

Report No.: SEWM2210000221RG08

Rev.: 01

Page: 1 of 66



TEST REPORT

Application No.: SEWM2210000221RG
Applicant: NetComm Wireless Pty Ltd
Address of Applicant: Level 5, 18-20 Orion Road, Lane Cove, NSW, Australia
Manufacturer: Casa Systems, Inc.
Address of Manufacturer: 100 Old River Road Andover, MA 01810
EUT Description: 5G Wi-Fi 6 Residential Gateway
Model No.: CFW-4222
Trade Mark: 
FCC ID: XIA-CFW4222
Standards: FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart E
Date of Receipt: 2022/11/01
Date of Test: 2022/11/21 to 2022/12/15
Date of Issue: 2022/12/15

Test Result :

PASS *

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Panta Sun
Wireless Laboratory Manager



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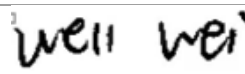
Report No.: SEWM2210000221RG08

Rev.: 01

Page: 2 of 66

1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022/12/15		Original

Prepared By	
	(Ives Cheng) / Test Engineer
Checked By	
	(Well Wei) / Reviewer



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2 Test Summary

Test Item	Band ^[1]	FCC rules No.	Test Requirements	Test Result	Result																						
Dynamic Frequency Selection	Band II-A Band II-C	15.407	DFS Detection Thresholds: <table><tr><th>Maximum Transmit Power</th><th>Value</th></tr><tr><td></td><td>(See Notes 1, 2, and 3)</td></tr><tr><td>EIRP ≥ 200 milliwatt</td><td>-64 dBm</td></tr><tr><td>EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz</td><td>-62 dBm</td></tr><tr><td>EIRP < 200 milliwatt that do not meet the power spectral density requirement</td><td>-64 dBm</td></tr></table> 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. Note 3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01. DFS Response Requirement: <table><tr><th>Parameter</th><th>Value</th></tr><tr><td>Non-occupancy period</td><td>Minimum 30 minutes</td></tr><tr><td>Channel Availability Check Time</td><td>60 seconds</td></tr><tr><td>Channel Move Time</td><td>10 seconds See Note 1</td></tr><tr><td>Channel Closing Transmission Time</td><td>200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2</td></tr><tr><td>U-NII Detection Bandwidth</td><td>Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.</td></tr></table> Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate 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.	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	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.	Clause 4.1	PASS
Maximum Transmit Power	Value																										
	(See Notes 1, 2, and 3)																										
EIRP ≥ 200 milliwatt	-64 dBm																										
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U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.																										
Note 1: Band II-A: 5250-5350MHz Band II-C: 5470-5725MHz																											



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Contents

1	Version	2
2	Test Summary	3
3	General Information	5
3.1	Details of Client	5
3.2	Test Location	5
3.3	Test Facility	5
3.4	General Description of EUT	6
3.5	Test Environment and Mode	9
3.6	Description of Support Units	9
3.7	Worst-case configuration and mode	9
4	Test results and Measurement Data	10
4.1	Dynamic Frequency Selection	10
4.1.1	DFS Measurement Configuration	10
4.1.2	DFS Threshold level	10
4.1.3	Power-on cycle	10
4.1.4	User Access Restrctions	10
4.1.5	Channel Loading/Data Streaming	10
4.1.6	Conducted Setup of Calibration of DFS Detection Threshold Level	11
4.1.7	Test Setup	11
4.1.8	Test Procedures	12
4.1.9	Applicability of DFS Requirements Prior to Use of a Cahannel	20
4.1.10	Applicability of DFS Requirements During Normal Operation	20
4.1.11	DFS Detection Thresholds	21
4.1.12	Response Requirements	21
4.1.13	Short Pulse Radar Test Waveforms	22
4.1.14	Long Pulse Radar Test Waveform	23
4.1.15	Frequency Hopping Radar Test Waveform	24
5	Measurement Uncertainty (95% confidence levels, k=2)	25
6	Equipment List	26
7	Photographs - Setup Photos	27



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3 General Information

3.1 Details of Client

Applicant:	NetComm Wireless Pty Ltd
Address of Applicant:	Level 5, 18-20 Orion Road, Lane Cove, NSW, Australia
Manufacturer:	Casa Systems, Inc.
Address of Manufacturer:	100 Old River Road Andover, MA 01810

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Ives Cheng

3.3 Test Facility

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

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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3.4 General Description of EUT

EUT Description:	5G Wi-Fi 6 Residential Gateway	
Model No.:	CFW-4222	
Trade Mark:	 casa systems	
Hardware Version:	V1.1	
Software Version:	CFW4222-CS.NA	
IMEI:	863109050018212	
WLAN Mode Supported:	802.11a:	20 MHz channel bandwidth
	802.11n:	20 MHz / 40 MHz channel bandwidth
	802.11ac:	20 MHz / 40 MHz / 80 MHz / 160 MHz channel bandwidth
	802.11ax:	20 MHz / 40 MHz / 80 MHz / 160 MHz channel bandwidth
Operation Frequency:	5250MHz to 5350MHz 5470MHz to 5725MHz	
Modulation Type:	802.11a:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11ac:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
	802.11ax:	OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Channel Spacing:	20MHz:	802.11a/n(HT20)/ac(VHT20)/ax(HE20)
	40MHz:	802.11n(HT40)/ac(VHT40)/ax(HE40)
	80MHz:	802.11ac(VHT80)/ax(HE80)
	160MHz:	802.11ac(VHT160)/ax(HE160)
Antenna Type:	PCB Antenna	
Antenna Gain:	5250MHz to 5350MHz: 0.82dBi(Ant3); 1.25dBi(Ant4); 1.63dBi(Ant5); 1.04dBi(Ant5); 5470MHz to 5725MHz: 2.05dBi(Ant3); 1.89dBi(Ant4); 1.64dBi(Ant5); 2.12dBi(Ant5);	
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
Smart System:	☒ SISO	802.11a/n/ac/ax
	☒ MIMO	802.11n/ac/ax: 4Tx & 4Rx
	☒ Diversity	802.11a: 4Tx & 4Rx
DFS Function:	☒ Master	
	☐ Slave with radar detection	☐ Slave without radar detection
RF Cable:	1.5dB	



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Rev.: 01

Page: 7 of 66

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Accessory:

Description	Manufacturer	Model No.	Power Rating
Adapter	Shenzhen Keyu Power Supply Technology Co., Ltd.	KA36B-1203000US	Input:100- 240V~, 50/60Hz, 1.0A Max, Output:12VDC, 3000 mA

Remark:

In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:

Frequency Range of Operation Operating Frequency Range (in each Band)	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre

For UNII Band II-A:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	52	5260
	56	5280
	64	5320
IEEE 802.11n/ac/ax 40MHz	54	5270
	62	5310
IEEE 802.11ac/ax 80MHz	58	5290
IEEE 802.11ax 160MHz	50	5250



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 8 of 66

For UNII Band II-C:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	100	5500
	116	5580
	140	5700
IEEE 802.11n/ac/ax 40MHz	102	5510
	110	5550
	134	5670
IEEE 802.11ac/ax 80MHz	106	5530
	122	5610
IEEE 802.11ax 160MHz	114	5570



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3.5 Test Environment and Mode

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	12
Remark: NV: Normal Voltage NT: Normal Temperature		

3.6 Description of Support Units

Description	Manufacturer	Model No.
Router	ASUS	GT-AXE11000 (FCC ID MSQ-RTAXJF00)

3.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

Modulation Type	SISO - Data Rate	CDD/MIMO - Data Rate
802.11a	6 Mbps	12 Mbps
802.11n (HT 20)	MCS0 (6.5 Mbps)	MCS0 (13 Mbps)
802.11n (HT 40)	MCS0 (13.5 Mbps)	MCS0 (27 Mbps)
802.11ac (VHT 20)	MCS0 (6.5 Mbps)	MCS0 (13 Mbps)
802.11ac (VHT 40)	MCS0 (13.5 Mbps)	MCS0 (27 Mbps)
802.11ac (VHT 80)	MCS0 (29.3 Mbps)	MCS0 (58.5 Mbps)
802.11ac (VHT 160)	MCS0 (58.5 Mbps)	MCS0 (117 Mbps)
802.11ax (HE 20)	MCS0 (8 Mbps)	MCS0 (16 Mbps)
802.11ax (HE 40)	MCS0 (16 Mbps)	MCS0 (32 Mbps)
802.11ax (HE 80)	MCS0 (34 Mbps)	MCS0 (68 Mbps)
802.11ax (HE 160)	MCS0 (68 Mbps)	MCS0 (136 Mbps)



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4 Test results and Measurement Data

4.1 Dynamic Frequency Selection

4.1.1 DFS Measurement Configuration

Test Condition	Conducted Measurement Use 50Ohms to connect cable/connector calibration and testing, Use wifi5 port for testing. Refer to Section 4.1.7 for test connection.
----------------	---

4.1.2 DFS Threshold level

DFS Threshold level:(-60.36)dBm	☒ At the antenna connector ☐ In front of the antenna
The Interference Radar Detection Threshold Level is: (Band II-C: -62dBm + 1.64dBi + 0dB = -60.36dBm) That had been taken into account the output power range and antenna gain.	

