



**CONTENTION BASED PROTOCOL PORTION of FCC 47 CFR PART 15 SUBPART E,
KDB 987594**

CONTENTION BASED PROTOCOL PORTION of RSS-248, ISSUE 1

TEST REPORT

FOR

802.11 a/b/g/n/ac/ax 2x2 CLIENT DEVICE with BT and BLE

MODEL NUMBER: S39

FCC ID: SBVRM039

IC: 5373A-RM039

REPORT NUMBER: 14093504-E10V2

ISSUE DATE: OCTOBER 25, 2022

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Cert. #0751.05

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	10/05/22	Initial Issue	--
V2	10/25/22	Add Tx Operational Status Data per TCB Workshop Notes	Doug Anderson

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	6
6. DECISION RULES AND MEASUREMENT UNCERTAINTY	7
6.1. METROLOGICAL TRACEABILITY	7
6.2. DECISION RULES.....	7
7. CONTENTION BASED PROTOCOL.....	8
7.1. OVERVIEW	8
7.1.1. LIMITS.....	8
7.1.2. FREQUENCY BANDS AND GOVERNING RULES	9
7.1.3. EQUIPMENT CLASSIFICATIONS	10
7.2. DESCRIPTION OF TEST SETUP.....	11
7.2.1. TEST AND MEASUREMENT SYSTEM.....	11
7.2.2. TEST AND MEASUREMENT SOFTWARE	13
7.2.3. TEST ROOM ENVIRONMENT	13
7.2.4. SETUP OF EUT.....	14
7.2.5. DESCRIPTION OF EUT	15
8. CONTENTION BASED PROTOCOL.....	16
8.1. LIMITS AND PROCEDURES.....	16
8.2. U-NII 5 BAND TEST CONDITION 1 RESULTS	17
8.3. U-NII 5 BAND TEST CONDITION 2 RESULTS	17
8.3.1. TEST CHANNEL	17
8.3.2. INCUMBENT SIGNAL PLOTS.....	17
8.3.3. EUT TRANSMISSION PLOTS.....	20
8.3.4. TABULATED TEST RESULTS	22
8.3.5. Tx OPERATIONAL STATUS TEST RESULTS	24
8.4. U-NII 5 BAND TEST CONDITION 3 RESULTS	25
8.5. U-NII 5 BAND TEST CONDITION 4 RESULTS	25
8.5.1. TEST CHANNEL	25
8.5.2. INCUMBENT SIGNAL PLOTS.....	25
8.5.3. EUT TRANSMISSION PLOTS.....	32
8.5.4. TABULATED TEST RESULTS	37
8.5.5. Tx OPERATIONAL STATUS TEST RESULTS	39
8.6. U-NII 6 BAND TEST CONDITION 1 RESULTS	40
8.7. U-NII 6 BAND TEST CONDITION 2 RESULTS	40
8.7.1. TEST CHANNEL	40

8.7.2.	INCUMBENT SIGNAL PLOTS	40
8.7.3.	EUT TRANSMISSION PLOTS	43
8.7.4.	TABULATED TEST RESULTS	45
8.7.5.	Tx OPERATIONAL STATUS TEST RESULTS	47
8.8.	<i>U-NII 6 BAND TEST CONDITION 3 RESULTS</i>	48
8.9.	<i>U-NII 6 BAND TEST CONDITION 4 RESULTS</i>	48
8.9.1.	TEST CHANNEL	48
8.9.2.	INCUMBENT SIGNAL PLOTS	48
8.9.3.	EUT TRANSMISSION PLOTS	55
8.9.4.	TABULATED TEST RESULTS	60
8.9.5.	Tx OPERATIONAL STATUS TEST RESULTS	62
8.10.	<i>U-NII 7 BAND TEST CONDITION 1 RESULTS</i>	63
8.11.	<i>U-NII 7 BAND TEST CONDITION 2 RESULTS</i>	63
8.11.1.	TEST CHANNEL	63
8.11.2.	INCUMBENT SIGNAL PLOTS	63
8.11.3.	EUT TRANSMISSION PLOTS	66
8.11.4.	TABULATED TEST RESULTS	68
8.11.5.	Tx OPERATIONAL STATUS TEST RESULTS	70
8.12.	<i>U-NII 7 BAND TEST CONDITION 3 RESULTS</i>	71
8.13.	<i>U-NII 7 BAND TEST CONDITION 4 RESULTS</i>	71
8.13.1.	TEST CHANNEL	71
8.13.2.	INCUMBENT SIGNAL PLOTS	71
8.13.3.	EUT TRANSMISSION PLOTS	78
8.13.4.	TABULATED TEST RESULTS	84
8.13.5.	Tx OPERATIONAL STATUS TEST RESULTS	86
8.14.	<i>U-NII 8 BAND TEST CONDITION 1 RESULTS</i>	87
8.15.	<i>U-NII 8 BAND TEST CONDITION 2 RESULTS</i>	87
8.15.1.	TEST CHANNEL	87
8.15.2.	INCUMBENT SIGNAL PLOTS	87
8.15.3.	EUT TRANSMISSION PLOTS	90
8.15.4.	TABULATED TEST RESULTS	92
8.15.5.	Tx OPERATIONAL STATUS TEST RESULTS	94
8.16.	<i>U-NII 8 BAND TEST CONDITION 3 RESULTS</i>	95
8.17.	<i>U-NII 8 BAND TEST CONDITION 4 RESULTS</i>	95
8.17.1.	TEST CHANNEL	95
8.17.2.	INCUMBENT SIGNAL PLOTS	95
8.17.3.	EUT TRANSMISSION PLOTS	102
8.17.4.	TABULATED TEST RESULTS	108
8.17.5.	Tx OPERATIONAL STATUS TEST RESULTS	110
9.	SETUP PHOTOS	111

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONOS INC.
614 CHAPALA ST.
SANTA BARBARA, CA, 93101, U.S.A.

EUT DESCRIPTION: 802.11 a/b/g/n/ac/ax 2x2 CLIENT DEVICE with BT and BLE

MODEL: S39

SERIAL NUMBER: F0-F6-C1-A0-09-3E:G

DATE TESTED: AUGUST 02 to 03, 2022 and NOVEMBER 24, 2022

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
Contention Based Protocol Portion of CFR 47 Part 15 Subpart E, KDB 987594	Complies
Contention Based Protocol Portion of RSS-248, Issue 1	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
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the DFS portion of FCC CFR 47 Part 15 Subpart E and FCC KDB 987594.

3. SUMMARY OF TEST RESULTS

Requirement Description	Result	Remarks
Contention Based Protocol Portion of FCC 47 CFR PART 15 SUBPART E, KDB 987594	Complies	None
Contention Based Protocol Portion of RSS-248, Issue 1	Complies	None

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 numbers 14093504-E7V4 and 14093504-E8V4.

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

5. FACILITIES AND ACCREDITATION

UL LLC 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
<input checked="" type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, California, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, California, USA	US0104	22541	550739
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, California, USA	US0104	2324B	550739

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).

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 4.8.1 of RSS-248, Issue 1:

“The Federal Communications Commission’s accepted KDB procedures 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
U-NII 1	5.15-5.25	15.407(a)(1)	Indoor Use/Outdoor Restrictions	789033 (U-NII)
U-NII 2A	5.25-5.35	15.407(a)(2)	Indoor/Outdoor/DFS	789033 (U-NII) 905462 (DFS)
U-NII 2B	5.35-5.47	Not Available		
U-NII 2C	5.47-5.725	15.407(a)(2)	Indoor/Outdoor/DFS	789033 (U-NII) 905462 (DFS)
U-NII 3	5.725-5.85	14.407(a)(3)	Indoor/Outdoor	789033 (U-NII) 926956 (*)
DSRC	5.85-5.925	95 Subpart L and 90 Subpart M	On-Board Units (OBU) must transmit signals to other OBUs and Roadside Units (RSU).	DSRC
U-NII 5	5.925-6.425	15.407(a)(4) – (8)	Low Power Indoor AP, Subordinates, Indoor Clients Standard Power AP, Fixed & Standard Clients	789033 (U-NII) 987594 (6 GHz Band)
U-NII 6	6.425-6.525	15.407(a)(5), (6), (8)	Low Power Indoor AP, Subordinates, Indoor Clients	
U-NII 7	6.525-6.875	15.407(a)(4) – (8)	Low Power Indoor AP, Subordinates, Indoor Clients Standard Power AP, Fixed & Standard Clients	
U-NII 8	6.875 -7.125	15.407(a)(5), (6), (8)	Low Power Indoor AP, Subordinates, Indoor Clients	
* 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

7.1.3. EQUIPMENT CLASSIFICATIONS

There are seven applicable equipment classes for U-NII 6 GHz device certifications, as illustrated in Figure 1. Multiple equipment classes can apply to one FCC ID. Equipment classes categorize the certification record by the different technical rules that apply.

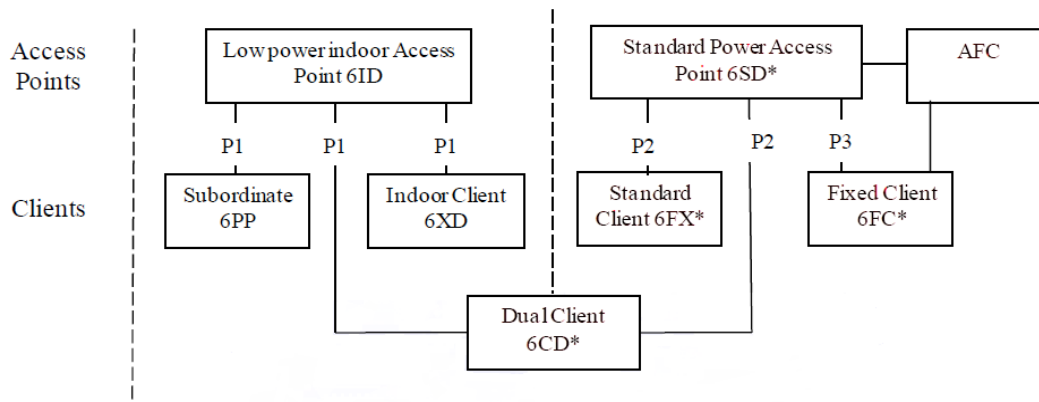


Figure 1 – Equipment Classes Overview

*** Applications accepted in phase 2.**

DEFINITION OF EQUIPMENT CLASSES

1. 6ID: 15E 6 GHz Low power indoor access point.
2. 6PP: 15E 6 GHz Subordinate indoor device. These devices are under control of a Low power indoor access point (P1).
3. 6XD: 15E 6 GHz Low power Indoor client. These devices are under control of a low power indoor access point (P1).
4. **6SD***: 15E 6 GHz Standard power access point. These devices are managed by the Automatic Frequency Coordination (AFC) system.
5. **6CD***: 15E 6 GHz Dual client. These devices are under control of either a low power indoor access point (6ID) (P1) or Standard power access point (P2).*
6. **6FX***: 15E 6 GHz Standard client. These devices are under control of a Standard power access point (P2).
7. **6FC***: 15E 6 GHz Fixed client. These devices are associated with a standard power access point (P3).

*** Applications accepted in phase 2.**

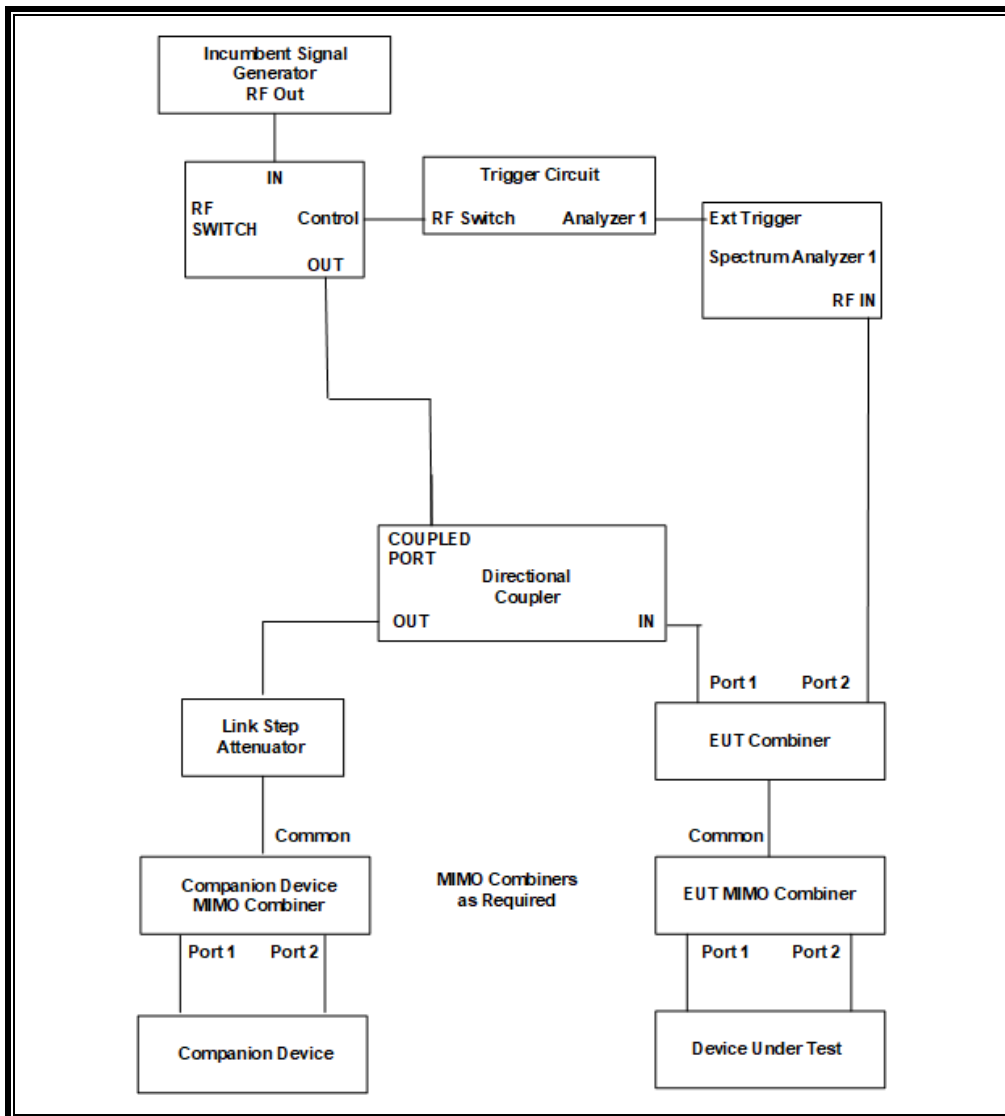
7.2. DESCRIPTION OF TEST SETUP

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.



