Certificate #7130.01

CE DFS Test Report

Project No.	:	2405G097
Equipment	:	Projector
Brand Name	:	XGIMI
Test Model	:	XN13A
Series Model	:	N/A
Applicant	:	XGIMI Technology Co., Ltd.
Address	:	Building No.4, Zone A, No.1129, Shijicheng Road, Chengdu High-tech Zone, Sichuan Pilot Free Trade Zone, China
Manufacturer	:	XGIMI Technology Co., Ltd.
Address	:	Building No.4, Zone A, No.1129, Shijicheng Road, Chengdu High-tech Zone, Sichuan Pilot Free Trade Zone, China
Factory	:	Yibin XGIMI Optoelectronic Co., Ltd.
Address	:	No. 2, West Section 4, Changjiang North Road, Lingang Economic Development Zone, Yibin City, Sichuan P.R. China
Date of Receipt	:	May 31, 2024
Date of Test	:	Jun. 06, 2024 ~ Jul. 05, 2024
Issued Date	:	Jul. 19, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: SSL2024053136
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.

Prepared by : Sheldon Ou

Approved by : Chay Cai

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

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BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

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-5-2405G097	R00	Original Report.	Jul. 19, 2024	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 City, Guangdong People's Republic of China.

2. TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By	Test Date
Dynamic Frequency Selection (DFS)	21°C	53%	DC 12V	Rexer Li	Jul. 01, 2024-Jul. 03, 2024

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.	N/A
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.	N/A
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.	N/A
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.	N/A

Note:

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

4. GENERAL INFORMATION

4.1 GENERAL DESCRIPTION OF EUT

Equipment	Projector
Brand Name	XGIMI
Test Model	XN13A
Series Model	N/A
Model Difference(s)	N/A
Hardware Version	V06
Software Version	V0.0.75
Power Source	DC voltage supplied from AC adapter. Model: S065ARV2000325
Power Rating	I/P: 100-240V~ 50/60Hz 1.8A Max O/P: 5.0V⎓3.0A 15.0W or 9.0V⎓3.0A 27.0W or 12.0V⎓3.0A 36.0W or 15.0V⎓3.0A 45.0W or 20.0V⎓3.25A 65.0W
Operation Frequency Band(s)	5250 MHz ~ 5350 MHz 5470 MHz ~ 5725 MHz
Modulation Type	IEEE 802.11a/n/ac: OFDM
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 866.7 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 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
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 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
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				

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ZTX	N/A	FPC	N/A	4.30
2	ZTX	N/A	FPC	N/A	5.99

Note:
This EUT supports CDD. Physically, the EUT provides two completed transmitters and receivers (2T2R).

4. The worst case for 1TX/2TX as follow:

Operating Mode / TX Mode	1TX	2TX
IEEE 802.11a	V (Ant. 1)	-
IEEE 802.11n(HT20)	-	V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT20)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT40)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT80)	-	V (Ant. 1+Ant. 2)

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.

4.3 CUSTOMER INFORMATION DESCRIPTION

1) The antenna gain is provided by the manufacturer.
2) The results of all test items include cable losses. Part of the cable losses (0.5dB) are provided by the manufacturer, while the other parts of the cable losses are provided by the testing laboratory.

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)

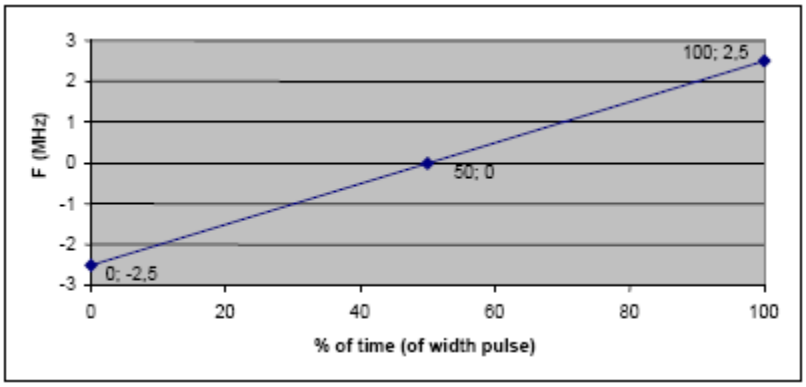
Note:	
(1)	Radar test signals #1 to #4 are constant PRF based signals. See figure D.1. These radar test signals are intended to simulate also radars using a packet based Staggered PRF. See figure D.2.
(2)	Radar test signal #4 is a modulated radar test signal. The modulation to be used is a chirp modulation 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

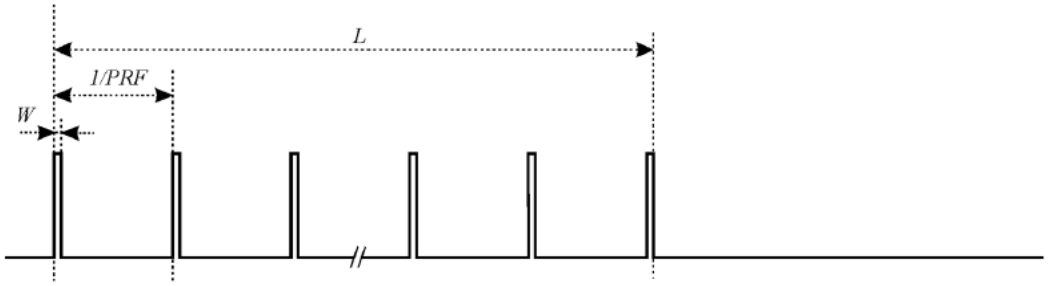


Figure D.1: General structure of a single burst/constant PRF based radar test signal