4.1.3 Power-on cycle

The time required for the Master Device and/or Client Device to complete its power-on cycle(93S).

4.1.4 User Access Restrctions

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

4.1.5 Channel Loading/Data Streaming

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



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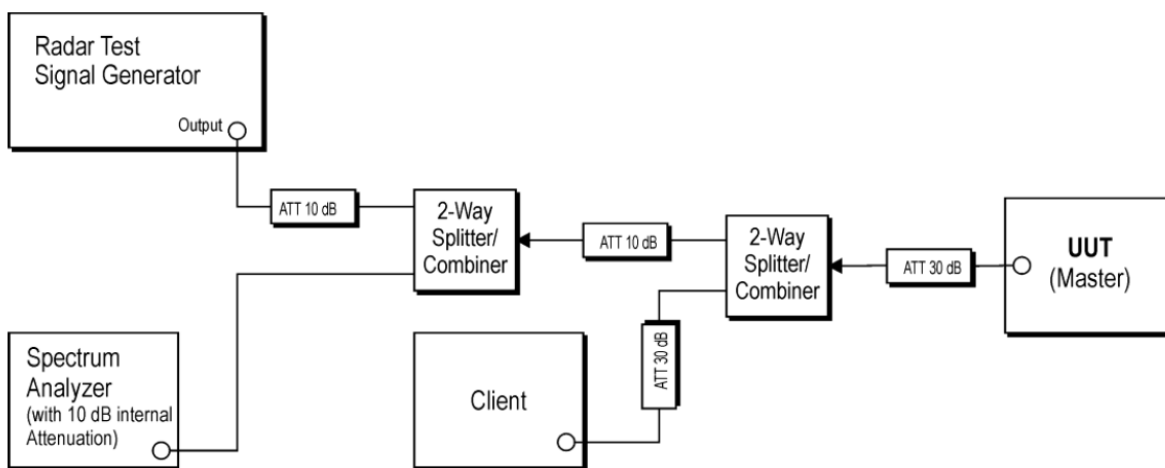
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4.1.6 Conducted Setup of Calibration of DFS Detection Threshold Level



4.1.7 Test Setup



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4.1.8 Test Procedures

4.1.8.1 U-NII Detection Bandwidth

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.

4.1.8.2 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*.

4.1.8.3 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



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Page: 13 of 66

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 2.5 minute sweep time. The spectrum analyzer's sweep will be started at the same time power is applied to the UUT 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.

4.1.8.4 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 (T_{power_up}). The *Channel Availability Check Time* commences on Chr at instant T1 and will end no sooner than T1 + T_{ch_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.



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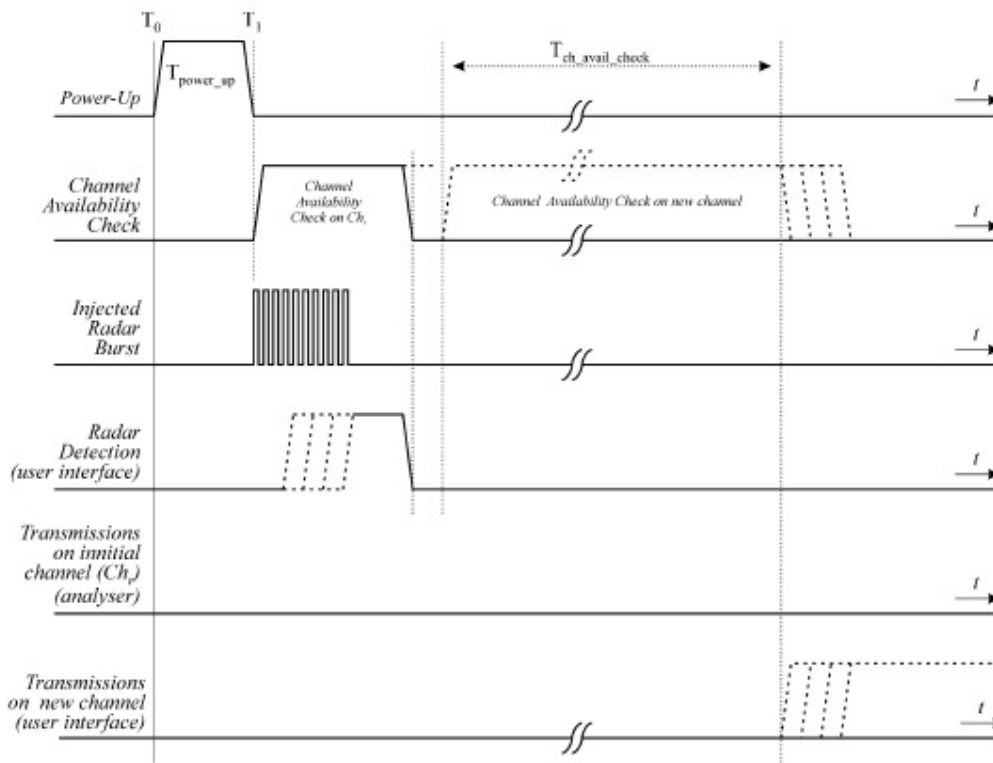


Figure 15: Example of timing for radar testing at the beginning of the Channel Availability Check Time

4.1.8.5 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**.

- 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.
- The UUT is powered on at T_0 . T_1 denotes the instant when the UUT has completed its power-up sequence ($T_{\text{power_up}}$). The *Channel Availability Check Time* commences on Ch_r at instant T_1 and will end no sooner than $T_1 + T_{\text{ch_avail_check}}$.
- A single *Burst* of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at $T_1 + 54$ 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.
- Visual indication or measured results on the UUT of successful detection of the radar *Burst* will be recorded and reported. Observation of Ch_r for UUT emissions will continue for 2.5 minutes after the radar *Burst* has been generated.
- Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Ch_r . The *Channel Availability Check* results will be recorded.

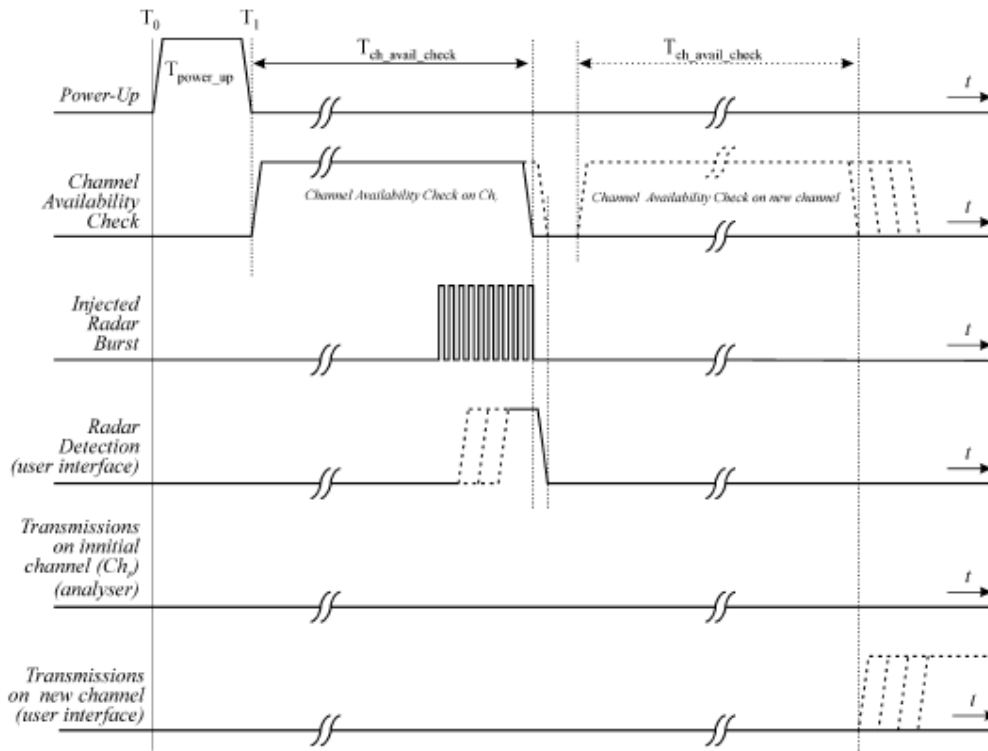


Figure 16: Example of timing for radar testing towards the end of the Channel Availability Check Time

4.1.8.6 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.