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.

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 the EUT is then attached to the spectrum analyzer in place of the monitoring cable. 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	01/27/23
Signal Generator, MXG X-Series RF Vector	Keysight	N5182B	215999	02/08/23
Frequency Extender	Keysight	N5182BX	213906	12/29/22

Note: 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

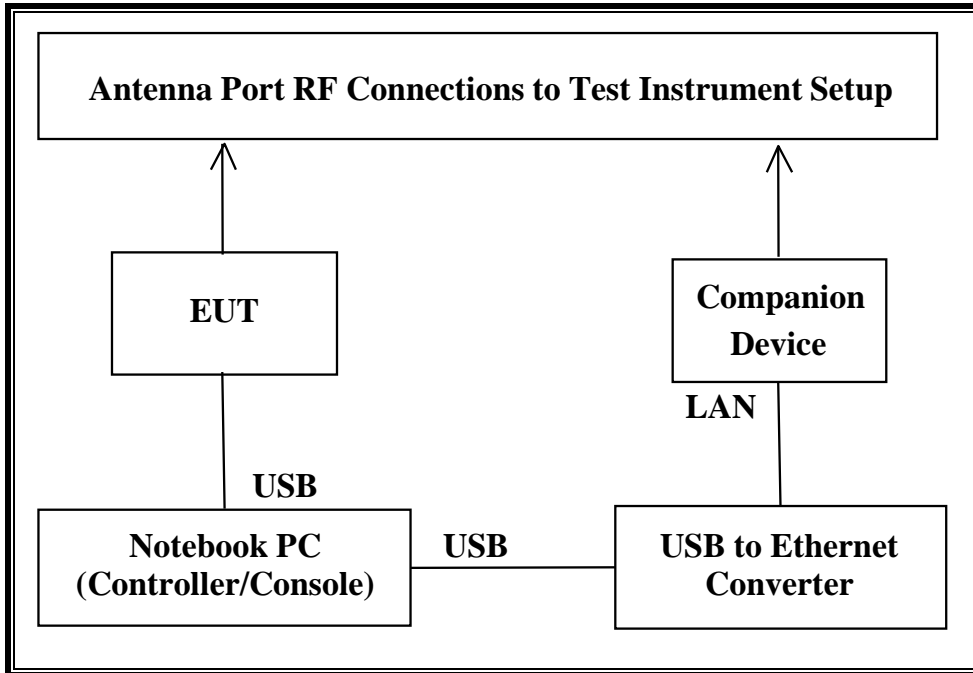
The test room temperature and humidity shall be maintained within normal temperature of 15~35 °C and normal humidity 20~75% (relative humidity).

ENVIRONMENT CONDITION

Parameter	Value
Temperature	25.4, 24.6 and 24.0 °C
Humidity	49, 49 and 34 %

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
WiFi 6e Gaming Router	ASUS Computer International	GT-AXE11000	M8IG0X401433A56	MSQ-RTAXJF00
AC Adapter 1 (Companion)	AC BEL	ADD011 LPS	ADD01117AG2116 03089A	DoC
Notebook PC (Console)	Lenovo	Type 2320-HQU	R9-WTGPF 13/01	DoC
AC Adapter 2 (Console PC)	Lenovo	ADLX65NCT2A	11S45N0323Z1ZLZ H3B467V	DoC

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 EUT is classified as a 6 GHz Low power Indoor Client.

The highest gain antenna assembly utilized with the EUT has a gain of 5.5 dBi in the U-NII 5 band, 5.2 dBi in the U-NII 6 band, 4.6 dBi in the U-NII 7 band and 4.1 dBi in the U-NII 8 band.

The lowest gain antenna assembly utilized with the EUT has a gain of 4.4 dBi in the U-NII 5 band, 2.7 dBi in the U-NII 6 band, 3.0 dBi in the U-NII 7 band and 3.5 dBi in the U-NII 8 band.

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

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 -57.6 dBm in the U-NII 5 band, -59.3 dBm in the U-NII 6 band, -59.0 dBm in the U-NII 7 band and -58.5 dBm in the U-NII 8 band.

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.

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 70.1-31060-dev-Cheng-20220715-main.

The software installed in the Companion Device is 70.2-32110.

TEST SETUP

The EUT is attached to a USB port of a console notebook 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

LIMITS

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 and is calculated using the following formula:

Band	Frequency Range (MHz)	Antenna Gain (dBi)	T_L at Radio Port (dBm/MHz)
U-NII 5	5925 to 6425	4.4	-57.6
U-NII 6	6425 to 6525	2.7	-59.3
U-NII 7	6525 to 6875	3.0	-59.0
U-NII 8	6875 to 7125	3.5	-58.5

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).

8.2. U-NII 5 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.

8.3. U-NII 5 BAND TEST CONDITION 2 RESULTS

TEST CONDITION 2 CRITERIA

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

8.3.1. TEST CHANNEL

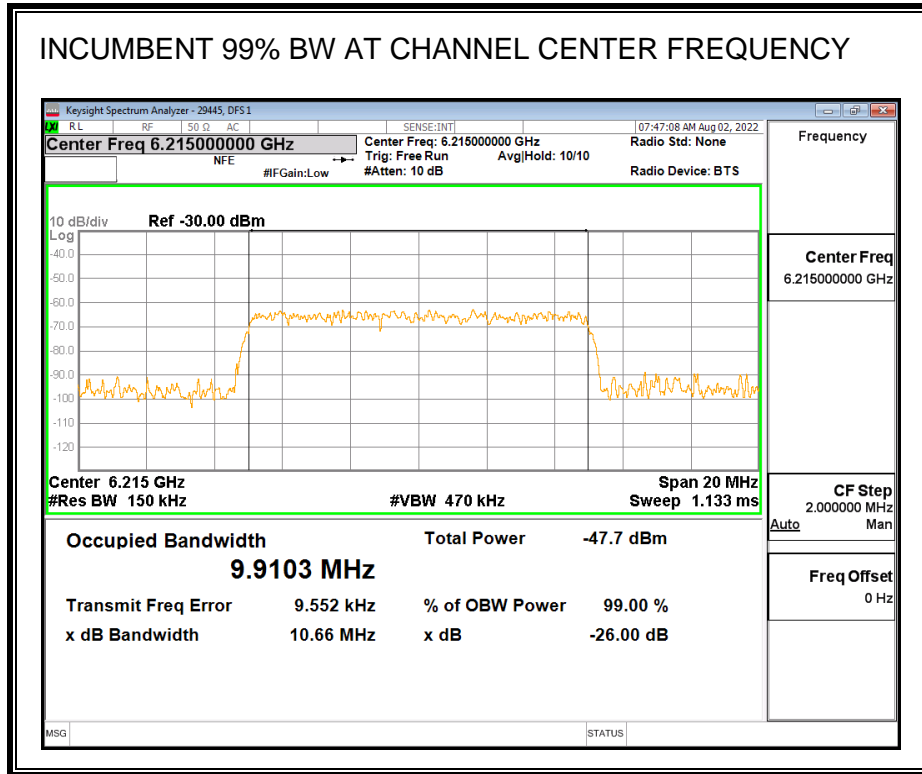
All tests were performed with the EUT set to a channel center frequency of 6215 MHz and a nominal channel bandwidth of 20 MHz.

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

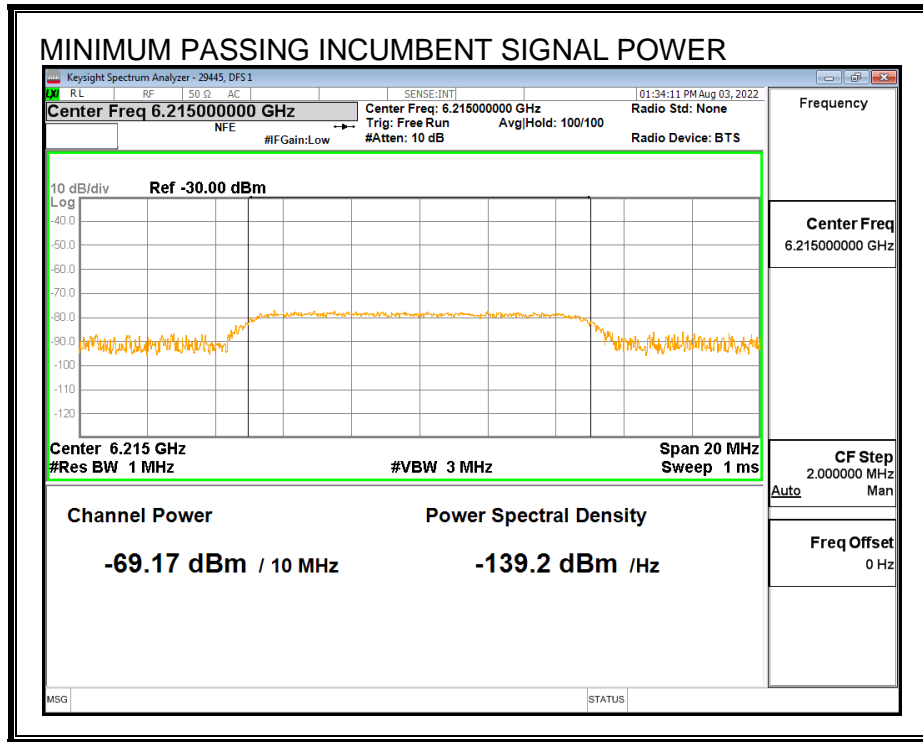
8.3.2. INCUMBENT SIGNAL PLOTS

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



MINIMUM PASSING INCUMBENT SIGNAL POWER

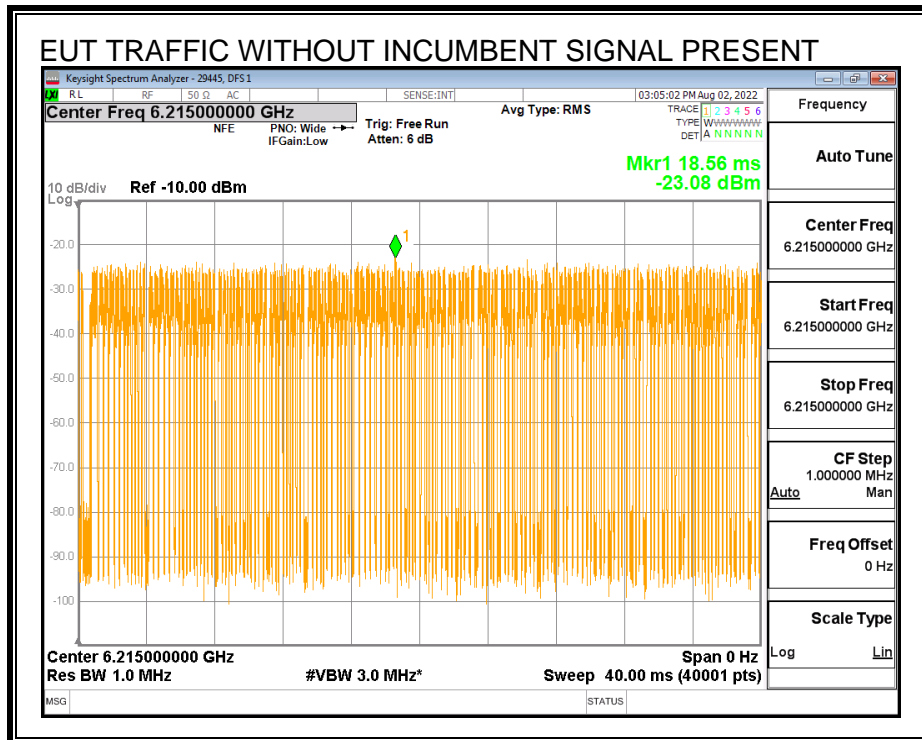


8.3.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

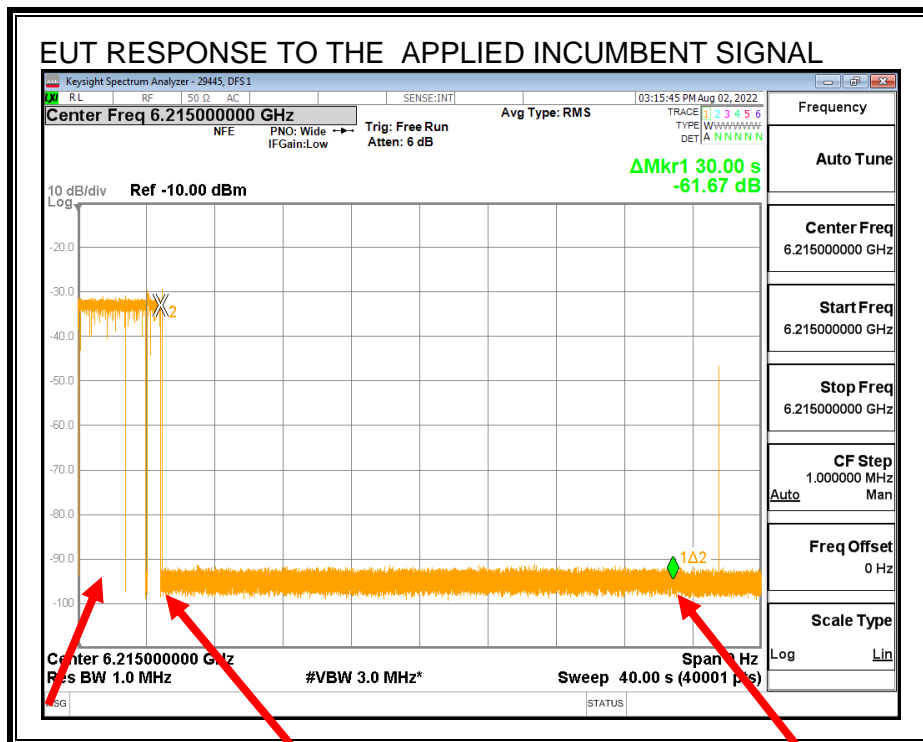
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 19.028 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



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.



Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Association to Companion Lost

Transmissions cease while the Incumbent AWGN Signal is present and does not resume after it is removed due to the loss of the association to the Companion Device.

