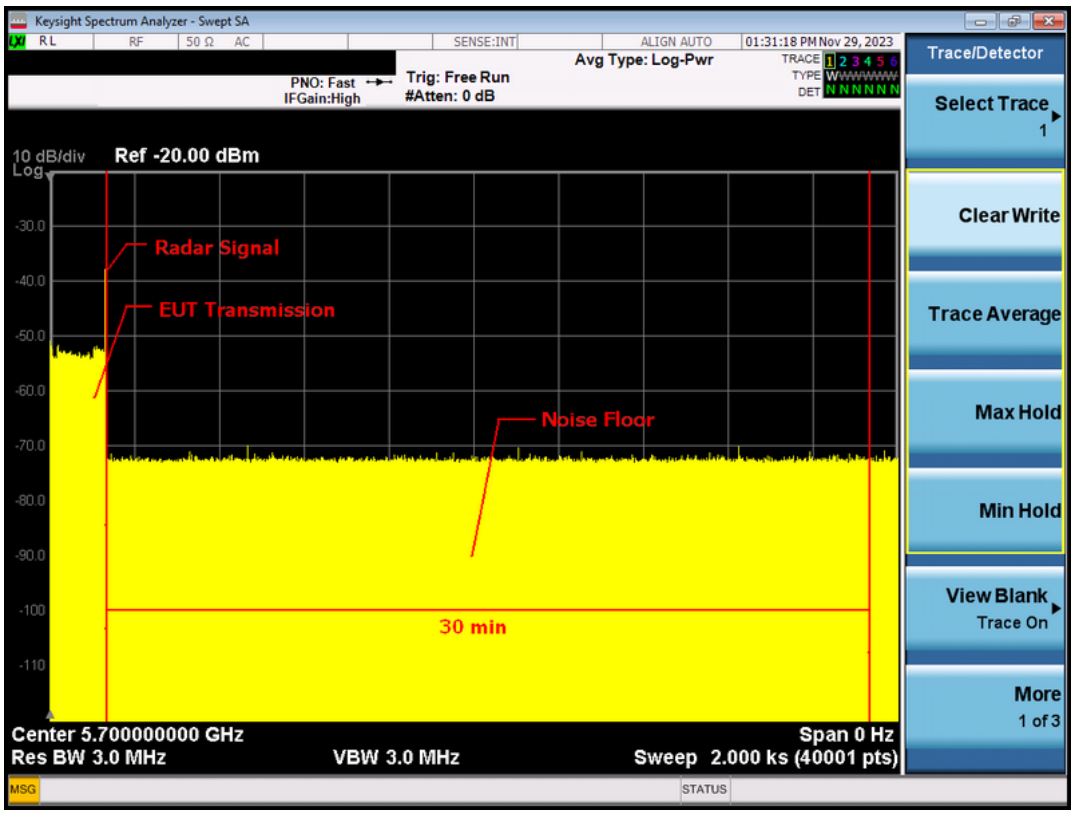
C6 Channel Move Time (With Reference Radar)



C5 Non-Occupancy Period (With Reference Radar)



C6 Non-Occupancy Period (With Reference Radar)