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- 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 T_0 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 T_2 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).

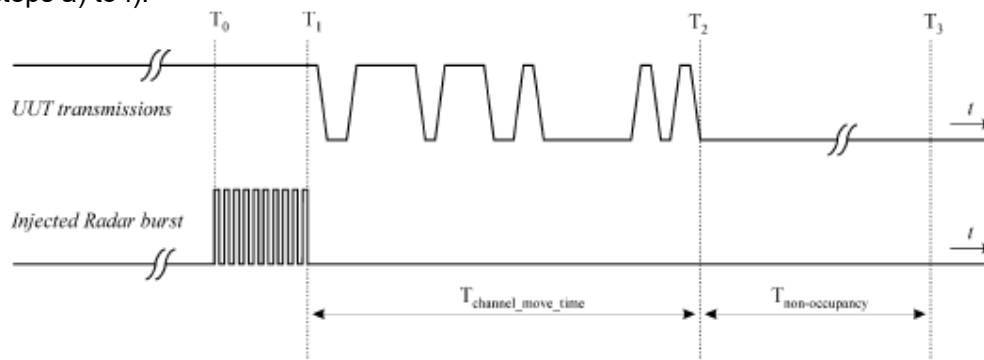


Figure 17: Example of Channel Closing Transmission Time & Channel Closing Time

4.1.8.7 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 T_0 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



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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).

4.1.8.8 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:

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

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

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

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

4.1.8.9 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).



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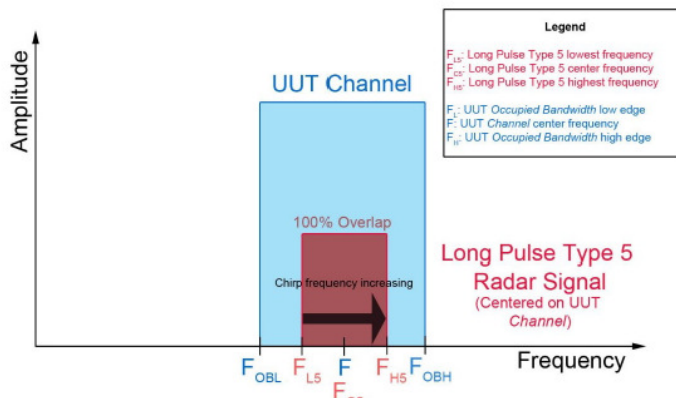


Figure 18: Example of the Relationship Between Long Pulse Type 5 Signal and the U-NII channel when the Signal is Tuned to the UUT Channel Center Frequency

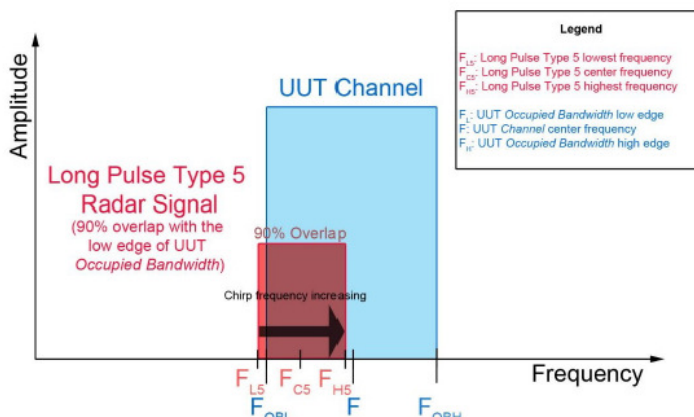


Figure 19: Example of the Relationship Between Long Pulse Type 5 Signal and the U-NII channel when the Signal is Tuned so that 90% of the Radar Signal Overlaps with the Low Edge of the UUT Occupied Bandwidth

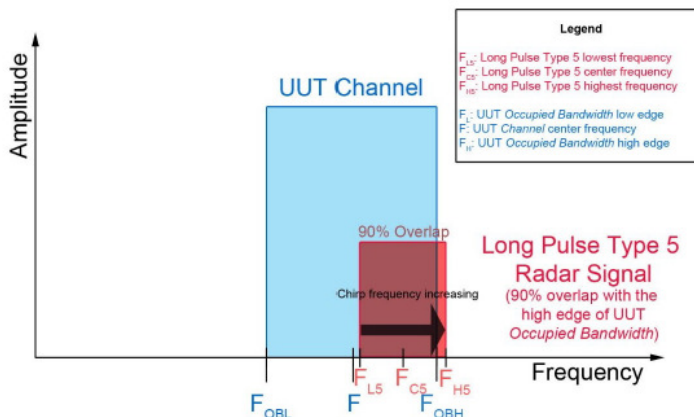


Figure 20: Example of the Relationship Between Long Pulse Type 5 Signal and the U-NII channel when the Signal is Tuned so that 90% of the Radar Signal Overlaps with the High Edge of the UUT Occupied Bandwidth

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

Report No.: SEWM2210000221RG08

Rev.: 01

Page: 19 of 66

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:

$$F_L + (0.4 * \text{Chirp Width [in MHz]})$$

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:

$$F_H - (0.4 * \text{Chirp Width [in MHz]})$$

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:

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

4.1.8.10 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:

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



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4.1.9 Applicability of DFS Requirements Prior to Use of a Channel

Requirement	DFS Operational mode		
	Master	Client Without Radar Detection	Client With Radar Detection
<i>Non-Occupancy Period</i>	Yes	Not required	Yes
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Availability Check Time</i>	Yes	Not required	Not required
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

4.1.10 Applicability of DFS Requirements During Normal Operation

Requirement	DFS Operational mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not required
<i>Channel Availability Check Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required

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

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



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4.1.11 DFS Detection Thresholds

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 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.	

4.1.12 Response Requirements

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	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 to facilitate 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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4.1.13 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 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	$\text{Roundup} \left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
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 $6 \cdot 1 \cdot 19 \cdot 10 \cdot \text{Roundup} \left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{3066} \right) \right\} \text{ Round up } \{17.2\} = 18$.

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



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8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	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	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 $(82.9\% + 60\% + 90\% + 88\%)/4 = 80.2\%$			

4.1.14 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

Each waveform is defined as follows:

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



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 24 of 66

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

6) If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the random time interval between the first and second pulses is chosen independently of the random time interval between the second and third pulses.

7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst Count. Each interval is of length $(12,000,000 / \text{Burst Count})$ microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and $[(12,000,000 / \text{Burst Count}) - (\text{Total Burst Length}) + (\text{One Random PRI Interval})]$ microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen randomly.

4.1.15 Frequency Hopping 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
6	1	333	9	0.333	300	70%	30

For the Frequency Hopping Radar Type, the same Burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm: If a segment does not contain at least 1 frequency within the U-NII Detection Bandwidth of the UUT, then that segment is not used.

The detailed test data see: **Appendix**



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 25 of 66

5 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	±1.0 %
Remark: The U_{lab} (lab Uncertainty) is less than $U_{CISPR/ETSI}$ (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.		



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6 Equipment List

RF Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date (yyyy/mm/dd)	Cal Due Date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2022/02/16	2023/02/15
Signal Analyzer	ROHDE & SCHWARZ	FSV3030	SUWI-01-02-02	2022/05/17	2023/05/16
Measurement Software	Tonscend	JS1120-3 Test System V3.1.55	SUWI-02-09-09	NCR	NCR
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2022/02/15	2023/02/14
Signal Analyzer	ROHDE & SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Power meter	Anritsu	ML2495A	SUWI-01-31-01	2021/12/04	2022/12/03
				2022/11/23	2023/11/22
Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	2021/12/04	2022/12/03
				2022/11/23	2023/11/22
MXG Vector signal genitor	KEYSIGHT	N5182B	SUWI-01-38-01	2022/02/14	2023/02/13
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-01	2022/02/15	2023/02/14
Wideband Radio Communication Tester	ROHDE & SCHWARZ	CMW500	SUWI-01-16-05	2022/02/14	2023/02/13



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 27 of 66

7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 28 of 66

Appendix



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 29 of 66

DFS Detection Thresholds Test Result

TestMode	Frequency[dbm]	Radar Type	Result	Gain	Limit[dbm]	Verdict
11ax160MIMO	5570	Type0	-60.41	1.64	-60.36	PASS
		Type1	-60.37	1.64	-60.36	PASS
		Type2	-60.47	1.64	-60.36	PASS
		Type3	-60.37	1.64	-60.36	PASS
		Type4	-60.60	1.64	-60.36	PASS
		Type5	-60.73	1.64	-60.36	PASS
		Type6	-60.63	1.64	-60.36	PASS