8.3.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f_{c1} (MHz)	6215
EUT Nominal Channel Bandwidth (MHz)	20
99% Occupied Bandwidth of the EUT (MHz)	18.9
EUT 99% OBW Lower Edge, F_L (MHz)	6205.55
EUT 99% OBW Upper Edge, F_H (MHz)	6224.45
Test Frequency of Incumbent Signal (MHz)	6215
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	4.4
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-57.6
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	-69.17
Margin (dBm)	-11.57
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

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

Test Date: 08/02/22

Tested by: 29445

Test location: DFS 1

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

8.3.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-69.17	4.4	0	-73.57	-62	Ceased
-74.46	4.4	0	-78.86	-62	Minimal
-77.25	4.4	0	-81.65	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1

8.4. U-NII 5 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

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

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

$$99\% BW_{EUT} > 4 \times 99\% BW_{INC}$$

8.5.1. TEST CHANNEL

All tests were performed with the EUT set to a channel center frequency of 6145 MHz and a nominal channel bandwidth of 80 MHz.

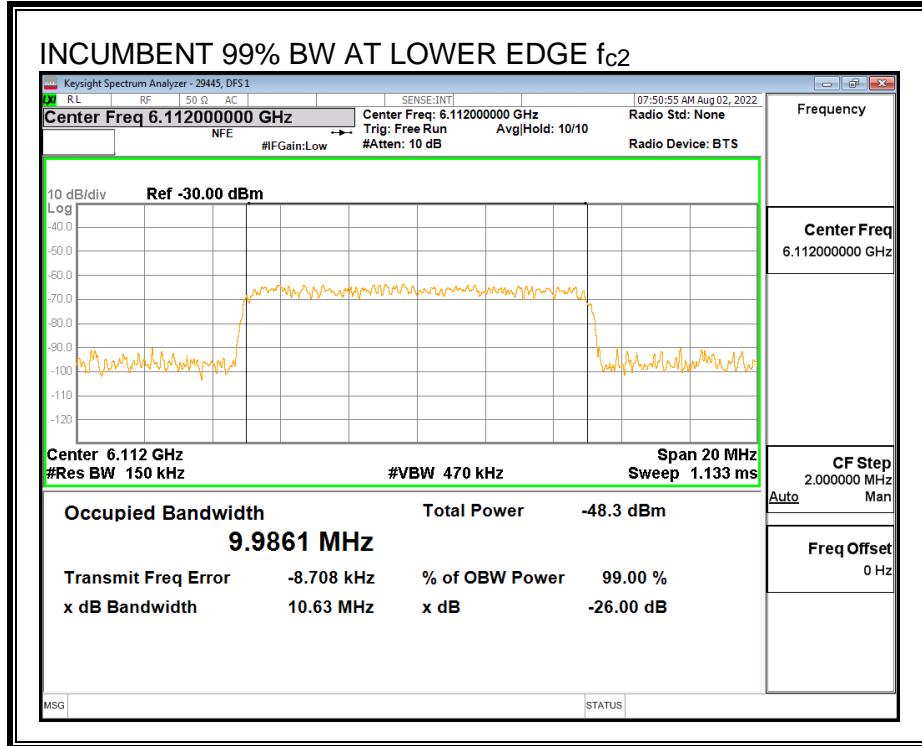
Only the lowest and highest supported channel bandwidths are required to be tested.

8.5.2. INCUMBENT SIGNAL PLOTS

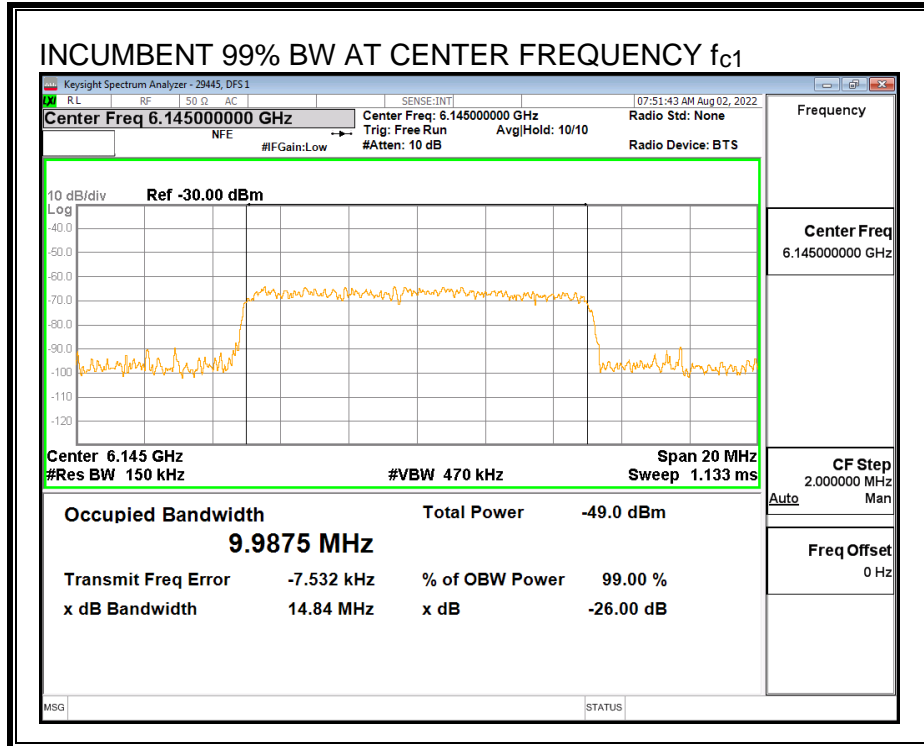
All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

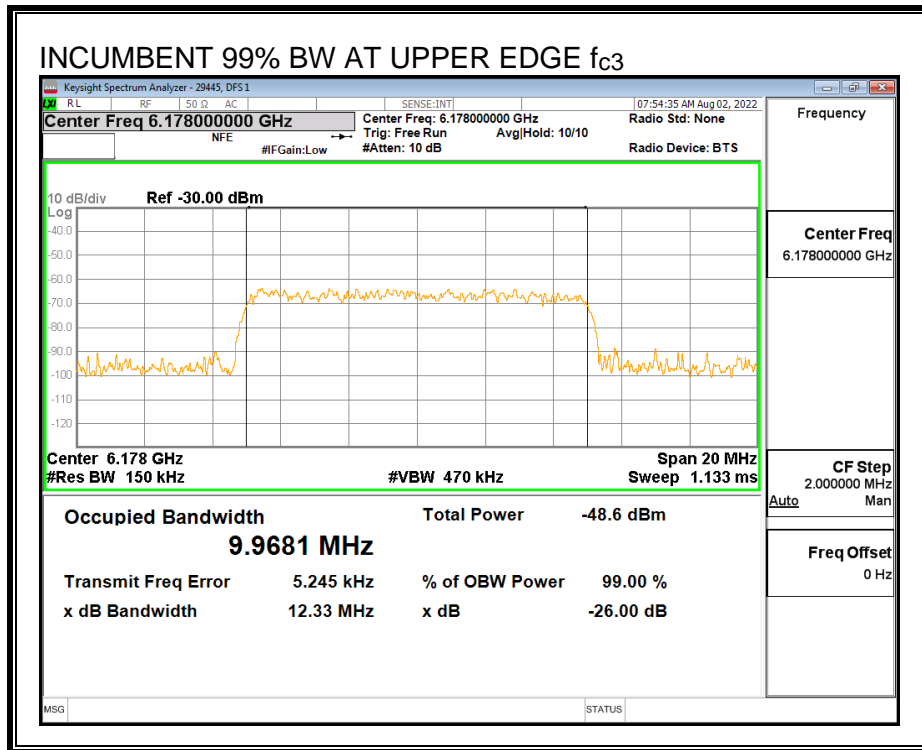
Lower Edge Incumbent Signal f_{c2} :



Center Frequency Incumbent Signal f_{c1} :

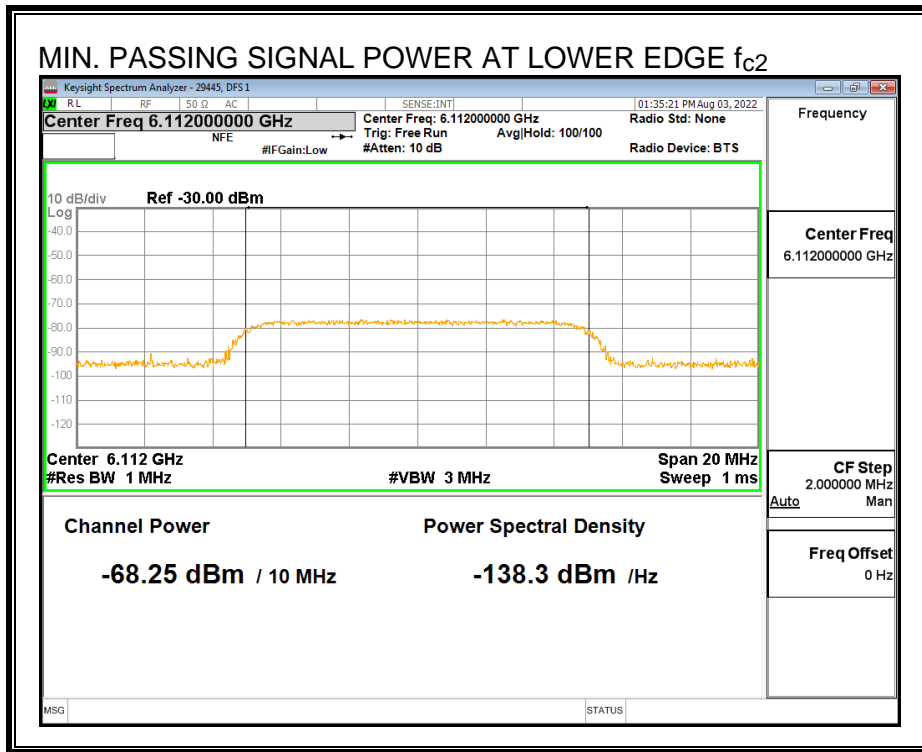


Upper Edge Incumbent Signal f_{c3} :

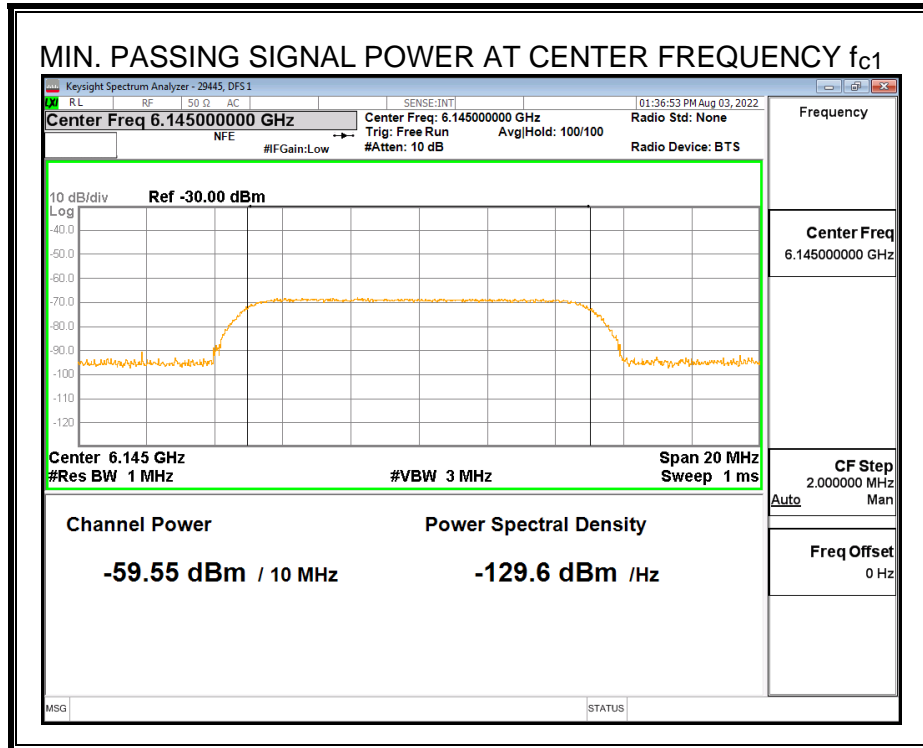


MINIMUM PASSING INCUMBENT SIGNAL POWER

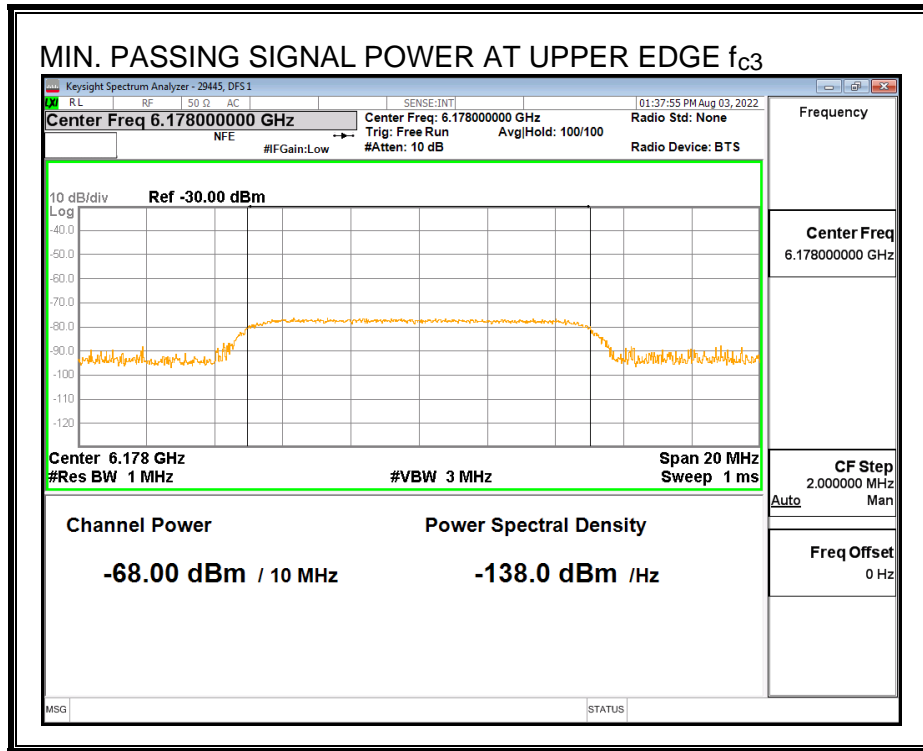
Lower Edge Incumbent Signal f_{c2} :



Center Frequency Incumbent Signal f_{c1} :



Upper Edge Incumbent Signal f_{c3} :