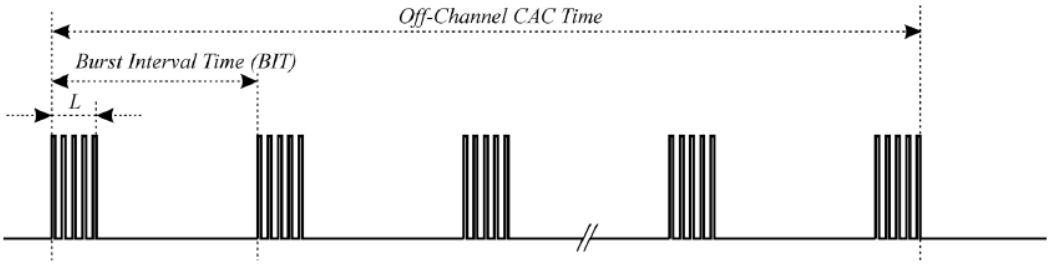


Figure D.2: General structure of a multiple burst/constant PRF based radar test signal

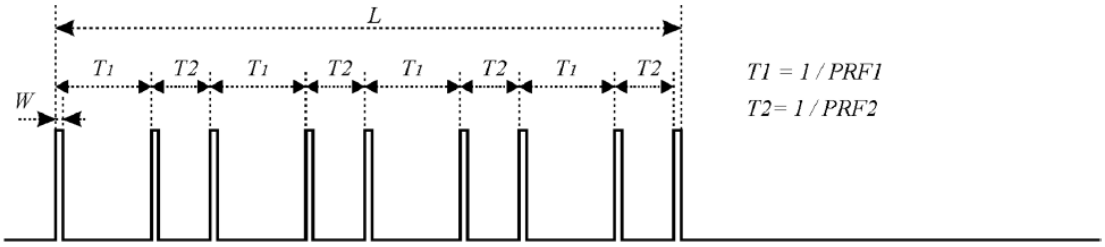


Figure D.3: General structure of a single burst/single pulse based staggered PRF radar test signal

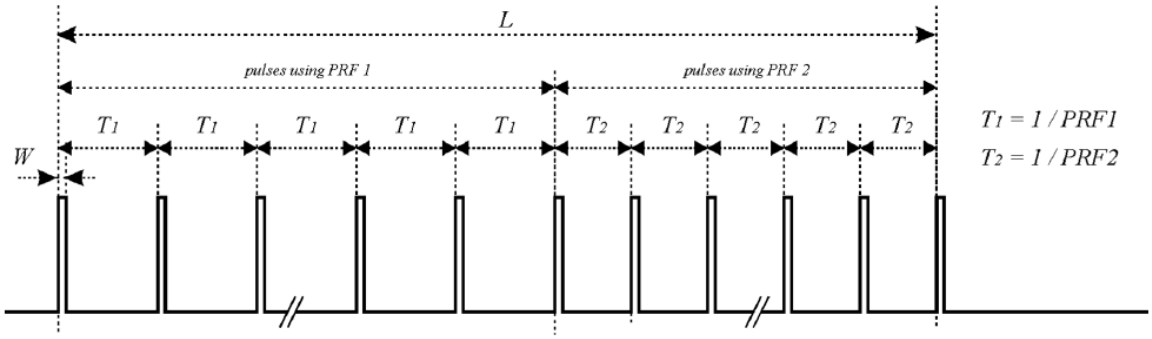


Figure D.4: General structure of a single burst/packet based staggered PRF radar test signal

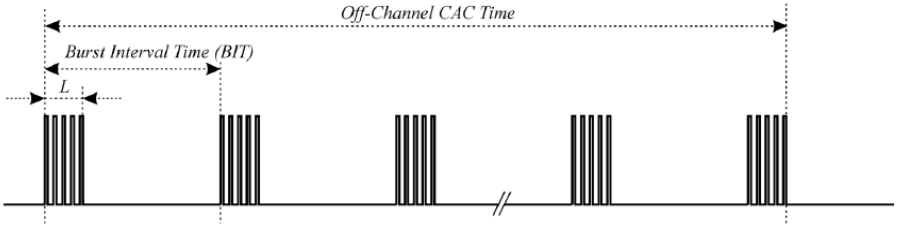


Figure D.5: General structure of a multiple burst/packet based staggered PRF based radar test signal

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: -59.07 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.=9.97 dBm/MHz, Antenna gain is 4.3 dBi.
The EUT is a slave device, the antenna gain of master peripheral used for testing is 2.9dBi.

(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 SHUTDOWN

5.2.1 LIMIT OF CHANNEL SHUTDOWN

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.

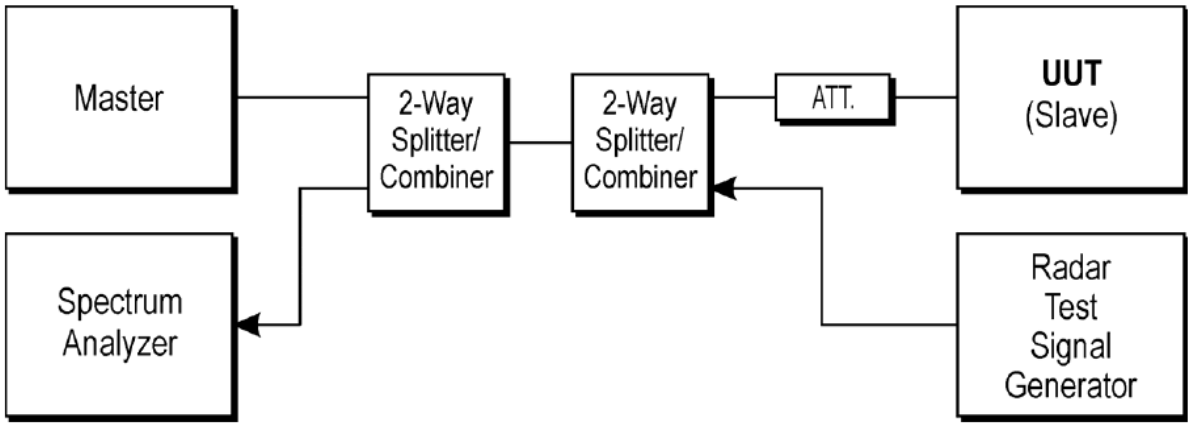
5.2.2 TEST PROCEDURES

Channel Shutdown:

Method of measurement: Refer as EN 301 893, clause 5.4.8.2.1.6

5.2.3 TEST SETUP

Slave without Radar Measurement

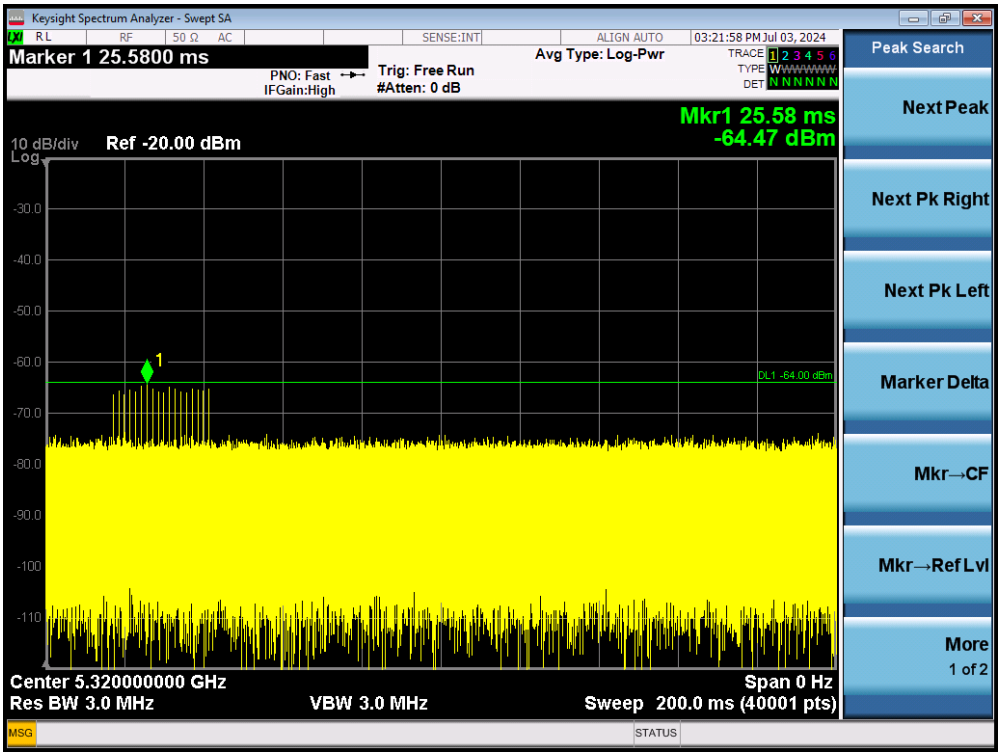


5.2.4 TEST RESULTS

Please refer to the Appendix A.

