TEST REPORT
For DFS

Report No. ··························:	**CTC20221569E03**
FCC ID······························:	**WNA-GN256VH**
Applicant···························:	**Shenzhen Skyworth Digital Technology Co.,LTD**
Address······························:	14/F,Block A,Skyworth Building,Gaoxin Ave.1.S.,Nanshan District,Shenzhen,China
Manufacturer ······················:	Shenzhen Skyworth Digital Technology Co.,LTD
Address······························:	14/F,Block A,Skyworth Building,Gaoxin Ave.1.S.,Nanshan District,Shenzhen,China
Product Name······················:	**GPON ONT**
Trade Mark··························:	/
Model/Type reference·············:	GN256VH
Listed Model(s) ···················:	WN37A, GN256V, GN256
Standard····························:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**
Date of receipt of test sample…:	Aug. 16, 2022
Date of testing………………..:	Aug. 16, 2022 to Sep. 27, 2022
Date of issue…………………...:	Sep. 27, 2022
Result……………………….…:	**PASS**

Compiled by: (Printed name+signature)	Lucy Lan	*lucy lan*
Supervised by: (Printed name+signature)	Miller Ma	*Miller Ma*
Approved by: (Printed name+signature)	Totti Zhao	*Totti Zhao*

Testing Laboratory Name……:	**CTC Laboratories, Inc.**
Address…………………………:	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

TABLE OF CONTENTS

1. TEST SUMMARY

1.1 Test Standards

The tests documented in this report were performed in accordance with FCC CFR 47 CFR Part 15, Subpart E, KDB 905462 D02.

1.2 Report version

Revised No.	Date of issue	Description
01	Sep. 27, 2022	Original

1.3 Test Description

CFR 47 Part 15 Subpart E 15.407 (h), KDB 905462 D02			
Test Item	**Test require**	**Result**	**Test Engineer**
DFS Detection Threshold	FCC 15.407, KDB 905462 D02	Pass	Lucy Lan
Channel Availability Check Time	FCC 15.407, KDB 905462 D02	Pass	Lucy Lan
Non-Occupancy Period	FCC 15.407, KDB 905462 D02	Pass	Lucy Lan
U-NII Detection Bandwidth	FCC 15.407, KDB 905462 D02	Pass	Lucy Lan
Channel Closing Transmission Time	FCC 15.407, KDB 905462 D02	Pass	Lucy Lan
Channel Move Time	FCC 15.407, KDB 905462 D02	Pass	Lucy Lan
Statistical Performance Check	FCC 15.407, KDB 905462 D02	Pass	Lucy Lan

Note:
1. The measurement uncertainty is not included in the test result.
2. N/A: Means this test item is not applicable for this device according to the technology characteristic of device.

1.4 Test Facility

Address of the report laboratory

CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

1.5 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6 Environmental conditions

Normal Condition	Temperature	22 °C ~ 28°C
	Relative humidity	50% ~ 65%
	Voltage	The equipment shall be the nominal voltage for which the equipment was designed.
Extreme Condition	Temperature	Measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer
	Voltage	Measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer

Normal Condition	T_N=Normal Temperature	22 °C ~ 28°C
Extreme Condition	T_L=Lower Temperature	0 °C
	T_H=Higher Temperature	45 °C

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2. GENERAL INFORMATION

2.1 General Description of EUT

Product Name:	GPON ONT
Trade Mark:	/
Model/Type reference:	GN256VH
Listed Model(s):	WN37A, GN256V, GN256
Product Appearance Description:	All these models are identical in the same PCB, layout and electrical circuit, Different is trade mark and model number.
Power supply:	DC12V 1.5A from AC/DC Adapter
Adapter Model:	BY-SKY120150U70P[Note1] Input: 100-240V~ 50/60Hz 0.6A Output: 12Vdc/1.5A
Hardware version:	/
Software version:	/

Technical index for 5G WIFI				
Operation Band:	☒U-NII-1	☒U-NII-2A	☒U-NII-2C	☒U-NII-3

Operation Frequency Range:	U-NII-1:	5150MHz~5250MHz
	U-NII-2A:	5250MHz~5350MHz
	U-NII-2C:	5470MHz~5600MHz; 5650MHz~5725MHz
	U-NII-3:	5725MHz~5850MHz

Support bandwidth:	802.11a	☒ 20MHz		
	802.11n	☒ 20MHz	☒ 40MHz	
	802.11ac	☒ 20MHz	☒ 40MHz	☒ 80MHz	☐ 160MHz

Modulation:	802.11a: OFDM (BIT/SK, QPSK, BPSK, 16QAM) 802.11n: OFDM (BIT/SK, QPSK, BPSK, 16QAM, 64QAM) 802.11ac: OFDM (BIT/SK, QPSK, BPSK, 16QAM, 64QAM, 256QAM)
Bit Rate of Transmitter:	802.11a: 6/9/12/18/24/36/48/54 Mbps 802.11n: up to 300Mbps 802.11ac: at most 866.7 Mbps

Note :
1. BY-SKY120150UYYP(YY=00-99, 2 digits, Represent different marketing purpose only, does not affect the safety and electromagnetic compatibility)

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15.407:U-NIL devices operating in the 5.25-5.35 GHZ band and the 5.47-5.725 GHZ band shall employ a TPC mechanism. The U-NIL device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm A TPC mechanism is not required for systems with an e.i.r.p of less than 500 mw.

U-NII devices operating in the 5.25-5.35 GHZ and 547-5.725 GHZ bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

1. The EUTradio operates in the following bands:
   a.5150-5250MHz
   b.5250-5350MHz
   c.5470-5725MHz
   d.5725-5850MHz.
2. The EUT operates in Master mode and does not support bridge mode and MESH mode.
3. The maximum e.i.r.p of the 5GHZ equipment is 25.80dBm and the minimum possible e.i.r.p is 11.2dBm for the UNII-2A and 2C frequency bands.
4. The channel loading data file will be transferred from the Master Device to the Client Device for all test configurations.
5. Information regarding the parameters of the detected Radar Waveforms is not available to the end user.
6. For the 5250-5350MHZ and 5470-5725MH bands, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.
7. The manufacturer is permitted to select the first channel either manually or randomly. The manufacturer may also block DFS channels from use.
8. The Master requires(63) seconds to complete its power-on cycle.

DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)	Antenna Technology
1	5150-5850	External Antenna	5	SISO&MIMO

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)	Antenna Technology
2	5150-5850	External Antenna	5	SISO&MIMO

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Operation Frequency List:

Band (MHz)	20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII-1	36	5180	38	5190	42	5210
	40	5200				
	44	5220	46	5230		
	48	5240				
U-NII-2A	52	5260	54	5270	58	5290
	56	5280				
	60	5300	62	5310		
	64	5320				
U-NII-2C	100	5500	102	5510	106	5530
	104	5520				
	108	5540	110	5550		
	112	5560				
	116	5580				
	132	5660	134	5670		
	136	5680				
	140	5700				
U-NII-3	149	5745	151	5755	155	5775
	153	5765				
	157	5785	159	5795		
	161	5805				
	165	5825				

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2.2 Measurement Instruments List

Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Keysight	N9020A	MY46471737	Dec.23, 2022
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2023
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec.23, 2022
4	Signal Generator	Agilent	E8257D	MY46521908	Dec.23, 2022
5	Power Sensor	Agilent	U2021XA	MY5365004	Mar. 15, 2023
6	Power Sensor	Agilent	U2021XA	MY5365006	Mar. 15, 2023
7	Simultaneous Sampling DAQ	Agilent	U2531A	TW54493510	Mar. 15, 2023
8	Climate Chamber	TABAI	PR-4G	A8708055	Dec.23, 2022
9	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec.23, 2022
10	Climate Chamber	ESPEC	MT3065	/	Dec.23, 2022
11	300328 v2.2.2 test system	TONSCEND	v2.6	/	/

Note: The cable loss has calculated in test result which connection between each test instruments.

2.3 Accessory Equipment information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	ThinkBook 14 G3ACL	/	Lenovo
Mobile Phone	A08G	/	/
Cable Information			
Name	Shielded Type	Ferrite Core	Length
Lan Cable	Without	Without	1M

3. Dynamic Frequency Selection

3.1 Applicability of DFS requirements

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	☑Master	☐Client Without Radar Detection	☐Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	☑Master Device or Client with Radar Detection	☐Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

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 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.		

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3.2 Limits

(1) DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

(2) DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See 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 facilitating a Channel move (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 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

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3.3 Parameters of radar test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 5 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$Roundup\left\{\left(\dfrac{1}{360}\right)\cdot\left(\dfrac{19\cdot10^6}{PRI_{\mu sec}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, excluding PRI values selected in Test A			
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 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 µsec is selected, the number of pulses would be Round up $\left\{\left(\dfrac{1}{360}\right)\cdot\left(\dfrac{19\cdot10^6}{3066}\right)\right\}$ = Round up {17.2} = 18.

Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538

3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355.0	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139.0	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate (82.9% + 60% + 90% + 88%)/4 = 80.2%			

Table 6 – 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 Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveforms are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type wave forms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Table 7 – Frequency Hopping Radar Test Waveform

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

For the Frequency Hopping Radar Type, the same Burst parameters are used for each wave form. The hopping sequence is different for each wave form and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250–5724MHz.Next,the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

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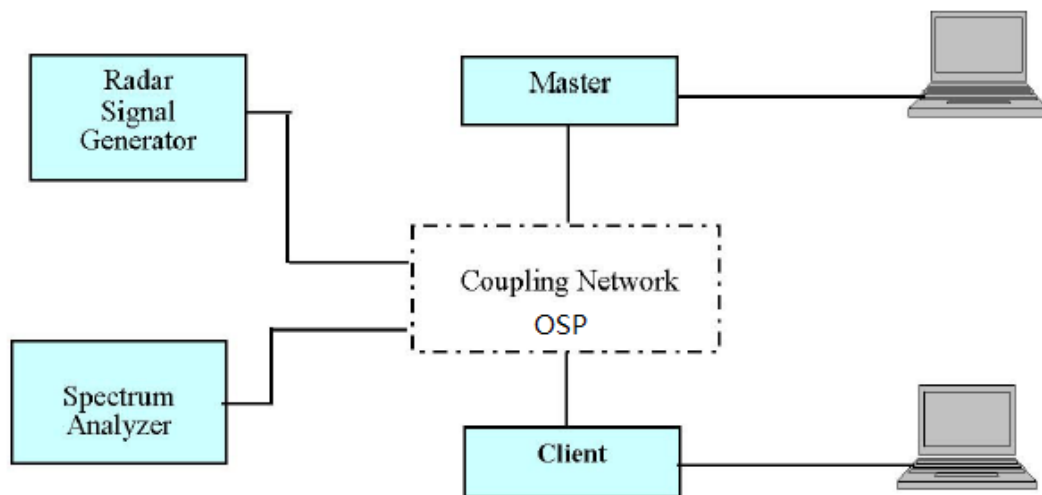
3.4 Test Setup

SYSTTEMITEST CONFIGURATON
Description of Test Configuration:
The EUT was configured for testing in an engineering mode which was provided by the manufacturer.
Stream the test file from the Master Device to the Client Device for IP based systems or frame based systems which dynamically allocate the talk/listen ratio.
Software to ping the client is used to simulate data transfer with a minimum channel loading of approximately 17% or greater.EUT Exercise Software
The test was performed under: DOS command, which was provided by the manufacturer.