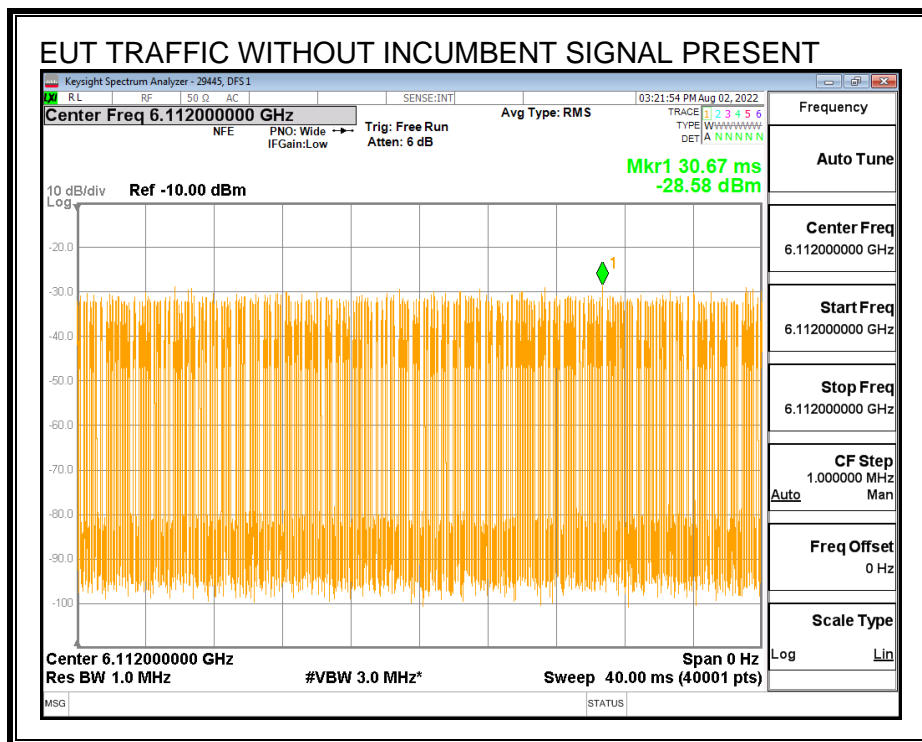
8.5.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

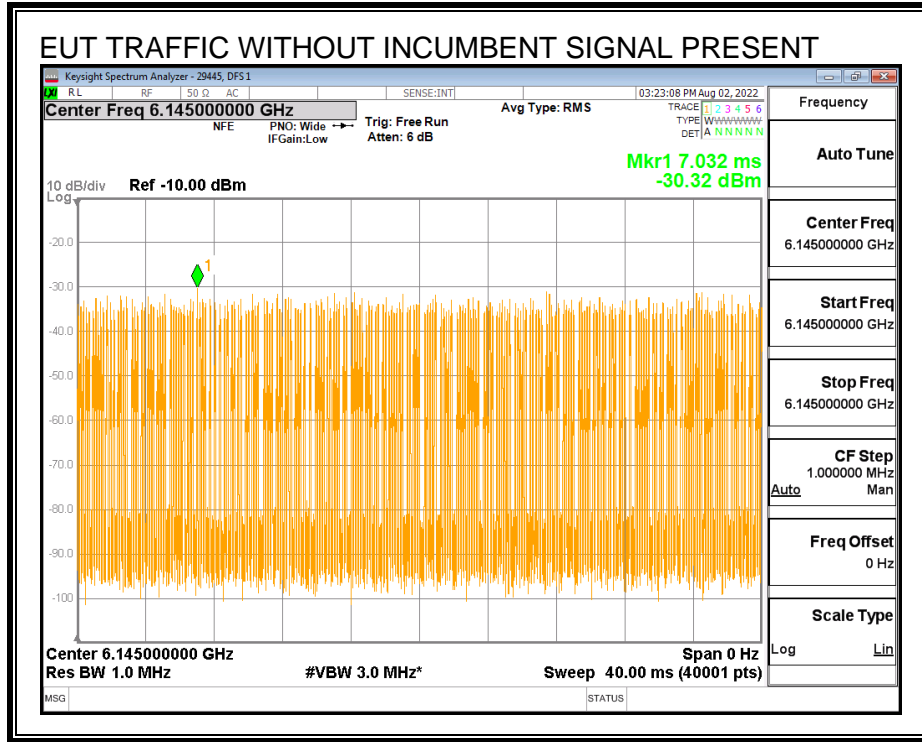
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 76.932 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

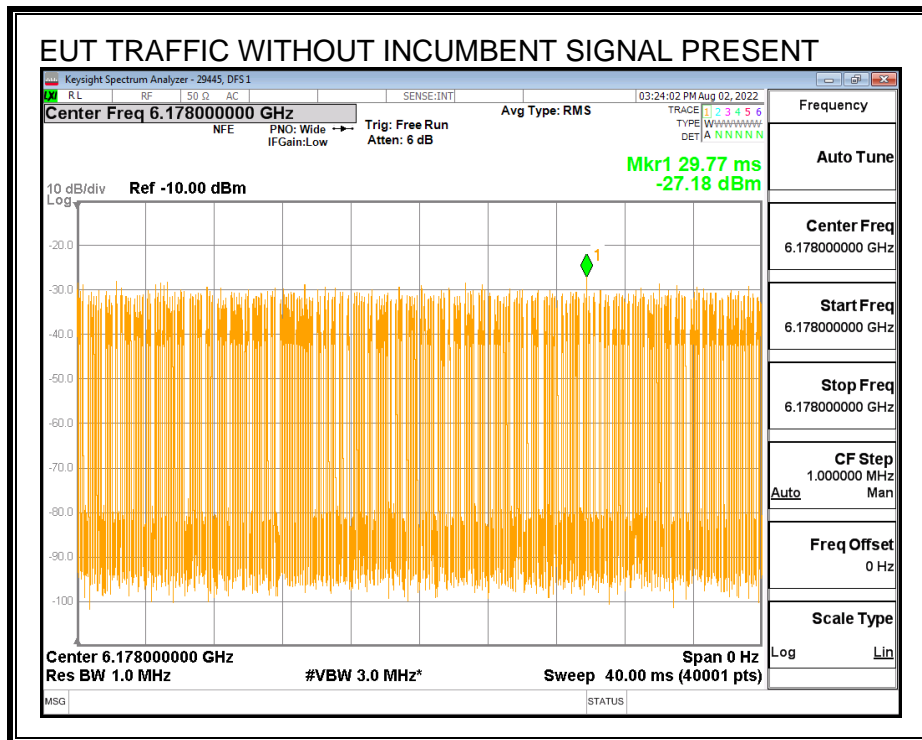
Lower Edge f_{c2} :



Center Frequency f_{c1} :



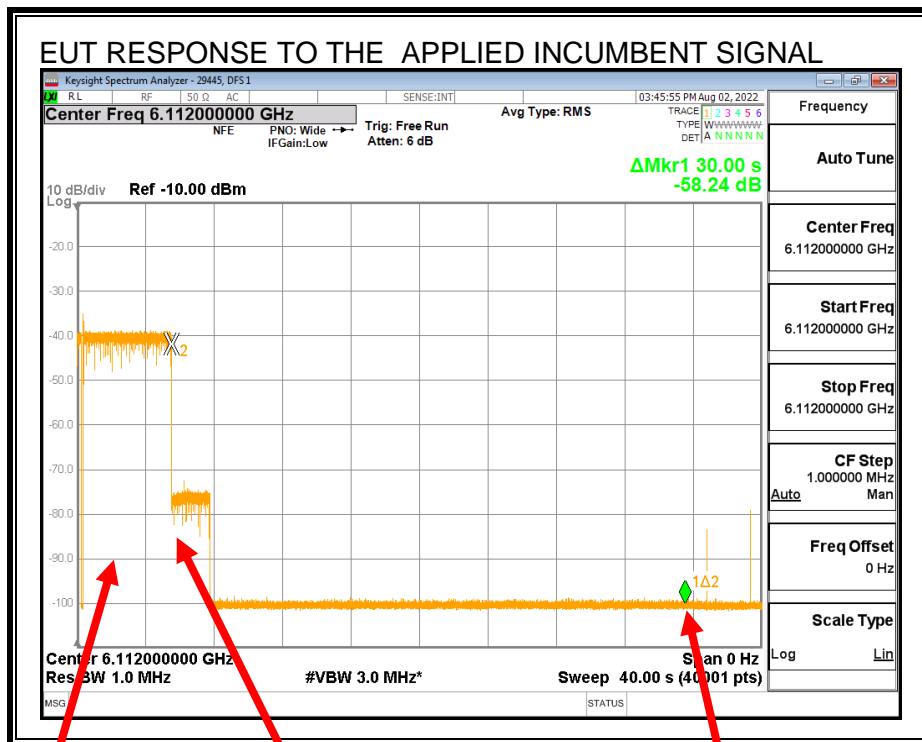
Upper Edge f_{c2} :



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 f_{c2} :



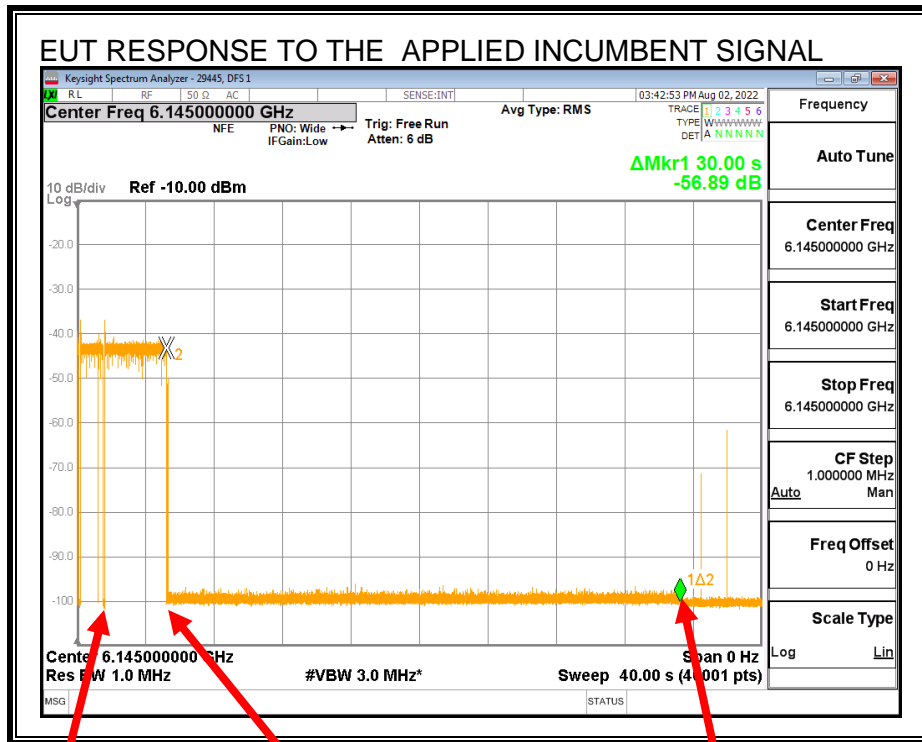
Normal Traffic

Application of Incumbent
 Transmissions Ceased

Incumbent Removed
 Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

Center Frequency Incumbent Signal f_{c1} :



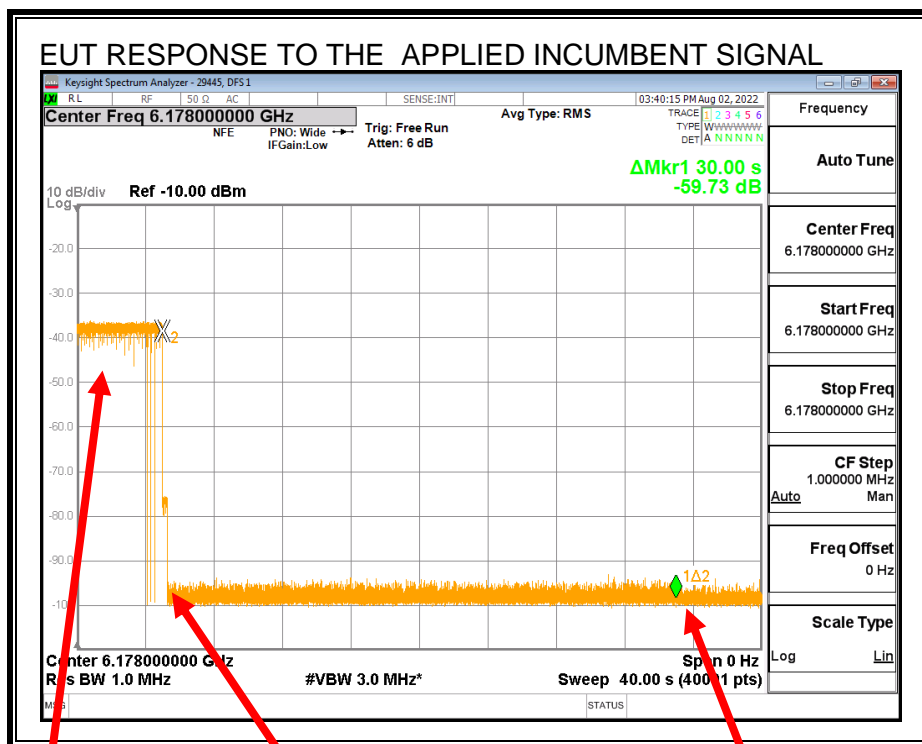
Normal Traffic

Application of Incumbent
 Transmissions Ceased

Incumbent Removed
 Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

Upper Edge Incumbent Signal f_{c3} :



Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Association to Companion Lost

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

8.5.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f_{c1} (MHz)	6145
EUT Nominal Channel Bandwidth (MHz)	80
99% Occupied Bandwidth of the EUT (MHz)	76.8
EUT 99% OBW Lower Edge, F_L (MHz)	6106.60
EUT 99% OBW Upper Edge, F_H (MHz)	6183.40
99% Occupied Bandwidth of the Incumbent Signal (MHz)	9.98
Test Frequency of Incumbent Signal (f_{c2}) Near EUT F_L (MHz)	6112
Test Frequency of Incumbent Signal at f_{c1} (MHz)	6145
Test Frequency of Incumbent Signal (f_{c3}) Near EUT F_H (MHz)	6178
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	4.4
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-57.6
Lowest Passing Measured Incumbent Signal Amplitude at f_{c2} (dBm)	
	-68.25
Margin (dBm)	-10.65
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c1} (dBm)	
	-59.55
Margin (dBm)	-1.95
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c3} (dBm)	
	-68.0
Margin (dBm)	-10.40
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

Trial	AWGN Detected (Yes / No)		
	Incumbent AWGN at f_{c2}	Incumbent AWGN at f_{c1}	Incumbent AWGN at 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: 08/02/22

Tested by: 29445

Test location: DFS 1

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

8.5.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c2} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-68.25	4.4	0	-72.65	-62	Ceased
-75.93	4.4	0	-80.33	-62	Minimal
-79.16	4.4	0	-83.56	-62	Normal