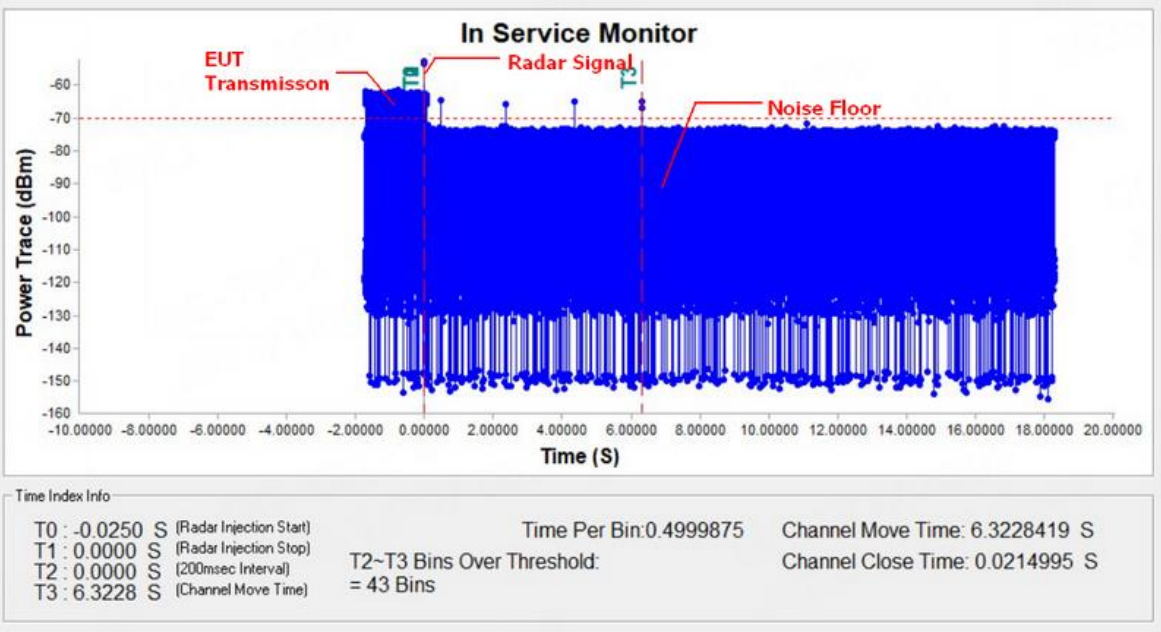
Test Mode:	IEEE 802.11ax(HE160)

Test Frequency	Radar Test Signal	Channel Closing Transmission Time (s)	Channel Move Time (s)	Non-Occupancy Period (min) (see note 1)
C5 within 5250 MHz to 5350 MHz **5250MHz**	See EN 301 893, table D.3	<1	<10	>30
C6 within 5470 MHz to 5725 MHz **5570MHz**	See EN 301 893, table D.3	<1	<10	>30

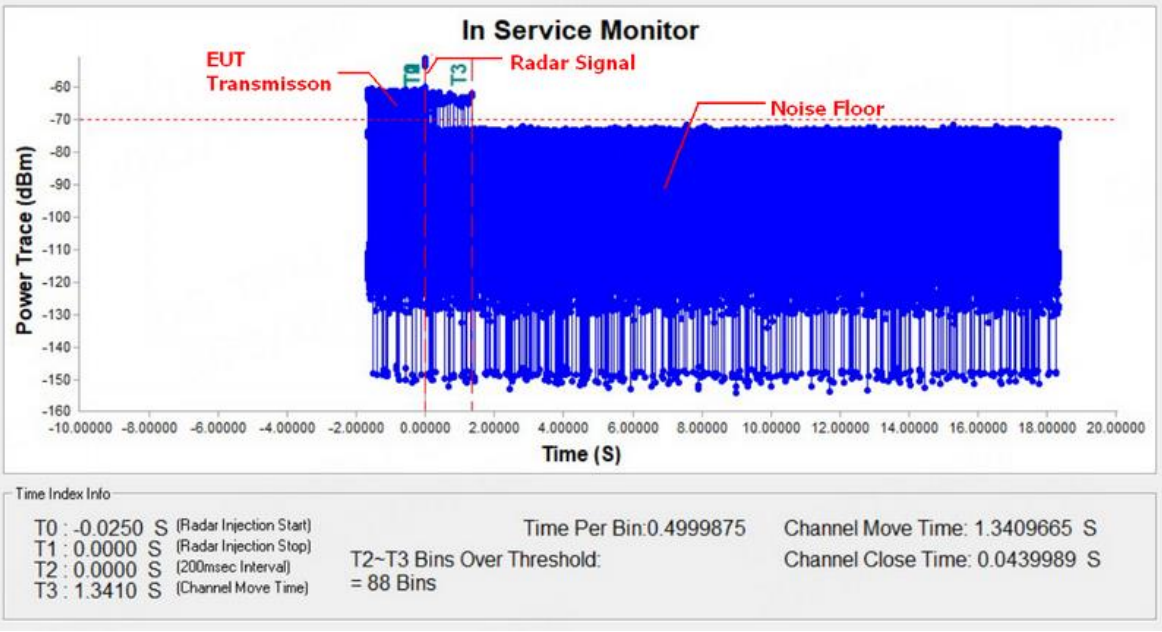
Note:

(1) The Non-Occupancy Period (NOP) is only applicable on a Master device or a Slave device with a Radar Interference Detection function. There is no need to verify the NOP for a period longer than 30 minutes which is the minimum time required. If the NOP is shorter than 30 minutes, indicate the exact time, if the NOP is longer than 30 minutes just mention '>30' as the result.

C5 Channel Closing Transmission Time (With Reference Radar)



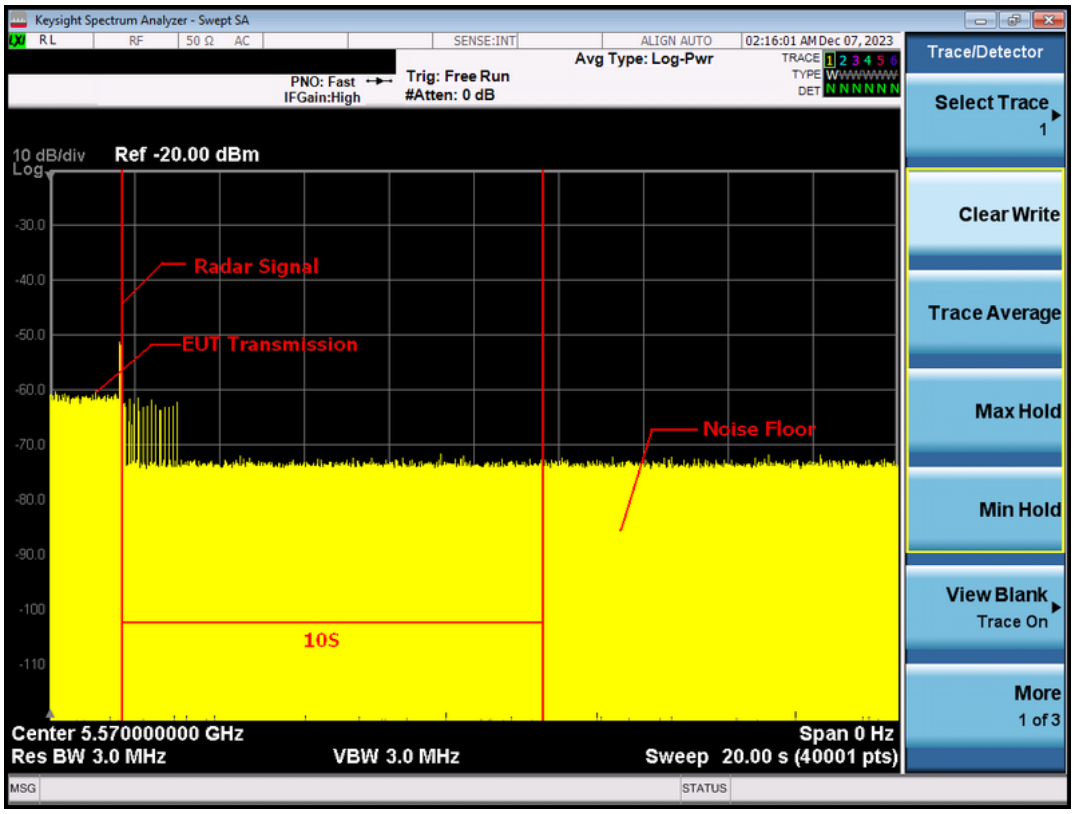
C6 Channel Closing Transmission Time (With Reference Radar)



