

TEST REPORT

Report Number : 15126863-E9V1

Applicant : Sonos Inc. 301 Coromar Dr. Goleta, CA 93117 USA

Model : S55

- Brand : SONOS
- FCC ID : SBVRM055
 - IC : 5373A-RM055
- EUT Description : Wireless Smart Speaker
- **Test Standard(s) :** CONTENTION BASED PROTOCOL PORTION of FCC 47 CFR PART 15 SUBPART E, KDB 987594 CONTENTION BASED PROTOCOL PORTION of RSS-248, ISSUE 2

Date Of Issue: 2024-04-31

Prepared by: UL VERIFICATION SERVICES 47173 Benicia Street Fremont, CA 94538 U.S.A. TEL: (510) 319-4000 FAX: (510) 661-0888



Revision History

Rev.	lssue Date	Revisions	Revised By
V1	2024-05-31	Initial Issue	

Page 2 of 121

TABLE OF CONTENTS

1.	ATTESTATION OF TEST RESULTS	5
2.	TEST METHODOLOGY	6
3.	SUMMARY OF TEST RESULTS	6
4.	REFERENCE DOCUMENTS	6
5.	FACILITIES AND ACCREDITATION	7
6.	DECISION RULES AND MEASUREMENT UNCERTAINTY	7
e	6.1. METROLOGICAL TRACEABILITY	7
F	0.2. DECISION RULES	
-	6.3. MEASUREMENT UNCERTAINTY	
-		
7.	CONTENTION BASED PROTOCOL	9
7	7.1. OVERVIEW	
	7.1.1. LIMITS	
	7.1.2. FREQUENCY BANDS AND GOVERNING RULES	
7	7.2. DESCRIPTION OF TEST SETUP1	1
	7.2.1. TEST AND MEASUREMENT SYSTEM	
	7.2.2. TEST AND MEASUREMENT SOFTWARE	
	7.2.3. TEST ROOM ENVIRONMENT 13 7.2.4. SETUP OF EUT 14	
	7.2.5. DESCRIPTION OF EUT	
8.	CONTENTION BASED PROTOCOL	ô
8	8.1. LIMITS AND PROCEDURES10	6
-	3.2. U-NII 5 BAND TEST CONDITION 1 RESULTS	
8	3.3. U-NII 5 BAND TEST CONDITION 2 RESULTS1	
	8.3.1. TEST CHANNEL	
	8.3.2. INCUMBENT SIGNAL PLOTS	
	8.3.3. EUT TRANSMISSION PLOTS	
	8.3.5. Tx OPERATIONAL STATUS TEST RESULTS	
8	8.4. U-NII 5 BAND TEST CONDITION 3 RESULTS	
۶	8.5. U-NII 5 BAND TEST CONDITION 4 RESULTS	6
Ľ	8.5.1. TEST CHANNEL	
	8.5.2. INCUMBENT SIGNAL PLOTS	7
	8.5.3. EUT TRANSMISSION PLOTS	
	8.5.4. TABULATED TEST RESULTS40	
	8.5.5. Tx OPERATIONAL STATUS TEST RESULTS	2
8	8.6. U-NII 6 BAND TEST CONDITION 1 RESULTS43	
8	8.7. U-NII 6 BAND TEST CONDITION 2 RESULTS	
	8.7.1. TEST CHANNEL	
	Page 3 of 121	-

	8.7.2. INCUMBENT SIGNAL PLOTS8.7.3. EUT TRANSMISSION PLOTS	
	8.7.3. EUT TRANSMISSION PLOTS8.7.4. TABULATED TEST RESULTS	
	8.7.5. Tx OPERATIONAL STATUS TEST RESULTS	.49 51
-	.8. U-NII 6 BAND TEST CONDITION 3 RESULTS	
8.	.9. U-NII 6 BAND TEST CONDITION 4 RESULTS	
	8.9.1. TEST CHANNEL8.9.2. INCUMBENT SIGNAL PLOTS	
	8.9.2. INCUMBENT SIGNAL PLOTS8.9.3. EUT TRANSMISSION PLOTS	
	8.9.4. TABULATED TEST RESULTS	
	8.9.5. Tx OPERATIONAL STATUS TEST RESULTS	
8	.10. U-NII 7 BAND TEST CONDITION 1 RESULTS	
-	.11. U-NII 7 BAND TEST CONDITION 2 RESULTS	
0.	8.11.1. TEST CHANNEL	
	8.11.2. INCUMBENT SIGNAL PLOTS	.70
	8.11.3. EUT TRANSMISSION PLOTS	.72
	8.11.4. TABULATED TEST RESULTS	.75
	8.11.5. Tx OPERATIONAL STATUS TEST RESULTS	
8	.12. U-NII 7 BAND TEST CONDITION 3 RESULTS	.78
8.	.13. U-NII 7 BAND TEST CONDITION 4 RESULTS	-
	8.13.1. TEST CHANNEL	
	8.13.2. INCUMBENT SIGNAL PLOTS	
	8.13.3. EUT TRANSMISSION PLOTS8.13.4. TABULATED TEST RESULTS	
	8.13.5. Tx OPERATIONAL STATUS TEST RESULTS	
8	.14. U-NII 8 BAND TEST CONDITION 1 RESULTS	
-		
Ø.	.15. U-NII 8 BAND TEST CONDITION 2 RESULTS	
	8.15.2. INCUMBENT SIGNAL PLOTS	
	8.15.3. EUT TRANSMISSION PLOTS	
	8.15.4. TABULATED TEST RESULTS1	101
	8.15.5. Tx OPERATIONAL STATUS TEST RESULTS1	03
8	.16. U-NII 8 BAND TEST CONDITION 3 RESULTS	104
8	.17. U-NII 8 BAND TEST CONDITION 4 RESULTS	104
	8.17.1. TEST CHANNEL	04
	8.17.2. INCUMBENT SIGNAL PLOTS1	
	8.17.3. EUT TRANSMISSION PLOTS	
	 8.17.4. TABULATED TEST RESULTS1 8.17.5. Tx OPERATIONAL STATUS TEST RESULTS1 	18
	0.17.0. IX OFERATIONAL STATUS TEST RESULTS	20
9.	SETUP PHOTOS1	21

Page 4 of 121

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	Sonos Inc. 301 Coromar Dr. Goleta, CA 93117 USA
EUT DESCRIPTION:	Wireless Smart Speaker
MODEL:	S55
SERIAL NUMBER:	NTU4130CU00233
DATE TESTED:	2024-04-11 - 2024-04-12

APPLICABLE STANDARDS				
STANDARD TEST RESULTS				
Contention Based Protocol Portion of 47 CFR Part 15 Subpart E, KDB 987594	Complies			
Contention Based Protocol Portion of RSS-248, Issue 2	Complies			

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released For UL Verification Services Inc. By:

Frank Ibrahim Staff Engineer CONSUMER TECHNOLOGY DIVISION UL Verification Services Inc.

Prepared By:

teny men

Henry Lau Senior Project Engineer CONSUMER TECHNOLOGY DIVISION UL Verification Services Inc.

Page 5 of 121

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the Contention Based Protocol portion of

- FCC 47 CFR Part 15 Subpart E
- FCC KDB 987594 D01 U-NII 6GHz General Requirements v02r02
- FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v02r01
- RSS-248 Issue 2

3. SUMMARY OF TEST RESULTS

Requirement Description	Result	Remarks
Contention Based Protocol Portion of FCC	Complies	
47 CFR PART 15 SUBPART E, KDB 987594		
Contention Based Protocol Portion of RSS-	Complies	
248, Issue 2		

Channel puncturing and channel bandwidth reduction: Not supported, please refer to section 7.2.5 in the report confirming this.

4. REFERENCE DOCUMENTS

Measurements of transmitter parameters as referenced in this report and all other manufacturer's declarations relevant to the RF test requirements are documented in UL Verification Services report number 15126863-E7 & E8.

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

Below is a list of the data provided by the customer:

1. Antenna gain and type (see section 7.3)

Page 6 of 121

5. FACILITIES AND ACCREDITATION

UL Verification Services Inc is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
\boxtimes	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA			
	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
	Building 3: 843 Auburn Court, Fremont, CA 94538, USA	US0104	2324A	550739
	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

6. DECISION RULES AND MEASUREMENT UNCERTAINTY

6.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

6.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement).

Page 7 of 121

6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U _{Lab}
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Power Spectral Density	2.47 dB
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) / 0.45 dB (AV)
Unwanted Emissions, Conducted	1.94 dB
Worst Case Conducted Disturbance, 9kHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9kHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Time Domain Measurements	0.02 %
Temperature	0.57°C
Humidity	3.39%
DC Supply Voltages	0.57%

Uncertainty figures are valid to a confidence level of 95%.

Page 8 of 121

7. CONTENTION BASED PROTOCOL

7.1. OVERVIEW

7.1.1. LIMITS

FCC

FCC Part 15 Subpart E, FCC KDB 987594 "U-NII 6 GHz devices operating in the 5.925-7.125 GHz band"; Section I.

INNOVATION, SCIENCE and ECONOMIC DEVELOPMENT CANADA (ISED)

Per Section 4.7.1 of RSS-248, Issue 2:

"The Federal Communications Commission's accepted KDB procedure KDB 987594 D02 listed on ISED's Certification and Engineering website (see the Normative Test Standards and Acceptable Alternate Procedures page) shall be used to demonstrate the compliance of a device with the contention-based protocol requirements set out in this section.

7.1.2. FREQUENCY BANDS AND GOVERNING RULES

Band	Frequency (GHz)	Rules	Notes	KDB/Publication		
			Low Power Indoor AP, Subordinates,			
U-NII 5	5.925-6.425	15.407(a)(4) - (8)	Indoor Clients Standard Power AP, Fixed,			
			Standard Clients & Dual Client			
U-NII 6	6.425-6.525	15 407(a)(5) (6) (9)	Low Power Indoor AP, Subordinates,	790022 (U NIII)		
U-INII O	0.423-0.323	15.407(a)(5), (6), (8)	Indoor Clients & Dual Client	789033 (U-NII)		
Low Power Indoor AP, Subordinates, Part 1						
U-NII 7	U-NII 7 6.525-6.875 15.407(a)(4) – (8) Indoor Clients Standard Power AP, Fixed		Band)			
	& Standard Clients & Dual Client					
	$\mathbf{U} \mathbf{N} \mathbf{U} 0 = (0.75, 7, 105, 15, 407(1)(5), (6), (9))$		Low Power Indoor AP, Subordinates,			
U-NII 8	U-NII 8 6.875 -7.125 15.407(a)(5), (6), (8) Indoor Clients & Dual Client					
* Transitio	* Transition period ended March 2, 2020 for marketing DTS in the 5 GHz Band, as stated in 15.408(b)(4)(ii)					

Table 1: Overview of U-NII Rules

<u>FCC</u>

<u>ISED</u>

Band	Frequency (GHz)	Rules	Notes	KDB/Publication
U-NII 5	5.925-6.425	RSS 248 - Section 4.2	Low-Power indoor AP, indoor subordinate devices, low-power client devices, Standard Power AP, Fixed client devices, standard client devices and dual client device	
U-NII 6	6.425-6.525	RSS 248 - Section 4.2	Low-Power indoor AP, indoor subordinate devices, low-power client devices, Standard Power AP, Fixed client devices, standard client devices and dual client device	RSS 248 987594 D02
U-NII 7	6.525-6.875	RSS 248 - Section 4.2	Low-Power indoor AP, indoor subordinate devices, low-power client devices, Standard Power AP, Fixed client devices, standard client devices and dual client device	
U-NII 8	6.875 -7.125	RSS 248 - Section 4.2	Low-Power indoor AP, indoor subordinate devices, low-power client devices, and dual client device	

Page 10 of 121

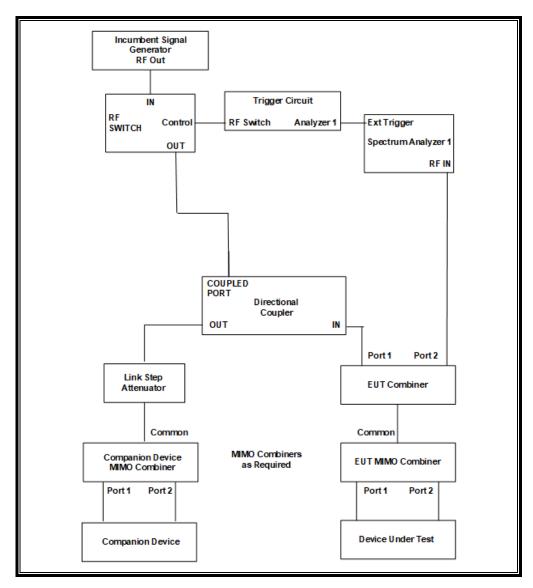
7.2. DESCRIPTION OF TEST SETUP

7.2.1. TEST AND MEASUREMENT SYSTEM

These tests were performed using a Conducted instrument configuration.