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-59.55	4.4	0	-63.95	-62	Ceased
-68.07	4.4	0	-72.47	-62	Minimal
-72.85	4.4	0	-77.25	-62	Normal

Incumbent AWGN at f_{c3} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-68.0	4.4	0	-72.4	-62	Ceased
-77.36	4.4	0	-81.76	-62	Minimal
-79.22	4.4	0	-83.62	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1

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

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

8.7.1. TEST CHANNEL

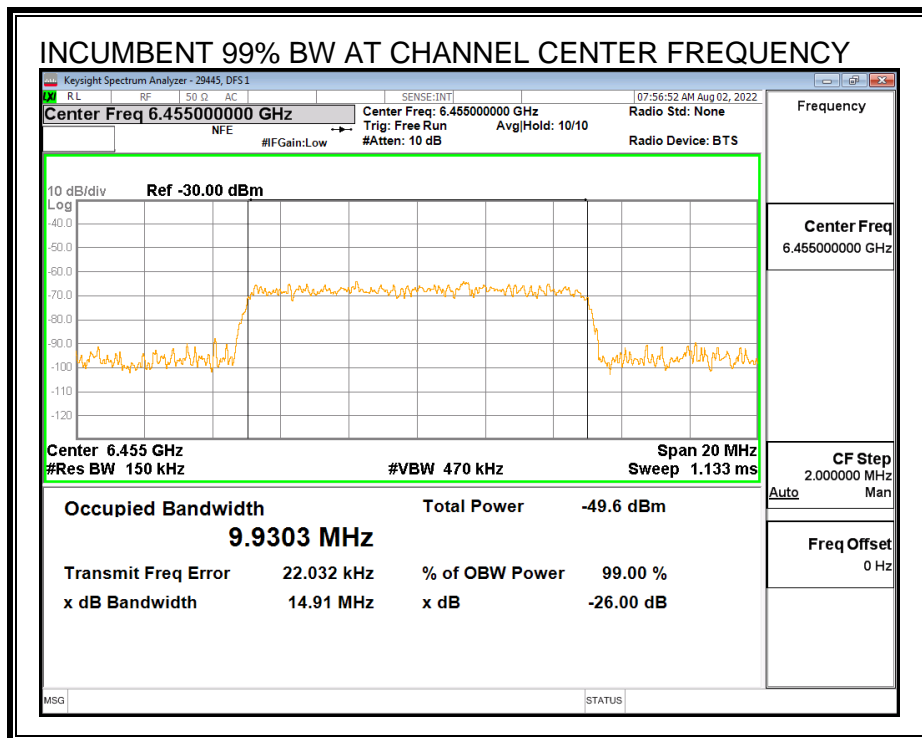
All tests were performed with the EUT set to a channel center frequency of 6455 MHz and a nominal channel bandwidth of 20 MHz.

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

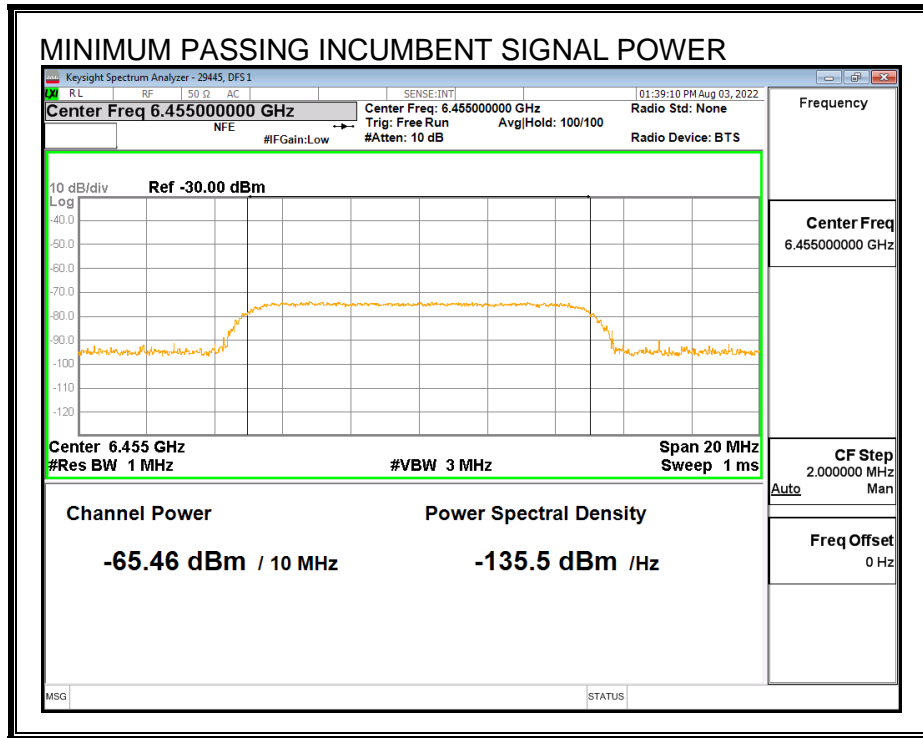
8.7.2. INCUMBENT SIGNAL PLOTS

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



MINIMUM PASSING INCUMBENT SIGNAL POWER

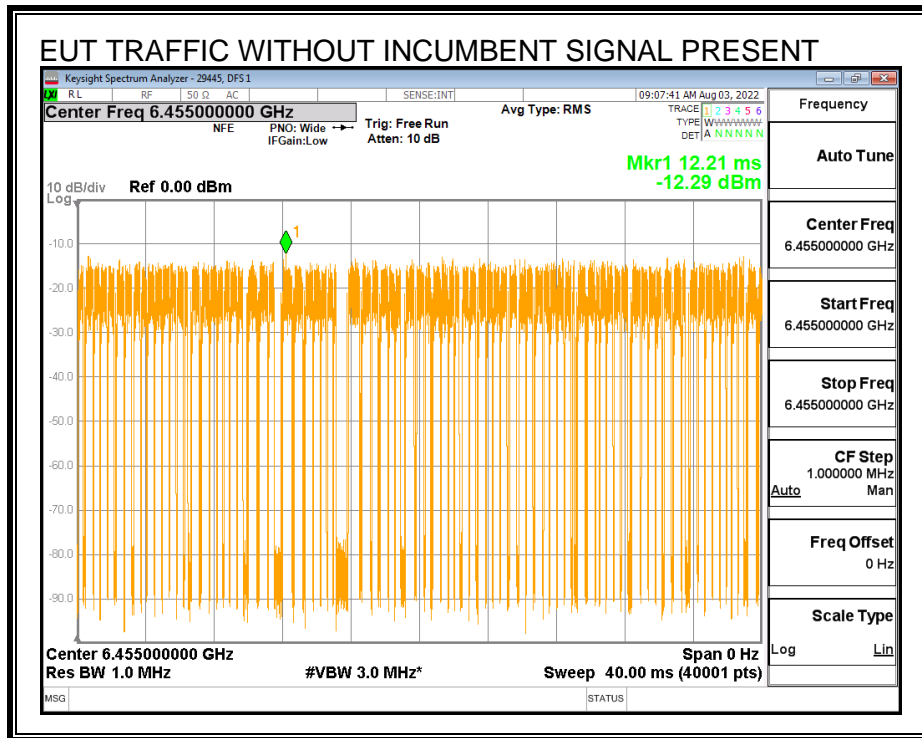


8.7.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

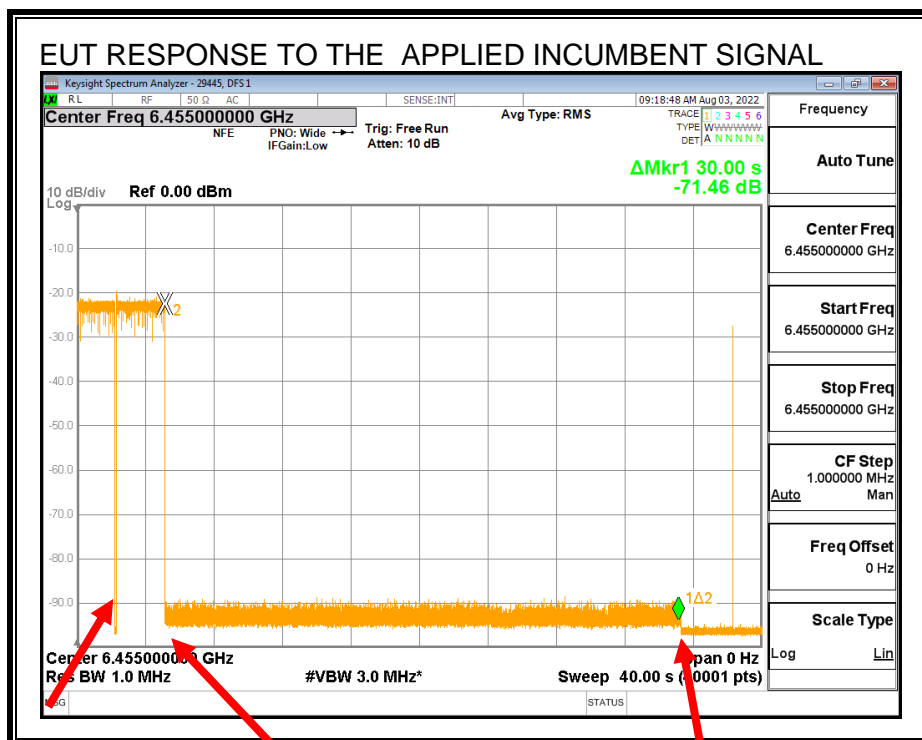
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 19.012 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



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.



Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Transmissions Resume

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

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)	18.9
EUT 99% OBW Lower Edge, F_L (MHz)	6445.55
EUT 99% OBW Upper Edge, F_H (MHz)	6464.45
Test Frequency of Incumbent Signal (MHz)	6455
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	2.7
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.3
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	
	-65.46
Margin (dBm)	-6.16
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)
Trial	Incumbent AWGN at 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: 08/03/22

Tested by: 29445

Test location: DFS 1

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

8.7.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-65.46	2.7	0	-68.16	-62	Ceased
-76.53	2.7	0	-79.23	-62	Minimal
-79.04	2.7	0	-81.74	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1

8.8. U-NII 6 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

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

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

$$99\% BW_{EUT} > 4 \times 99\% BW_{INC}$$

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.

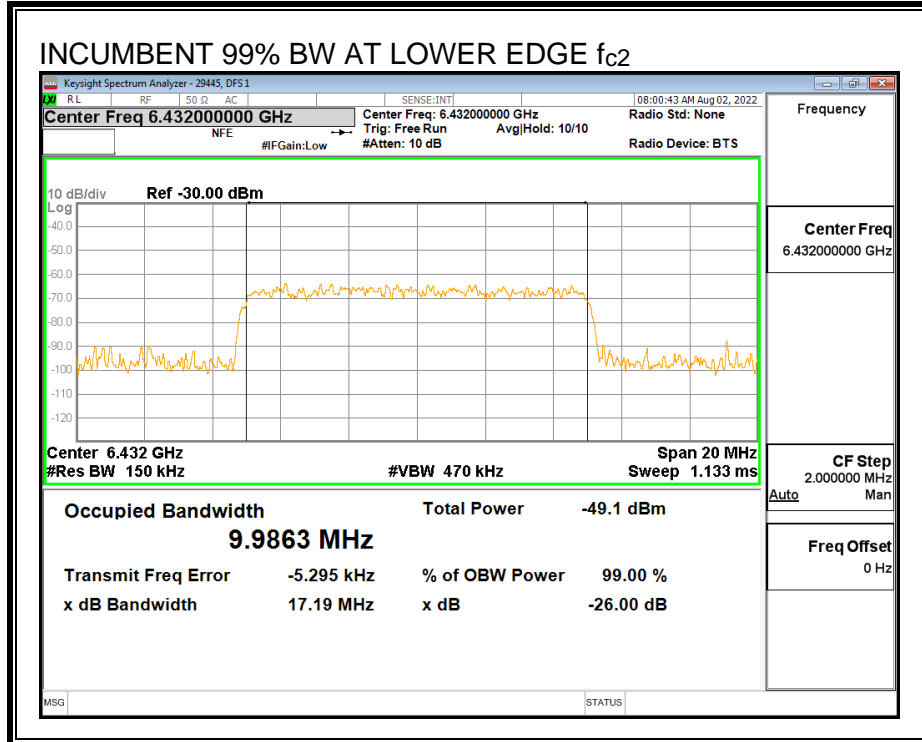
Only the lowest and highest supported channel bandwidths are required to be tested.