System Block Diagram

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Conducted Method

7.2.1   Setup for Master with injection at the Master

Figure 2: Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master

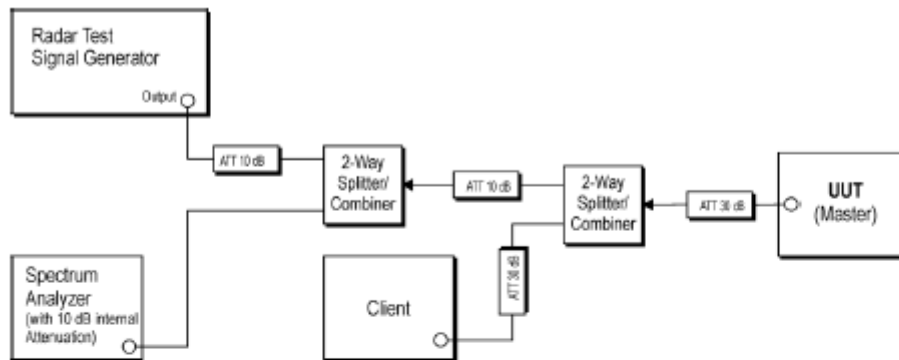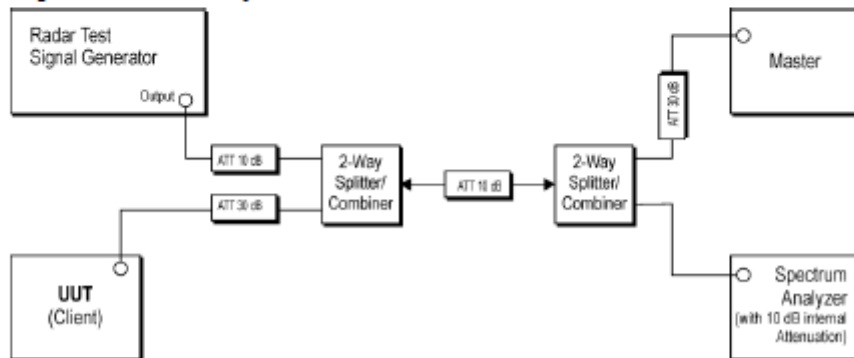**7.2.2   Setup for Client with injection at the Master**

Figure 3: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Master

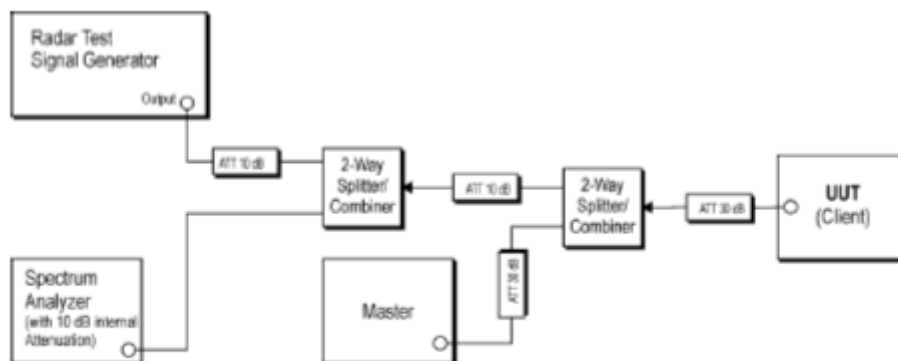**7.2.3   Setup for Client with injection at the Client**

Figure 4: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Client

3.5 Test Procedure

Please refer to KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02 Clause 7.8.

6.5.1   U-NII Detection Bandwidth
Set up the generating equipment as shown in Figure 8, or equivalent. Set up the DFS timing monitoring equipment as shown in Figure 13 or Figure 14. Set up the overall system for either radiated or conducted coupling to the UUT.

Adjust the equipment to produce a single Burst of any one of the Short Pulse Radar Types 0 – 4 in Table 5 at the center frequency of the UUT Operating Channel at the specified DFS Detection Threshold level found in Table 3.

Set the UUT up as a standalone device (no associated Client or Master, as appropriate) and no traffic. Frame based systems will be set to a talk/listen ratio reflecting the worst case (maximum) that is user configurable during this test.

Generate a single radar Burst, and note the response of the UUT. Repeat for a minimum of 10 trials. The UUT must detect the Radar Waveform within the DFS band using the specified U-NII Detection Bandwidth criterion shown in Table 4. In cases where the channel bandwidth may exceed past the DFS band edge on specific channels (i.e., 802.11ac or wideband frame based systems) select a channel that has the entire emission bandwidth within the DFS band. If this is not possible, test the detection BW to the DFS band edge.

Starting at the center frequency of the UUT operating Channel, increase the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion specified in Table 4. Repeat this measurement in 1MHz steps at frequencies 5 MHz below where the detection rate begins to fall. Record the highest frequency (denote as FH) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies above FH is not required to demonstrate compliance.

Starting at the center frequency of the UUT operating Channel, decrease the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion specified in Table 4. Repeat this measurement in 1MHz steps at frequencies 5 MHz above where the detection rate begins to fall. Record the lowest frequency (denote as FL) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies below FL is not required to demonstrate compliance.

The U-NII Detection Bandwidth is calculated as follows:

U-NII Detection Bandwidth = FH – FL

The U-NII Detection Bandwidth must meet the U-NII Detection Bandwidth criterion specified in Table 4. Otherwise, the UUT does not comply with DFS requirements. This is essential to ensure that the UUT is capable of detecting Radar Waveforms across the same frequency spectrum that contains the significant energy from the system. In the case that the U-NII Detection Bandwidth is greater than or equal to the 99 percent power bandwidth for the measured FH and FL, the test can be truncated and the U-NII Detection Bandwidth can be reported as the measured FH and FL.

6.5.2   Performance Requirements Check
The following tests must be performed for U-NII device certification: Initial Channel Startup Check with a radar Burst at start of Channel Availability Check and with a radar Burst at end of Channel Availability Check; In-Service Monitoring; and the 30 minute Non-Occupancy Period.

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6.5.3.1   Initial Channel Availability Check Time

The Initial Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms and only needs to be performed one time.

a) The U-NII devices will be powered on and be instructed to operate on the appropriate U-NII Channel that must incorporate DFS functions. At the same time the UUT is powered on, the spectrum analyzer will be set to zero span mode with a 3 MHz RBW and 3 MHz VBW on the Channel occupied by the radar (Chr) with a 4 minute sweep time. The spectrum analyzer's sweep will be started at the same time power is applied to the U-NII device.

b) The UUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.

c) Confirm that the UUT initiates transmission on the channel

This measurement can be used to determine the length of the power-on cycle if it is not supplied by the manufacturer. If the spectrum analyzer sweep is started at the same time the UUT is powered on and the UUT does not begin transmissions until it has completed the cycle, the power-on time can be determined by comparing the two times.

6.5.3..2 Radar Burst at the Beginning of the Channel Availability Check Time

The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time. This is illustrated in Figure 15.

a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections on configuration for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.

b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (Tpower_up). The Channel Availability Check Time commences on Chr at instant T1 and will end no sooner than T1 + Tch_avail_check.

c) A single Burst of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T1. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.

d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.

e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The Channel Availability Check results will be recorded.

Figure 15: Example of timing for radar testing at the beginning of the Channel Availability Check Time

6.5.3.3   Radar Burst at the End of the Channel Availability Check Time
The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1dB occurs at the end of the Channel Availability Check Time. This is illustrated in Figure 16.

a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.
b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (Tpower_up). The Channel Availability Check Time commences on Chr at instant T1 and will end no sooner than T1 + Tch_avail_check.
c) A single Burst of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T1 + 54 seconds. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.