CONDUCTED TEST CONFIGURATION

NOTE: This is a comprehensive setup diagram of the receiver performance test and measurement system. Not all of the devices shown below are used for every applicable receiver test. Also, coupler port designations "IN" and "OUT" refer to labeling on the coupler, not the RF signal flow.



Page 11 of 121

SYSTEM OVERVIEW

Should multiple RF ports be utilized for the EUT and/or Companion devices (for example, for diversity or MIMO implementations), combiner/dividers are inserted between the EUT MIMO Combiner/Divider, and the attenuator connected to the EUT (and/or between the Companion MIMO Combiner/Divider and the attenuator connected to the Companion Device). Additional attenuators may be utilized such that there is one attenuator at each RF port on each device. This testing was performed in a MIMO configuration with two transmit/receive chains on the EUT.

SYSTEM CALIBRATION

The monitoring cable is disconnected from the spectrum analyzer and a 50-ohm load is connected to the end of the monitoring cable in place of the spectrum analyzer. The cable connected to one of the ports on the EUT is then attached to the spectrum analyzer in place of the monitoring cable. The cable connected to the other EUT port is terminated. A signal generator is then set to produce a modulated AWGN Incumbent Signal that has a 99% occupied power bandwidth of 10 MHz. The output amplitude of the signal generator is adjusted to yield the allowable maximum AWGN Incumbent Signal level as measured on the spectrum analyzer. The EUT and monitoring cables are then returned to their original configurations to perform the test.

TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description Manufacturer Model ID No.				Cal Due	
Spectrum Analyzer, PXA, 3Hz to 8.4GHz	Keysight	N9030A	150667	2025-01-31	
Signal Generator, MXG X-Series RF Vector	Keysight	N5182B	215999	2025-01-31	
Frequency Extender	Keysight	N5182BX	213906	2025-01-31	

FRE

Note:

1. An MXG series Signal Generator and separate external Frequency Extender module are shown in the preceding test system block diagram as a stand-alone Incumbent Signal Generator.

7.2.2. TEST AND MEASUREMENT SOFTWARE

The following test and measurement software was utilized for the tests documented in this report:

TEST SOFTWARE LIST				
Name Version Test / Function				
PXA Read	3.1	Signal Generator Screen Capture		

.

7.2.3. TEST ROOM ENVIRONMENT

.

The test room temperature and humidity shall be maintained within normal temperature of 15~35 °C and normal humidity 20~75% (relative humidity).

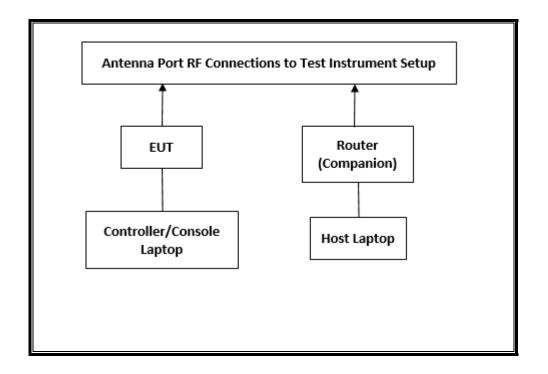
ENVIRONMENT CONDITION

Parameter	Value
Temperature	23 °C
Humidity	45 %

Page 13 of 121

7.2.4. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the tests documented in this report:

	PERIPHERAL SUPPORT EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	FCC ID			
Wireless GT-AXE11000 Wifi	ASUSTEK	GT-AXE11000	M9IG0X403210HEZ	MSQ-			
6E Tri Band Gigabit Router	Computer			RTAXJF00			
AC/DC Adapter (AP)	Acbel	ADD011	ADD01117AG213402136A	DoC			
	Electronic Co.						
Host PC (AP)	Lenovo	Туре 4236-В92	PB-HEX04 12/05	DoC			
AC/DC Adapter	Lenovo	42T4418	11S42T4418Z1ZGWG08R90	DoC			
(AP Laptop)			М				
Controller/Console Laptop	Lenovo	TYPE 20L8-	PC-0yQ74R 18/10	DoC			
(EUT)		S1GA00					
AC/DC Adapter	Lenovo	ADLX6SYAC2D	8SSA10R16896A1WH9BK0	DoC			
(EUT Laptop)			8LF				

Page 14 of 121

7.2.5. DESCRIPTION OF EUT

The EUT operates in the following bands: U-NII 5 (5925 MHz-6425 MHz), U-NII 6 (6425 MHz-6525 MHz), U-NII 7 (6525 MHz-6875 MHz) and U-NII 8 (6875 MHz-7125 MHz).

The lowest gain antenna assembly utilized with the EUT has a gain of 2.8 dBi in the U-NII 5 band, 2 dBi in the U-NII 6 band, 2.3 dBi in the U-NII 7 band and 2 dBi in the U-NII 8 band.

The maximum allowable conducted AWGN Incumbent Detection Threshold level is –62 dBm/MHz. After correction for antenna gain the conducted AWGN Incumbent Detection Threshold at the antenna port is –62 + antenna gain. This results in a maximum allowable AWGN Incumbent Detection Threshold of -59.2 dBm in the U-NII 5 band, -60 dBm in the U-NII 6 band, -59.7 dBm in the U-NII 7 band and -60 dBm in the U-NII 8 band.

The calibrated conducted AWGN Incumbent Detection Threshold level is set to –62 dBm. The tested level is lower than the maximum allowable level hence it provides a margin to the limit.

Two antennas are utilized to meet the diversity and MIMO operational requirements.

The EUT uses two transmitter/receiver chains, each connected to a 50-ohm coaxial antenna port. All antenna ports are connected to the test system via a power divider to perform conducted tests.

Channel puncturing is not supported.

Channel bandwidth reduction is not supported.

WLAN traffic was generated by transferring a data stream from the EUT to the Companion Device using iPerf version 2.0.5 software package.

The EUT utilizes the 802.11ax architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The software installed in the EUT is 78.1-48130-diag-jaws-dev-woosung-202312211600.

The software installed in the access point is V3.0.0.4.386_45940-gaafbb83.

TEST SETUP

The EUT is attached to a USB port of a host laptop computer during testing. The EUT is linked to a companion 802.11 wireless radio device. A commercial traffic generation program (iPERF) was utilized to generate traffic from the EUT to the companion radio device.

8. CONTENTION BASED PROTOCOL

8.1. LIMITS AND PROCEDURES

<u>LIMITS</u>

FCC Part 15 Subpart E, FCC KDB 987594 "U-NII 6 GHz devices operating in the 5.925-7.125 GHz band"; Section I.

AWGN INCUMBENT SIGNAL DETECTION THRESHOLD

FCC Part 15 Subpart E, FCC KDB 987594 "U-NII 6 GHz devices operating in the 5.925-7.125 GHz band"; Section I, Clause (c), Step 6.

For an EUT with a non-zero dBi antenna gain the maximum detection threshold level, T_{L} , of the 10 MHz wide AWGN Incumbent Signal at the port of the radio module in a conducted test setup shall be no greater than -62 dBm/MHz. It shall be adjusted by the gain of the bypassed antenna as shown in the table below:

Band	Frequency Range (MHz)	Antenna Gain (dBi)	T _L at Radio Port (dBm/MHz)
U-NII 5	5925 to 6425	2.8	-59.2
U-NII 6	6425 to 6525	2	-60
U-NII 7	6525 to 6875	2.3	-59.7
U-NII 8	6875 to 7125	2	-60

TEST PROCEDURE

FCC Part 15 Subpart E, FCC KDB 987594 "U-NII 6 GHz devices operating in the 5.925-7.125 GHz band"; Section I, Clause (c).

Testing is performed by starting at a level much lower than required detection level and then the level is increased.

Page 16 of 121

8.2. U-NII 5 BAND TEST CONDITION 1 RESULTS

TEST CONDITION 1 CRITERIA

99% BW_{EUT} ≤ **99% BW**_{INC}

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.3. U-NII 5 BAND TEST CONDITION 2 RESULTS

TEST CONDITION 2 CRITERIA

99% BW_{INC} < 99% BW_{EUT} ≤ 2 x 99% BW_{INC}

8.3.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6215 MHz and a nominal channel bandwidth of 20 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 17 of 121

8.3.2. INCUMBENT SIGNAL PLOTS

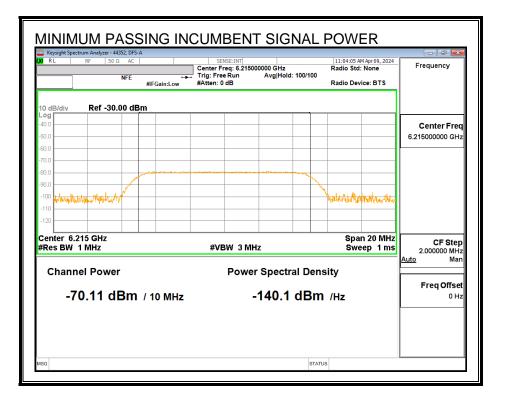
All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

keysight Spectrum Analyzer - 44352, DFS-A RL RF 50 Ω AC NFE	Trig: I	SENSE:INT r Freq: 6.215000000 GHz Free Run Avg Hold: ^ n: 0 dB	11:04:52 AM Apr0 Radio Std: Non 100/100 Radio Device: E	e Frequency
0 dB/div Ref -20.00 dBm 9 00.0				6.215000000 GH
	-1-4 -11-4-11-11-11-11-11-11-11-11-11-11-11-1	and an and a start of the second s		
Center 6.215 GHz Res BW 150 kHz			Span 20	MHz CF Ste
Occupied Bandwidth		VBW 470 kHz Total Power	Sweep -40.4 dBm	2.000000 MH Auto Ma
Transmit Freq Error x dB Bandwidth	1.068 kHz 10.95 MHz	% of OBW Power x dB	r 99.00 % -26.00 dB	01
G			STATUS	

Page 18 of 121

MINIMUM PASSING INCUMBENT SIGNAL POWER



Page 19 of 121

8.3.3. EUT TRANSMISSION PLOTS

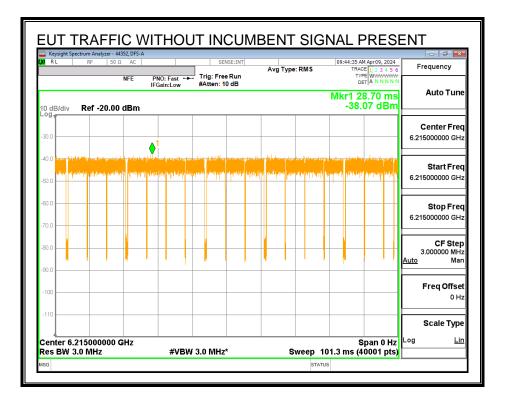
EUT 99% OCCUPIED POWER BANDWIDTH

EUT 99% OCCUPIED POWER BANDWIDTH Key 09:44:08 AM Apr 09, 2024 Radio Std: None Center Freq: 6.215000000 GHz Trig: Free Run Avg|Hold: 100/100 #Atten: 10 dB Frequency NFE Radio Device: BTS #IFGain:Low Ref -10.00 dBm 0 dB/div **Center Freq** 6.215000000 GHz (part who) MURANA man Center 6.215 GHz Span 40 MHz CF Step 4.000000 MHz #Res BW 200 kHz #VBW 620 kHz Sweep 1 ms Mar Auto **Total Power** -18.6 dBm **Occupied Bandwidth** 17.989 MHz Freq Offset 0 Hz -52.595 kHz **Transmit Freq Error** % of OBW Power 99.00 % x dB Bandwidth 19.93 MHz x dB -26.00 dB STATUS