8.9.2. INCUMBENT SIGNAL PLOTS

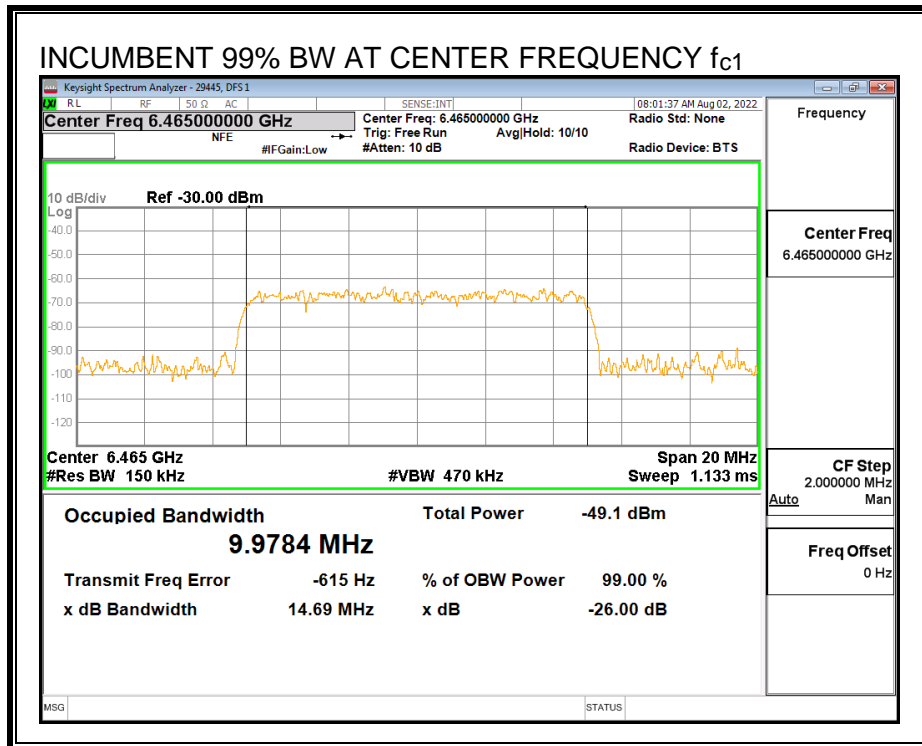
All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

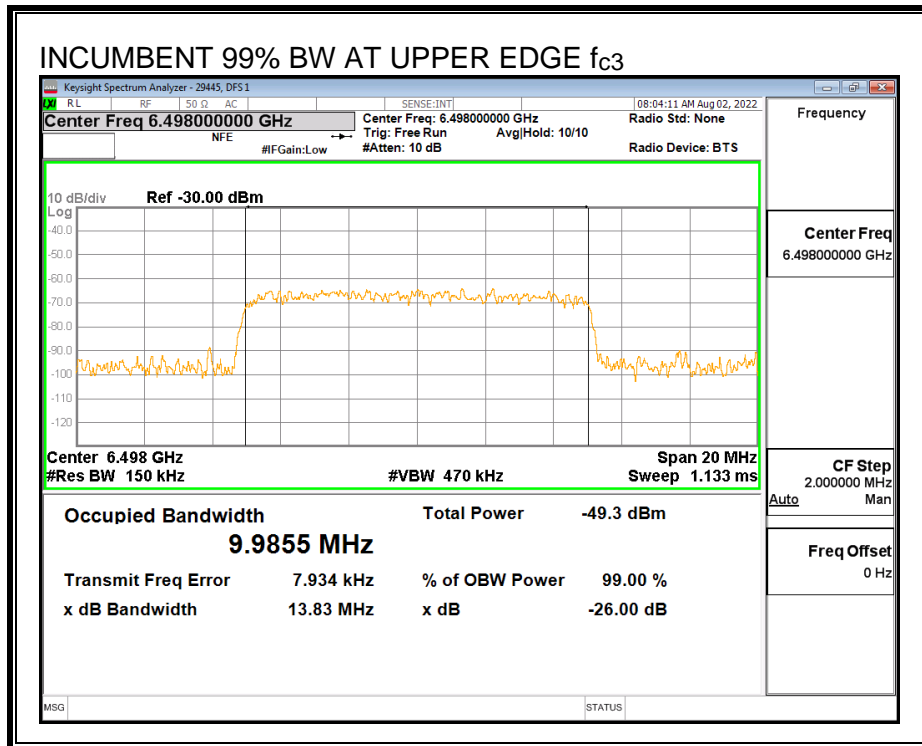
Lower Edge Incumbent Signal f_{c2}:



Center Frequency Incumbent Signal f_{c1} :

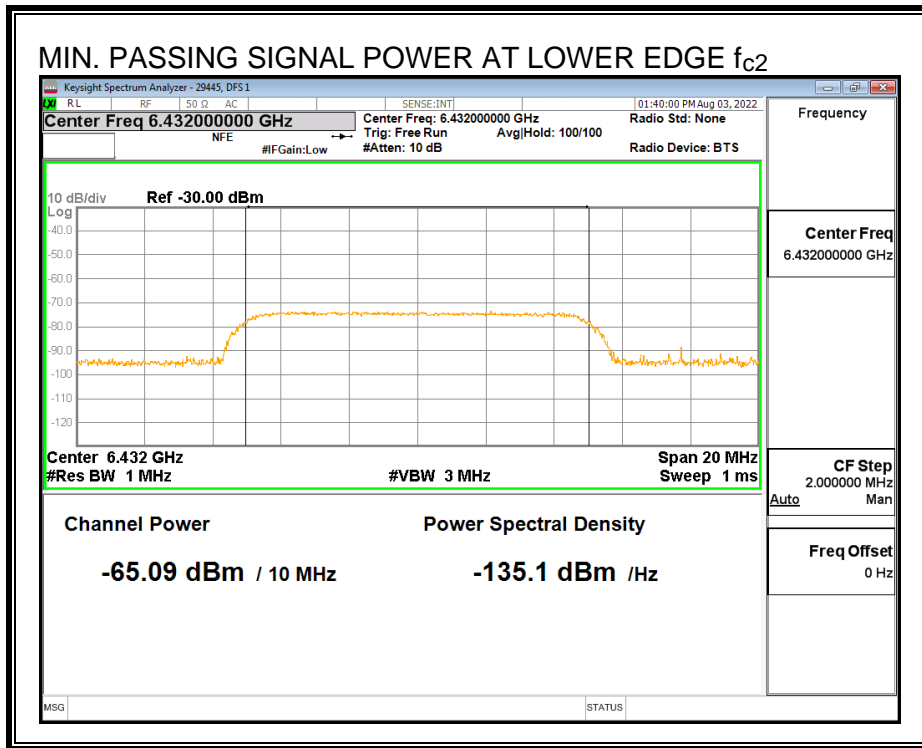


Upper Edge Incumbent Signal f_{c3} :

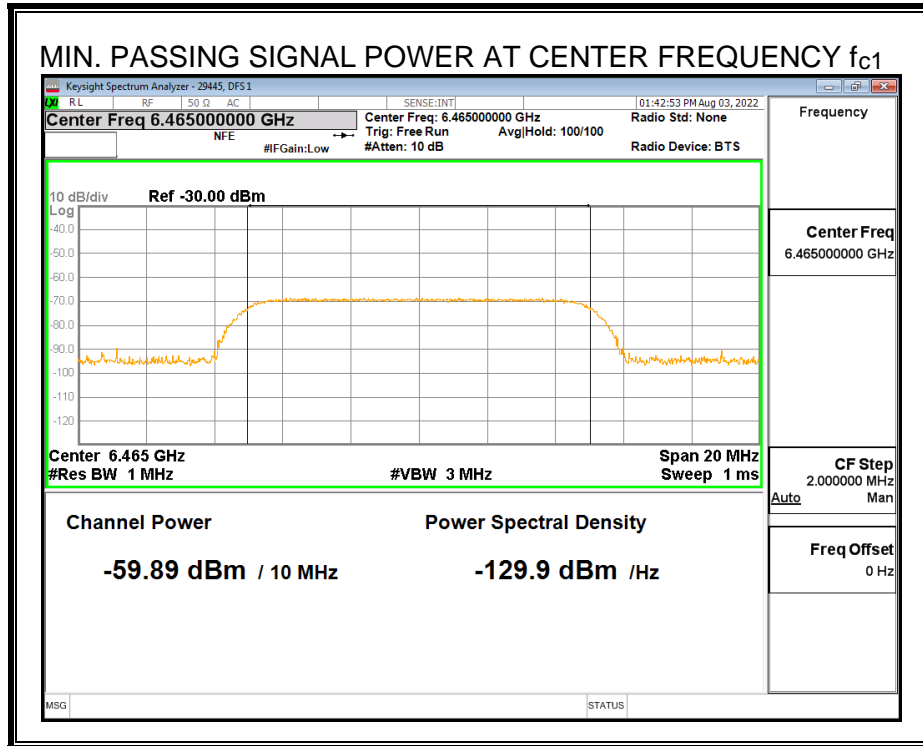


MINIMUM PASSING INCUMBENT SIGNAL POWER

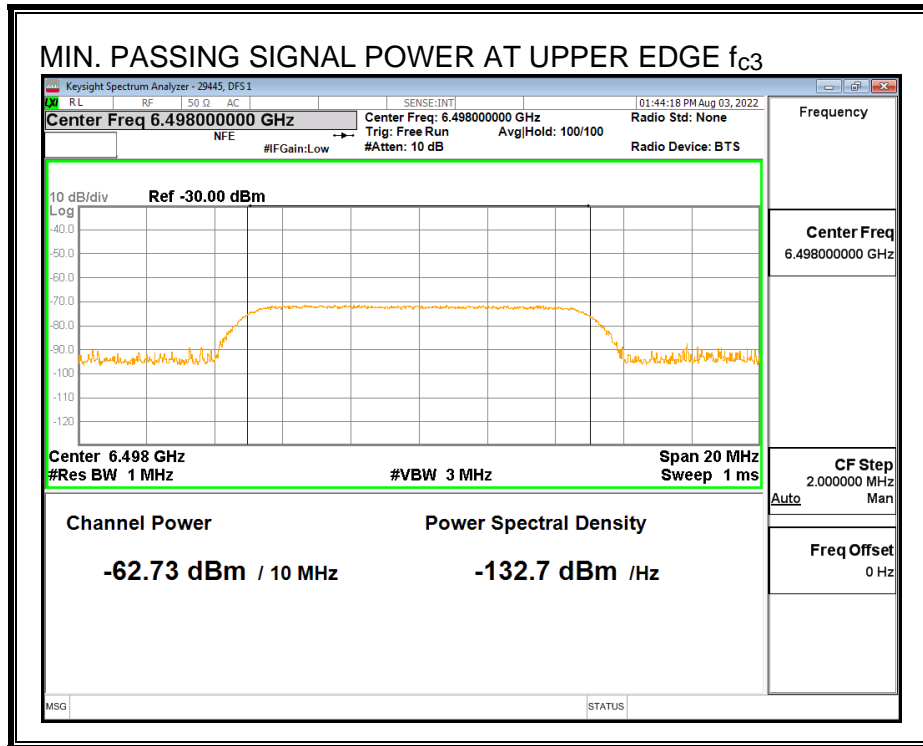
Lower Edge Incumbent Signal f_{c2} :



Center Frequency Incumbent Signal f_{c1} :



Upper Edge Incumbent Signal f_{c3} :



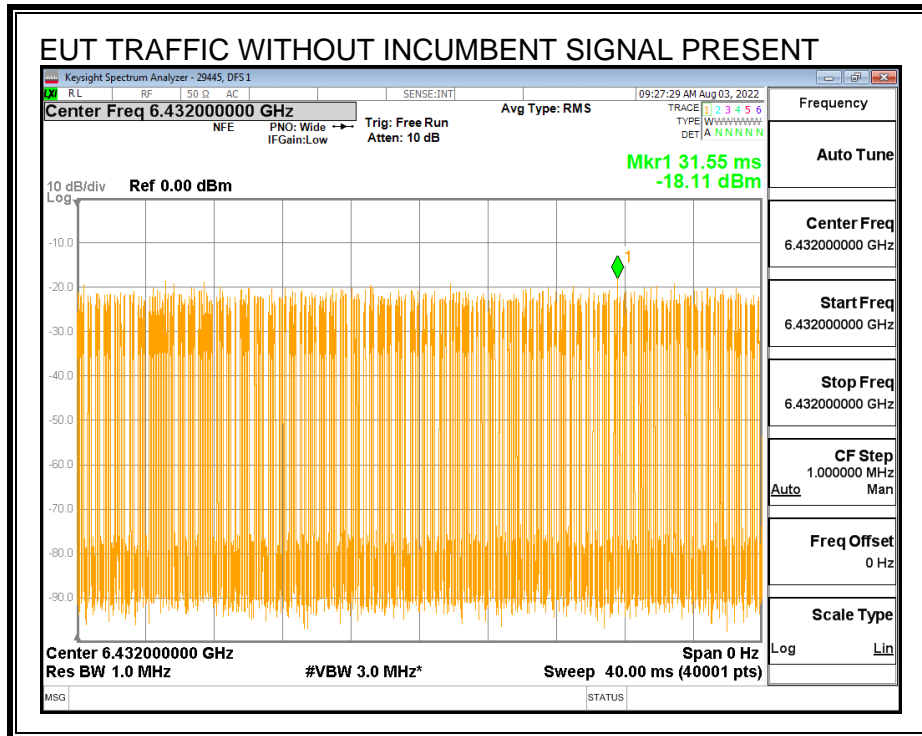
8.9.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

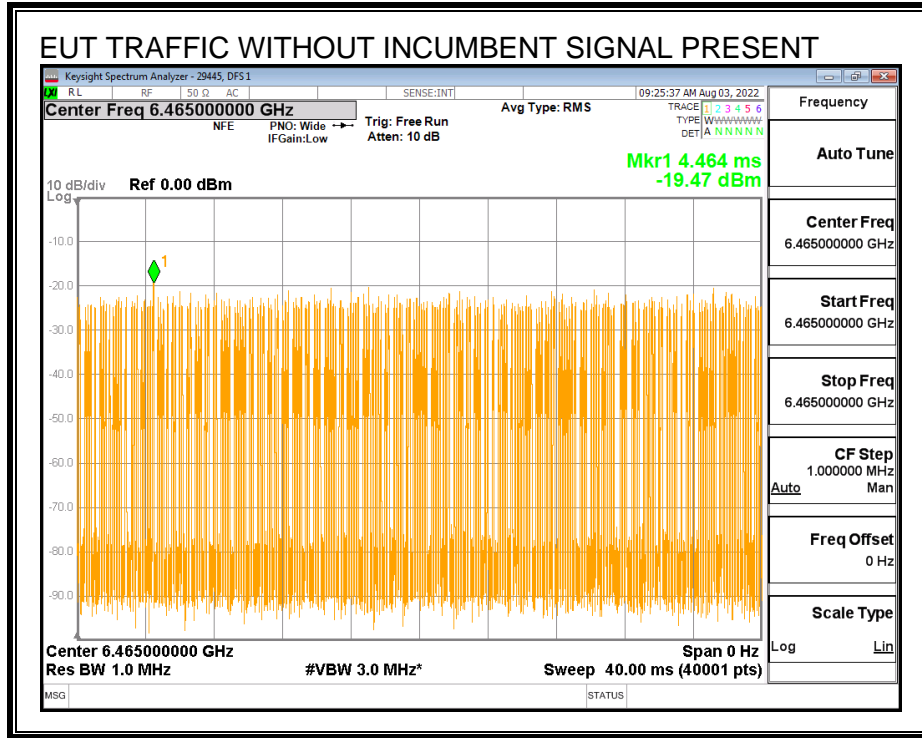
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 76.742 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