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e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The Channel Availability Check results will be recorded.
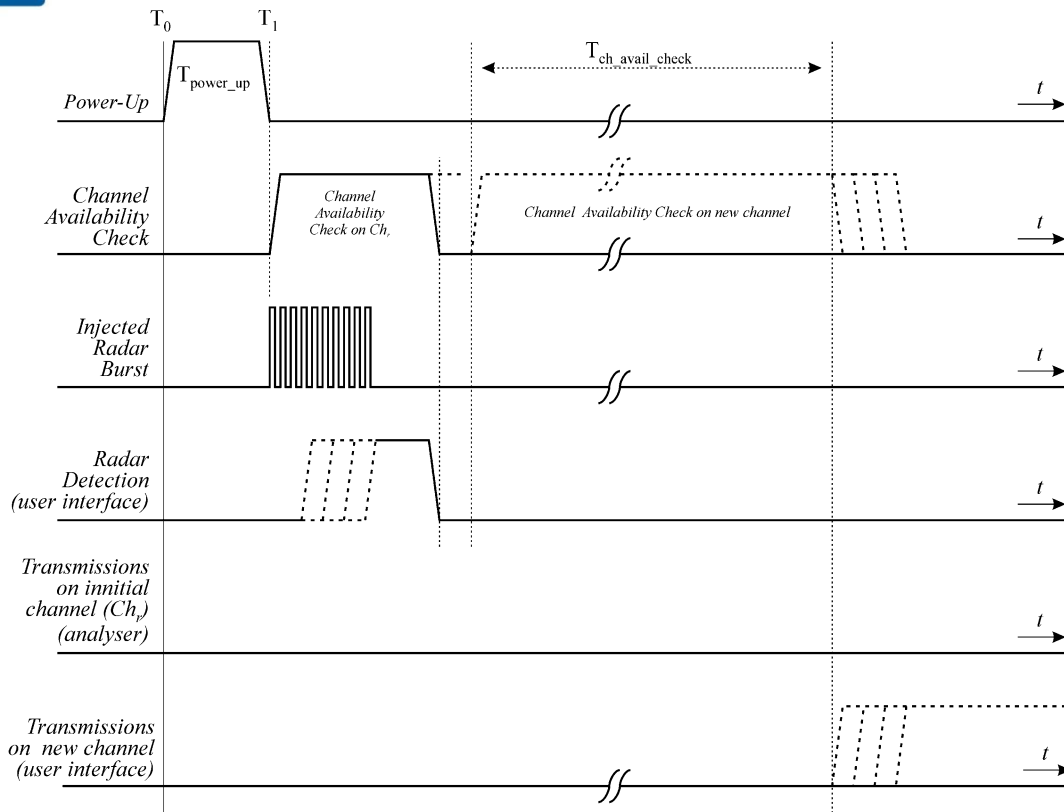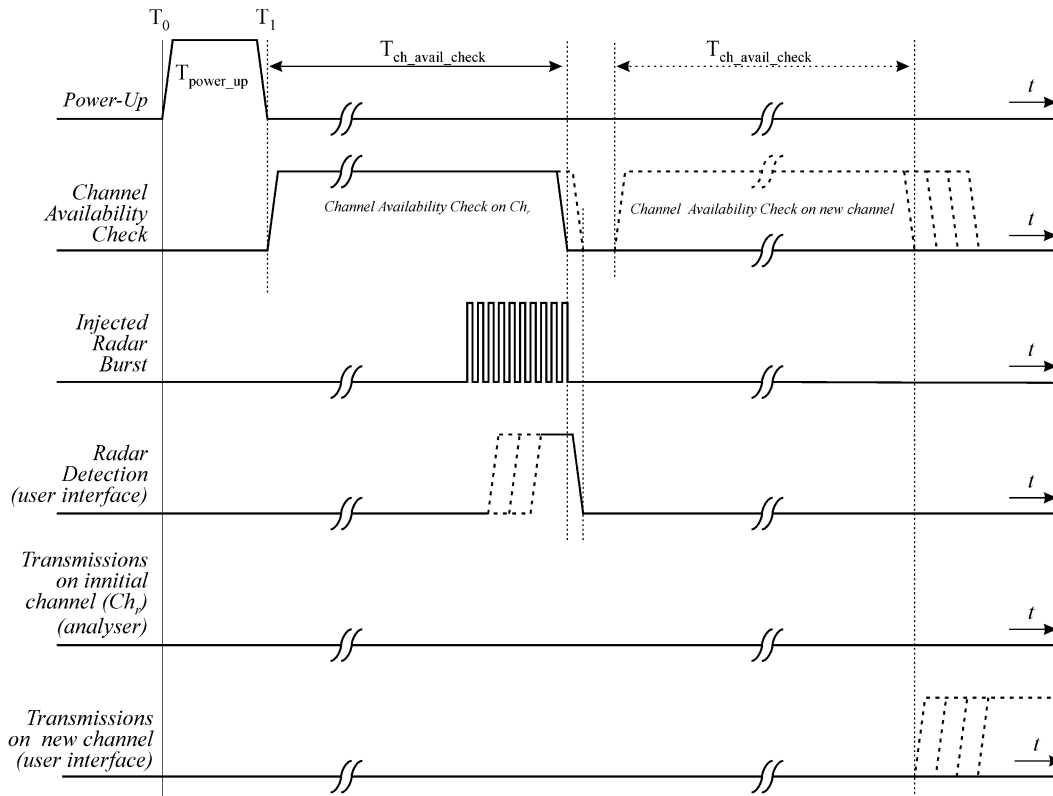

Figure 16: Example of timing for radar testing towards the end of the Channel Availability Check Time

6.5.4   In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

These tests define how the following DFS parameters are verified during In-Service Monitoring;
- Channel Closing Transmission Time
- Channel Move Time
- Non-Occupancy Period
The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U- NII device (In- Service Monitoring).

a) One frequency will be chosen from the Operating Channels of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands. For 802.11 devices, the test frequency must contain control signals. This can be verified by disabling channel loading and monitoring the spectrum analyzer. If no control signals are detected, another frequency must be selected within the emission bandwidth where control signals are detected.
b) In case the UUT is a U-NII device operating as a Client Device (with or without DFS), a U-NII device operating as a Master Device will be used to allow the UUT (Client device) to Associate with the Master Device. In case the UUT is a Master Device, a U-NII device operating as a Client Device will be used and it is assumed that the Client will Associate with the UUT (Master). In both cases for conducted tests, the Radar Waveform generator will be connected to the Master Device. For radiated tests, the emissions of the Radar Waveform generator will be directed towards the Master Device. If the Master Device has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.
c) Stream the channel loading test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
d) At time T0 the Radar Waveform generator sends a Burst of pulses for one of the Radar Type 0 in Table 5 at levels defined in Table 3, on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
e) Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Measure and record the Channel Move Time and Channel Closing Transmission Time if radar detection occurs. Figure 17 illustrates Channel Closing Transmission Time.
f) When operating as a Master Device, monitor the UUT for more than 30 minutes following instant T2 to verify that the UUT does not resume any transmissions on this Channel. Perform this test once and record the measurement result.
g) In case the UUT is a U-NII device operating as a Client Device with In-Service Monitoring, perform steps a) to f).
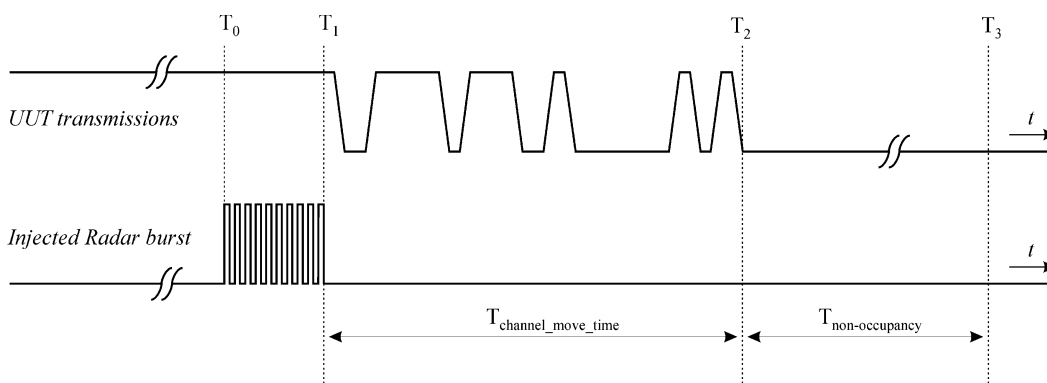
Figure 17: Example of Channel Closing Transmission Time & Channel Closing Time

6.5.5 Statistical Performance Check

The steps below define the procedure to determine the minimum percentage of successful detection requirements found in Tables 5-7 when a radar burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device (In- Service Monitoring).

a) One frequency will be chosen from the Operating Channels of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands.

b) In case the UUT is a U-NII device operating as a Client Device (with or without Radar Detection), a U-NII device operating as a Master Device will be used to allow the UUT (Client device) to Associate with the Master Device. In case the UUT is a Master Device, a U-NII device operating as a Client Device will be used and it is assumed that the Client will Associate with the UUT (Master). In both cases for conducted tests, the Radar Waveform generator will be connected to the Master Device. For radiated tests, the emissions of the Radar Waveform generator will be directed towards the Master Device. If the Master Device has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.

c) Stream the channel loading test file from the Master Device to the Client Device on the test Channel

for the entire period of the test.

d) At time T0 the Radar Waveform generator sends the individual waveform for each of the Radar Types 1- 6 in Tables 5-7, at levels defined in Table 3, on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.

e) Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Radar Type 0 to ensure detection occurs.

f) 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.

g) In case the UUT is a U-NII device operating as a Client Device with In-Service Monitoring, perform steps a) to f).

7.8.4.1 Short Pulse Radar Test

Once the performance requirements check is complete, statistical data will be gathered, to determine the ability of the device to detect the radar test waveforms (Short Pulse Radar Types 1-4) found in Table 5. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trials. The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100 = \text{Percentage of Successful Detection } Radar\ Waveform \text{ N} = P_dN$$

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

$$\frac{P_d1 + P_d2 + P_d3 + P_d4}{4}$$

The minimum number of trails, minimum percentage of successful detection and the aggregate minimum percentage of successful detection are found in **Table 5**.

7.8.4.2   Long Pulse Radar Test

Statistical data will be gathered to determine the ability of the device to detect the Long Pulse Radar Type 5 found in Table 6. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trials.

Three subsets of trials will be performed with a minimum of ten trials per subset. The subset of trials differ in where the Long Pulse Type 5 Signal is tuned in frequency:

a) the Channel center frequency (Figure 18);
b) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the low edge of the UUT Occupied Bandwidth (Figure 19); and
c) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the high edge of the UUT Occupied Bandwidth (Figure 20).
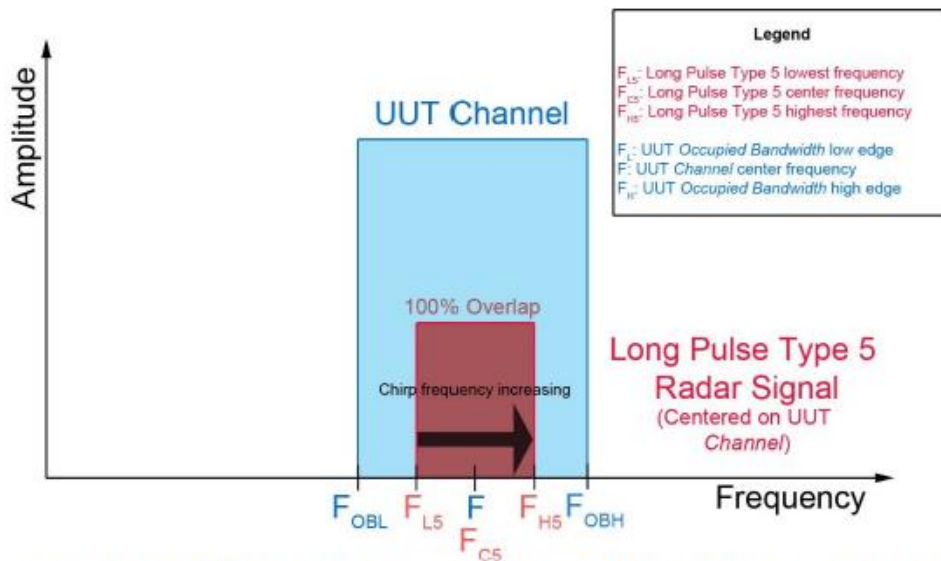
Figure 18: Example of the Relationship Between Long Pulse Type 5 Signal and the U-NII channel when the Signal is Tuned to the UUT Channel Center Frequency
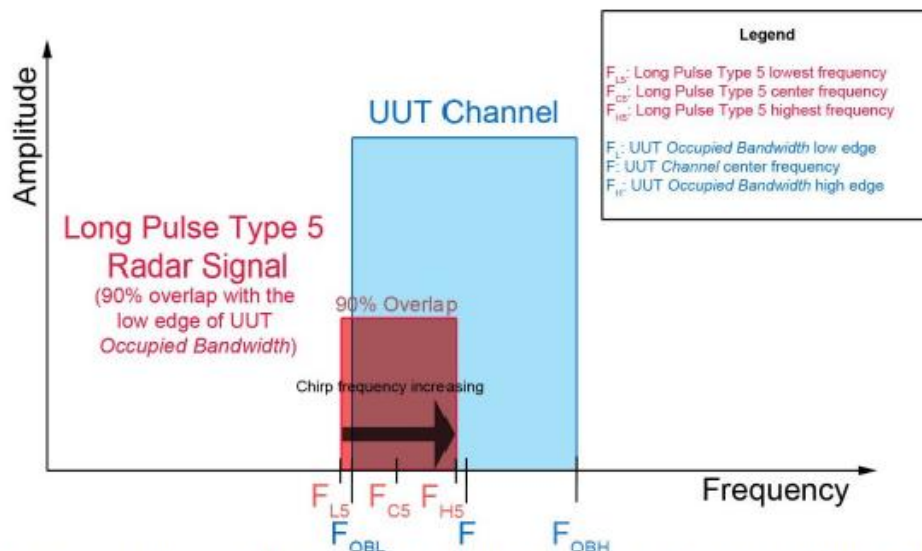
Figure 19: Example of the Relationship Between Long Pulse Type 5 Signal and the U-NII channel when the Signal is Tuned so that 90% of the Radar Signal Overlaps with the Low Edge of the UUT Occupied Bandwidth

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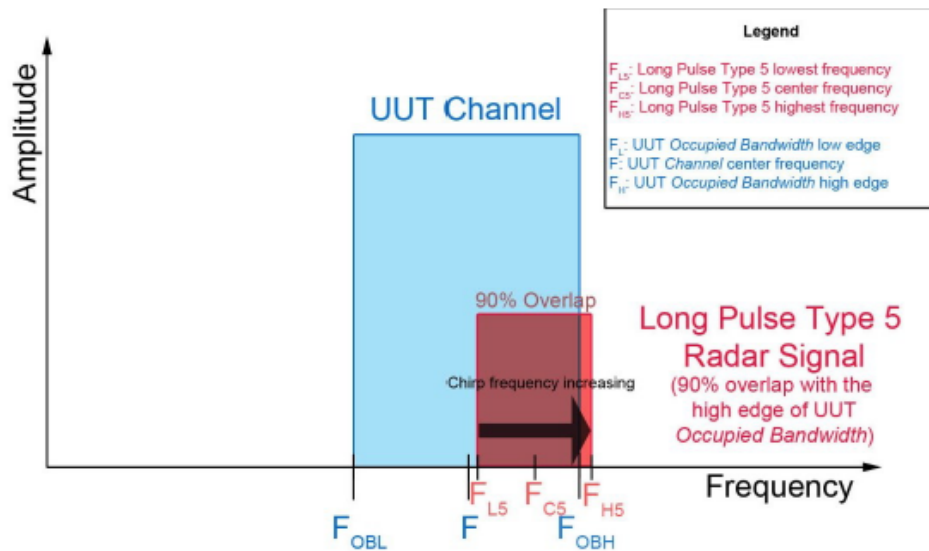
Figure 20: Example of the Relationship Between Long Pulse Type 5 Signal and the U-NII channel when the Signal is Tuned so that 90% of the Radar Signal Overlaps with the High Edge of the UUT Occupied Bandwidth

For subset case 1: the center frequency of the signal generator will remain fixed at the center of the UUT Channel.

For subset case 2: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 2.The center frequency of the signal generator for each trial is calculated by:

$FL + (0.4 * Chirp\ Width\ [in\ MHz])$

For subset case 3: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 3.The center frequency of the signal generator for each trial is calculated by:

$FH - (0.4 * Chirp\ Width\ [in\ MHz])$

The percentage of successful detection is calculated by dividing the sum of the detections for the three subsets by the sum of trials for the three subsets:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100$$

7.8.4.3   Frequency Hopping Radar Test

Statistical data will be gathered to determine the ability of the device to detect the Frequency Hopping radar test signal (radar type 6) found in Table 7. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs. The probability of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100$$

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3.6 Test Result

3.6.1 DFS DETECTION THRESHOLD

The EUT operates in 5230-5350 MHZ and 5470-5723 MHZ range

The maximum conducted output power of EUT is 19.85dbm antenna gain is 5.0dBi, the Maximum EIRP=19.85+5=24.85dBm, Therefore the required interference threshold level
 is -64dbm, the required radiated threshold at antenna port is -62dbm.The calibrated radiated DFS detection threshold level is set to-64dBm, threshold level=-64dBm + antenna gain=-59dBm.

DFS Threshold Level		
DFS Threshold Level Value	Limit	Result
-62dBm	≤ -59dBm	Pass

Note:EUT'Maxmun.E.I.R.P>200 mw

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11AC80MIMO_5290_Type3

11AC80MIMO_5290_Type4

11AC80MIMO_5290_Type5

11AC80MIMO_5290_Type6

3.6.2 DFS U-NII Detection Bandwidth

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02

TestMode	Channel	FL[MHz]	FH[MHz]	Detection Bandwidth [MHz]	OCB [MHz]	Ratio [%]	Limit [%]	Verdict
11N20MIMO	5260	5247	5272	25	17.498	142.87	≥100	PASS
11N40MIMO	5270	5243	5297	54	36.216	149.11	≥100	PASS
11AC80MIMO	5290	5234	5346	112	75.219	148.90	≥100	PASS

Test Mode	Channel	Radar Freq.	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Ratio (%)
11N20MIMO	5260	5245	0	0	0	0	0	0	0	0	0	0	0
		5246	0	0	0	0	0	0	0	0	0	0	0
		5247	1	1	1	1	1	1	1	1	1	1	100
		5248	1	1	1	1	1	1	1	1	1	1	100
		5249	1	1	1	1	1	1	1	1	1	1	100
		5250	1	1	1	1	1	1	1	1	1	1	100
		5255	1	1	1	1	1	1	1	1	1	1	100
		5260	1	1	1	1	1	1	1	1	1	1	100
		5265	1	1	1	1	1	1	1	1	1	1	100
		5270	1	1	1	1	1	1	1	1	1	1	100
		5271	1	1	1	1	1	1	1	1	1	1	100
		5272	0	1	1	1	1	1	1	1	1	1	90
		5273	0	0	0	0	0	0	0	0	0	0	0
		5274	0	0	0	0	0	0	0	0	0	0	0
		5275	0	0	0	0	0	0	0	0	0	0	0

Test Mode	Channel	Radar Freq.	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Ratio (%)
11N40MIMO	5270	5240	0	0	0	0	0	0	0	0	0	0	0
		5241	0	0	0	0	0	0	0	0	0	0	0
		5242	0	0	0	0	0	0	0	0	0	0	0
		5243	0	1	1	1	1	1	1	1	1	1	90
		5244	0	1	1	1	1	1	1	1	1	1	90
		5245	1	1	1	1	1	1	1	1	1	1	100
		5250	1	1	1	1	1	1	1	1	1	1	100
		5255	1	1	1	1	1	1	1	1	1	1	100
		5260	1	1	1	1	1	1	1	1	1	1	100
		5265	1	1	1	1	1	1	1	1	1	1	100
		5270	1	1	1	1	1	1	1	1	1	1	100
		5275	1	1	1	1	1	1	1	1	1	1	100
		5280	1	1	1	1	1	1	1	1	1	1	100
		5285	1	1	1	1	1	1	1	1	1	1	100
		5290	1	1	1	1	1	1	1	1	1	1	100
		5295	1	1	1	1	1	1	1	1	1	1	100
		5296	1	1	1	1	1	1	1	1	1	1	100
		5297	1	1	1	1	1	1	1	1	1	1	100
		5298	0	0	0	0	0	0	0	0	0	0	0
		5299	0	0	0	0	0	0	0	0	0	0	0
		5300	0	0	0	0	0	0	0	0	0	0	0