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 20 of 121

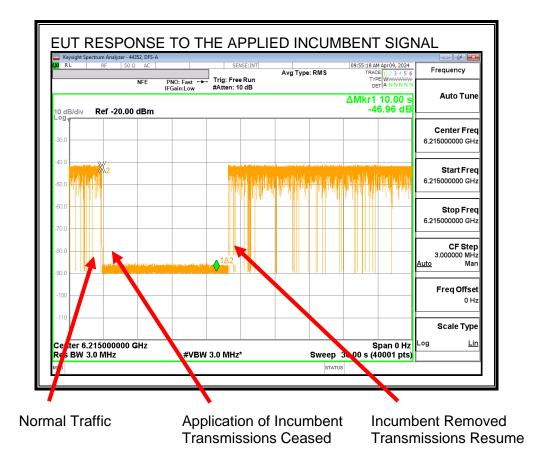
TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



Page 21 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 22 of 121

8.3.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f _{c1} (MHz)	6215
EUT Nominal Channel Bandwidth (MHz)	
99% Occupied Bandwidth of the EUT (MHz)	17.989
EUT 99% OBW Lower Edge, F _L (MHz)	6206.01
EUT 99% OBW Upper Edge, F _H (MHz)	6223.99
Test Frequency of Incumbent Signal (MHz)	
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	
Minimum Antenna Gain (dBi)	2.80
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.2
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	-70.1
Margin (dBm)	-10.91
Result (PASS / FAIL)	PASS

Test Date: 2024-04-09 Tested by: 44352 Test location: DFS-A

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 23 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)
Trial	Incumbent AWGN at $\rm f_{c1}$
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
Test Result	PASS

Test Date: 2024-04-09 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 24 of 121

8.3.5. Tx OPERATIONAL STATUS TEST RESULTS

<u>Test Condition 2: 99% BW_{INC} < 99% BW_{EUT} ≤ 2 x 99% BW_{INC}</u>

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-70.11	2.8	0	-72.91	-62	Ceased
-71.08	2.8	0	-73.88	-62	Minimal
-77.98	2.8	0	-80.78	-62	Normal

Test Date: 2024-04-09 Tested by: 44352 Test location: DFS-A

Page 25 of 121

8.4. U-NII 5 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

$2 \times 99\% BW_{INC} < 99\% BW_{EUT} \le 4 \times 99\% BW_{INC}$

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.5. U-NII 5 BAND TEST CONDITION 4 RESULTS

TEST CONDITION 4 CRITERIA

99% BW_{EUT} > 4 x 99% BW_{INC}

8.5.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6225 MHz and a nominal channel bandwidth of 80 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 26 of 121

8.5.2. INCUMBENT SIGNAL PLOTS

All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

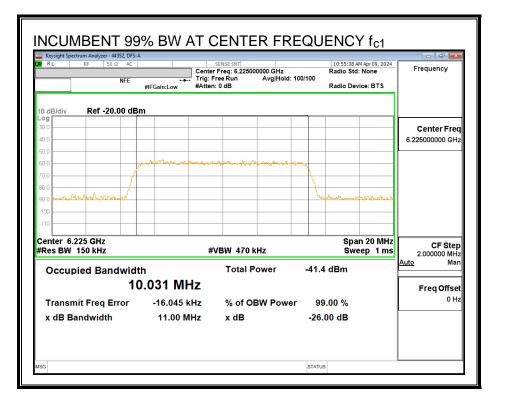
INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

Lower Edge Incumbent Signal fc2:

Keysight Spectrum Analyzer - 44352, DFS-A RL RF 50 Ω AC		SENSE:INT Freq: 6.192000			10:55:25 AM Apr 0 Radio Std: None	
NFE		Free Run n: 0 dB	Avg Hold: 10	0/100	Radio Device: B	TS
0 dB/div Ref -20.00 dBm						
	•			_		
10.0						Center Fre 6.192000000 GH
0.0						0.132000000 011
0.0	mannonamano	amanalanana	mannagant	~		
ro.o				<u>\</u>		
0.0						
0.0 warmoundat				- h	mar mar Maras	<u>madra</u>
100						
110						
enter 6.192 GHz Res BW 150 kHz	#	VBW 470 k	Hz		Span 20 Sweep	1 ms 2.000000 MH
Occupied Bandwidth	ı	Total Po	ower	-41.1	dBm	Auto Ma
	.046 MHz					FreqOffse
Transmit Freq Error	1.564 kHz	% of OE	W Power	99	0.00 %	0 Н
x dB Bandwidth	11.00 MHz	x dB		-26.	00 dB	
sg				STATUS		

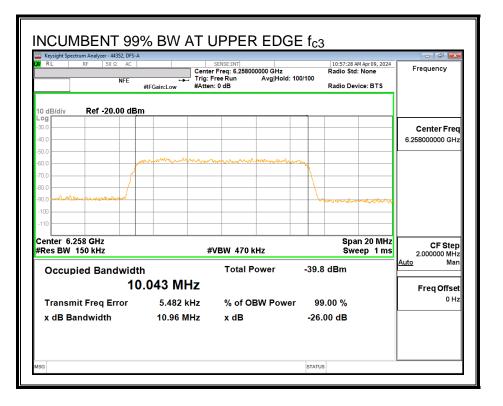
Page 27 of 121

Center Frequency Incumbent Signal fc1:



Page 28 of 121

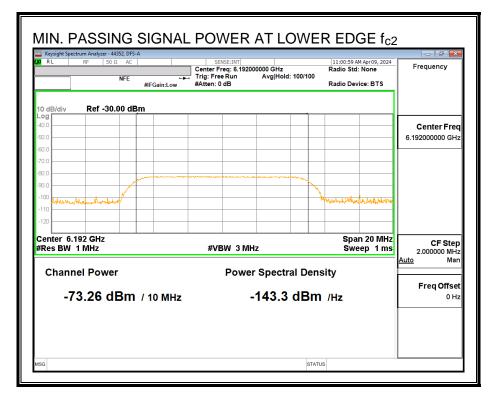
Upper Edge Incumbent Signal fc3:



Page 29 of 121

MINIMUM PASSING INCUMBENT SIGNAL POWER

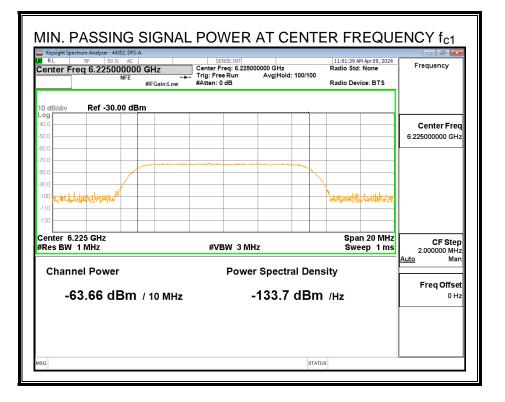
Lower Edge Incumbent Signal fc2:



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

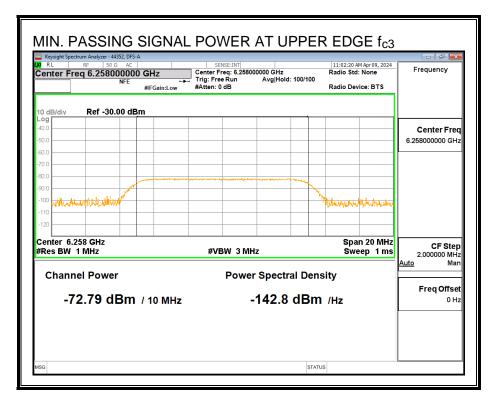
Page 30 of 121

Center Frequency Incumbent Signal fc1:



Page 31 of 121

Upper Edge Incumbent Signal fc3:



Page 32 of 121

8.5.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

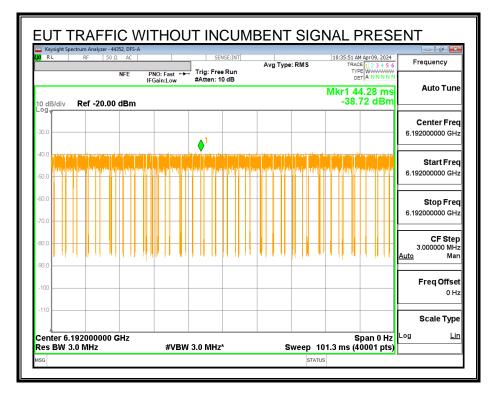
EUT 99% OCCUPIED POWER BANDWIDTH zer - 44352. DFS-A Kev 10:06:19 AM Apr 09, 2024 Radio Std: None Center Freq: 6.225000000 GHz Trig: Free Run Avg|Hold: 100/100 #Atten: 10 dB Frequency NFE •• Radio Device: BTS #IFGain:Low Ref -10.00 dBm 0 dB/div **Center Freq** 6.225000000 GHz mannaparanaparanta Center 6.225 GHz Span 160 MHz CF Step 16.000000 MHz #Res BW 820 kHz #VBW 2.7 MHz Sweep 1 ms Mar Auto **Total Power** -19.3 dBm **Occupied Bandwidth** 77.038 MHz Freq Offset 0 Hz -110.81 kHz Transmit Freq Error % of OBW Power 99.00 % x dB Bandwidth 80.33 MHz x dB -26.00 dB STATUS

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Page 33 of 121

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

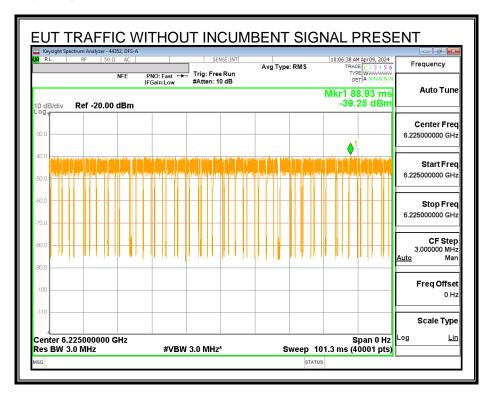
Lower Edge fc2:



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

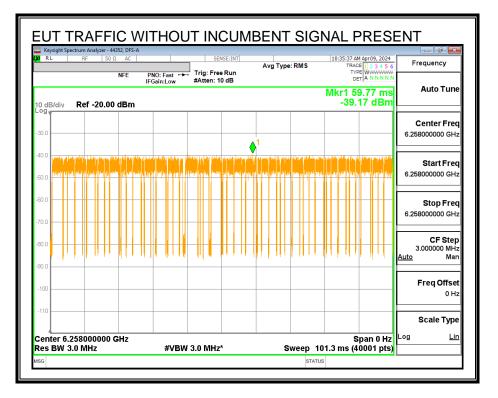
Page 34 of 121

Center Frequency fc1:



Page 35 of 121

Upper Edge fc3:

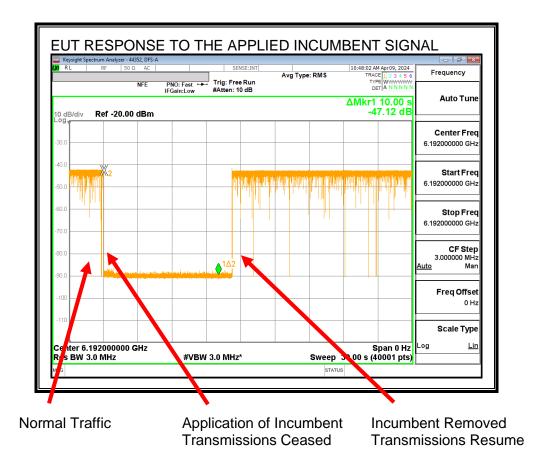


Page 36 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

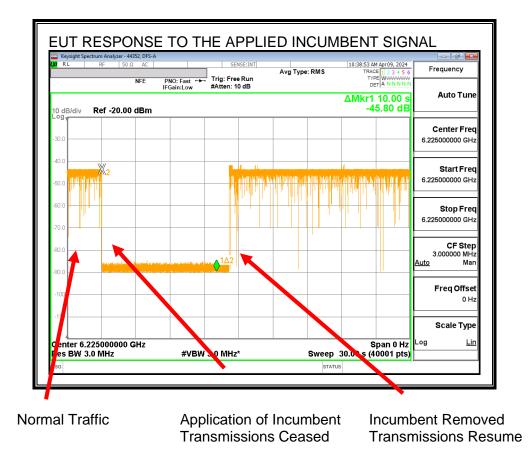
A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.