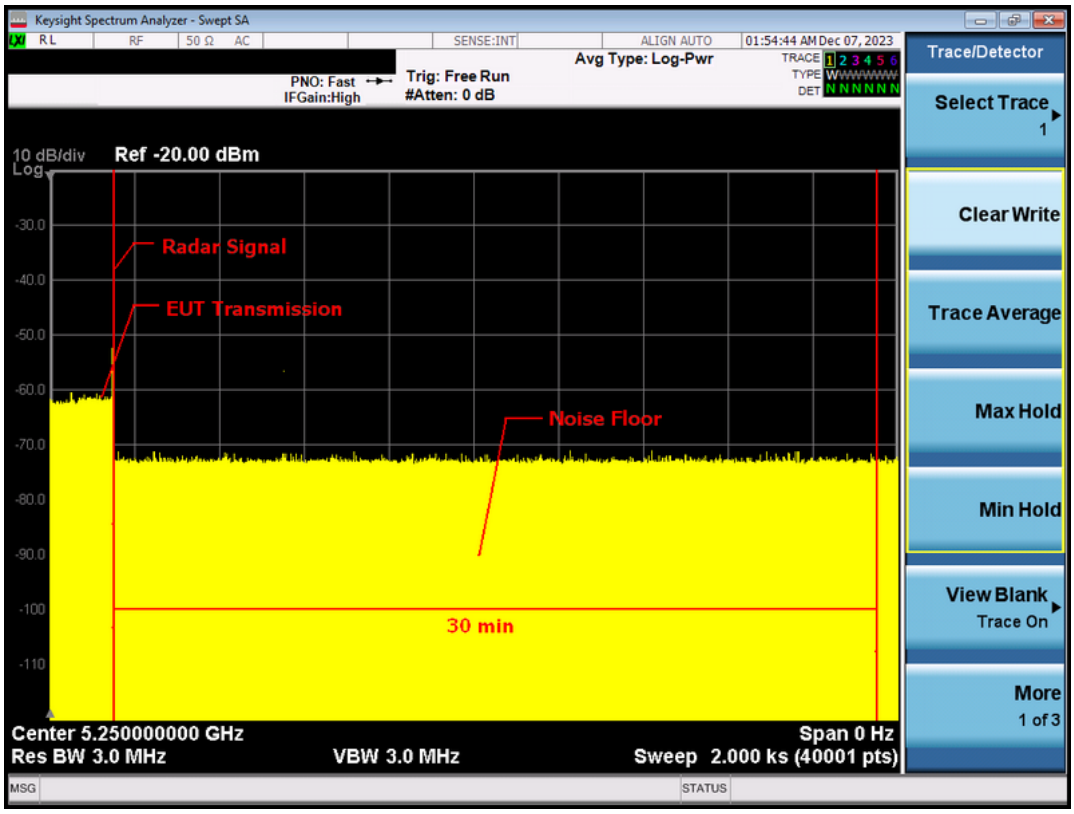
C5 Channel Move Time (With Reference Radar)