6. DFS DETECTION THRESHOLD

Radar Signal Reference



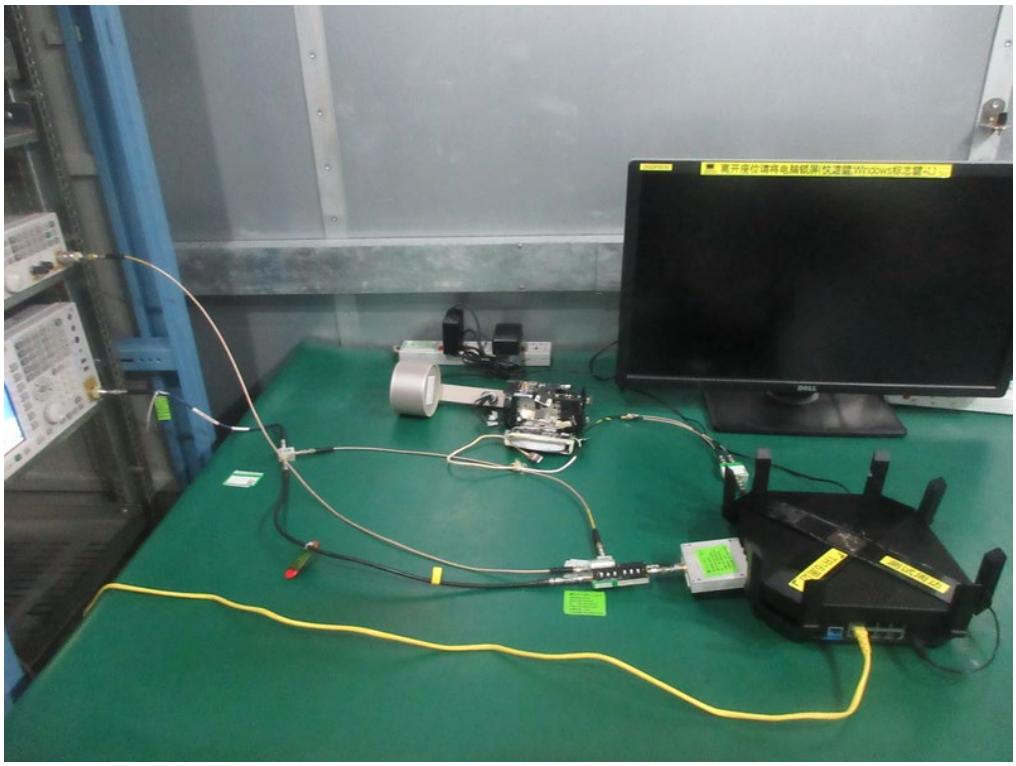
7. MEASUREMENT INSTRUMENTS LIST

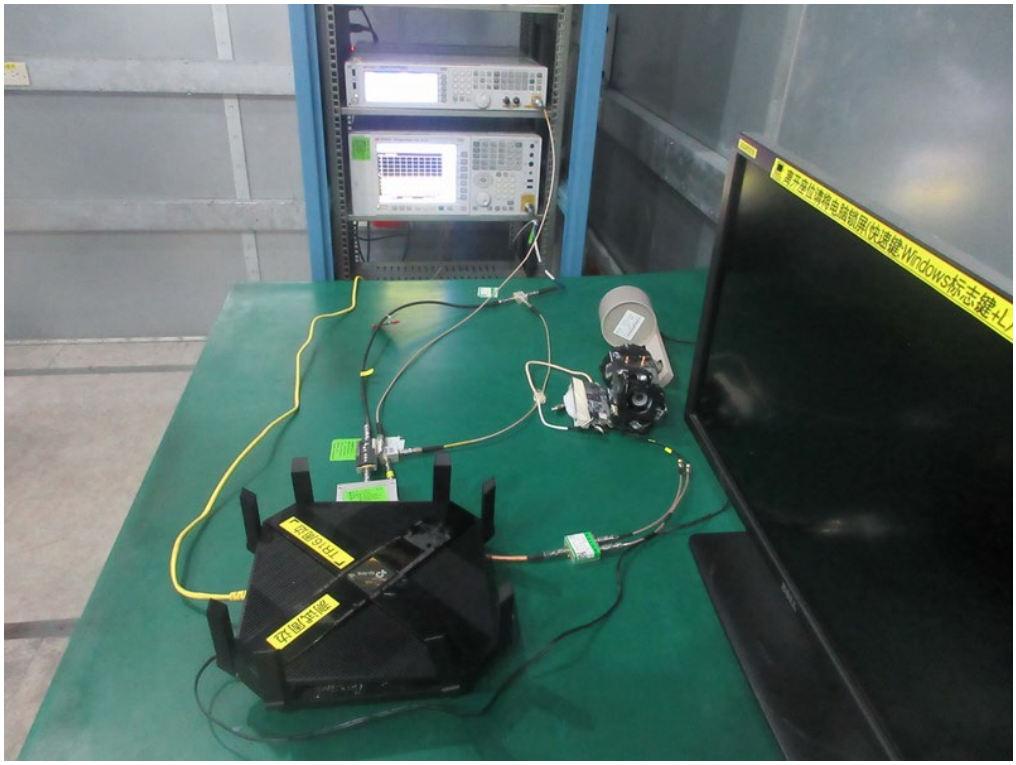
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY54430251	May 31, 2025
2	Power Splitter	Mini-Circuits	ZFRSC-183-S+	SFG32801811-1	May 31, 2025
3	Attenuator	STI	STI01-0201-01	N/A	Dec. 22, 2024
4	Power Splitter	Mini-Circuits	ZFRSC-183-S+	SFG32801811-3	May 31, 2025
5	Power Splitter	Mini-Circuits	ZN4PD-642W-S+	SN224901449	Dec. 22, 2024
6	EXG-B RF Vector Signal Generator	Keysight	N5172B	MY53051637	Dec. 22, 2024
7	Power Splitter	N/A	N/A	SZ201504604	Dec. 22, 2024
8	DC Block	N/A	N/A	N/A	N/A
9	20DB	N/A	N/A	N/A	N/A
10	Wi-Fi Router	tp-link	Archer AX6000	N/A	N/A
11	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.

8. EUT TEST PHOTO

DFS Test Photos



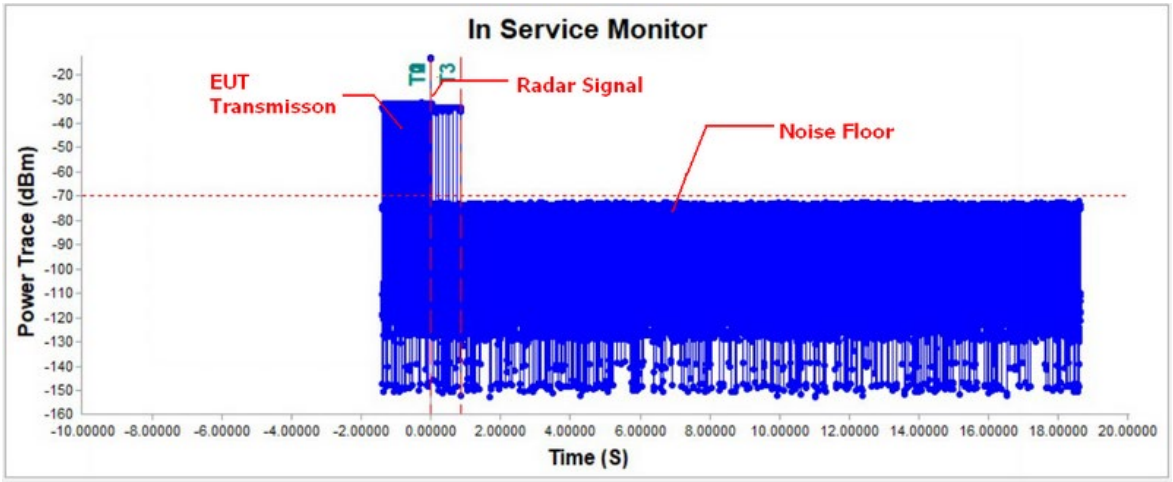


APPENDIX A - CHANNEL SHUTDOWN

Test Mode:	IEEE 802.11a

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

C5 Channel Closing Transmission Time (With Reference Radar)



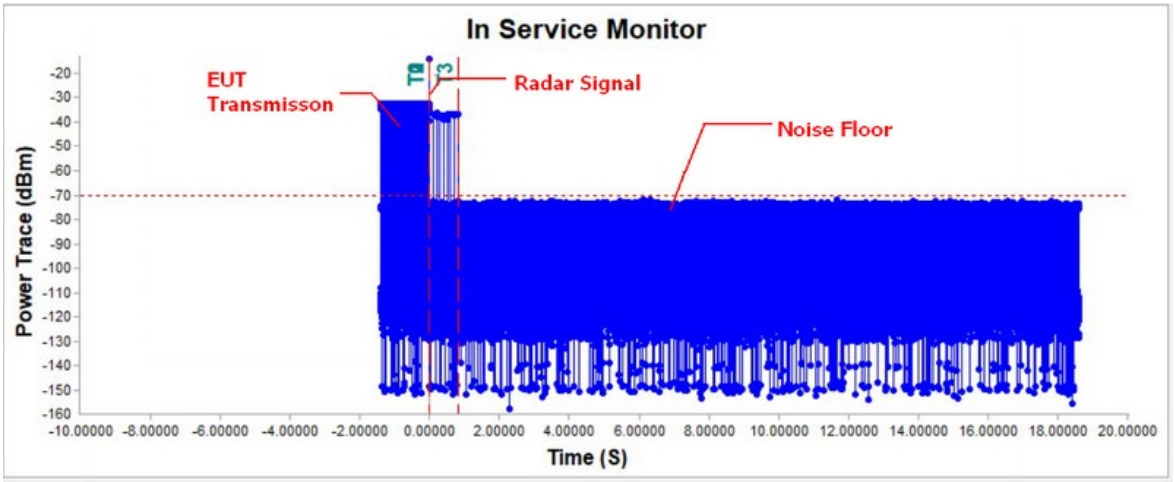
Time Index Info

T0 : -0.0240 S (Radar Injection Start)
T1 : 0.0000 S (Radar Injection Stop)
T2 : 0.0000 S (200msec Interval)
T3 : 0.8440 S (Channel Move Time)