Lower Edge Incumbent Signal fc2:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

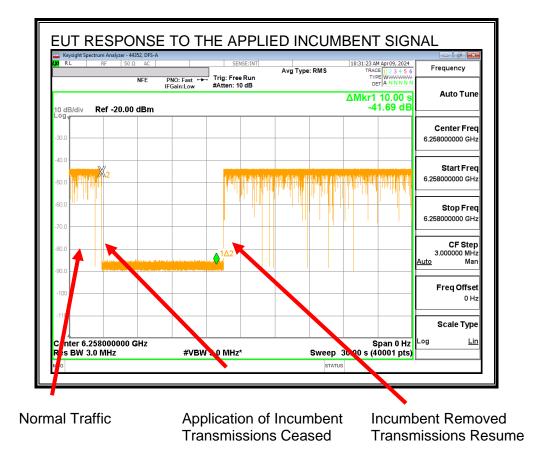
Center Frequency Incumbent Signal fc1:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 38 of 121

Upper Edge Incumbent Signal fc3:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 39 of 121

8.5.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f _{c1} (MHz)	6225
EUT Nominal Channel Bandwidth (MHz)	80
99% Occupied Bandwidth of the EUT (MHz)	77.038
EUT 99% OBW Lower Edge, F _L (MHz)	6186.48
EUT 99% OBW Upper Edge, F _H (MHz)	6263.52
99% Occupied Bandwidth of the Incumbent Signal (MHz)	10.031
Test Frequency of Incumbent Signal (f_{c2}) Near EUT F _L (MHz)	6192
Test Frequency of Incumbent Signal at f _{c1} (MHz)	6225
Test Frequency of Incumbent Signal (f _{c3}) Near EUT F _H (MHz)	6258
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.80
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.2
Lowest Passing Measured Incumbent Signal Amplitude at f _{c2} (dBm)	-73.3
Margin (dBm)	-14.06
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c1} (dBm)	-63.7
Margin (dBm)	-4.46
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c3} (dBm)	-72.8
Margin (dBm)	-13.59
Result (PASS / FAIL)	PASS

Test Date: 2024-04-09 Tested by: 44352 Test location: DFS-A

Page 40 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)				
	Incumbent AWGN	Incumbent AWGN	Incumbent		
Trial	at f _{c2}	at f _{c1}	AWGN at $\rm f_{c3}$		
1	Yes	Yes	Yes		
2	Yes	Yes	Yes		
3	Yes	Yes	Yes		
4	Yes	Yes	Yes		
5	Yes	Yes	Yes		
6	Yes	Yes	Yes		
7	Yes	Yes	Yes		
8	Yes	Yes	Yes		
9	Yes	Yes	Yes		
10	Yes	Yes	Yes		
Test Result	PASS	PASS	PASS		

Test Date: 2024-04-09 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 41 of 121

8.5.5. Tx OPERATIONAL STATUS TEST RESULTS

Test Condition 4: 99% BW_{EUT} > 4 x 99% BW_{INC}

Incumbent AWGN at f_{c2}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-73.26	2.8	0	-76.06	-62	Ceased
-74.22	2.8	0	-77.02	-62	Minimal
-79.17	2.8	0	-81.97	-62	Normal

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-63.66	2.8	0	-66.46	-62	Ceased
-64.65	2.8	0	-67.45	-62	Minimal
-73.62	2.8	0	-76.42	-62	Normal

Incumbent AWGN at f_{c3}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-72.79	2.8	0	-75.59	-62	Ceased
-73.76	2.8	0	-76.56	-62	Minimal
-77.66	2.8	0	-80.46	-62	Normal

Test Date: 2024-04-09 Tested by: 44352 Test location: DFS-A

Page 42 of 121

8.6. U-NII 6 BAND TEST CONDITION 1 RESULTS

TEST CONDITION 1 CRITERIA

$99\% \ BW_{EUT} \leq 99\% \ BW_{INC}$

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.7. U-NII 6 BAND TEST CONDITION 2 RESULTS

TEST CONDITION 2 CRITERIA

99% BW_{INC} < 99% BW_{EUT} ≤ 2 x 99% BW_{INC}

8.7.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6455 MHz and a nominal channel bandwidth of 20 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 43 of 121

8.7.2. INCUMBENT SIGNAL PLOTS

All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

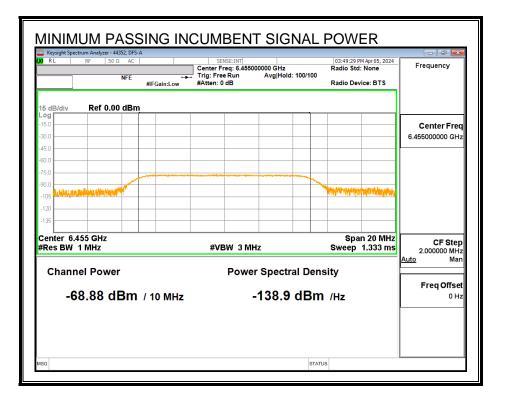
INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

300 6.45500000 400 6.45500000 600	Keysight Spectrum Analyzer - 44352, DFS-A RL RF 50 Ω AC NFE #	Trig: F	SENSE:INT r Freq: 6.455000000 GHz Free Run Avg Ho n: 0 dB	: bld: 100/100	03:50:25 PM Apr0 Radio Std: Non Radio Device: E	e Frequency
Composition	20.0					Center Fre
Image: Constraint of the second se	50.0 60.0 70.0 80.0		per no filo and a per second			
Occupied Bandwidth Total Power -31.6 dBm Freq C	Center 6.455 GHz	#	VBW 470 kHz		Span 20	MHz CF Ste 33 ms 2.000000 MH
Transmit Fred Error -2.968 kHz % of OBW Power 99.00 %	10.					Auto Ma Freq Offse
x dB Bandwidth 10.90 MHz x dB -26.00 dB	Transmit Freq Error x dB Bandwidth	-2.968 kHz 10.90 MHz				

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 44 of 121

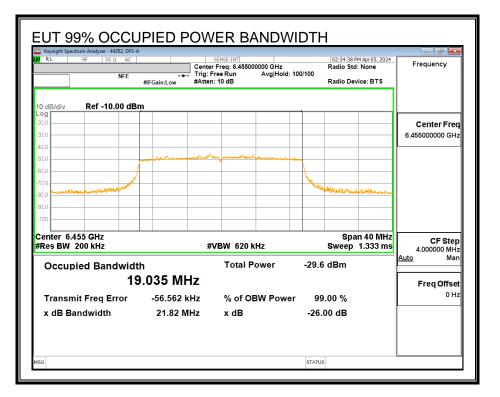
MINIMUM PASSING INCUMBENT SIGNAL POWER



Page 45 of 121

8.7.3. EUT TRANSMISSION PLOTS

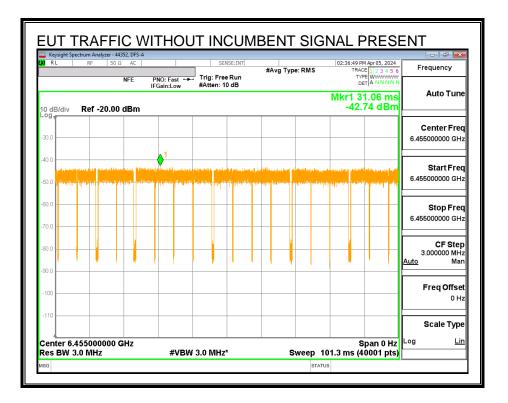
EUT 99% OCCUPIED POWER BANDWIDTH



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Page 46 of 121

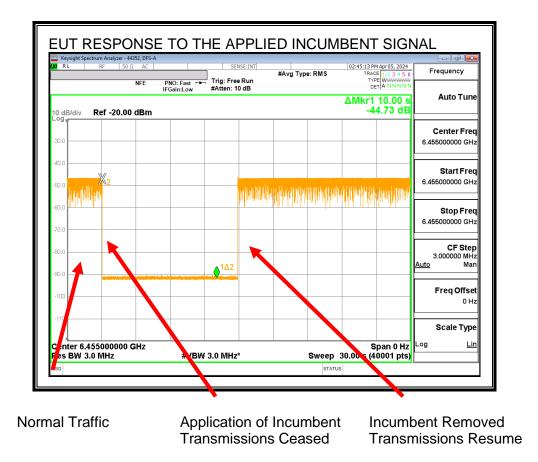
TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



Page 47 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 48 of 121

8.7.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f _{c1} (MHz)	6455
EUT Nominal Channel Bandwidth (MHz)	20
99% Occupied Bandwidth of the EUT (MHz)	19.035
EUT 99% OBW Lower Edge, F _L (MHz)	6445.48
EUT 99% OBW Upper Edge <i>,</i> F _H (MHz)	6464.52
Test Frequency of Incumbent Signal (MHz)	6455
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.00
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-60.0
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	-68.9
Margin (dBm)	-8.88
Result (PASS / FAIL)	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 49 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)
Trial	Incumbent AWGN at ${\rm f_{c1}}$
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
Test Result	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 50 of 121

8.7.5. Tx OPERATIONAL STATUS TEST RESULTS

<u>Test Condition 2: 99% BW_{INC} < 99% BW_{EUT} ≤ 2 x 99% BW_{INC}</u>

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-68.88	2	0	-70.88	-62	Ceased
-69.91	2	0	-71.91	-62	Minimal
-74.77	2	0	-76.77	-62	Normal

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 51 of 121

8.8. U-NII 6 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

$2 \times 99\% BW_{INC} < 99\% BW_{EUT} \le 4 \times 99\% BW_{INC}$

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.9. U-NII 6 BAND TEST CONDITION 4 RESULTS

TEST CONDITION 4 CRITERIA

99% BW_{EUT} > 4 x 99% BW_{INC}

8.9.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6465 MHz and a nominal channel bandwidth of 80 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 52 of 121

8.9.2. INCUMBENT SIGNAL PLOTS

All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

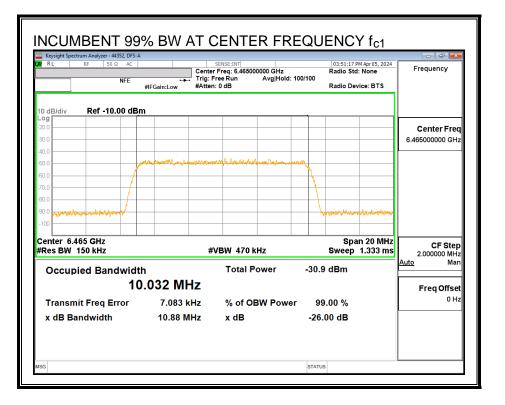
Lower Edge Incumbent Signal fc2:

Keysight Spectrum Analyzer - 44352, DFS-A R L RF 50 Ω AC		SENSE:INT		0:49 PM Apr 05, 2024	Frequency
enter Freq 6.432000000	Trig: F	r Freq: 6.432000000 GHz Free Run Avg Hold: 1	100/100	Std: None	Trequency
	#IFGain:Low #Atter	n: 0 dB	Radio	Device: BTS	
dB/div Ref -10.00 dBr	n				
pg					Contor Fro
10					Center Fre 6.432000000 GH
.0					0.4020000000
.0	man man have been and the	allenashineshineshineshineshineshineshineshine			
.0			<u> </u>		
.0					
.0					
. O white when the state of the			Mar March	wanyoh when we want	
00					
enter 6.432 GHz Res BW 150 kHz	#	VBW 470 kHz		Span 20 MHz ep 1.333 ms	CF Ste 2.000000 MH
Occupied Bandwidt	h	Total Power	-31.4 dBn	<u>າ</u>	<u>Auto</u> Ma
•	.000 MHz				
					Freq Offse
Transmit Freq Error	-21.411 kHz	% of OBW Power		•	
x dB Bandwidth	10.90 MHz	x dB	-26.00 di	3	
1			STATUS		

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

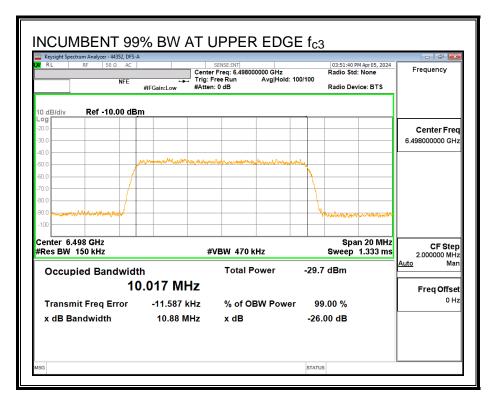
Page 53 of 121

Center Frequency Incumbent Signal fc1:



Page 54 of 121

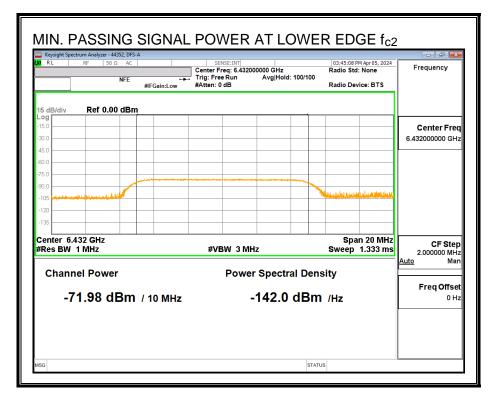
Upper Edge Incumbent Signal fc3:



Page 55 of 121

MINIMUM PASSING INCUMBENT SIGNAL POWER

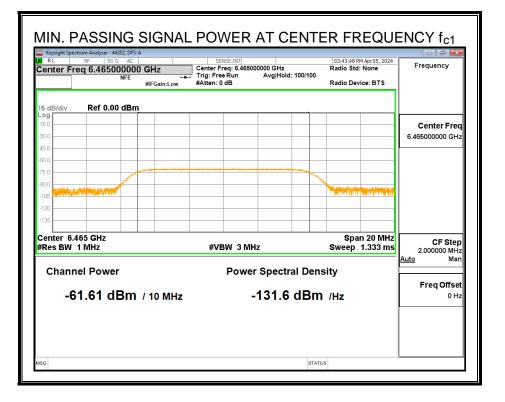
Lower Edge Incumbent Signal fc2:



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

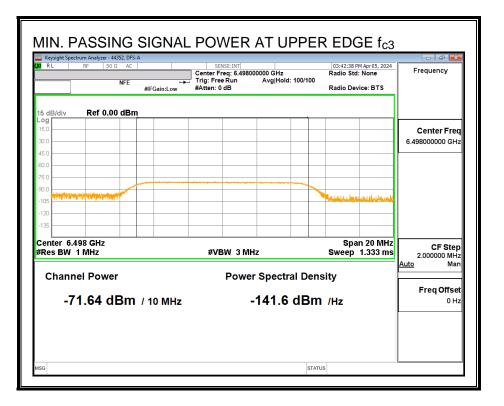
Page 56 of 121

Center Frequency Incumbent Signal fc1:



Page 57 of 121

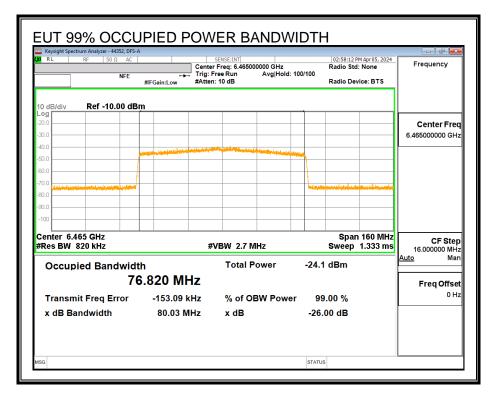
Upper Edge Incumbent Signal fc3:



Page 58 of 121

8.9.3. EUT TRANSMISSION PLOTS

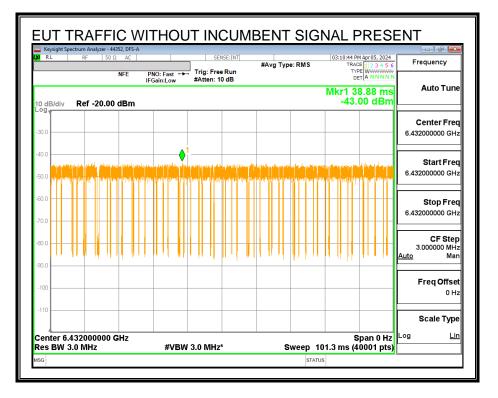
EUT 99% OCCUPIED POWER BANDWIDTH



Page 59 of 121

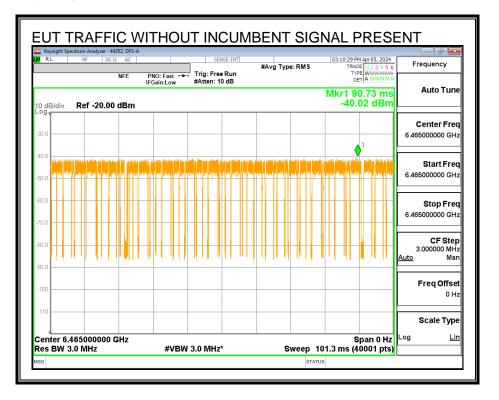
TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

Lower Edge fc2:



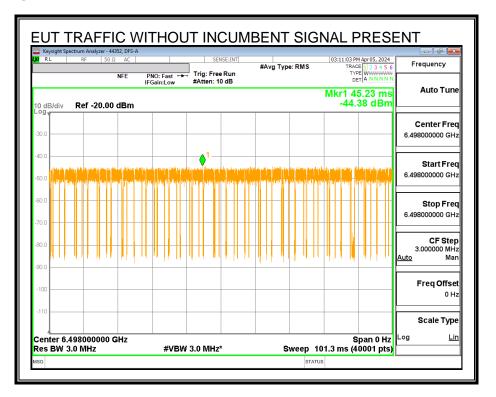
Page 60 of 121

Center Frequency fc1:



Page 61 of 121

Upper Edge fc3:

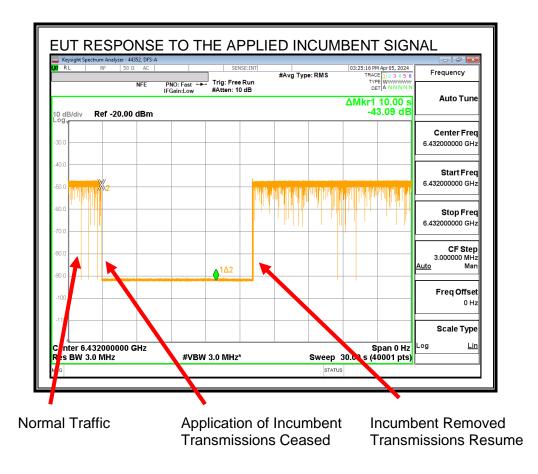


Page 62 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.

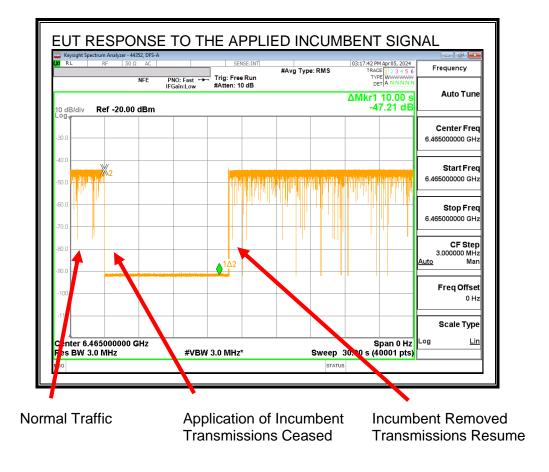
Lower Edge Incumbent Signal fc2:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 63 of 121

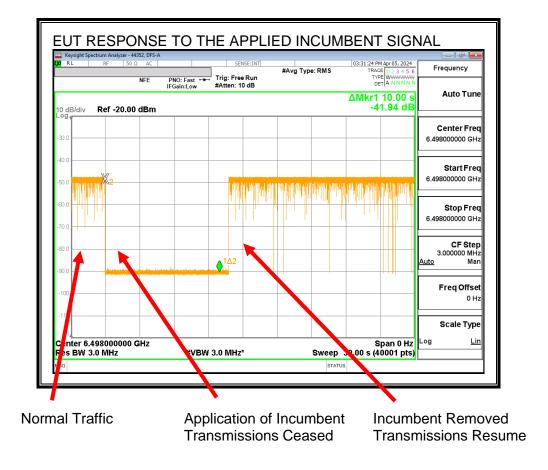
Center Frequency Incumbent Signal fc1:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 64 of 121

Upper Edge Incumbent Signal fc3:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 65 of 121

8.9.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f _{c1} (MHz)	6465
EUT Nominal Channel Bandwidth (MHz)	80
99% Occupied Bandwidth of the EUT (MHz)	76.82
EUT 99% OBW Lower Edge, F _L (MHz)	6426.59
EUT 99% OBW Upper Edge, F _H (MHz)	6503.41
99% Occupied Bandwidth of the Incumbent Signal (MHz)	10
Test Frequency of Incumbent Signal (f _{c2}) Near EUT F _L (MHz)	6432
Test Frequency of Incumbent Signal at f _{c1} (MHz)	6465
Test Frequency of Incumbent Signal (f _{c3}) Near EUT F _H (MHz)	6498
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.00
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-60.0
	1
Lowest Passing Measured Incumbent Signal Amplitude at f _{c2} (dBm)	-72.0
Margin (dBm)	-11.98
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c1} (dBm)	-61.6
Margin (dBm)	-1.61
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c3} (dBm)	-71.6
Margin (dBm)	-11.64
Result (PASS / FAIL)	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 66 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN	I Detected (Yes / No)
	Incumbent AWGN	Incumbent AWGN	Incumbent
Trial	at f _{c2}	at f _{c1}	AWGN at $\rm f_{c3}$
1	Yes	Yes	Yes
2	Yes	Yes	Yes
3	Yes	Yes	Yes
4	Yes	Yes	Yes
5	Yes	Yes	Yes
6	Yes	Yes	Yes
7	Yes	Yes	Yes
8	Yes	Yes	Yes
9	Yes	Yes	Yes
10	Yes	Yes	Yes
Test Result	PASS	PASS	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 67 of 121

8.9.5. Tx OPERATIONAL STATUS TEST RESULTS

Test Condition 4: 99% BW_{EUT} > 4 x 99% BW_{INC}

Incumbent AWGN at f_{c2}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-71.98	2	0	-73.98	-62	Ceased
-72.97	2	0	-74.97	-62	Minimal
-77.98	2	0	-79.98	-62	Normal

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-61.61	2	0	-63.61	-62	Ceased
-62.56	2	0	-64.56	-62	Minimal
-72.39	2	0	-74.39	-62	Normal

Incumbent AWGN at f_{c3}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-71.64	2	0	-73.64	-62	Ceased
-72.57	2	0	-74.57	-62	Minimal
-76.33	2	0	-78.33	-62	Normal

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 68 of 121

8.10. U-NII 7 BAND TEST CONDITION 1 RESULTS

TEST CONDITION 1 CRITERIA

$99\% \ BW_{EUT} \leq 99\% \ BW_{INC}$

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.11. U-NII 7 BAND TEST CONDITION 2 RESULTS

TEST CONDITION 2 CRITERIA

99% BWINC < 99% BWEUT ≤ 2 x 99% BWINC

8.11.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6695 MHz and a nominal channel bandwidth of 20 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 69 of 121

8.11.2. INCUMBENT SIGNAL PLOTS

All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

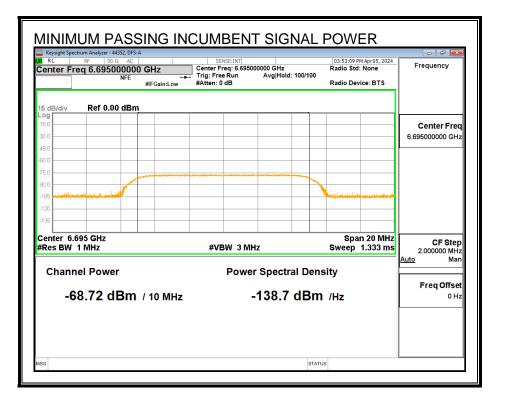
INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

Keysight Spectrum Analyzer - 44352, DFS-A RL RF 50 Ω AC NFE			d: 100/100	03:52:27 PM Apr 05, 2024 Radio Std: None Radio Device: BTS	Frequency
10 dB/div Ref -10.00 dBn]
30.0					Center Fre 6.695000000 GH
50.0 60.0	when the work of a particular and	ันกมีผู้สระวั _{นก} ับ _เ กิจารส _า นส ^า สลุนรมิวารหมัยไปป	anny		-
80.0					-
90.0				wander and the second and the second	A
Center 6.695 GHz #Res BW 150 kHz	#	VBW 470 kHz		Span 20 MHz Sweep 1.333 ms	s 2.000000 MH
Occupied Bandwidth 10	.014 MHz	Total Power	-31.	2 dBm	Auto Ma Freq Offse
Transmit Freq Error	-110 Hz	% of OBW Pow		9.00 %	0 H
x dB Bandwidth	10.88 MHz	x dB	-26	.00 dB	
				IS	