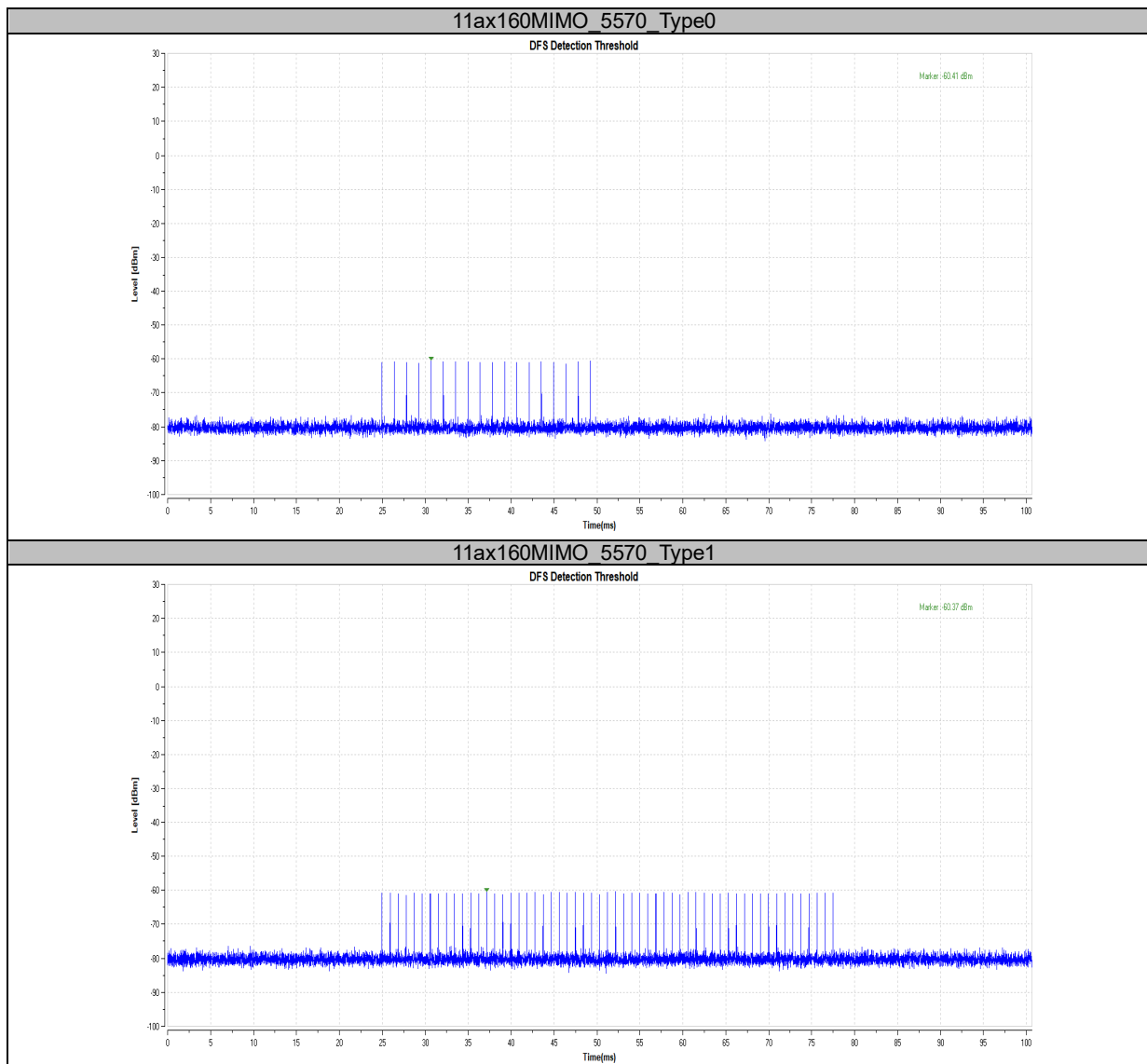
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Test Graphs



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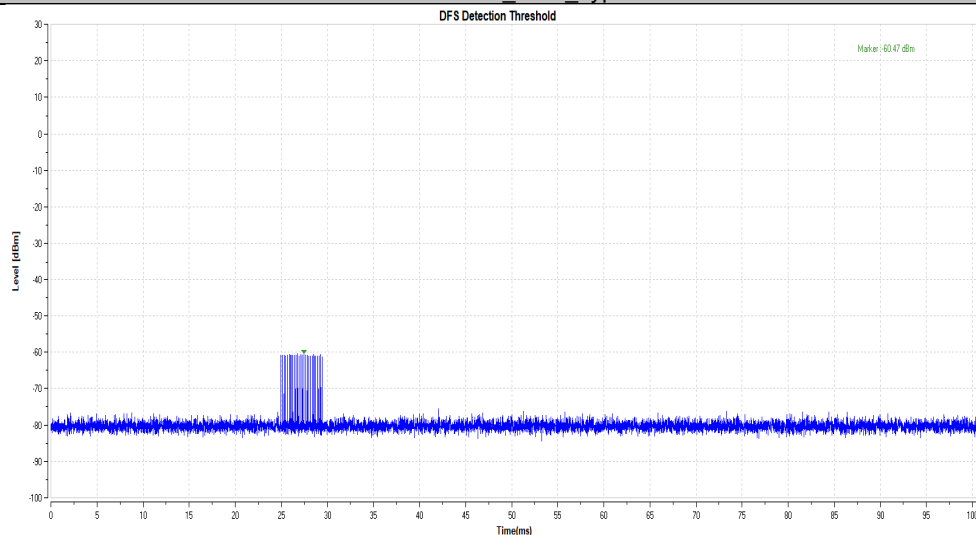
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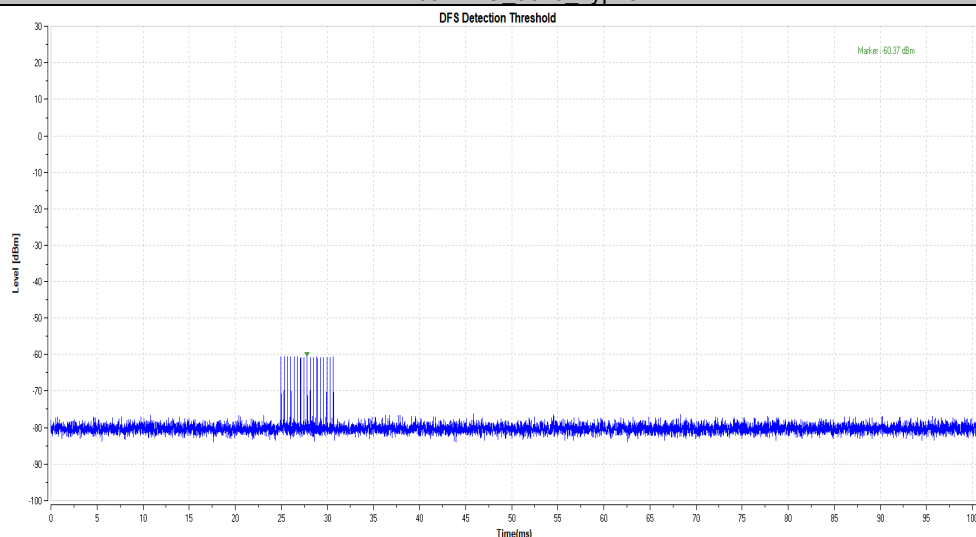
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Page: 31 of 66