Time Per Bin:0.4999875
T2~T3 Bins Over Threshold:
= 27 Bins

Channel Move Time: 0.8439789 S
Channel Close Time: 0.0134997 S

C6 Channel Closing Transmission Time (With Reference Radar)



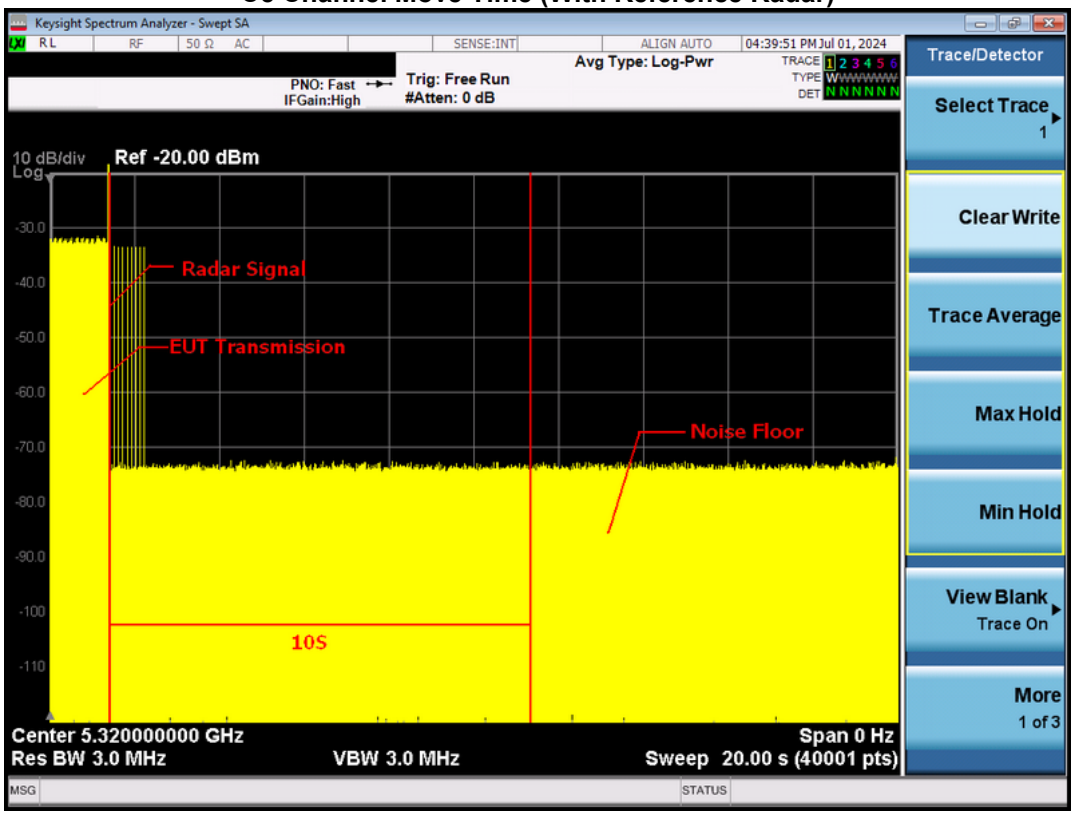
Time Index Info

T0 : -0.0240 S (Radar Injection Start)
T1 : 0.0000 S (Radar Injection Stop)
T2 : 0.0000 S (200msec Interval)
T3 : 0.8180 S (Channel Move Time)

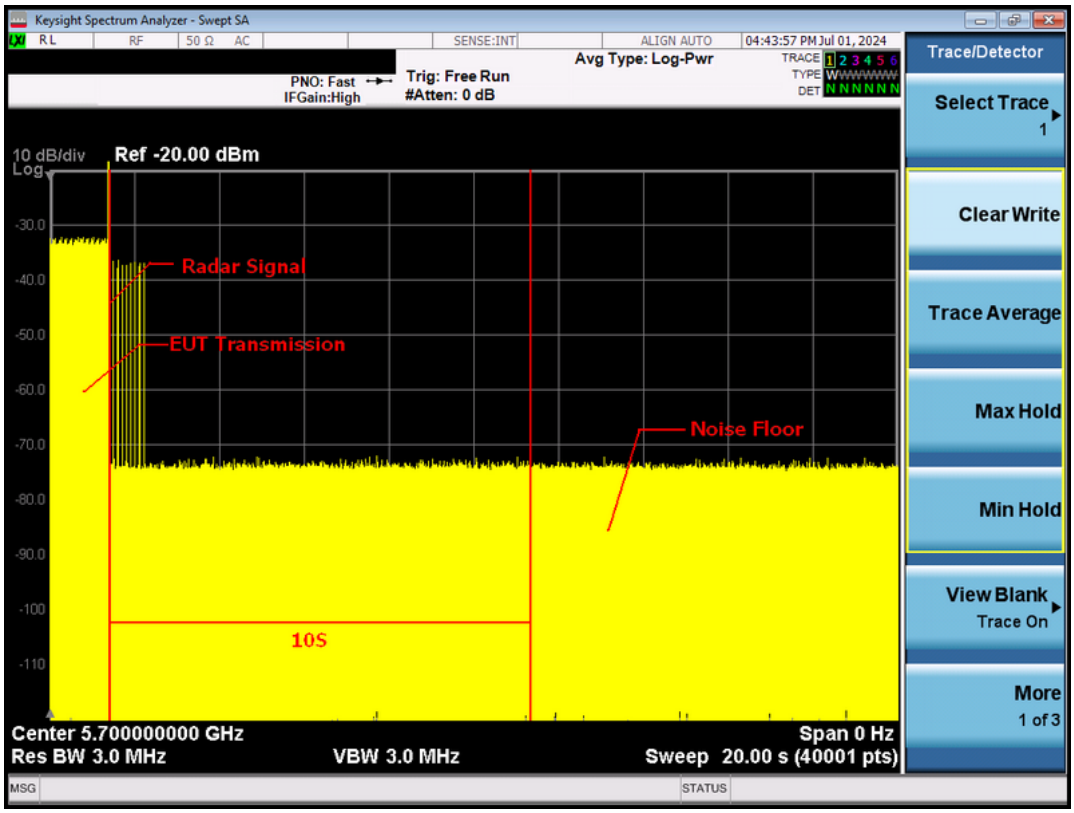
Time Per Bin:0.4999875
T2~T3 Bins Over Threshold:
= 13 Bins