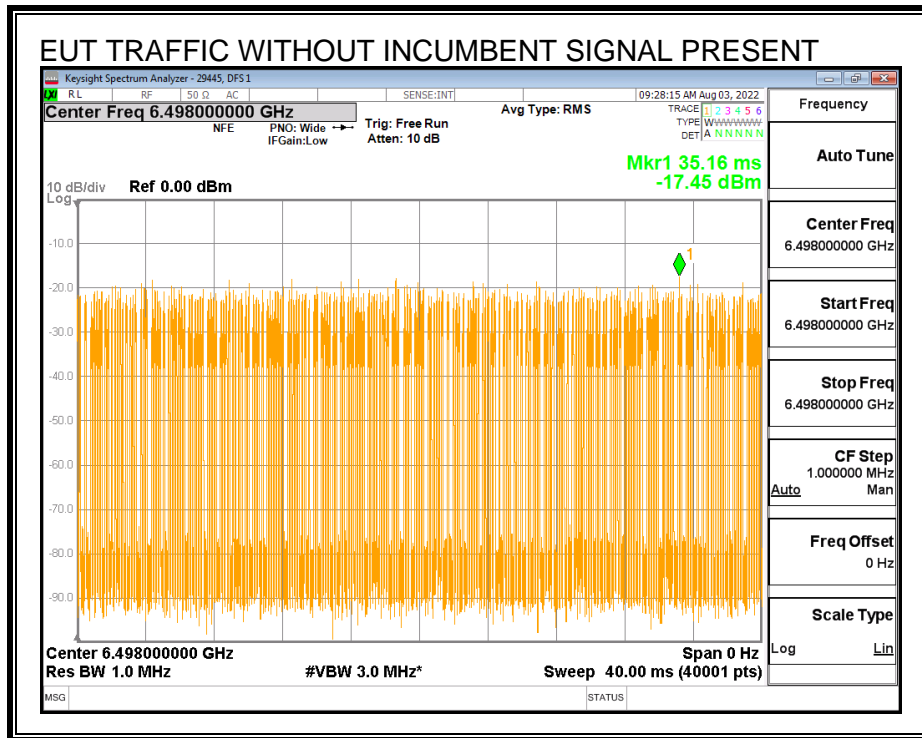
Lower Edge f_{c2} :



Center Frequency f_{c1} :



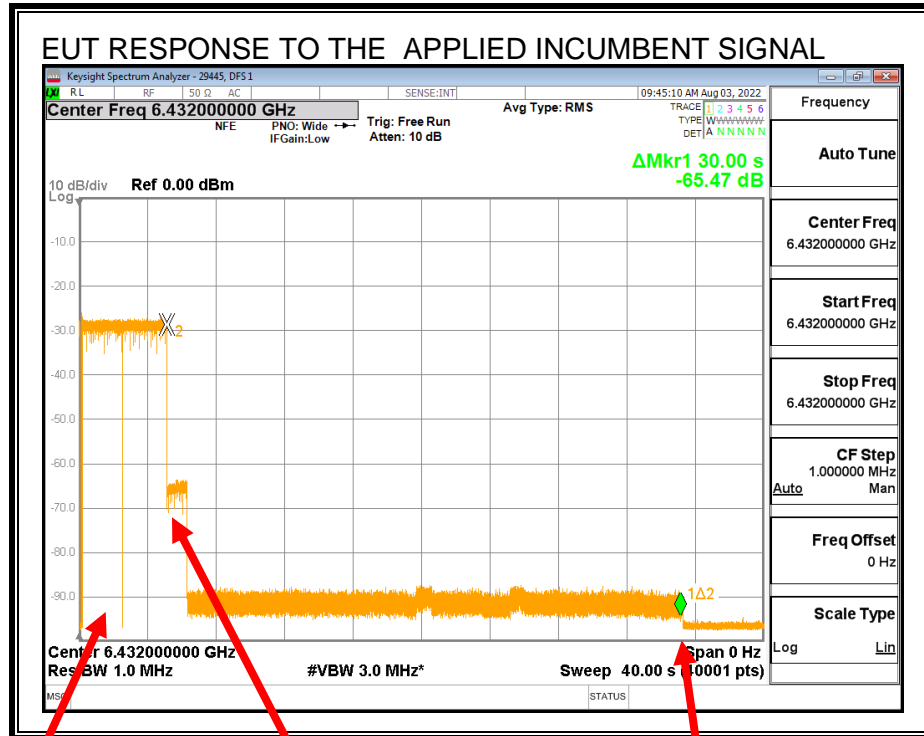
Upper Edge f_{c2} :



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 f_{c2} :



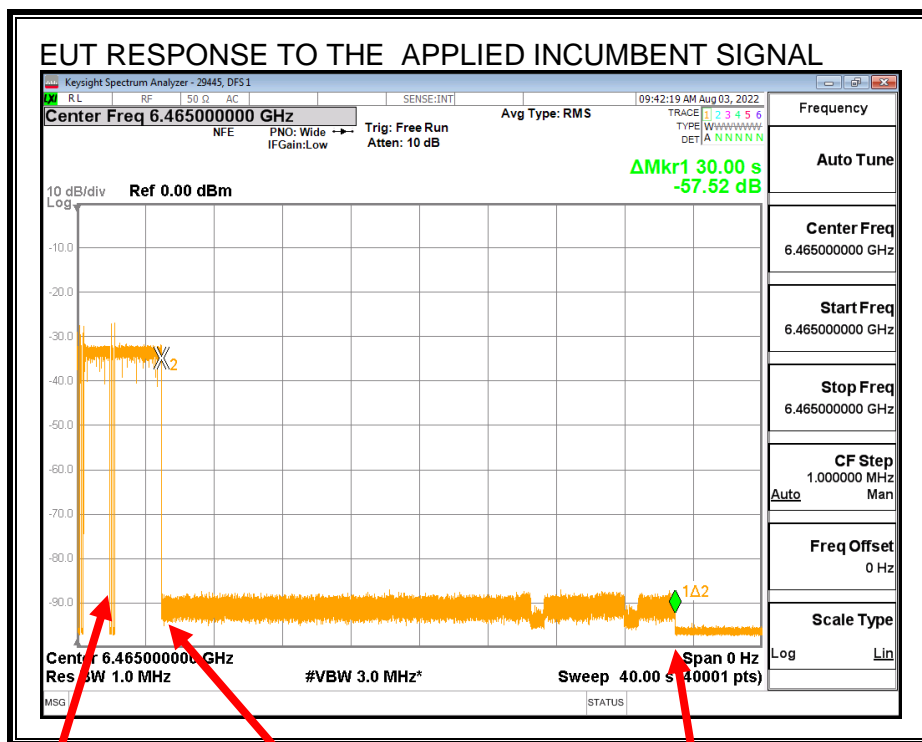
Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

Center Frequency Incumbent Signal f_{c1} :



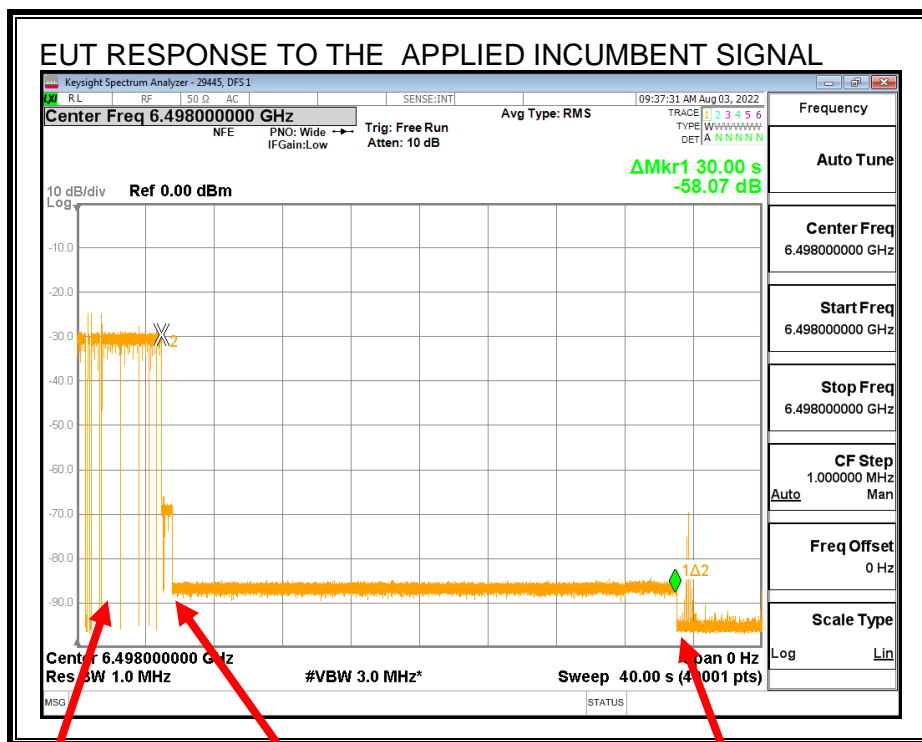
Normal Traffic

Application of Incumbent
 Transmissions Ceased

Incumbent Removed
 Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

Upper Edge Incumbent Signal f_{c3} :



Normal Traffic

Application of Incumbent
 Transmissions Ceased

Incumbent Removed
 Association to Companion Lost

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

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)	76.8
EUT 99% OBW Lower Edge, F_L (MHz)	6426.60
EUT 99% OBW Upper Edge, F_H (MHz)	6503.40
99% Occupied Bandwidth of the Incumbent Signal (MHz)	9.98
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)	2.7
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.3
Lowest Passing Measured Incumbent Signal Amplitude at f_{c2} (dBm)	
	-65.09
Margin (dBm)	-5.79
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c1} (dBm)	
	-59.89
Margin (dBm)	-0.59
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c3} (dBm)	
	-62.73
Margin (dBm)	-3.43
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

Trial	AWGN Detected (Yes / No)		
	Incumbent AWGN at f_{c2}	Incumbent AWGN at f_{c1}	Incumbent AWGN at f_{c3}
1	Yes	Yes	Yes
2	Yes	Yes	Yes
3	Yes	Yes	Yes
4	Yes	No	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: 08/03/22

Tested by: 29445

Test location: DFS 1

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

8.9.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c2} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-65.09	2.7	0	-67.79	-62	Ceased
-75.97	2.7	0	-78.67	-62	Minimal
-78.81	2.7	0	-81.51	-62	Normal

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-59.89	2.7	0	-62.59	-62	Ceased
-68.1	2.7	0	-70.8	-62	Minimal
-73.11	2.7	0	-75.81	-62	Normal

Incumbent AWGN at f_{c3} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-62.73	2.7	0	-65.43	-62	Ceased
-76.97	2.7	0	-79.67	-62	Minimal
-78.98	2.7	0	-81.68	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1

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

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

8.11.1. TEST CHANNEL

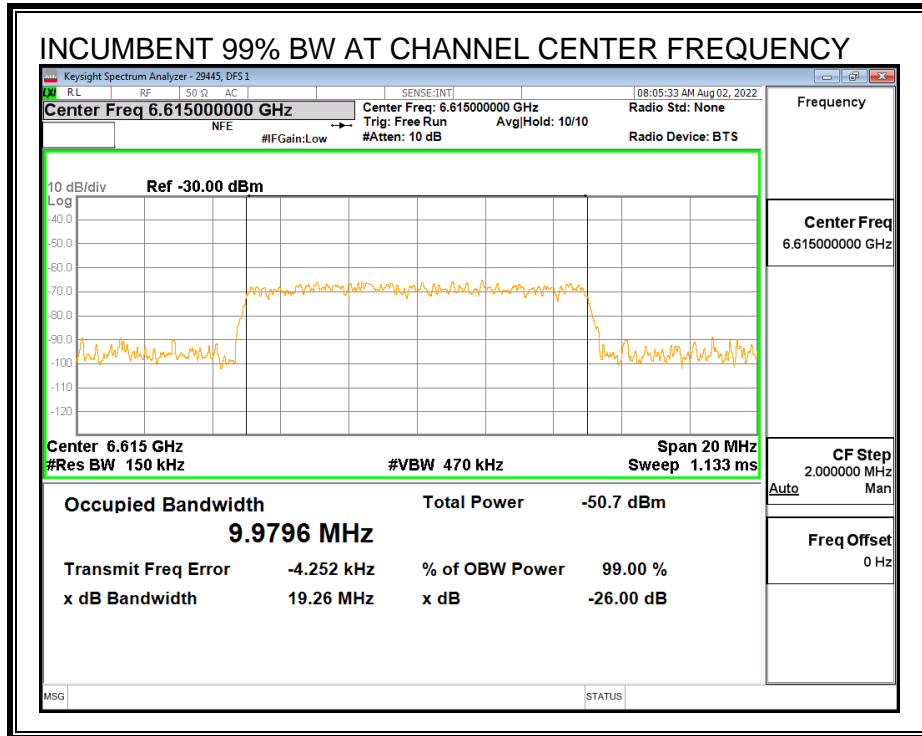
All tests were performed with the EUT set to a channel center frequency of 6615 MHz and a nominal channel bandwidth of 20 MHz.