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 70 of 121

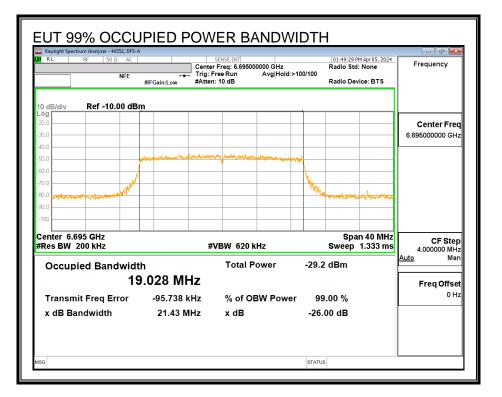
MINIMUM PASSING INCUMBENT SIGNAL POWER



Page 71 of 121

8.11.3. EUT TRANSMISSION PLOTS

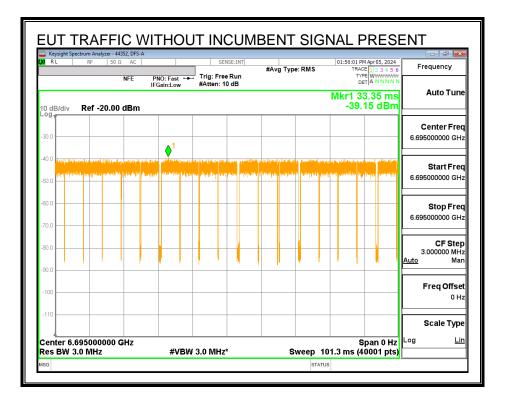
EUT 99% OCCUPIED POWER BANDWIDTH



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 72 of 121

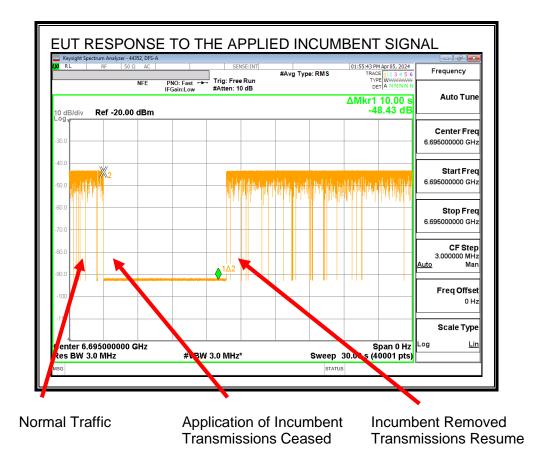
TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



Page 73 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 74 of 121

8.11.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f _{c1} (MHz)	6695
EUT Nominal Channel Bandwidth (MHz)	20
99% Occupied Bandwidth of the EUT (MHz)	19.028
EUT 99% OBW Lower Edge, F _L (MHz)	6685.49
EUT 99% OBW Upper Edge, F _H (MHz)	6704.51
Test Frequency of Incumbent Signal (MHz)	6695
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.30
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.7
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	-68.7
Margin (dBm)	-9.02
Result (PASS / FAIL)	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Page 75 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)
Trial	Incumbent AWGN at $\rm f_{c1}$
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
Test Result	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 76 of 121

8.11.5. Tx OPERATIONAL STATUS TEST RESULTS

Test Condition 2: 99% BW_{INC} < 99% BW_{EUT} ≤ 2 x 99% BW_{INC}

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-68.72	2.3	0	-71.02	-62	Ceased
-69.75	2.3	0	-72.05	-62	Minimal
-74.83	2.3	0	-77.13	-62	Normal

The path loss from the internal antenna assembly to the radio port is incorporated into the antenna gain figure.

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 77 of 121

8.12. U-NII 7 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

2 x 99% BW_{INC} < 99% BW_{EUT} ≤ 4 x 99% BW_{INC}

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.13. U-NII 7 BAND TEST CONDITION 4 RESULTS

TEST CONDITION 4 CRITERIA

99% BW_{EUT} > 4 x 99% BW_{INC}

8.13.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6705 MHz and a nominal channel bandwidth of 80 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 78 of 121

8.13.2. INCUMBENT SIGNAL PLOTS

All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

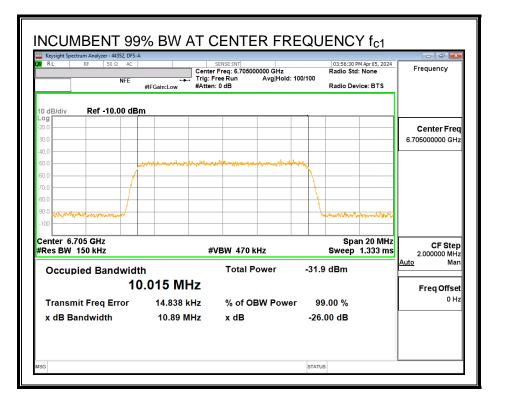
INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

Lower Edge Incumbent Signal fc2:

Keysight Spec	trum Analyzer - 44352, DFS- <i>J</i> RF 50 Ω AC NFE	A #IEGain:l ow	SENSE:INT Center Freq: 6.672 Trig: Free Run #Atten: 0 dB	2000000 GHz Avg Hold: 100/100	03:56:14 PM Apr 05, 2024 Radio Std: None Radio Device: BTS	Frequency
) dB/div	Ref -10.00 dB		#Atten: 0 db		Radio Device. D 13	1
29 0.0						Center Fr 6.672000000 G
0.0		, and a second second	particular and a second and	an man balance		-
0.0 0.0						-
).0).0 00	and water and a second second				James Marine and Marine and	
enter 6.0 Res BW			#VBW 470) kHz	Span 20 MH: Sweep 1.333 m	
Occup	vied Bandwidt 1(th 0.057 Mł		Power -30).7 dBm	Auto M Freq Offs
Transm	nit Freq Error	-10.685	(Hz % of (OBW Power	99.00 %	0
x dB Ba	andwidth	10.89 N	IHz x dB	-2	6.00 dB	

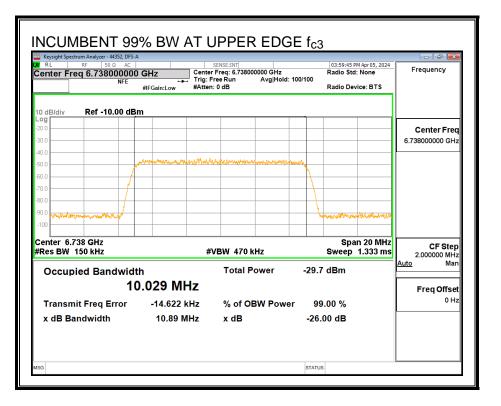
Page 79 of 121

Center Frequency Incumbent Signal fc1:



Page 80 of 121

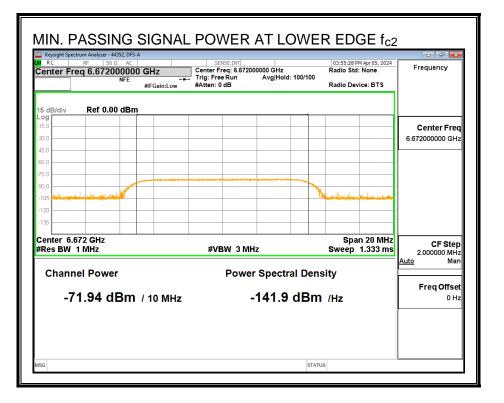
Upper Edge Incumbent Signal fc3:



Page 81 of 121

MINIMUM PASSING INCUMBENT SIGNAL POWER

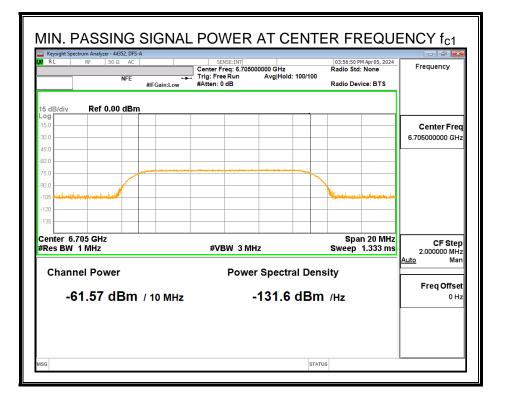
Lower Edge Incumbent Signal fc2:



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

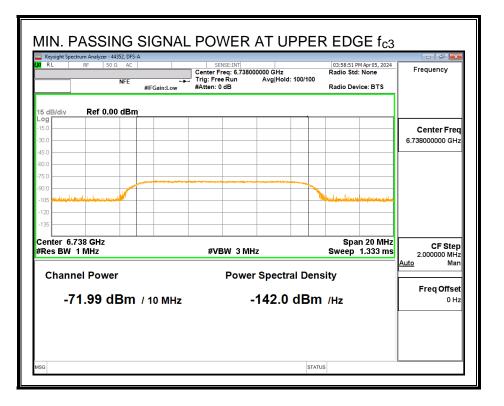
Page 82 of 121

Center Frequency Incumbent Signal fc1:



Page 83 of 121

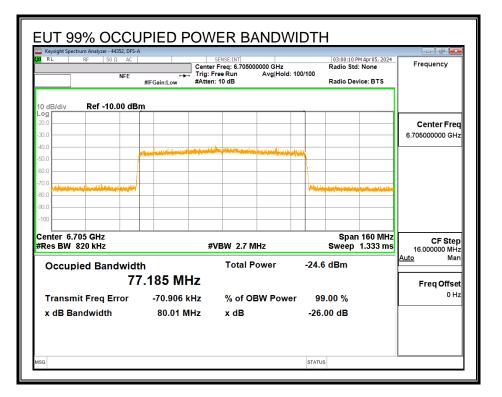
Upper Edge Incumbent Signal fc3:



Page 84 of 121

8.13.3. EUT TRANSMISSION PLOTS

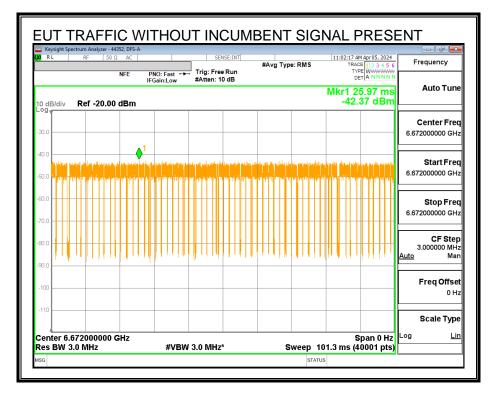
EUT 99% OCCUPIED POWER BANDWIDTH



Page 85 of 121

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

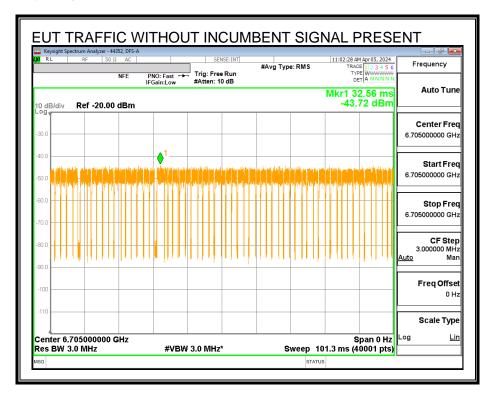
Lower Edge fc2:



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

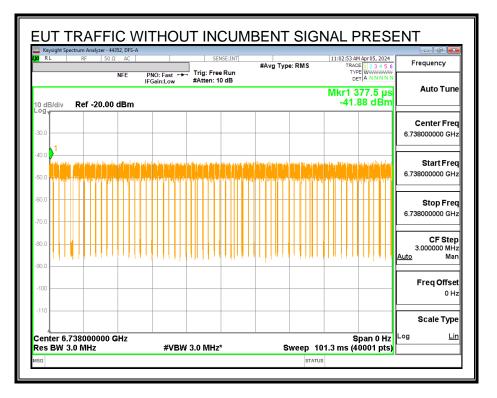
Page 86 of 121

Center Frequency fc1:



Page 87 of 121

Upper Edge fc3:

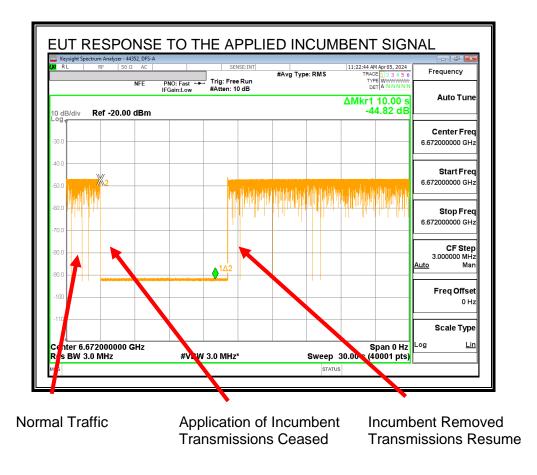


Page 88 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

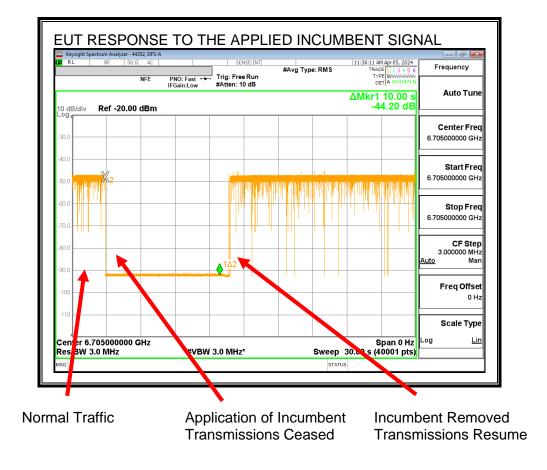
A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.