Channel Move Time: 0.8179796 S
Channel Close Time: 0.0064998 S

C5 Channel Move Time (With Reference Radar)



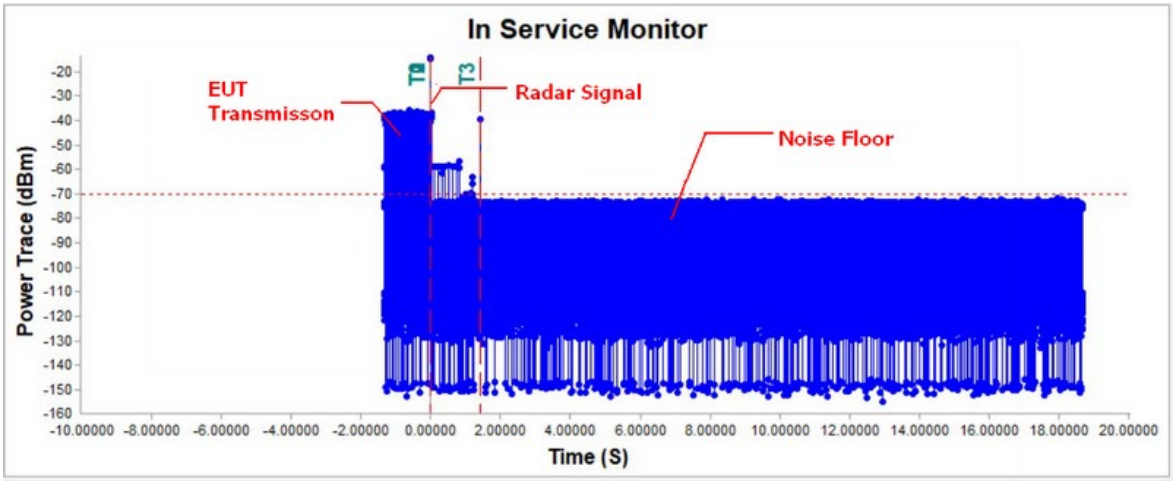
C6 Channel Move Time (With Reference Radar)



Test Mode:	IEEE 802.11ac(VHT80)

Test Frequency	Radar Test Signal	Channel Closing Transmission Time (s)	Channel Move Time (s)
C5 within 5250 MHz to 5350 MHz **5290MHz**	See EN 301 893, table D.3	<1	<10
C6 within 5470 MHz to 5725 MHz **5530MHz**	See EN 301 893, table D.3	<1	<10

C5 Channel Closing Transmission Time (With Reference Radar)



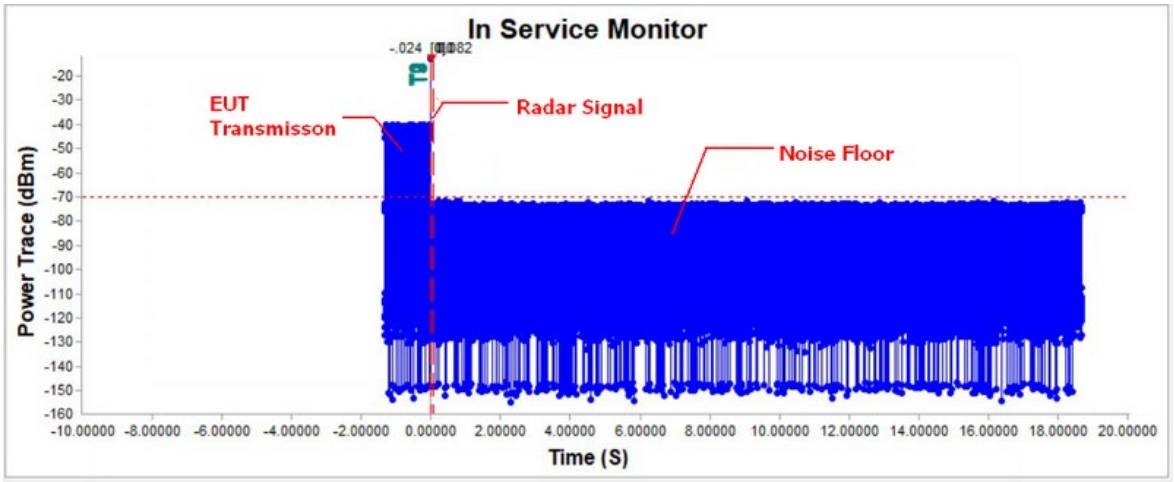
Time Index Info

T0 : -0.0250 S (Radar Injection Start)
T1 : 0.0000 S (Radar Injection Stop)
T2 : 0.0000 S (200msec Interval)
T3 : 1.4060 S (Channel Move Time)

Time Per Bin:0.4999875
T2~T3 Bins Over Threshold:
= 32 Bins

Channel Move Time: 1.4059649 S
Channel Close Time: 0.0159996 S

C6 Channel Closing Transmission Time (With Reference Radar)