11ax160MIMO 5570_Type2



11ax160MIMO 5570_Type3



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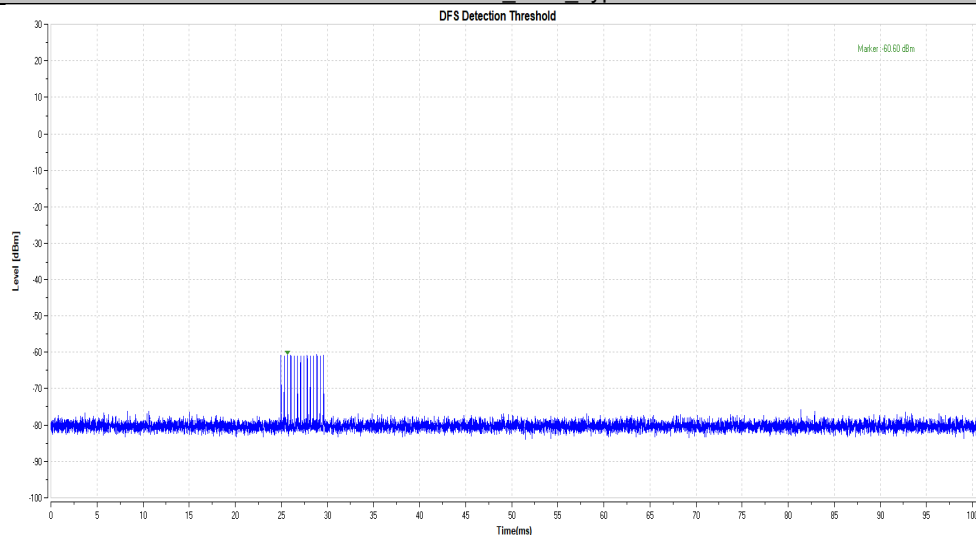
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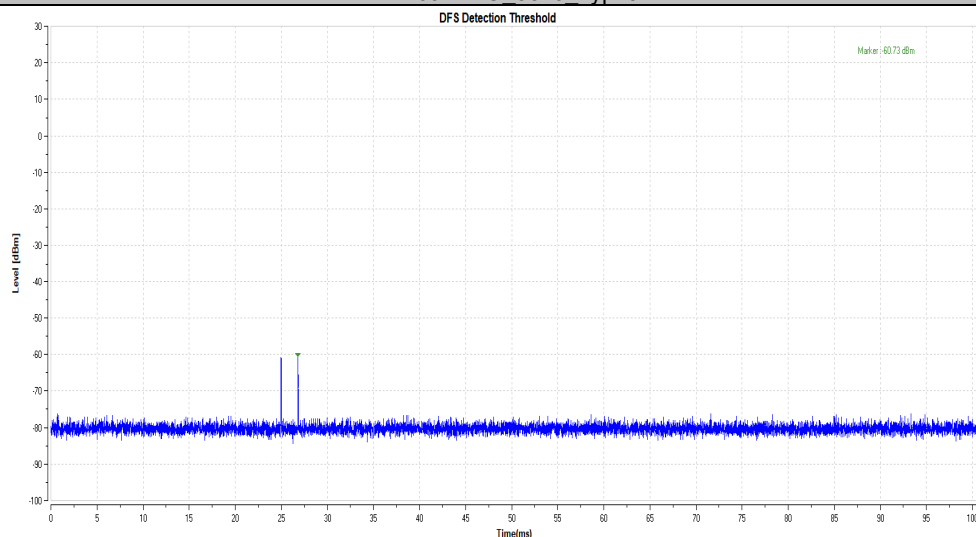
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Page: 32 of 66

11ax160MIMO_5570_Type4



11ax160MIMO_5570_Type5



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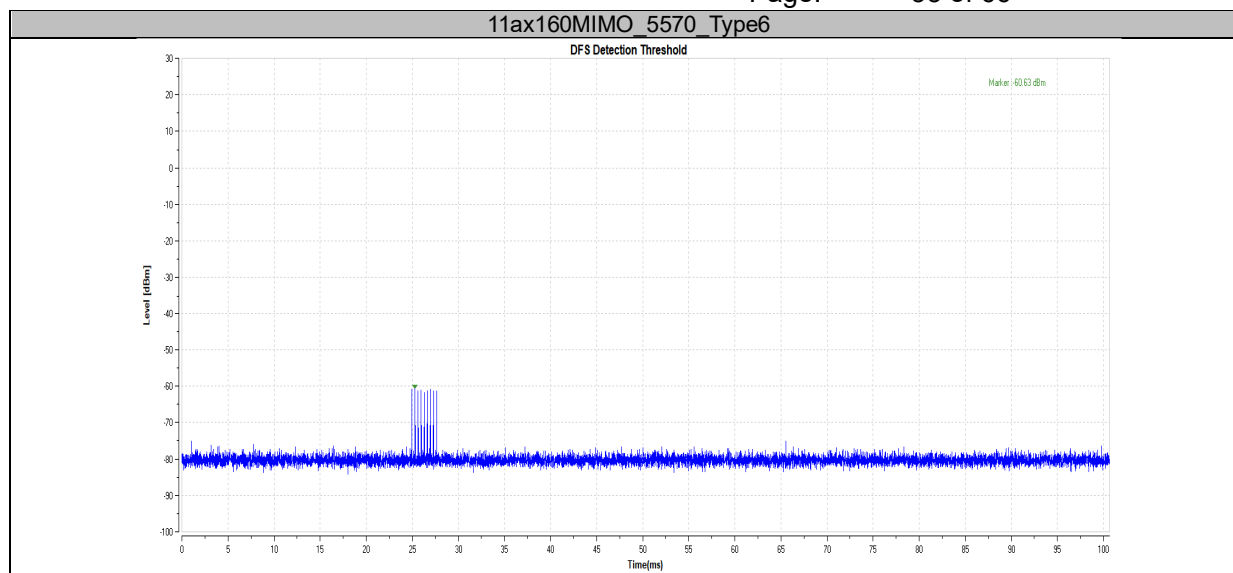
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Rev.: 01

Page: 33 of 66



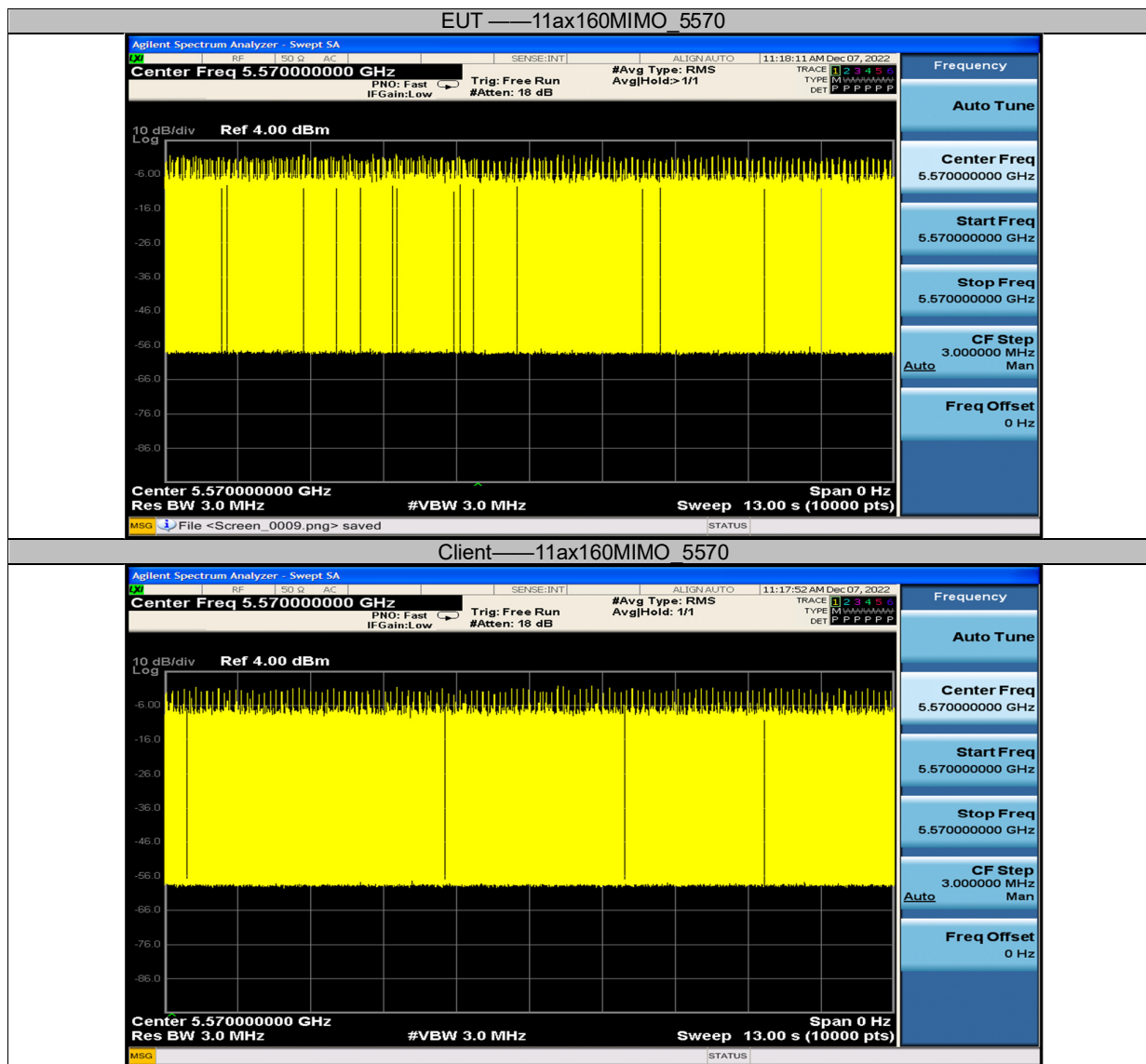
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Data Traffic Plot Test Graphs