Lower Edge Incumbent Signal fc2:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

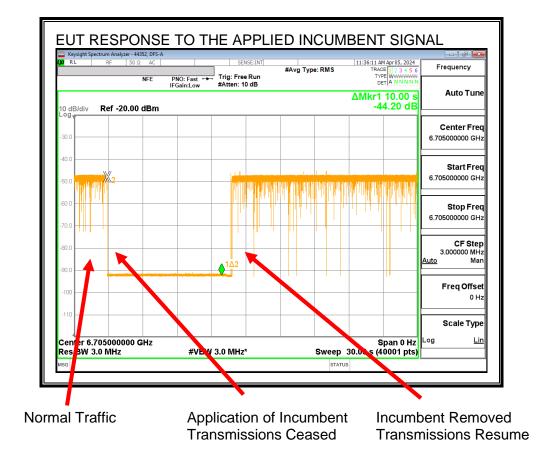
Center Frequency Incumbent Signal fc1:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 90 of 121

Upper Edge Incumbent Signal fc3:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 91 of 121

8.13.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

	-
EUT Channel Center Frequency, f _{c1} (MHz)	6705
EUT Nominal Channel Bandwidth (MHz)	80
99% Occupied Bandwidth of the EUT (MHz)	77.185
EUT 99% OBW Lower Edge, F _L (MHz)	6666.41
EUT 99% OBW Upper Edge, F _H (MHz)	6743.59
99% Occupied Bandwidth of the Incumbent Signal (MHz)	10.015
Test Frequency of Incumbent Signal (f _{c2}) Near EUT F _L (MHz)	6672
Test Frequency of Incumbent Signal at f _{c1} (MHz)	6705
Test Frequency of Incumbent Signal (f _{c3}) Near EUT F _H (MHz)	6738
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.30
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.7
	T
Lowest Passing Measured Incumbent Signal Amplitude at f _{c2} (dBm)	-71.9
Margin (dBm)	-12.24
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c1} (dBm)	-61.6
Margin (dBm)	-1.87
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c3} (dBm)	-72.0
Margin (dBm)	-12.29
Result (PASS / FAIL)	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 92 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

_	AWGN	I Detected (Yes / No)
	Incumbent AWGN	Incumbent AWGN	Incumbent
Trial	at f _{c2}	at f _{c1}	AWGN at $\rm f_{c3}$
1	Yes	Yes	Yes
2	Yes	Yes	Yes
3	Yes	Yes	Yes
4	Yes	Yes	Yes
5	Yes	Yes	Yes
6	Yes	Yes	Yes
7	Yes	Yes	Yes
8	Yes	Yes	Yes
9	Yes	Yes	Yes
10	Yes	Yes	Yes
Test Result	PASS	PASS	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 93 of 121

8.13.5. Tx OPERATIONAL STATUS TEST RESULTS

Test Condition 4: 99% BW_{EUT} > 4 x 99% BW_{INC}

Incumbent AWGN at f_{c2}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-71.94	2.3	0	-74.24	-62	Ceased
-72.94	2.3	0	-75.24	-62	Minimal
-78.12	2.3	0	-80.42	-62	Normal

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-61.57	2.3	0	-63.87	-62	Ceased
-62.61	2.3	0	-64.91	-62	Minimal
-73.23	2.3	0	-75.53	-62	Normal

Incumbent AWGN at f_{c3}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-71.99	2.3	0	-74.29	-62	Ceased
-73	2.3	0	-75.3	-62	Minimal
-77.15	2.3	0	-79.45	-62	Normal

The path loss from the internal antenna assembly to the radio port is incorporated into the antenna gain figure.

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 94 of 121

8.14. U-NII 8 BAND TEST CONDITION 1 RESULTS

TEST CONDITION 1 CRITERIA

99% BW_{EUT} ≤ 99% BW_{INC}

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.15. U-NII 8 BAND TEST CONDITION 2 RESULTS

TEST CONDITION 2 CRITERIA

99% BW_{INC} < 99% BW_{EUT} ≤ 2 x 99% BW_{INC}

8.15.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 7015 MHz and a nominal channel bandwidth of 20 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 95 of 121

8.15.2. INCUMBENT SIGNAL PLOTS

All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

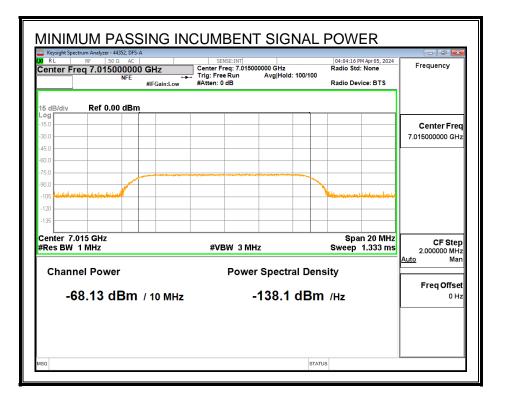
INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

Keysight Spectrum Analyzer - 44352, DFS-A RL	Trig: F	SENSE:INT r Freq: 7.015000000 GHz Free Run Avg Ho n: 0 dB	ld: 100/100	04:03:42 PM Apr 05, Radio Std: None Radio Device: BT	Frequency
10 dB/div Ref -10.00 dBm 20.0					Center Fre
40.0	and a second second second	مر المعرفة المعالية	the second		7.015000000 GH
60.0					
80.0 90.0 protection of the second				Www.westler.geterty.co.sonety.co	
Center 7.015 GHz #Res BW 150 kHz	#	VBW 470 kHz		Span 20 M Sweep 1.333	
Occupied Bandwidth	018 MHz	Total Power	-30.	2 dBm	Auto Ma
Transmit Freq Error x dB Bandwidth	603 Hz 10.91 MHz	% of OBW Pow x dB		9.00 % .00 dB	0+
ISG			STATU	IS	

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 96 of 121

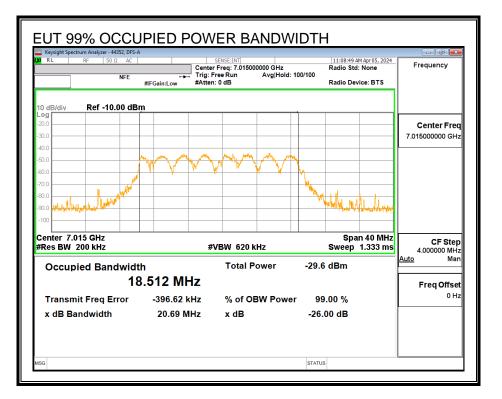
MINIMUM PASSING INCUMBENT SIGNAL POWER



Page 97 of 121

8.15.3. EUT TRANSMISSION PLOTS

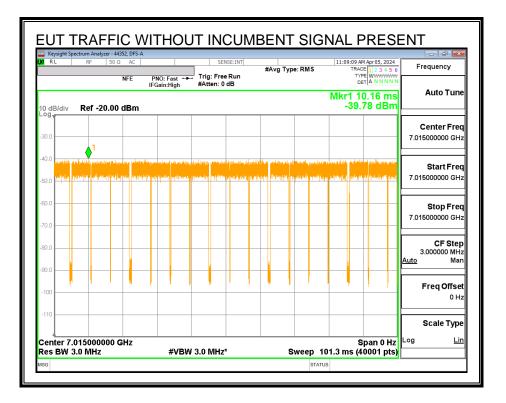
EUT 99% OCCUPIED POWER BANDWIDTH



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 98 of 121

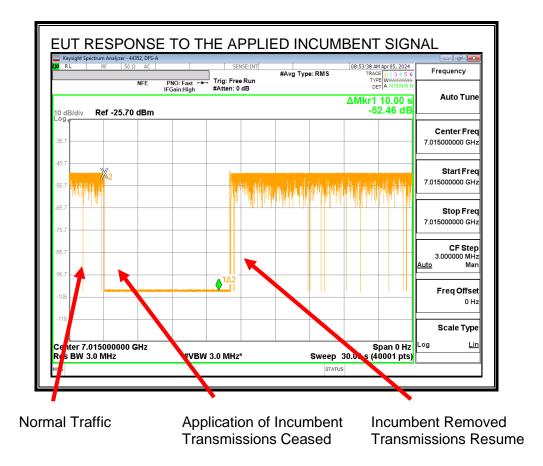
TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



Page 99 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 100 of 121

8.15.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f _{c1} (MHz)	7015
EUT Nominal Channel Bandwidth (MHz)	20
99% Occupied Bandwidth of the EUT (MHz)	18.512
EUT 99% OBW Lower Edge, F _L (MHz)	7005.74
EUT 99% OBW Upper Edge, F _H (MHz)	7024.26
Test Frequency of Incumbent Signal (MHz)	7015
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.00
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-60.0
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	-68.1
Margin (dBm)	-8.13
Result (PASS / FAIL)	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Page 101 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)
Trial	Incumbent AWGN at $\rm f_{c1}$
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
Test Result	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 102 of 121

8.15.5. Tx OPERATIONAL STATUS TEST RESULTS

Test Condition 2: 99% BW_{INC} < 99% BW_{EUT} ≤ 2 x 99% BW_{INC}

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-68.13	2	0	-70.13	-62	Ceased
-69.13	2	0	-71.13	-62	Minimal
-75.19	2	0	-77.19	-62	Normal

The path loss from the internal antenna assembly to the radio port is incorporated into the antenna gain figure.

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 103 of 121

8.16. U-NII 8 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

2 x 99% BW_{INC} < 99% BW_{EUT} ≤ 4 x 99% BW_{INC}

The lowest and highest supported channel bandwidths do not meet the criteria for this test condition therefore this test was not performed.

8.17. U-NII 8 BAND TEST CONDITION 4 RESULTS

TEST CONDITION 4 CRITERIA

99% BW_{EUT} > 4 x 99% BW_{INC}

8.17.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6945 MHz and a nominal channel bandwidth of 80 MHz.

Only the lowest and highest supported channel bandwidths are required to be tested.