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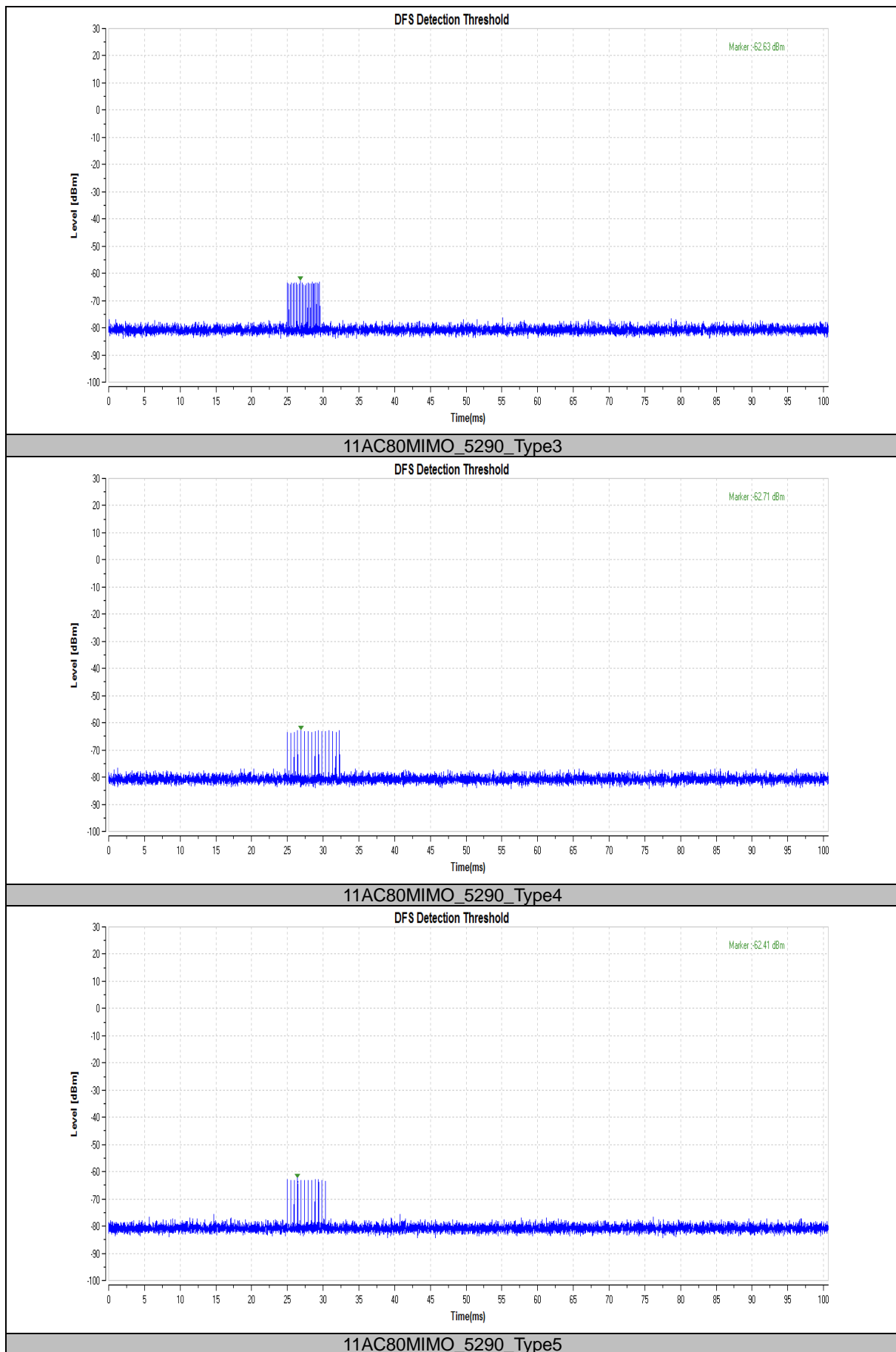| Test Mode	Channel	Radar Freq.	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Ratio (%)
11AC80MIMO	5290	5230	0	0	0	0	0	0	0	0	0	0	0
		5231	0	0	0	0	0	0	0	0	0	0	0
		5232	0	0	0	0	0	0	0	0	0	0	0
		5233	0	0	0	0	0	0	0	0	0	0	0
		5234	1	1	1	1	1	1	1	1	1	1	100
		5235	1	1	1	1	1	1	1	1	1	1	100
		5240	1	1	1	1	1	1	1	1	1	1	100
		5245	1	1	1	1	1	1	1	1	1	1	100
		5250	1	1	1	1	1	1	1	1	1	1	100
		5255	1	1	1	1	1	1	1	1	1	1	100
		5260	1	1	1	1	1	1	1	1	1	1	100
		5265	1	1	1	1	1	1	1	1	1	1	100
		5270	1	1	1	1	1	1	1	1	1	1	100
		5275	1	1	1	1	1	1	1	1	1	1	100
		5280	1	1	1	1	1	1	1	1	1	1	100
		5285	1	1	1	1	1	1	1	1	1	1	100
		5290	1	1	1	1	1	1	1	1	1	1	100
		5295	1	1	1	1	1	1	1	1	1	1	100
		5300	1	1	1	1	1	1	1	1	1	1	100
		5305	1	1	1	1	1	1	1	1	1	1	100
		5310	1	1	1	1	1	1	1	1	1	1	100
		5315	1	1	1	1	1	1	1	1	1	1	100
		5320	1	1	1	1	1	1	1	1	1	1	100
		5325	1	1	1	1	1	1	1	1	1	1	100
		5330	1	1	1	1	1	1	1	1	1	1	100
		5335	1	1	1	1	1	1	1	1	1	1	100
		5340	1	1	1	1	1	1	1	1	1	1	100
		5345	1	1	1	1	1	1	1	1	1	1	100
		5346	1	0	1	1	1	1	1	1	1	1	90
		5347	0	0	0	0	0	0	0	0	0	0	0
		5348	0	0	0	0	0	0	0	0	0	0	0
		5349	0	0	0	0	0	0	0	0	0	0	0
		5350	0	0	0	0	0	0	0	0	0	0	0

3.6.3 DFS Channel Availability Check

DFS Channel Availability Check (5290 MHz; 80 MHz)

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02

Initial Channel Availability Check Time
11AC80MIMO_5290

Beginning of Channel Availability Check Time
11AC80MIMO_5290

End of Channel Availability Check Time
11AC80MIMO_5290

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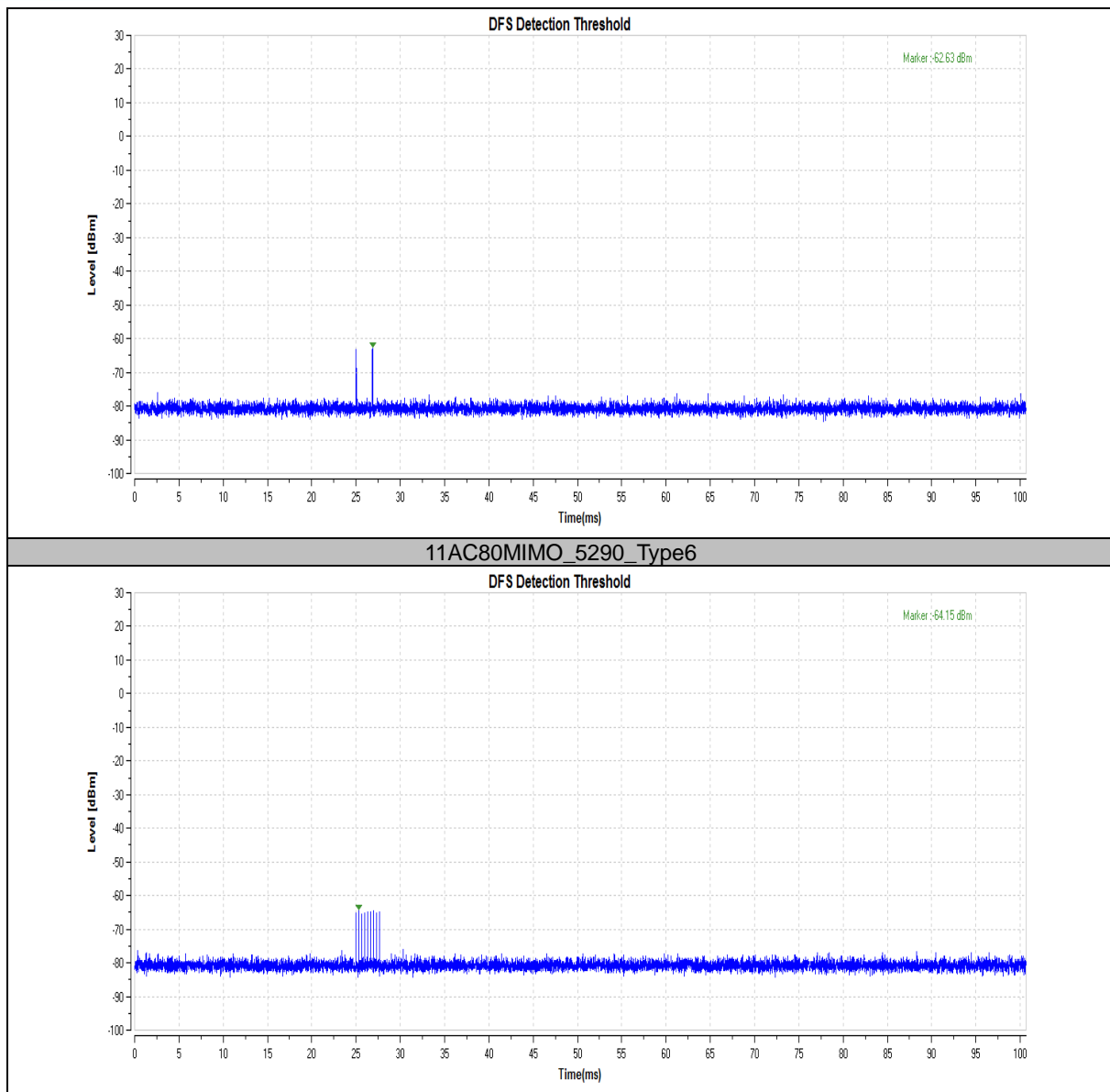Tel.: (86)755-27521059   Fax: (86)755-27521011   Http://www.sz-ctc.org.cn
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End of CAC

T0:Beginning of CAC Time   T1:Beginning of CAC Time + 6s   T2:End of CAC Time - 6s   T3:End of CAC Time

T0: 102s
T1: 108s
T2: 156s
T3: 162s

CAC Time:60s

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3.6.4 DFS In-Service Monitoring

DFS In-Service Monitoring (5290 MHz;80 MHz)

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02

TestMode	Channel	CCT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
80M	5290	200+16.9	200+60	2068.3	10000	PASS