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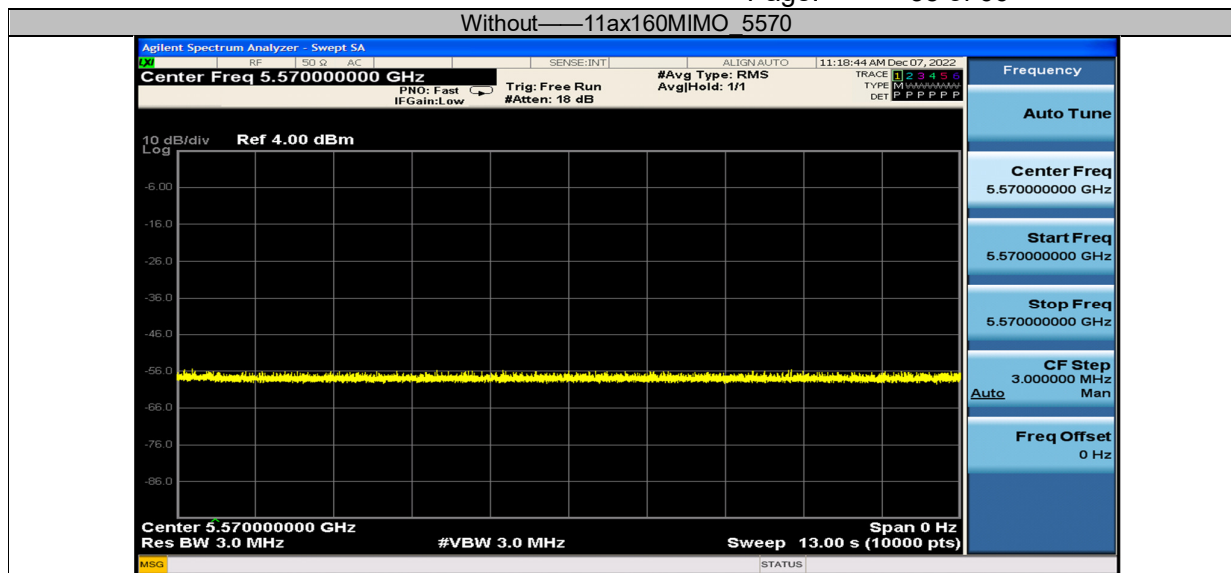
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Page: 36 of 66

Channel Loading Test Result

TestMode	Frequency[MHz]	Result	Limit [%]	Verdict
11ax160MIMO	5570	37.26	17	PASS



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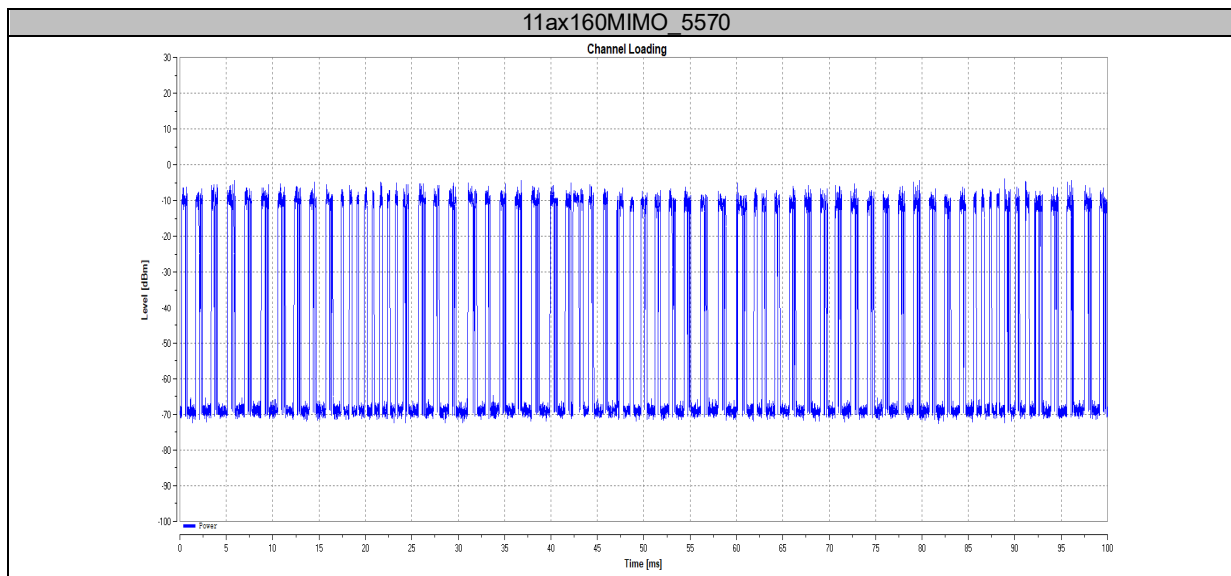
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Test Graphs



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Rev.: 01

Page: 38 of 66

Channel Availability Check Time Test Result

TestMode	Frequency[MHz]	Result	Verdict
11ax160MIMO	5570	See test Graph	PASS

TestMode	Frequency[MHz]	Result	Verdict
11ax160MIMO	5570	See test Graph	PASS

TestMode	Frequency[MHz]	Result	Verdict
11ax160MIMO	5570	See test Graph	PASS



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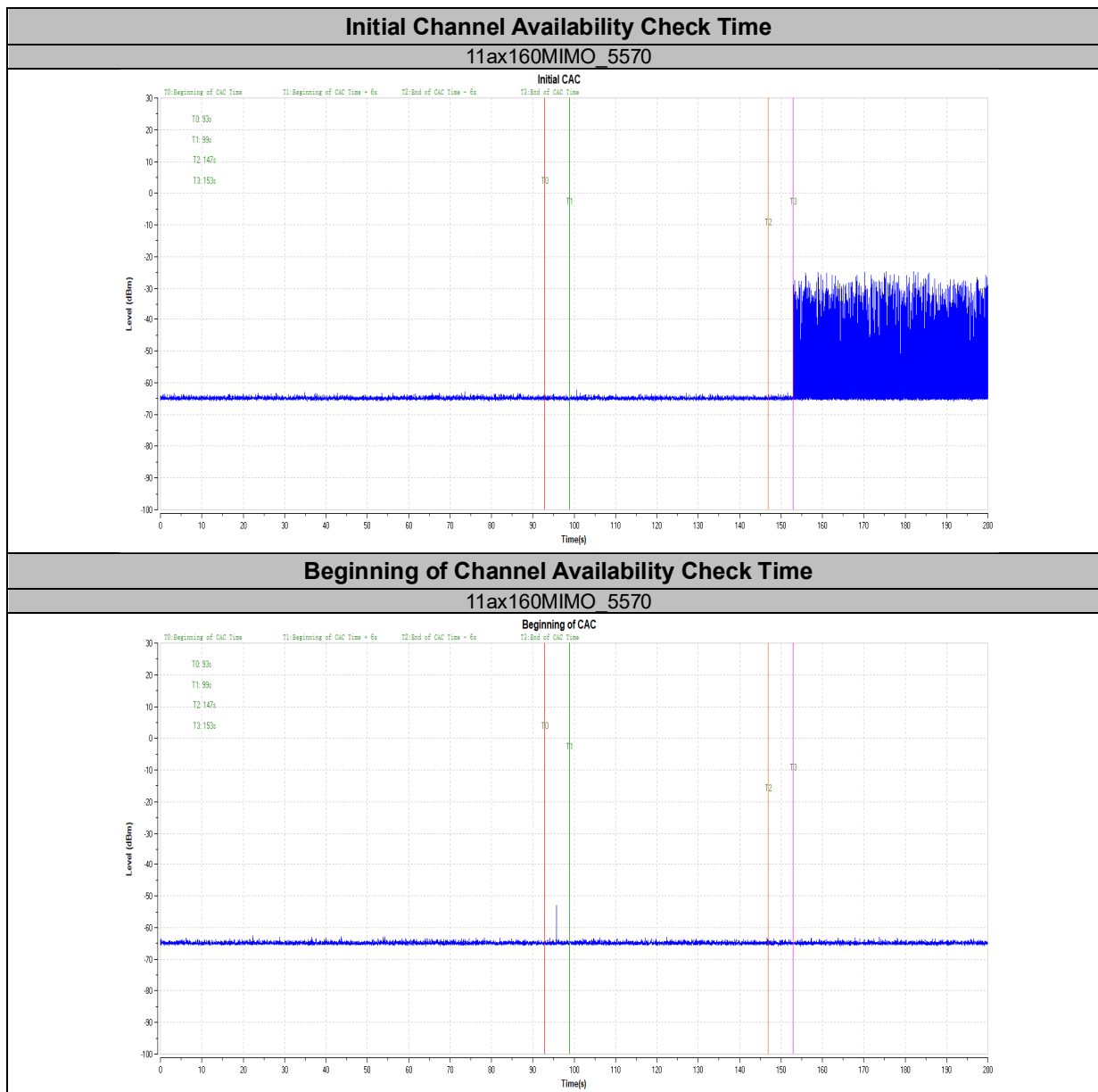
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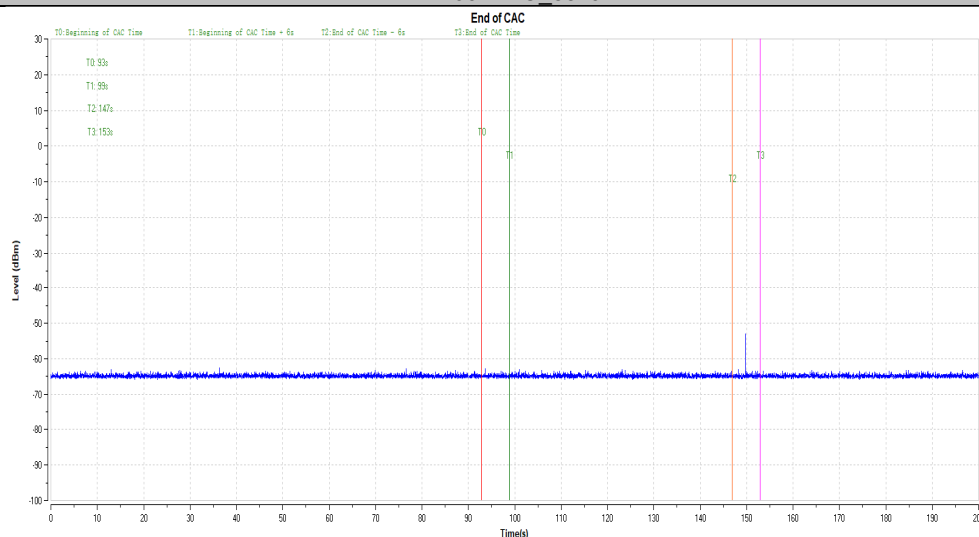
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Rev.: 01