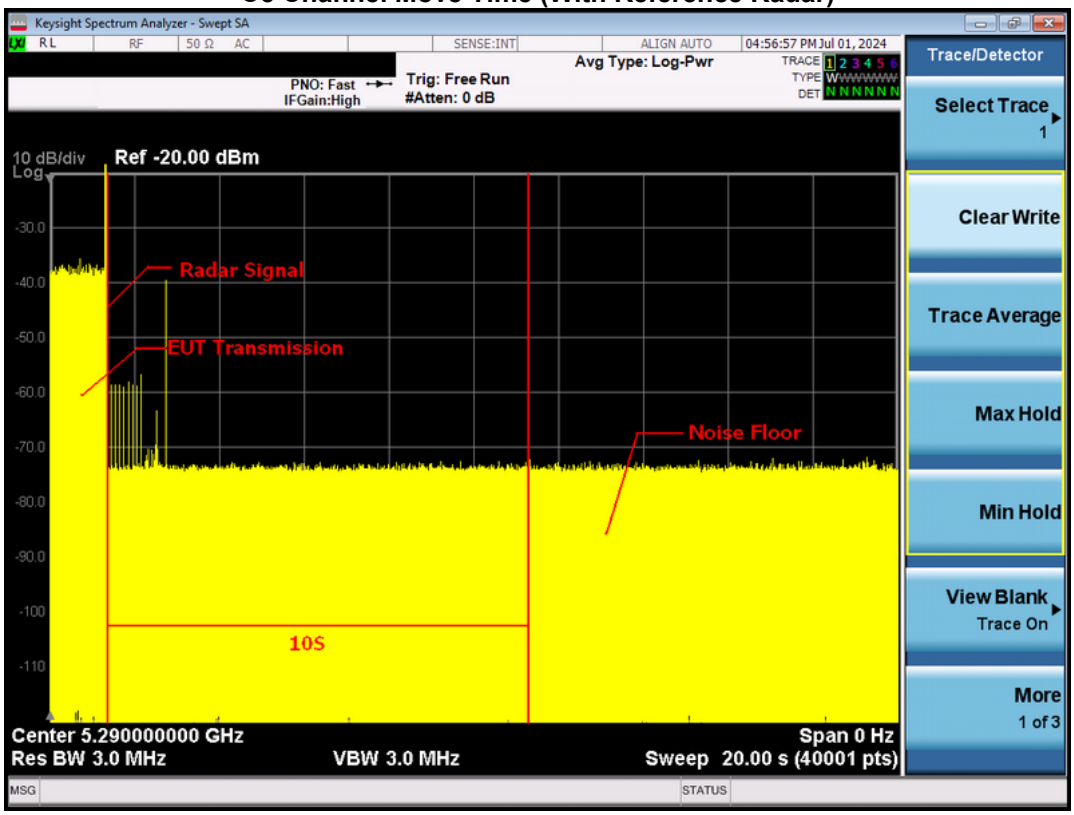
Time Index Info

T0 : -0.0240 S (Radar Injection Start)
T1 : 0.0000 S (Radar Injection Stop)
T2 : 0.0000 S (200msec Interval)
T3 : 0.0820 S (Channel Move Time)

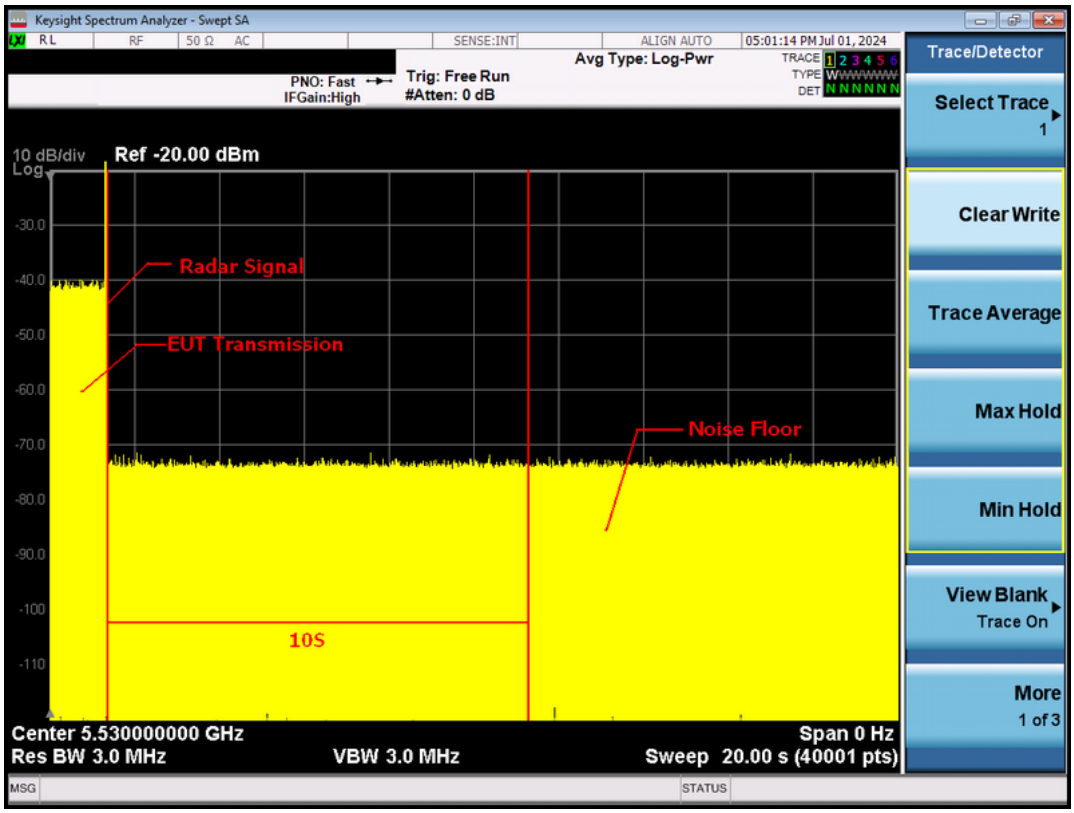
Time Per Bin:0.4999875
T2~T3 Bins Over Threshold:
= 21 Bins

Channel Move Time: 0.081998 S
Channel Close Time: 0.0104997 S

C5 Channel Move Time (With Reference Radar)