TestMode	Channel	Result	Limit[s]	Verdict
80M	5290	see test graph	>=1800	PASS

CMT: Channel Move Time
CCT: Channel Closing Transmission Time
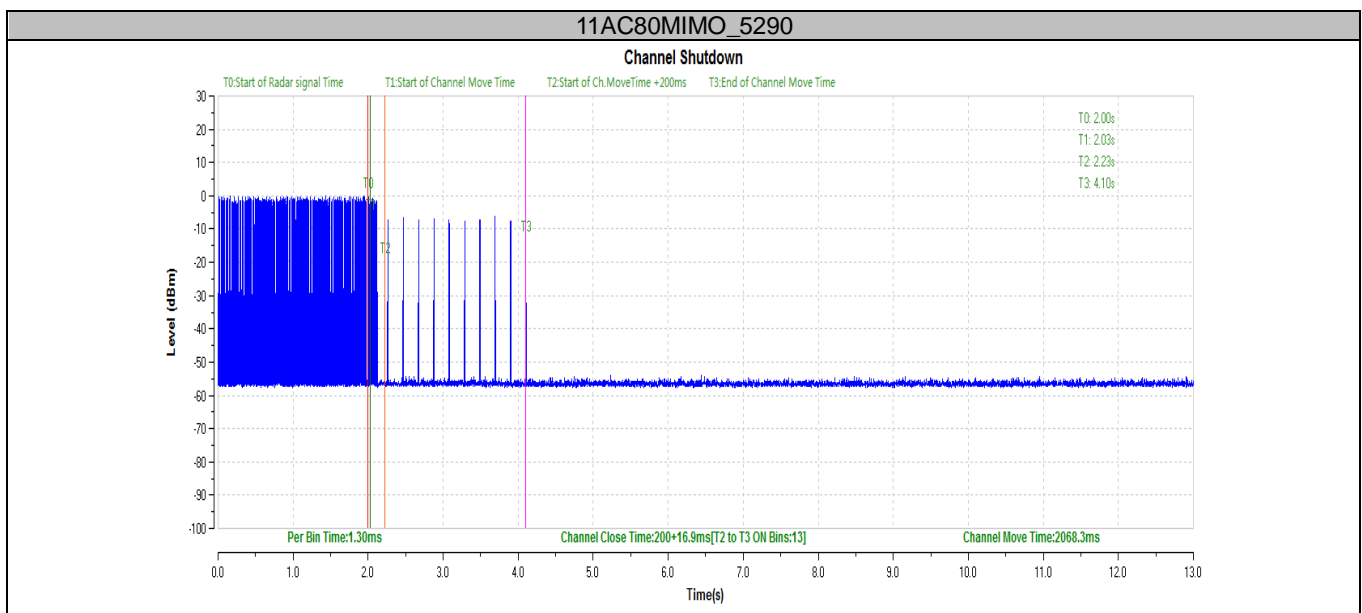
Non-Occupancy Period
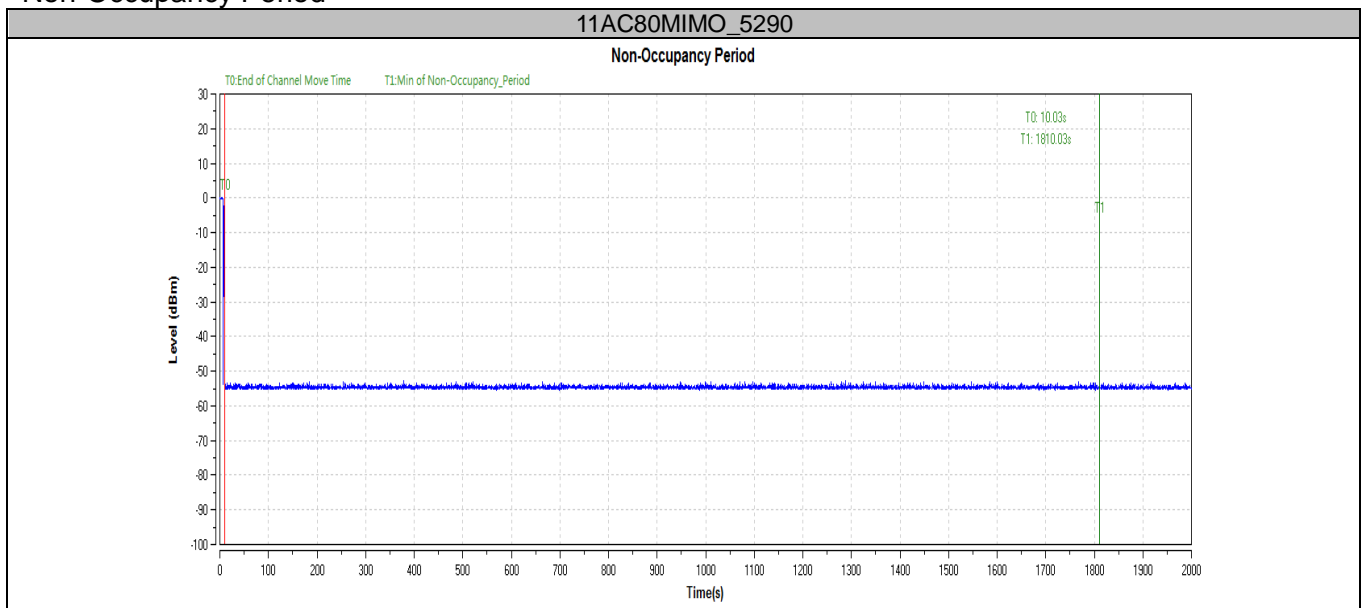
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3.6.5 DFS Statistical Performance Check

Note: that the frequency of the injected signal is varied across the signal 99% bandwidth from trial to trial.

TestMode	Channel	Radar Type	Pass Times	Fail Times	Probability (%)	Limit (%)	Verdict
11N20MIMO	5260	Type1	30	0	100.00	60	PASS
		Type2	23	7	76.67	60	PASS
		Type3	27	3	90.00	60	PASS
		Type4	29	1	96.67	60	PASS
		Type 1-4	---	---	90.84	80	PASS
		Type5	26	4	86.67	70	PASS
		Type6	29	1	96.67	80	PASS
11N40MIMO	5270	Type1	29	1	96.67	60	PASS
		Type2	25	5	83.33	60	PASS
		Type3	28	2	93.33	60	PASS
		Type4	26	4	86.67	60	PASS
		Type 1-4	---	---	90.00	80	PASS
		Type5	26	4	86.67	70	PASS
		Type6	29	1	96.67	80	PASS
11AC80MIMO	5290	Type1	30	0	100.00	60	PASS
		Type2	25	5	83.33	60	PASS
		Type3	29	1	96.67	60	PASS
		Type4	26	4	86.67	60	PASS
		Type 1-4	---	---	91.67	80	PASS
		Type5	23	7	76.67	70	PASS
		Type6	30	0	100.00	80	PASS

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TestMode	Channel	Radar Type	Trial ID	Pulse width(μs)	PRI(μs)	Pulses per Burst	Detection (1: Yes; 0: No)
11N20MIMO	5260	Type1	0	1.0	938.0	57	1
		Type1	1	1.0	698.0	76	1
		Type1	2	1.0	618.0	86	1
		Type1	3	1.0	538.0	99	1
		Type1	4	1.0	878.0	61	1
		Type1	5	1.0	3066.0	18	1
		Type1	6	1.0	638.0	83	1
		Type1	7	1.0	918.0	58	1
		Type1	8	1.0	838.0	63	1
		Type1	9	1.0	858.0	62	1
		Type1	10	1.0	798.0	67	1
		Type1	11	1.0	718.0	74	1
		Type1	12	1.0	578.0	92	1
		Type1	13	1.0	598.0	89	1
		Type1	14	1.0	558.0	95	1
		Type1	15	1.0	2536.0	21	1
		Type1	16	1.0	966.0	55	1
		Type1	17	1.0	827.0	64	1
		Type1	18	1.0	2501.0	22	1
		Type1	19	1.0	2595.0	21	1
		Type1	20	1.0	1114.0	48	1
		Type1	21	1.0	1302.0	41	1
		Type1	22	1.0	3045.0	18	1
		Type1	23	1.0	1624.0	33	1
		Type1	24	1.0	2878.0	19	1
		Type1	25	1.0	1027.0	52	1
		Type1	26	1.0	2485.0	22	1
		Type1	27	1.0	1600.0	33	1
		Type1	28	1.0	1172.0	46	1
		Type1	29	1.0	1177.0	45	1
		Type2	0	3.2	179.0	26	0
		Type2	1	1.1	207.0	23	1
		Type2	2	2.1	230.0	24	1
		Type2	3	4.8	200.0	29	1
		Type2	4	3.9	214.0	28	1
		Type2	5	2.9	222.0	26	1
		Type2	6	3.2	204.0	26	1
		Type2	7	2.5	192.0	25	1
		Type2	8	3.1	164.0	26	1
		Type2	9	1.2	156.0	23	1
		Type2	10	3.9	210.0	27	1
		Type2	11	4.6	201.0	29	0
		Type2	12	3.2	162.0	26	0
		Type2	13	2.2	197.0	25	1
		Type2	14	4.5	163.0	29	1
		Type2	15	3.0	203.0	26	0
		Type2	16	5.0	168.0	29	1
		Type2	17	2.4	217.0	25	0
		Type2	18	2.9	191.0	26	1
		Type2	19	2.3	166.0	25	1
		Type2	20	3.7	150.0	27	1
		Type2	21	2.2	176.0	25	1
		Type2	22	4.9	195.0	29	0

		Type2	23	2.9	202.0	26	1
		Type2	24	2.5	178.0	25	1
		Type2	25	1.1	206.0	23	1
		Type2	26	3.8	155.0	27	1
		Type2	27	4.7	157.0	29	0
		Type2	28	2.4	224.0	25	1
		Type2	29	4.2	159.0	28	1
		Type3	0	8.2	355.0	17	1
		Type3	1	6.1	487.0	16	1
		Type3	2	7.1	344.0	16	1
		Type3	3	9.8	288.0	18	1
		Type3	4	8.9	230.0	18	1
		Type3	5	7.9	432.0	17	1
		Type3	6	8.2	207.0	17	1
		Type3	7	7.5	443.0	17	1
		Type3	8	8.1	439.0	17	1
		Type3	9	6.2	223.0	16	1
		Type3	10	8.9	208.0	18	1
		Type3	11	9.6	463.0	18	1
		Type3	12	8.2	441.0	17	1
		Type3	13	7.2	323.0	16	1
		Type3	14	9.5	297.0	18	0
		Type3	15	8.0	412.0	17	1
		Type3	16	10.0	324.0	18	1
		Type3	17	7.4	271.0	17	1
		Type3	18	7.9	349.0	17	1
		Type3	19	7.3	409.0	16	1
		Type3	20	8.7	373.0	18	1
		Type3	21	7.2	254.0	16	1
		Type3	22	9.9	274.0	18	1
		Type3	23	7.9	278.0	17	1
		Type3	24	7.5	317.0	17	0
		Type3	25	6.1	260.0	16	1
		Type3	26	8.8	211.0	18	1
		Type3	27	9.7	272.0	18	1
		Type3	28	7.4	264.0	17	1
		Type3	29	9.2	284.0	18	0
		Type4	0	16.0	355.0	14	1
		Type4	1	11.3	487.0	12	1
		Type4	2	13.5	344.0	13	1
		Type4	3	19.4	288.0	16	1
		Type4	4	17.5	230.0	15	1
		Type4	5	15.3	432.0	14	1
		Type4	6	15.9	207.0	14	1
		Type4	7	14.3	443.0	13	1
		Type4	8	15.8	439.0	14	1
		Type4	9	11.5	223.0	12	1
		Type4	10	17.4	208.0	15	1
		Type4	11	19.0	463.0	16	1
		Type4	12	16.0	441.0	14	1
		Type4	13	13.8	323.0	13	1
		Type4	14	18.9	297.0	16	1
		Type4	15	15.5	412.0	14	1
		Type4	16	19.9	324.0	16	1
		Type4	17	14.1	271.0	13	1
		Type4	18	15.2	349.0	14	1