Page: 40 of 66

End of Channel Availability Check Time

11ax160MIMO 5570



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 41 of 66

Channel Move Time and Channel Closing Transmission Time Test Result

TestMode	Frequency[MHz]	CCTT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
11ax160MIMO	5570	200+6.5	200+60	478.1	10000	PASS



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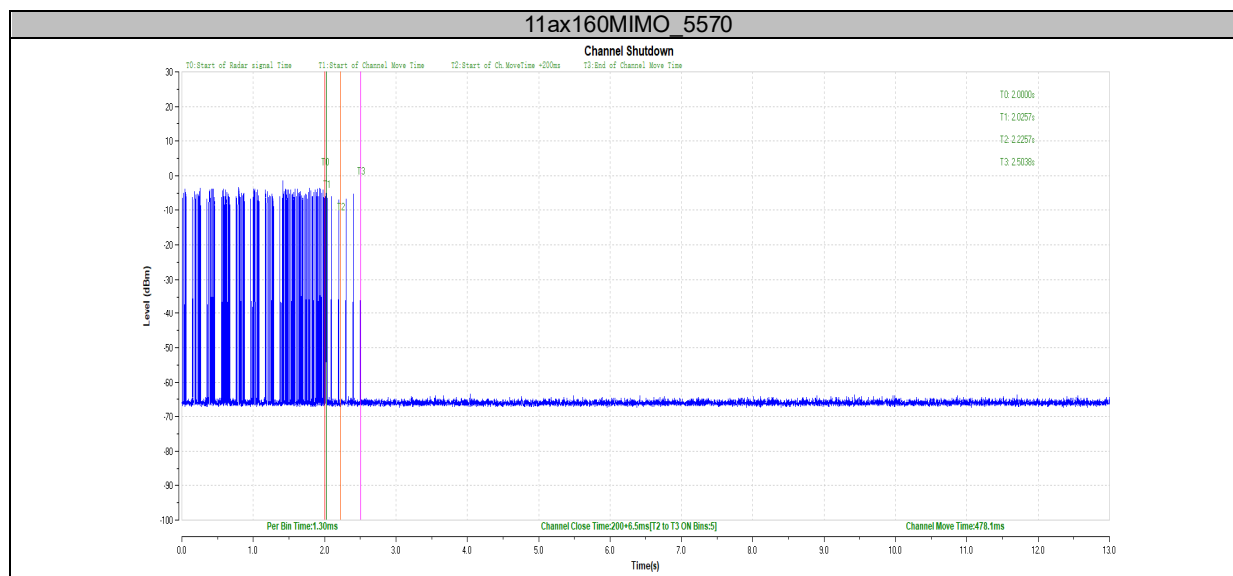
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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 42 of 66

Test Graphs



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 43 of 66

Non-Occupancy Period

Test Result

TestMode	Frequency[MHz]	Result	Limit[s]	Verdict
11ax160MIMO	5570	see test graph	≥1800	PASS



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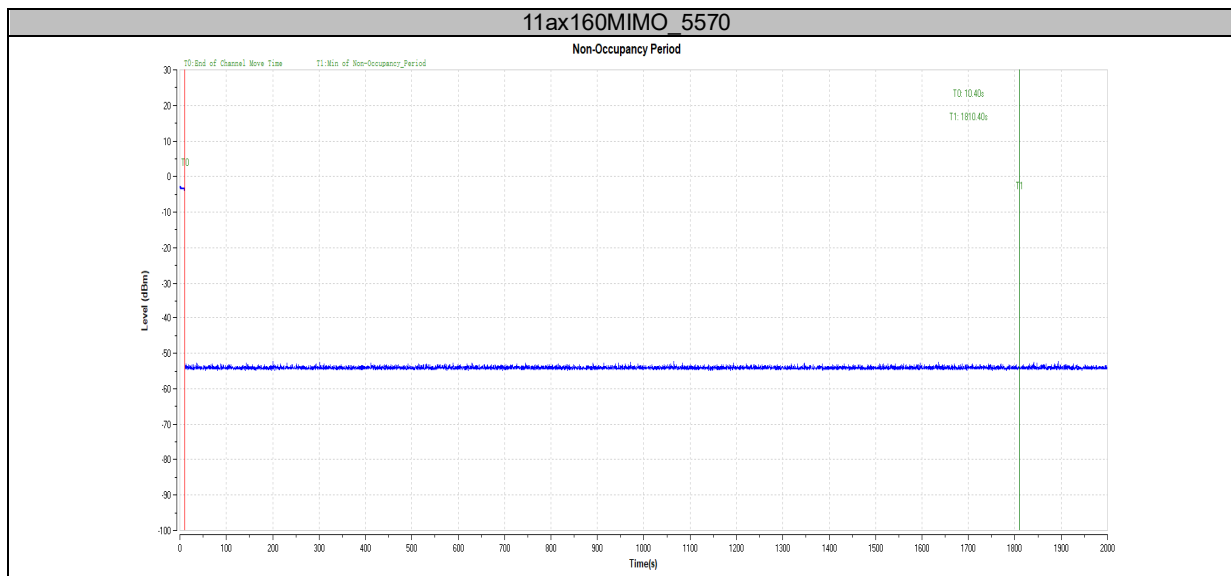
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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 44 of 66

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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 45 of 66

U-NII Detection Bandwidth**Test Result**

TestMode	Frequency[MHz]	FL[MHz]	FH[MHz]	Detection Bandwidth [MHz]	OCB [MHz]	Ratio [%]	Limit [%]	Verdict
11ac20MIMO	5500	5490	5510	20	16.173	123.66	≥100	PASS
11ac40MIMO	5510	5490	5530	40	36.134	110.70	≥100	PASS
11ac80MIMO	5530	5490	5570	80	75.756	105.60	≥100	PASS
11ax160MIMO	5570	5490	5650	160	155.63	102.81	≥100	PASS