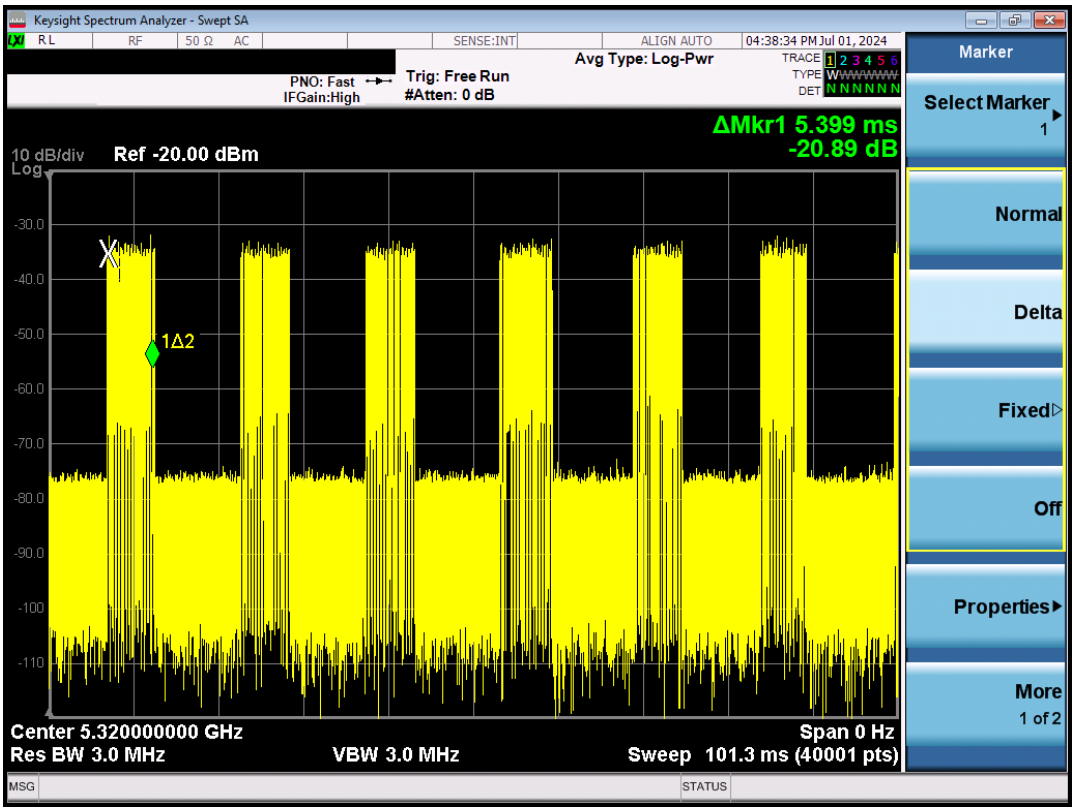


C6 Channel Move Time (With Reference Radar)

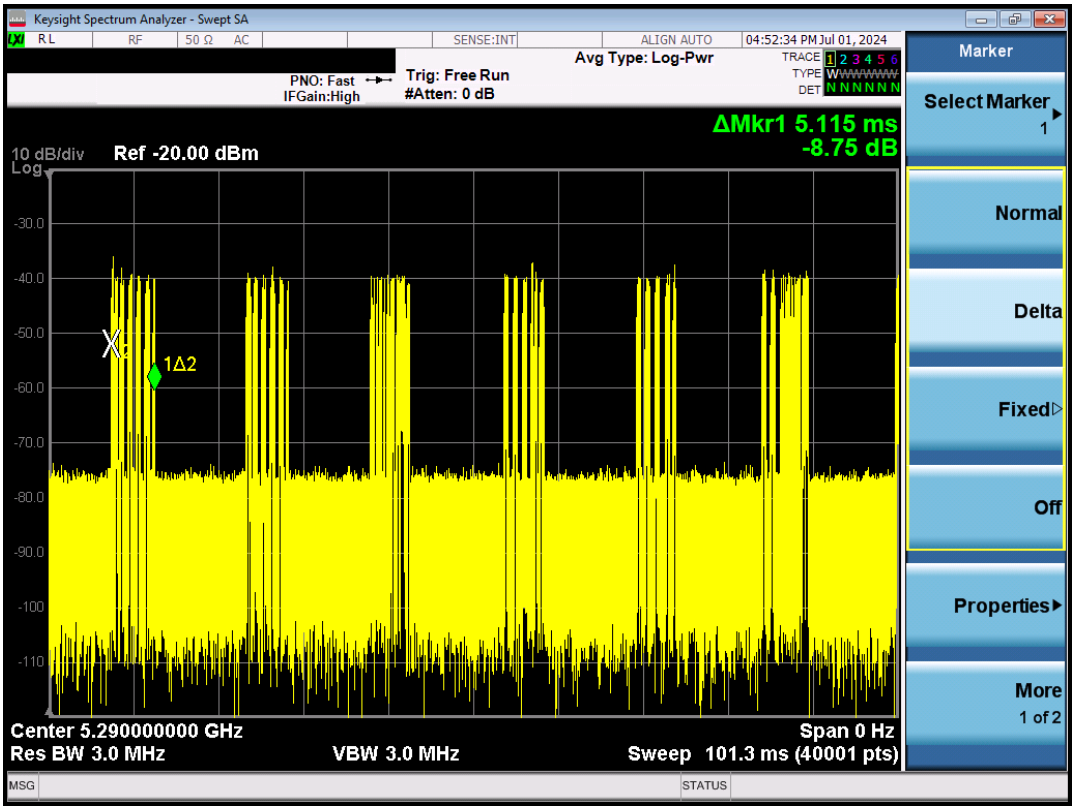


Channel Loading

IEEE 802.11a



IEEE 802.11ac(VHT80)



Frequency (MHz)	Marker Delta (ms)	Number	On Time (ms)	Total Time (ms)	Duty cycle (%)	Limit (%)
5320	5.399	6	32.394	101.3	31.98	30
5290	5.115	6	30.69	101.3	30.30	30

End of Test Report