		Type4	19	13.8	409.0	13	1
		Type4	20	17.1	373.0	15	1
		Type4	21	13.8	254.0	13	1
		Type4	22	19.8	274.0	16	1
		Type4	23	15.3	278.0	14	1
		Type4	24	14.5	317.0	13	1
		Type4	25	11.3	260.0	12	0
		Type4	26	17.3	211.0	15	1
		Type4	27	19.2	272.0	16	1
		Type4	28	14.2	264.0	13	1
		Type4	29	18.2	284.0	15	1
11N40MIMO	5270	Type1	0	1.0	938.0	57	1
		Type1	1	1.0	698.0	76	1
		Type1	2	1.0	618.0	86	1
		Type1	3	1.0	538.0	99	1
		Type1	4	1.0	878.0	61	1
		Type1	5	1.0	3066.0	18	1
		Type1	6	1.0	638.0	83	1
		Type1	7	1.0	918.0	58	1
		Type1	8	1.0	838.0	63	1
		Type1	9	1.0	858.0	62	1
		Type1	10	1.0	798.0	67	1
		Type1	11	1.0	718.0	74	1
		Type1	12	1.0	578.0	92	0
		Type1	13	1.0	598.0	89	1
		Type1	14	1.0	558.0	95	1
		Type1	15	1.0	2536.0	21	1
		Type1	16	1.0	966.0	55	1
		Type1	17	1.0	827.0	64	1
		Type1	18	1.0	2501.0	22	1
		Type1	19	1.0	2595.0	21	1
		Type1	20	1.0	1114.0	48	1
		Type1	21	1.0	1302.0	41	1
		Type1	22	1.0	3045.0	18	1
		Type1	23	1.0	1624.0	33	1
		Type1	24	1.0	2878.0	19	1
		Type1	25	1.0	1027.0	52	1
		Type1	26	1.0	2485.0	22	1
		Type1	27	1.0	1600.0	33	1
		Type1	28	1.0	1172.0	46	1
		Type1	29	1.0	1177.0	45	1
		Type2	0	3.2	179.0	26	1
		Type2	1	1.1	207.0	23	1
		Type2	2	2.1	230.0	24	0
		Type2	3	4.8	200.0	29	1
		Type2	4	3.9	214.0	28	1
		Type2	5	2.9	222.0	26	1
		Type2	6	3.2	204.0	26	1
		Type2	7	2.5	192.0	25	1
		Type2	8	3.1	164.0	26	0
		Type2	9	1.2	156.0	23	1
		Type2	10	3.9	210.0	27	1
		Type2	11	4.6	201.0	29	1
		Type2	12	3.2	162.0	26	0
		Type2	13	2.2	197.0	25	1
		Type2	14	4.5	163.0	29	1

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Type2	15	3.0	203.0	26	1
Type2	16	5.0	168.0	29	1
Type2	17	2.4	217.0	25	1
Type2	18	2.9	191.0	26	1
Type2	19	2.3	166.0	25	1
Type2	20	3.7	150.0	27	0
Type2	21	2.2	176.0	25	1
Type2	22	4.9	195.0	29	1
Type2	23	2.9	202.0	26	1
Type2	24	2.5	178.0	25	1
Type2	25	1.1	206.0	23	1
Type2	26	3.8	155.0	27	1
Type2	27	4.7	157.0	29	0
Type2	28	2.4	224.0	25	1
Type2	29	4.2	159.0	28	1
Type3	0	8.2	355.0	17	1
Type3	1	6.1	487.0	16	1
Type3	2	7.1	344.0	16	1
Type3	3	9.8	288.0	18	1
Type3	4	8.9	230.0	18	1
Type3	5	7.9	432.0	17	1
Type3	6	8.2	207.0	17	0
Type3	7	7.5	443.0	17	1
Type3	8	8.1	439.0	17	1
Type3	9	6.2	223.0	16	1
Type3	10	8.9	208.0	18	1
Type3	11	9.6	463.0	18	1
Type3	12	8.2	441.0	17	1
Type3	13	7.2	323.0	16	0
Type3	14	9.5	297.0	18	1
Type3	15	8.0	412.0	17	1
Type3	16	10.0	324.0	18	1
Type3	17	7.4	271.0	17	1
Type3	18	7.9	349.0	17	1
Type3	19	7.3	409.0	16	1
Type3	20	8.7	373.0	18	1
Type3	21	7.2	254.0	16	1
Type3	22	9.9	274.0	18	1
Type3	23	7.9	278.0	17	1
Type3	24	7.5	317.0	17	1
Type3	25	6.1	260.0	16	1
Type3	26	8.8	211.0	18	1
Type3	27	9.7	272.0	18	1
Type3	28	7.4	264.0	17	1
Type3	29	9.2	284.0	18	1
Type4	0	16.0	355.0	14	1
Type4	1	11.3	487.0	12	1
Type4	2	13.5	344.0	13	1
Type4	3	19.4	288.0	16	1
Type4	4	17.5	230.0	15	1
Type4	5	15.3	432.0	14	1
Type4	6	15.9	207.0	14	0
Type4	7	14.3	443.0	13	1
Type4	8	15.8	439.0	14	1
Type4	9	11.5	223.0	12	1
Type4	10	17.4	208.0	15	0

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		Type4	11	19.0	463.0	16	1
		Type4	12	16.0	441.0	14	1
		Type4	13	13.8	323.0	13	1
		Type4	14	18.9	297.0	16	1
		Type4	15	15.5	412.0	14	1
		Type4	16	19.9	324.0	16	1
		Type4	17	14.1	271.0	13	1
		Type4	18	15.2	349.0	14	1
		Type4	19	13.8	409.0	13	1
		Type4	20	17.1	373.0	15	1
		Type4	21	13.8	254.0	13	1
		Type4	22	19.8	274.0	16	1
		Type4	23	15.3	278.0	14	1
		Type4	24	14.5	317.0	13	1
		Type4	25	11.3	260.0	12	1
		Type4	26	17.3	211.0	15	1
		Type4	27	19.2	272.0	16	1
		Type4	28	14.2	264.0	13	0
		Type4	29	18.2	284.0	15	0
11AC80MIMO	5290	Type1	0	1.0	938.0	57	0
		Type1	1	1.0	698.0	76	1
		Type1	2	1.0	618.0	86	1
		Type1	3	1.0	538.0	99	1
		Type1	4	1.0	878.0	61	1
		Type1	5	1.0	3066.0	18	1
		Type1	6	1.0	638.0	83	1
		Type1	7	1.0	918.0	58	1
		Type1	8	1.0	838.0	63	1
		Type1	9	1.0	858.0	62	1
		Type1	10	1.0	798.0	67	1
		Type1	11	1.0	718.0	74	1
		Type1	12	1.0	578.0	92	1
		Type1	13	1.0	598.0	89	1
		Type1	14	1.0	558.0	95	1
		Type1	15	1.0	2536.0	21	1
		Type1	16	1.0	966.0	55	1
		Type1	17	1.0	827.0	64	1
		Type1	18	1.0	2501.0	22	1
		Type1	19	1.0	2595.0	21	1
		Type1	20	1.0	1114.0	48	1
		Type1	21	1.0	1302.0	41	1
		Type1	22	1.0	3045.0	18	1
		Type1	23	1.0	1624.0	33	1
		Type1	24	1.0	2878.0	19	1
		Type1	25	1.0	1027.0	52	1
		Type1	26	1.0	2485.0	22	1
		Type1	27	1.0	1600.0	33	1
		Type1	28	1.0	1172.0	46	1
		Type1	29	1.0	1177.0	45	1
		Type2	0	3.2	179.0	26	1
		Type2	1	1.1	207.0	23	1
		Type2	2	2.1	230.0	24	1
		Type2	3	4.8	200.0	29	1
		Type2	4	3.9	214.0	28	1
		Type2	5	2.9	222.0	26	1
		Type2	6	3.2	204.0	26	1

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Type2	7	2.5	192.0	25	0
Type2	8	3.1	164.0	26	1
Type2	9	1.2	156.0	23	0
Type2	10	3.9	210.0	27	1
Type2	11	4.6	201.0	29	1
Type2	12	3.2	162.0	26	1
Type2	13	2.2	197.0	25	1
Type2	14	4.5	163.0	29	0
Type2	15	3.0	203.0	26	1
Type2	16	5.0	168.0	29	0
Type2	17	2.4	217.0	25	0
Type2	18	2.9	191.0	26	1
Type2	19	2.3	166.0	25	1
Type2	20	3.7	150.0	27	1
Type2	21	2.2	176.0	25	1
Type2	22	4.9	195.0	29	1
Type2	23	2.9	202.0	26	1
Type2	24	2.5	178.0	25	1
Type2	25	1.1	206.0	23	1
Type2	26	3.8	155.0	27	1
Type2	27	4.7	157.0	29	1
Type2	28	2.4	224.0	25	1
Type2	29	4.2	159.0	28	1
Type3	0	8.2	355.0	17	1
Type3	1	6.1	487.0	16	1
Type3	2	7.1	344.0	16	1
Type3	3	9.8	288.0	18	1
Type3	4	8.9	230.0	18	1
Type3	5	7.9	432.0	17	1
Type3	6	8.2	207.0	17	1
Type3	7	7.5	443.0	17	1
Type3	8	8.1	439.0	17	1
Type3	9	6.2	223.0	16	1
Type3	10	8.9	208.0	18	1
Type3	11	9.6	463.0	18	1
Type3	12	8.2	441.0	17	1
Type3	13	7.2	323.0	16	1
Type3	14	9.5	297.0	18	1
Type3	15	8.0	412.0	17	1
Type3	16	10.0	324.0	18	1
Type3	17	7.4	271.0	17	1
Type3	18	7.9	349.0	17	1
Type3	19	7.3	409.0	16	1
Type3	20	8.7	373.0	18	1
Type3	21	7.2	254.0	16	1
Type3	22	9.9	274.0	18	1
Type3	23	7.9	278.0	17	1
Type3	24	7.5	317.0	17	0
Type3	25	6.1	260.0	16	1
Type3	26	8.8	211.0	18	1
Type3	27	9.7	272.0	18	1
Type3	28	7.4	264.0	17	1
Type3	29	9.2	284.0	18	1
Type4	0	16.0	355.0	14	1
Type4	1	11.3	487.0	12	1
Type4	2	13.5	344.0	13	1