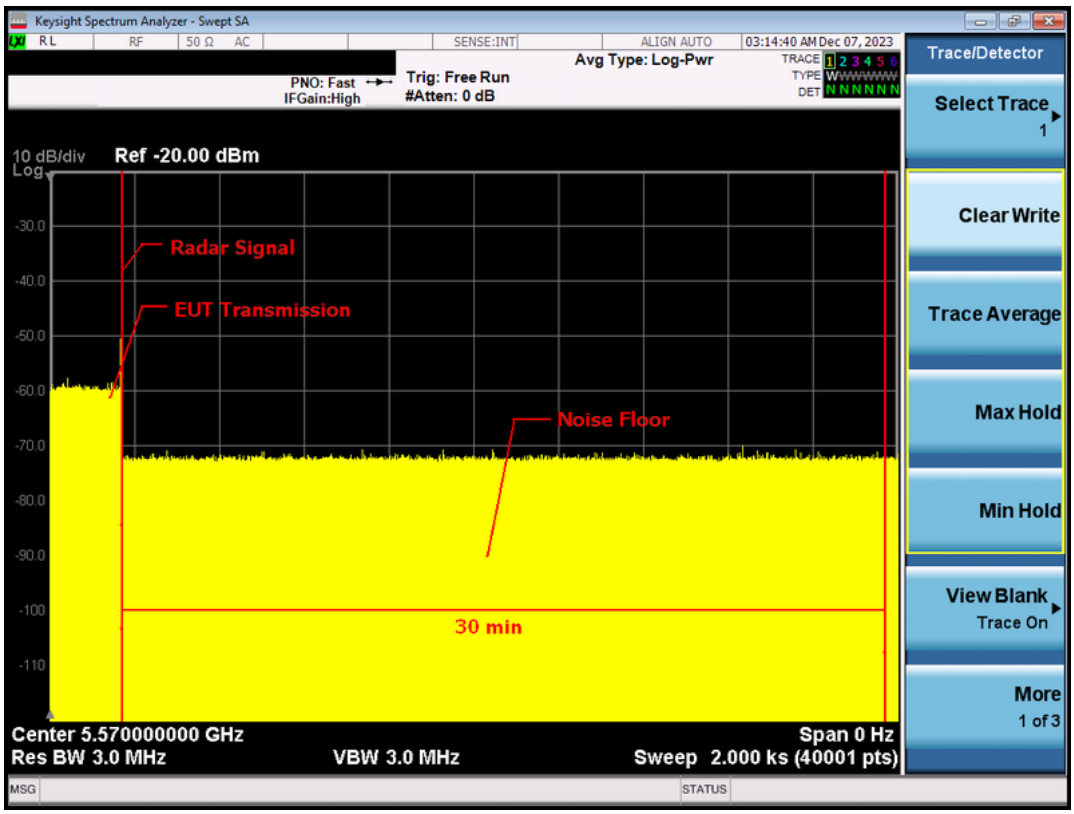
C6 Channel Move Time (With Reference Radar)



C5 Non-Occupancy Period (With Reference Radar)