Page 104 of 121

8.17.2. INCUMBENT SIGNAL PLOTS

All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

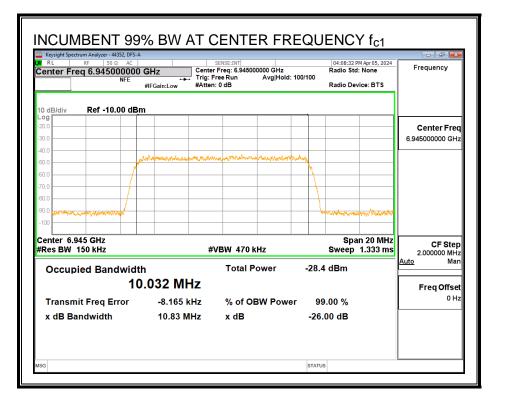
Lower Edge Incumbent Signal fc2:

	Center Fre
00 00 00 00 00 00	
10 miles and a second a se	
enter 6.912 GHz Span 20 MHz Res BW 150 kHz #VBW 470 kHz Sweep 1.333 ms ₂	CF Ste
Occupied Bandwidth Total Power -28.8 dBm	M: Freq Offs
Transmit Freq Error 4.919 kHz % of OBW Power 99.00 %	. 01
x dB Bandwidth 10.92 MHz x dB -26.00 dB	

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

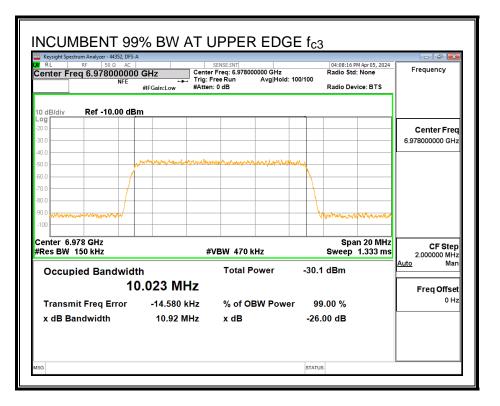
Page 105 of 121

Center Frequency Incumbent Signal fc1:



Page 106 of 121

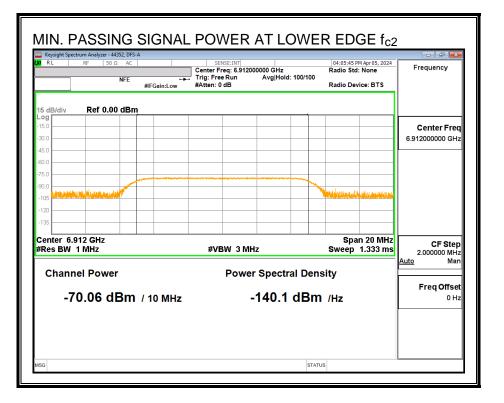
Upper Edge Incumbent Signal fc3:



Page 107 of 121

MINIMUM PASSING INCUMBENT SIGNAL POWER

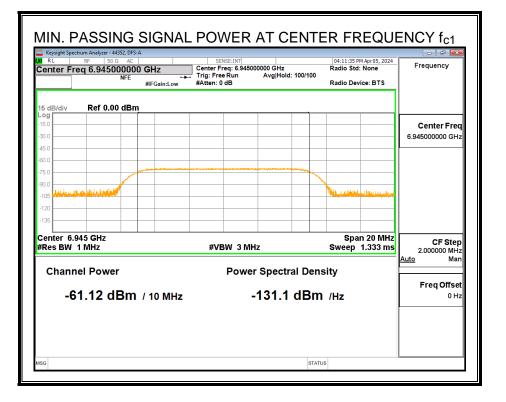
Lower Edge Incumbent Signal fc2:



UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

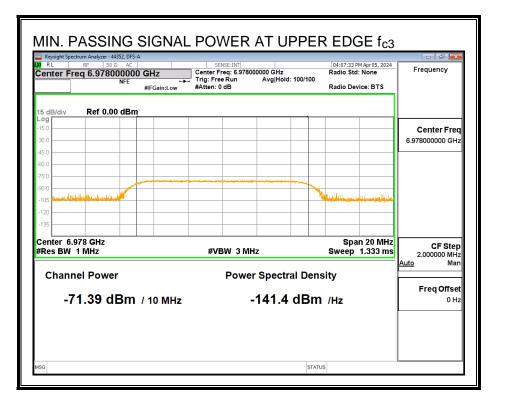
Page 108 of 121

Center Frequency Incumbent Signal fc1:



Page 109 of 121

Upper Edge Incumbent Signal fc3:

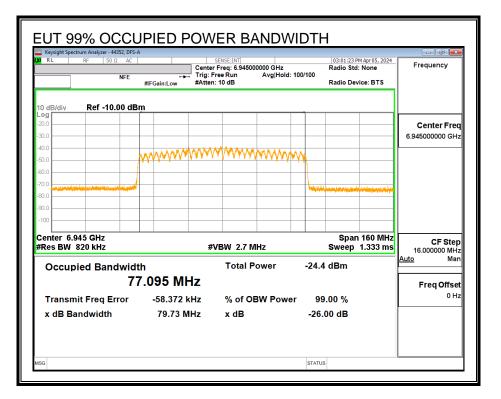


UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 110 of 121

8.17.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

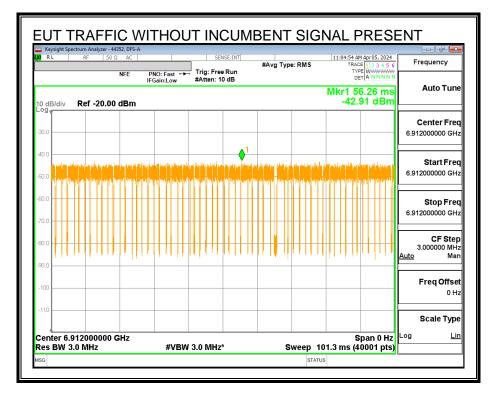


UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Page 111 of 121

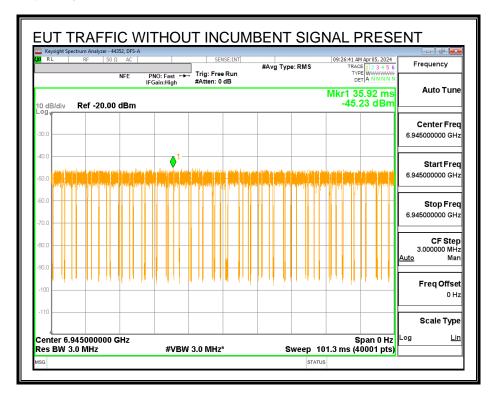
TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

Lower Edge fc2:



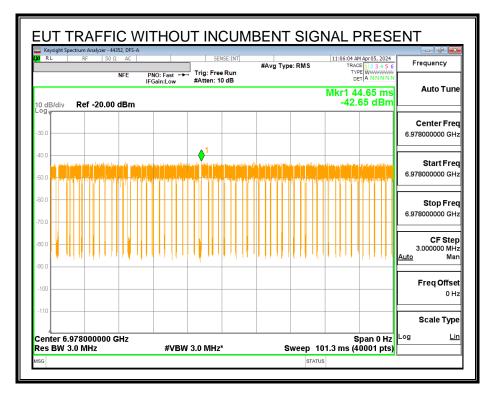
Page 112 of 121

Center Frequency fc1:



Page 113 of 121

Upper Edge fc3:

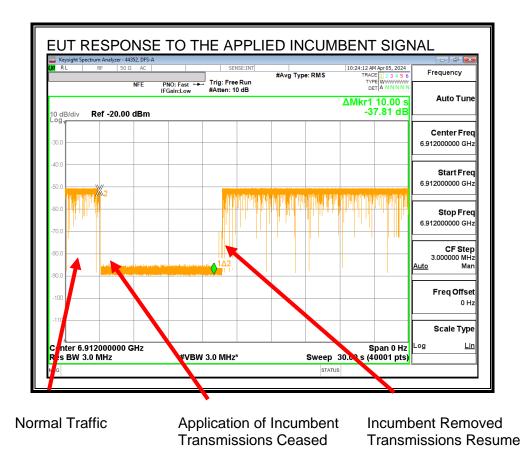


Page 114 of 121

EUT RESPONSE TO THE APPLIED INCUMBENT SIGNAL

A link between the EUT and the Companion Device was established on the test channel. Traffic flowing from the EUT to the Companion Device was then initiated. A sweep was started, and the incumbent signal was continuously applied at approximately 5 seconds after the start of the sweep for a duration of 30 seconds and removed after the end of the observation period. Markers are placed at the beginning and end of the observation period.

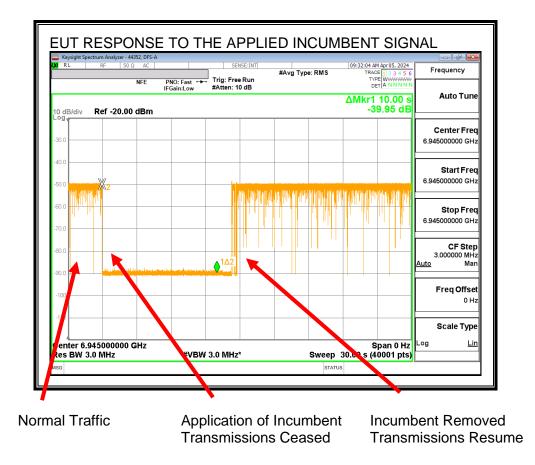
Lower Edge Incumbent Signal fc2:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 115 of 121

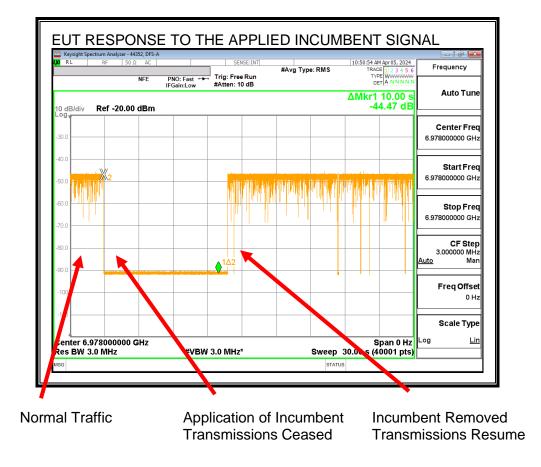
Center Frequency Incumbent Signal fc1:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 116 of 121

Upper Edge Incumbent Signal fc3:



Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed.

Page 117 of 121

8.17.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f _{c1} (MHz)	6945
EUT Nominal Channel Bandwidth (MHz)	80
99% Occupied Bandwidth of the EUT (MHz)	77.095
EUT 99% OBW Lower Edge, F _L (MHz)	6906.45
EUT 99% OBW Upper Edge, F _H (MHz)	6983.55
99% Occupied Bandwidth of the Incumbent Signal (MHz)	10.023
Test Frequency of Incumbent Signal (f _{c2}) Near EUT F _L (MHz)	6912
Test Frequency of Incumbent Signal at f _{c1} (MHz)	6945
Test Frequency of Incumbent Signal(f _{c3})Near EUT F _H (MHz)	6978
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.00
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-60.0
	T
Lowest Passing Measured Incumbent Signal Amplitude at f _{c2} (dBm)	-70.1
Margin (dBm)	-10.06
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c1} (dBm)	-61.1
Margin (dBm)	-1.12
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f _{c3} (dBm)	-71.4
Margin (dBm)	-11.39
Result (PASS / FAIL)	PASS

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 118 of 121

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)			
	Incumbent AWGN	Incumbent AWGN	Incumbent	
Trial	at f _{c2}	at f _{c1}	AWGN at $\rm f_{c3}$	
1	Yes	Yes	Yes	
2	Yes	Yes	Yes	
3	Yes	Yes	Yes	
4	Yes	Yes	Yes	
5	Yes	Yes	Yes	
6	Yes	Yes	Yes	
7	Yes	Yes	Yes	
8	Yes	Yes	Yes	
9	Yes	Yes	Yes	
10	Yes	Yes	Yes	
Test Result	PASS	PASS	PASS	

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

A minimum detection rate of 90% is required for the EUT to be compliant.

Page 119 of 121

8.17.5. Tx OPERATIONAL STATUS TEST RESULTS

Test Condition 4: 99% BW_{EUT} > 4 x 99% BW_{INC}

Incumbent AWGN at f_{c2}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-70.06	2	0	-72.06	-62	Ceased
-71.03	2	0	-73.03	-62	Minimal
-76.03	2	0	-78.03	-62	Normal

Incumbent AWGN at f_{c1}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-61.12	2	0	-63.12	-62	Ceased
-62.1	2	0	-64.1	-62	Minimal
-72.1	2	0	-74.1	-62	Normal

Incumbent AWGN at f_{c3}:

			Adjusted		
Measured Incumbent		Antenna	Incumbent		
Power at the EUT Radio	Antenna Gain	Cable Path	Power at the	Detection Limit	EUT Tx
Port (dBm)	(dBi)	Loss (dB)	Antenna (dBm)	(dBm)	Status
-71.39	2	0	-73.39	-62	Ceased
-72.31	2	0	-74.31	-62	Minimal
-77.43	2	0	-79.43	-62	Normal

The path loss from the internal antenna assembly to the radio port is incorporated into the antenna gain figure.

Test Date: 2024-04-05 Tested by: 44352 Test location: DFS-A

Page 120 of 121

9. SETUP PHOTOS

Refer to UL Verification Services Inc Report # 15126863-EP1V1.

END OF TEST REPORT

UL VERIFICATION SERVICES INC. 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc. FORM NO: CCSUP4701J TEL: (510) 319-4000 FAX: (510) 661-0888

Page 121 of 121