		Type4	3	19.4	288.0	16	1
		Type4	4	17.5	230.0	15	1
		Type4	5	15.3	432.0	14	1
		Type4	6	15.9	207.0	14	0
		Type4	7	14.3	443.0	13	1
		Type4	8	15.8	439.0	14	1
		Type4	9	11.5	223.0	12	1
		Type4	10	17.4	208.0	15	1
		Type4	11	19.0	463.0	16	1
		Type4	12	16.0	441.0	14	1
		Type4	13	13.8	323.0	13	1
		Type4	14	18.9	297.0	16	0
		Type4	15	15.5	412.0	14	1
		Type4	16	19.9	324.0	16	1
		Type4	17	14.1	271.0	13	1
		Type4	18	15.2	349.0	14	1
		Type4	19	13.8	409.0	13	1
		Type4	20	17.1	373.0	15	1
		Type4	21	13.8	254.0	13	1
		Type4	22	19.8	274.0	16	1
		Type4	23	15.3	278.0	14	1
		Type4	24	14.5	317.0	13	1
		Type4	25	11.3	260.0	12	1
		Type4	26	17.3	211.0	15	1
		Type4	27	19.2	272.0	16	0
		Type4	28	14.2	264.0	13	1
		Type4	29	18.2	284.0	15	0

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TestMode	Channel	Radar Type	Trial ID	Number Of Bursts	Wavform Length (s))	Radar Frequency	Detection (1: Yes; 0: No)
11N20MIMO	5260	Type5	0	15	12	5260	0
		Type5	1	8	12	5260	1
		Type5	2	11	12	5260	1
		Type5	3	20	12	5260	1
		Type5	4	17	12	5260	1
		Type5	5	14	12	5260	1
		Type5	6	15	12	5260	1
		Type5	7	12	12	5260	1
		Type5	8	14	12	5260	1
		Type5	9	8	12	5260	0
		Type5	10	17	12	5257.651	1
		Type5	11	19	12	5258.851	1
		Type5	12	15	12	5256.451	1
		Type5	13	12	12	5255.251	1
		Type5	14	19	12	5258.451	1
		Type5	15	14	12	5256.051	1
		Type5	16	20	12	5259.251	1
		Type5	17	12	12	5255.251	0
		Type5	18	14	12	5256.051	1
		Type5	19	12	12	5255.251	1
		Type5	20	16	12	5262.749	1
		Type5	21	12	12	5265.149	1
		Type5	22	20	12	5260.749	1
		Type5	23	14	12	5263.949	1
		Type5	24	13	12	5264.349	1
		Type5	25	8	12	5266.749	1
		Type5	26	17	12	5262.349	1
		Type5	27	19	12	5261.149	1
		Type5	28	12	12	5264.749	0
		Type5	29	18	12	5261.949	1
11N40MIMO	5270	Type5	0	15	12	5270	0
		Type5	1	8	12	5270	1
		Type5	2	11	12	5270	0
		Type5	3	20	12	5270	1
		Type5	4	17	12	5270	1
		Type5	5	14	12	5270	1
		Type5	6	15	12	5270	0
		Type5	7	12	12	5270	1
		Type5	8	14	12	5270	1
		Type5	9	8	12	5270	1
		Type5	10	17	12	5258.292	1
		Type5	11	19	12	5259.492	0
		Type5	12	15	12	5257.092	1
		Type5	13	12	12	5255.892	1
		Type5	14	19	12	5259.092	1
		Type5	15	14	12	5256.692	1
		Type5	16	20	12	5259.892	1
		Type5	17	12	12	5255.892	1
		Type5	18	14	12	5256.692	1
		Type5	19	12	12	5255.892	1
		Type5	20	16	12	5282.108	1
		Type5	21	12	12	5284.508	1
		Type5	22	20	12	5280.108	1
		Type5	23	14	12	5283.308	1
		Type5	24	13	12	5283.708	1
		Type5	25	8	12	5286.108	1
		Type5	26	17	12	5281.708	1
		Type5	27	19	12	5280.508	1
		Type5	28	12	12	5284.108	1
		Type5	29	18	12	5281.308	1

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		Type5	0	15	12	5290	0
		Type5	1	8	12	5290	1
		Type5	2	11	12	5290	0
		Type5	3	20	12	5290	1
		Type5	4	17	12	5290	1
		Type5	5	14	12	5290	1
		Type5	6	15	12	5290	1
		Type5	7	12	12	5290	0
		Type5	8	14	12	5290	1
		Type5	9	8	12	5290	1
		Type5	10	17	12	5258.7905	1
		Type5	11	19	12	5259.9905	1
		Type5	12	15	12	5257.5905	1
		Type5	13	12	12	5256.3905	0
11AC80MIMO	5290	Type5	14	19	12	5259.5905	1
		Type5	15	14	12	5257.1905	0
		Type5	16	20	12	5260.3905	1
		Type5	17	12	12	5256.3905	0
		Type5	18	14	12	5257.1905	0
		Type5	19	12	12	5256.3905	1
		Type5	20	16	12	5321.6095	1
		Type5	21	12	12	5324.0095	1
		Type5	22	20	12	5319.6095	1
		Type5	23	14	12	5322.8095	1
		Type5	24	13	12	5323.2095	1
		Type5	25	8	12	5325.6095	1
		Type5	26	17	12	5321.2095	1
		Type5	27	19	12	5320.0095	1
		Type5	28	12	12	5323.6095	1
		Type5	29	18	12	5320.8095	1

TestMode	Channel	Radar Type	Trial ID	Pulse width (µs)	PRI (µs)	Pulses per Hop	Detection (1: Yes; 0: No)
		Type6	0	1	333.3	9	1
		Type6	1	1	333.3	9	1
		Type6	2	1	333.3	9	1
		Type6	3	1	333.3	9	1
		Type6	4	1	333.3	9	1
		Type6	5	1	333.3	9	1
		Type6	6	1	333.3	9	1
		Type6	7	1	333.3	9	1
		Type6	8	1	333.3	9	1
		Type6	9	1	333.3	9	1
		Type6	10	1	333.3	9	1
		Type6	11	1	333.3	9	1
		Type6	12	1	333.3	9	1
		Type6	13	1	333.3	9	1
11N20MIMO	5260	Type6	14	1	333.3	9	1
		Type6	15	1	333.3	9	1
		Type6	16	1	333.3	9	1
		Type6	17	1	333.3	9	1
		Type6	18	1	333.3	9	1
		Type6	19	1	333.3	9	1
		Type6	20	1	333.3	9	1
		Type6	21	1	333.3	9	1
		Type6	22	1	333.3	9	0
		Type6	23	1	333.3	9	1
		Type6	24	1	333.3	9	1
		Type6	25	1	333.3	9	1
		Type6	26	1	333.3	9	1
		Type6	27	1	333.3	9	1
		Type6	28	1	333.3	9	1
		Type6	29	1	333.3	9	1

		Type6	0	1	333.3	9	0
		Type6	1	1	333.3	9	1
		Type6	2	1	333.3	9	1
		Type6	3	1	333.3	9	1
		Type6	4	1	333.3	9	1
		Type6	5	1	333.3	9	1
		Type6	6	1	333.3	9	1
		Type6	7	1	333.3	9	1
		Type6	8	1	333.3	9	1
		Type6	9	1	333.3	9	1
		Type6	10	1	333.3	9	1
		Type6	11	1	333.3	9	1
		Type6	12	1	333.3	9	1
		Type6	13	1	333.3	9	1
11N40MIMO	5270	Type6	14	1	333.3	9	1
		Type6	15	1	333.3	9	1
		Type6	16	1	333.3	9	1
		Type6	17	1	333.3	9	1
		Type6	18	1	333.3	9	1
		Type6	19	1	333.3	9	1
		Type6	20	1	333.3	9	1
		Type6	21	1	333.3	9	1
		Type6	22	1	333.3	9	1
		Type6	23	1	333.3	9	1
		Type6	24	1	333.3	9	1
		Type6	25	1	333.3	9	1
		Type6	26	1	333.3	9	1
		Type6	27	1	333.3	9	1
		Type6	28	1	333.3	9	1
		Type6	29	1	333.3	9	1
		Type6	0	1	333.3	9	1
		Type6	1	1	333.3	9	1
		Type6	2	1	333.3	9	1
		Type6	3	1	333.3	9	1
		Type6	4	1	333.3	9	1
		Type6	5	1	333.3	9	1
		Type6	6	1	333.3	9	1
		Type6	7	1	333.3	9	1
		Type6	8	1	333.3	9	1
		Type6	9	1	333.3	9	1
		Type6	10	1	333.3	9	1
		Type6	11	1	333.3	9	1
		Type6	12	1	333.3	9	1
		Type6	13	1	333.3	9	1
11AC80MIMO	5290	Type6	14	1	333.3	9	1
		Type6	15	1	333.3	9	1
		Type6	16	1	333.3	9	1
		Type6	17	1	333.3	9	1
		Type6	18	1	333.3	9	1
		Type6	19	1	333.3	9	1
		Type6	20	1	333.3	9	1
		Type6	21	1	333.3	9	1
		Type6	22	1	333.3	9	1
		Type6	23	1	333.3	9	1
		Type6	24	1	333.3	9	1
		Type6	25	1	333.3	9	1
		Type6	26	1	333.3	9	1
		Type6	27	1	333.3	9	1
		Type6	28	1	333.3	9	1
		Type6	29	1	333.3	9	1

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