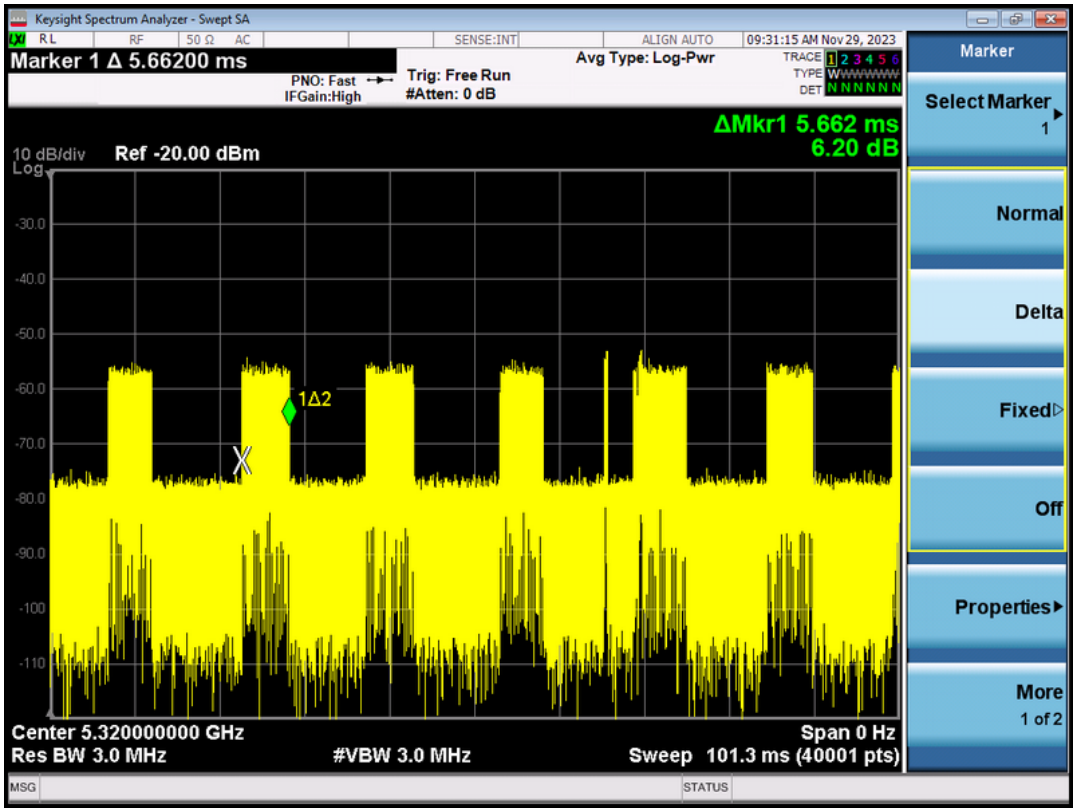


C6 Non-Occupancy Period (With Reference Radar)

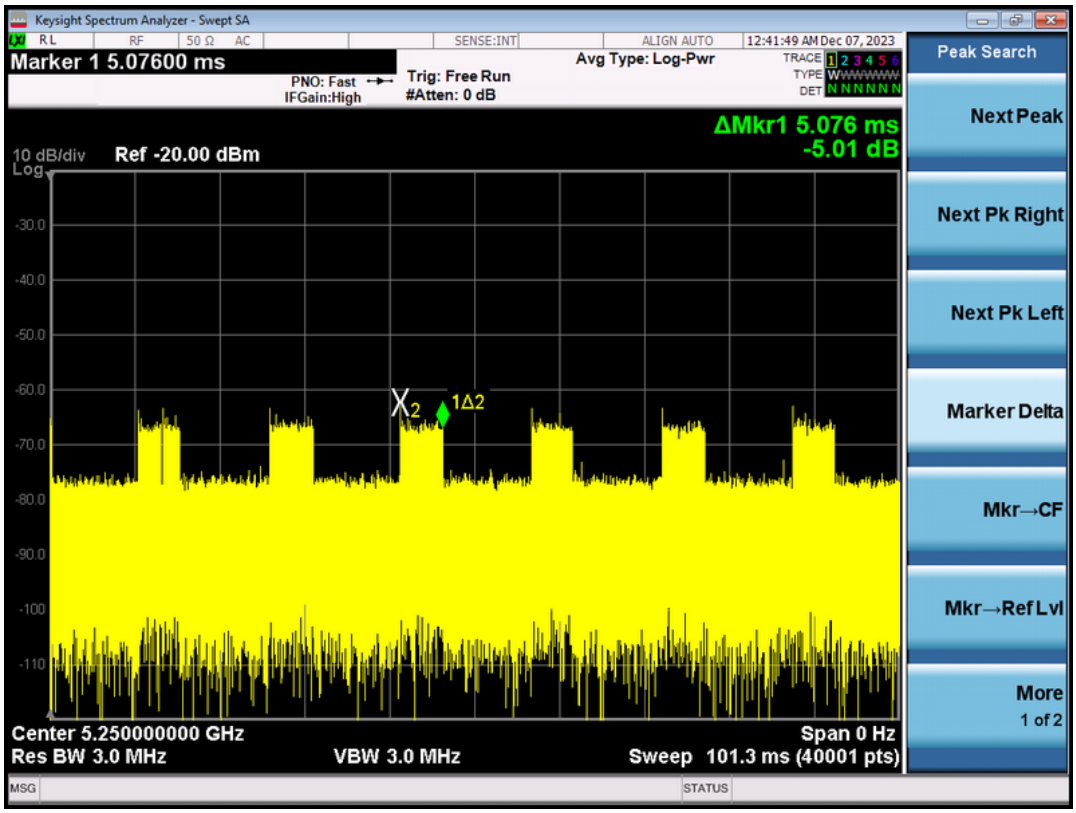


Channel Loading

IEEE 802.11a



IEEE 802.11ax(HE160)



Frequency (MHz)	Marker Delta (ms)	Number	On Time (ms)	Total Time (ms)	Duty cycle (%)	Limit (%)
5320	5.662	6	33.972	101.3	33.54	30
5250	5.076	6	30.456	101.3	30.07	30

End of Test Report