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Test Mode	Frequency[MHz]	Radar Freq.	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Ratio (%)
11ac20MIMO	5500	5489	1	0	1	0	0	0	0	0	0	0	20
		5490	1	1	1	1	1	1	1	1	1	1	100
		5491	1	1	1	1	1	1	1	0	1	1	90
		5492	1	1	0	1	1	1	1	1	1	1	90
		5493	1	1	1	1	1	1	0	1	1	1	90
		5494	1	1	1	1	1	1	1	1	1	1	100
		5495	1	1	1	1	1	1	0	1	1	1	90
		5496	1	1	0	1	1	1	1	1	1	1	90
		5497	1	1	1	1	1	1	1	1	1	1	100
		5498	1	1	1	1	1	1	0	1	1	1	90
		5499	1	1	1	1	1	1	1	1	1	1	100
		5500	1	1	1	1	1	1	1	1	1	0	90
		5505	1	1	1	1	1	1	1	1	1	1	100
		5510	1	1	1	1	1	1	1	1	1	1	100
		5511	0	0	0	0	0	0	0	0	0	0	0
		5512	0	0	0	0	0	0	0	0	0	0	0
		5513	0	0	0	0	0	0	0	0	0	0	0
		5514	1	0	0	0	0	0	0	0	0	0	10
		5515	0	0	0	0	0	0	0	0	0	0	0
11ac40MIMO	5510	5485	0	0	0	0	0	0	0	0	0	0	0
		5486	0	0	0	0	0	0	0	0	0	0	0
		5487	0	0	0	0	0	0	0	0	0	0	0
		5488	0	0	0	0	0	0	0	0	0	0	0
		5489	1	0	0	0	0	0	0	0	0	0	10
		5490	1	1	1	1	1	1	1	1	1	1	100
		5495	1	1	1	1	1	1	1	1	1	1	100
		5500	1	1	1	1	1	1	1	1	1	1	100
		5505	1	1	1	1	1	1	1	1	1	1	100
		5510	1	1	1	1	1	1	1	1	1	1	100
		5515	1	1	1	1	1	1	1	1	1	1	100
		5520	1	1	1	1	1	1	1	1	1	1	100
		5525	1	1	1	1	1	1	1	1	1	1	100
		5530	1	1	1	1	1	1	1	1	1	1	100
		5531	0	0	0	0	0	0	0	0	0	0	0
		5532	0	0	0	0	0	0	0	0	0	0	0
		5533	0	0	0	0	0	0	0	0	0	0	0
		5534	0	0	0	0	0	0	0	0	0	0	0
		5535	0	0	0	0	0	0	0	0	0	0	0
11ac80MIMO	5530	5485	0	0	0	0	0	0	0	0	0	0	0
		5486	0	0	0	0	0	0	0	0	0	0	0
		5487	0	0	0	0	0	0	0	0	0	0	0
		5488	0	0	0	0	0	0	0	0	0	0	0
		5489	0	0	0	0	0	0	0	0	0	0	0
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		5540	1	1	1	1	1	1	1	1	1	1	100



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 47 of 66

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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 48 of 66

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Test Graphs



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Statistical Performance check

Test Result

TestMode	Frequency[MHz]	Radar Type	Pass Times	Fail Times	Probability (%)	Limit (%)	Verdict
11ac20MIMO	5500	Type1	28	2	93.33	60	PASS
		Type2	29	1	96.67	60	PASS
		Type3	29	1	96.67	60	PASS
		Type4	27	3	90.00	60	PASS
		Type 1-4	---	---	94.17	80	PASS
		Type5	28	2	93.33	80	PASS
11ac40MIMO	5510	Type6	30	0	100.00	70	PASS
		Type1	28	2	93.33	60	PASS
		Type2	28	2	93.33	60	PASS
		Type3	29	1	96.67	60	PASS
		Type4	28	2	93.33	60	PASS
		Type 1-4	---	---	94.16	80	PASS
11ac80MIMO	5530	Type5	30	0	100.00	80	PASS
		Type6	30	0	100.00	70	PASS
		Type1	27	3	90.00	60	PASS
		Type2	29	1	96.67	60	PASS
		Type3	29	1	96.67	60	PASS
		Type4	29	1	96.67	60	PASS
11ax160MIMO	5570	Type 1-4	---	---	95.00	80	PASS
		Type5	30	0	100.00	80	PASS
		Type6	30	0	100.00	70	PASS
		Type1	29	1	96.67	60	PASS
		Type2	28	2	93.33	60	PASS
		Type3	29	1	96.67	60	PASS
		Type4	30	0	100.00	60	PASS
		Type 1-4	---	---	96.67	80	PASS
		Type5	29	1	96.67	80	PASS
		Type6	30	0	100.00	70	PASS



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TestMode	Frequency[MHz]	Radar Type	Trial ID	Pulse width(μs)	PRI(μs)	Pulses per Burst	Detection (1: Yes; 0: No)
11ac20MIMO	5500	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	0
		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	0
		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	0
		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
		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	1
		Type2	12	3.2	162.0	26	1
		Type2	13	2.2	197.0	25	1
		Type2	14	4.5	163.0	29	1
		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	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



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 53 of 66

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	0
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	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
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Type4	10	17.4	208.0	15	1
Type4	11	19.0	463.0	16	1
Type4	12	16.0	441.0	14	0
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	0
Type4	19	13.8	409.0	13	1
Type4	20	17.1	373.0	15	1



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		Type4	21	13.8	254.0	13	1
		Type4	22	19.8	274.0	16	1
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11ac40MIMO	5510	Type4	29	18.2	284.0	15	1
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		Type1	13	1.0	598.0	89	1
		Type1	14	1.0	558.0	95	1
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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 55 of 66

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Type3	5	7.9	432.0	17	1
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Type4	12	16.0	441.0	14	1
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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 56 of 66

		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
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		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
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		Type1	29	1.0	1177.0	45	1
		Type2	0	3.2	179.0	26	1
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		Type2	2	2.1	230.0	24	1
		Type2	3	4.8	200.0	29	1
		Type2	4	3.9	214.0	28	1
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		Type2	6	3.2	204.0	26	1
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		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	1



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 57 of 66

Type2	12	3.2	162.0	26	1
Type2	13	2.2	197.0	25	1
Type2	14	4.5	163.0	29	1
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Type2	22	4.9	195.0	29	1
Type2	23	2.9	202.0	26	1
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Type3	5	7.9	432.0	17	1
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Type3	7	7.5	443.0	17	0
Type3	8	8.1	439.0	17	1
Type3	9	6.2	223.0	16	1
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Type3	11	9.6	463.0	18	1
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Type4	7	14.3	443.0	13	1
Type4	8	15.8	439.0	14	1



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		Type4	9	11.5	223.0	12	1
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		Type4	21	13.8	254.0	13	1
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		Type2	0	3.2	179.0	26	1
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		Type2	3	4.8	200.0	29	1
		Type2	4	3.9	214.0	28	1
		Type2	5	2.9	222.0	26	1



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 59 of 66

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
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Type2	14	4.5	163.0	29	1
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Type2	16	5.0	168.0	29	1
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Type3	13	7.2	323.0	16	1
Type3	14	9.5	297.0	18	1
Type3	15	8.0	412.0	17	0
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
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Type3	23	7.9	278.0	17	1
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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 60 of 66

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
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Type4	29	18.2	284.0	15	1



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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 61 of 66

TestMode	Frequency[MHz]	Radar Type	Trial ID	Number Of Bursts	Waveform Length (s))	Radar Frequency	Detection (1: Yes; 0: No)
11ac20MIMO	5500	Type5	0	15	12	5500	1
		Type5	1	8	12	5500	1
		Type5	2	11	12	5500	1
		Type5	3	20	12	5500	1
		Type5	4	17	12	5500	1
		Type5	5	14	12	5500	1
		Type5	6	15	12	5500	1
		Type5	7	12	12	5500	1
		Type5	8	14	12	5500	1
		Type5	9	8	12	5500	1
		Type5	10	17	12	5497	1
		Type5	11	19	12	5498.2	1
		Type5	12	15	12	5495.8	1
		Type5	13	12	12	5494.6	0
		Type5	14	19	12	5497.8	1
		Type5	15	14	12	5495.4	1
		Type5	16	20	12	5498.6	1
		Type5	17	12	12	5494.6	1
		Type5	18	14	12	5495.4	1
		Type5	19	12	12	5494.6	1
		Type5	20	16	12	5503.4	1
		Type5	21	12	12	5505.8	1
		Type5	22	20	12	5501.4	1
		Type5	23	14	12	5504.6	1
		Type5	24	13	12	5505	0
		Type5	25	8	12	5507.4	1
		Type5	26	17	12	5503	1
		Type5	27	19	12	5501.8	1
		Type5	28	12	12	5505.4	1
		Type5	29	18	12	5502.6	1
11ac40MIMO	5510	Type5	0	15	12	5510	1
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		Type5	24	13	12	5524.9	1
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		Type5	18	14	12	5496.985	1
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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 63 of 66

	Type5	20	16	12	5641.815	1
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	Type5	22	20	12	5639.815	1
	Type5	23	14	12	5643.015	1
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TestMode	Frequency[MHz]	Radar Type	Trial ID	Pulse width (μs)	PRI (μs)	Pulses per Hop	Detection (1: Yes; 0: No)
11ac20MIMO	5500	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
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11ac40MIMO	5510	Type6	0	1	333.3	9	1
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		Type6	24	1	333.3	9	1
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		Type6	26	1	333.3	9	1
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11ax160MIMO	5570	Type6	0	1	333.3	9	1
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Report No.: SEWM2210000221RG08

Rev.: 01

Page: 66 of 66

	Type6	20	1	333.3	9	1
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---End of Report---



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