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

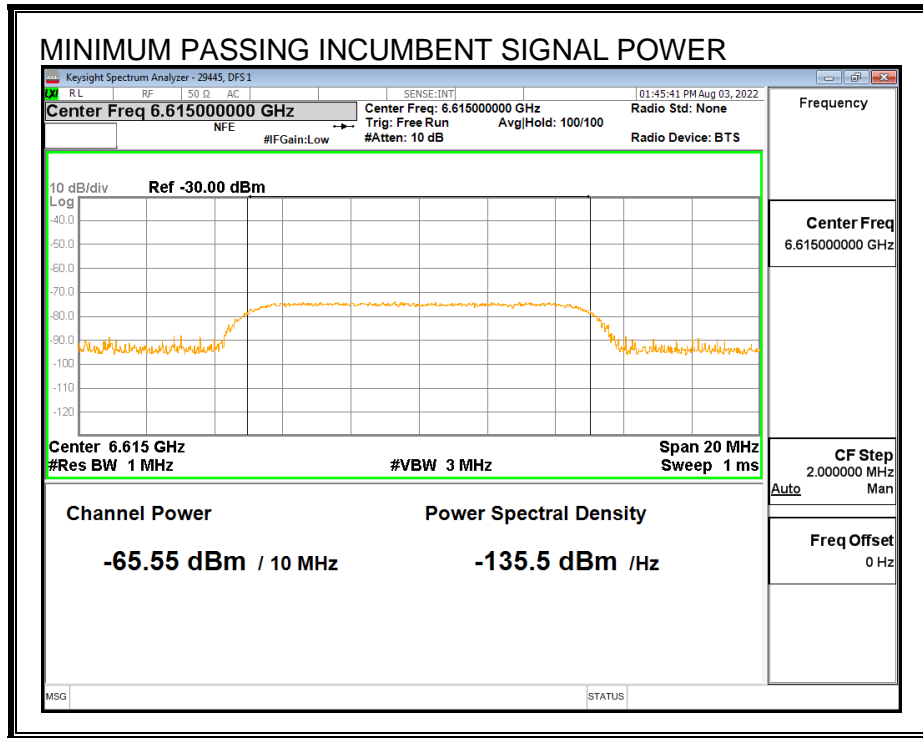
8.11.2. INCUMBENT SIGNAL PLOTS

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



MINIMUM PASSING INCUMBENT SIGNAL POWER

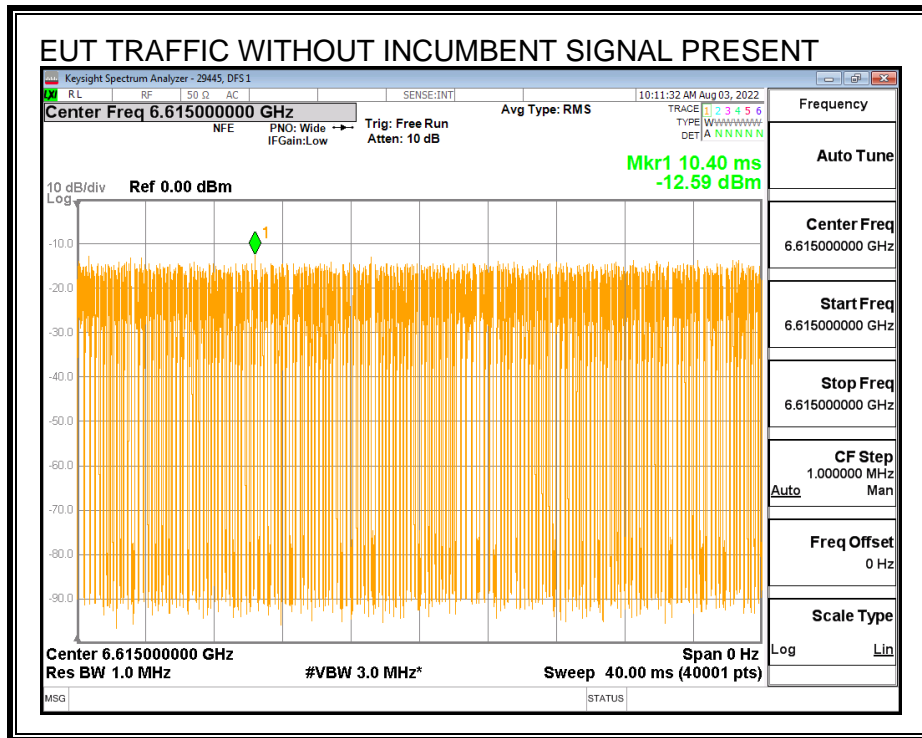


8.11.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

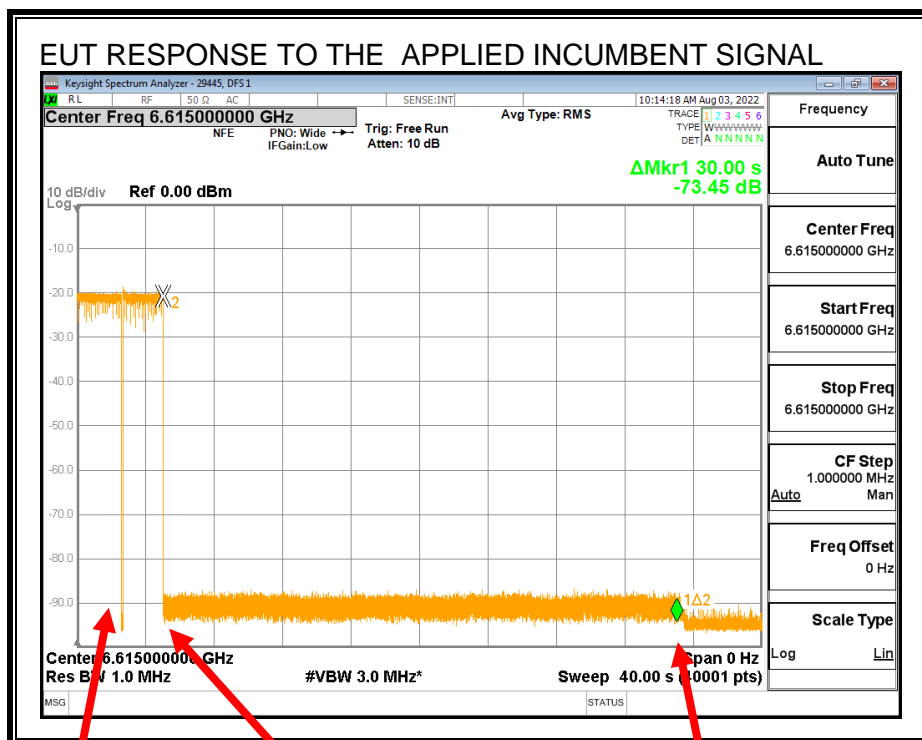
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 18.946 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



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.



Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Transmissions Resume

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

8.11.4. TABULATED TEST RESULTS

INCUMBENT SIGNAL DETECTION RESULTS

EUT Channel Center Frequency, f_{c1} (MHz)	6615
EUT Nominal Channel Bandwidth (MHz)	20
99% Occupied Bandwidth of the EUT (MHz)	18.9
EUT 99% OBW Lower Edge, F_L (MHz)	6605.55
EUT 99% OBW Upper Edge, F_H (MHz)	6624.45
Test Frequency of Incumbent Signal (MHz)	6615
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	3.0
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.0
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	
	-65.55
Margin (dBm)	-6.55
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

	AWGN Detected (Yes / No)
Trial	Incumbent AWGN at 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: 08/03/22

Tested by: 29445

Test location: DFS 1

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

8.11.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-65.55	3.0	0	-68.55	-62	Ceased
-75.14	3.0	0	-78.14	-62	Minimal
-76.96	3.0	0	-79.96	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1

8.12. U-NII 7 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

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

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

8.13. U-NII 7 BAND TEST CONDITION 4 RESULTS

TEST CONDITION 4 CRITERIA

$$99\% BW_{EUT} > 4 \times 99\% BW_{INC}$$

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.

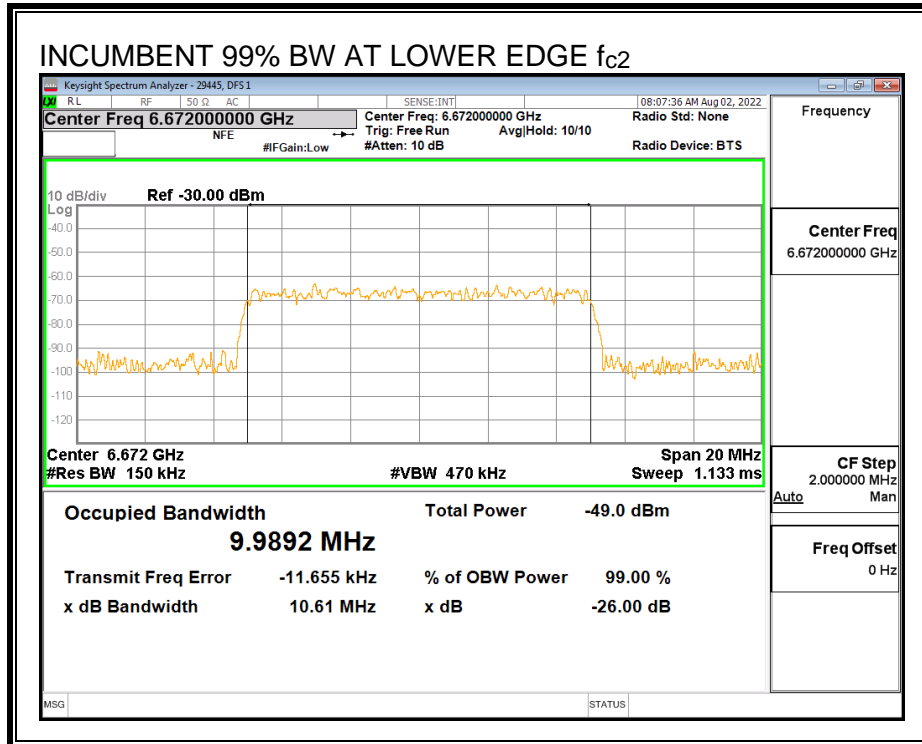
Only the lowest and highest supported channel bandwidths are required to be tested.

8.13.2. INCUMBENT SIGNAL PLOTS

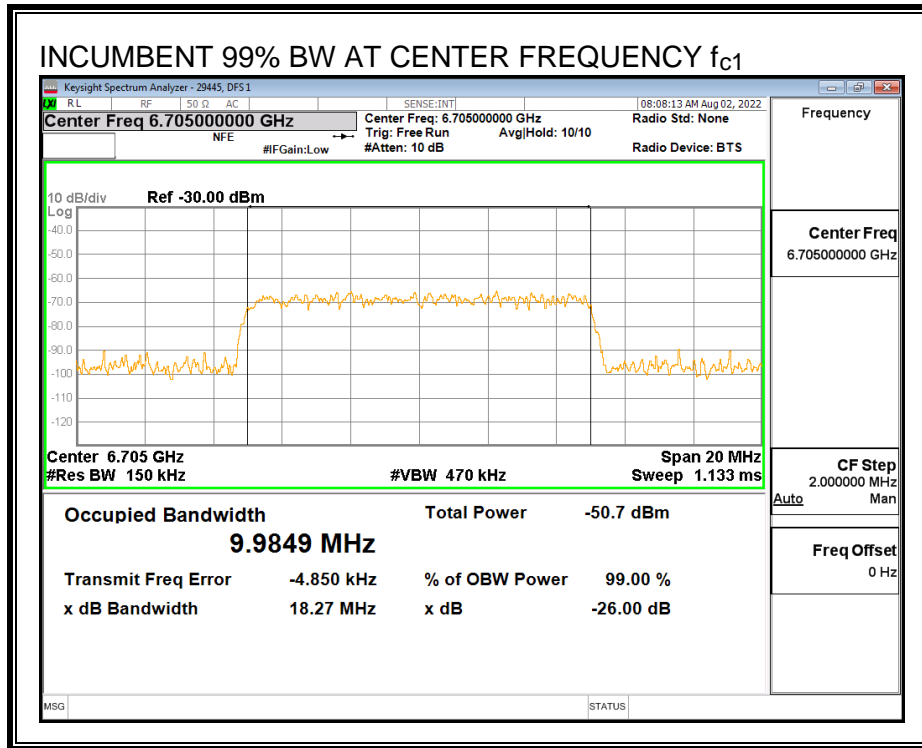
All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

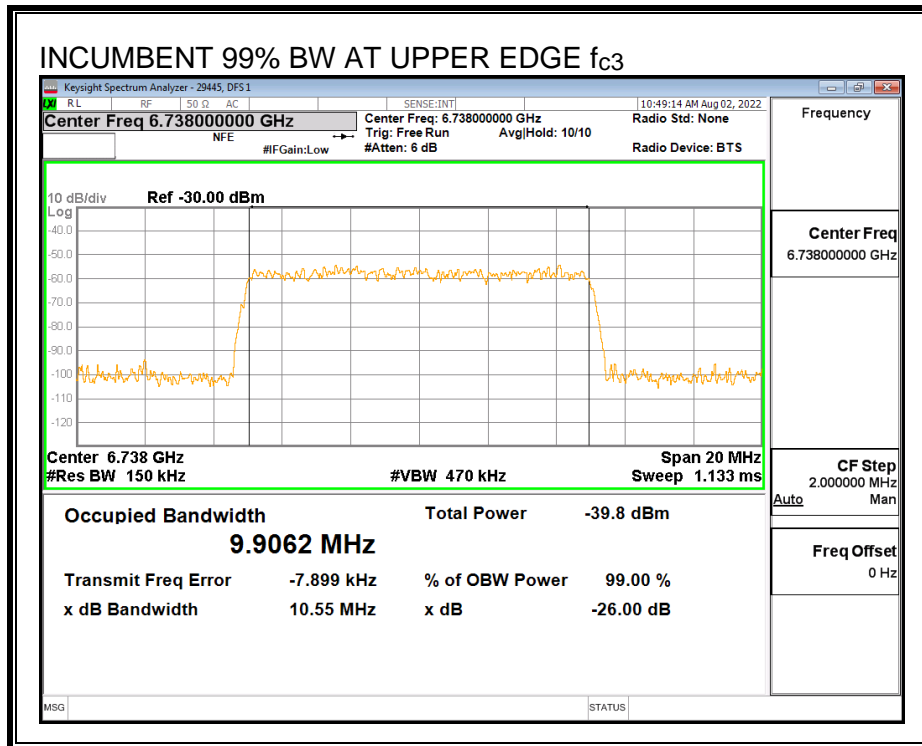
Lower Edge Incumbent Signal f_{c2} :



Center Frequency Incumbent Signal f_{c1} :

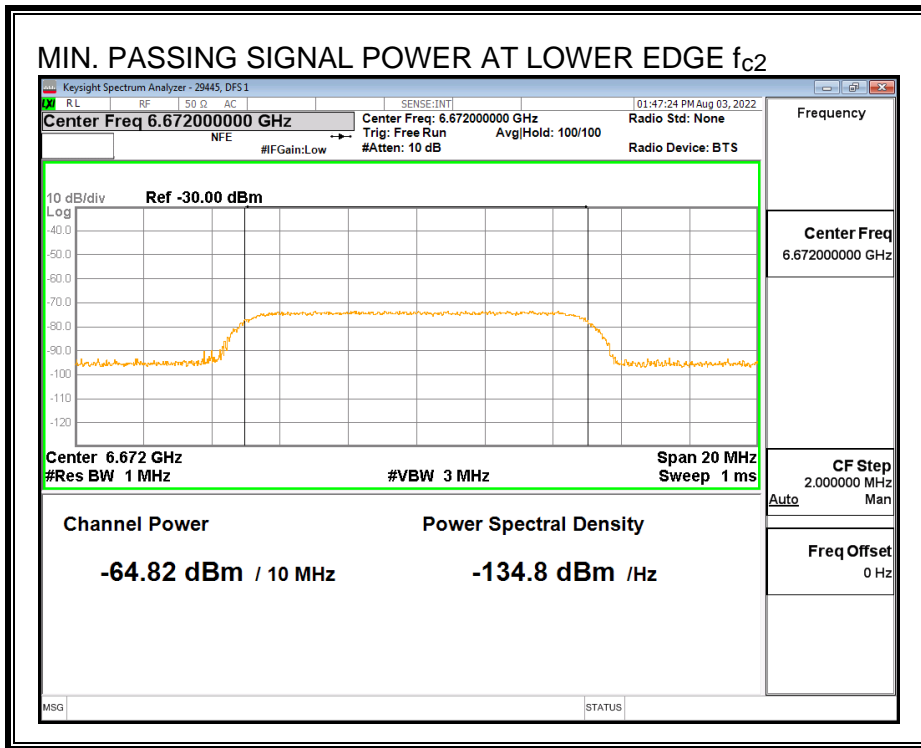


Upper Edge Incumbent Signal f_{c3} :

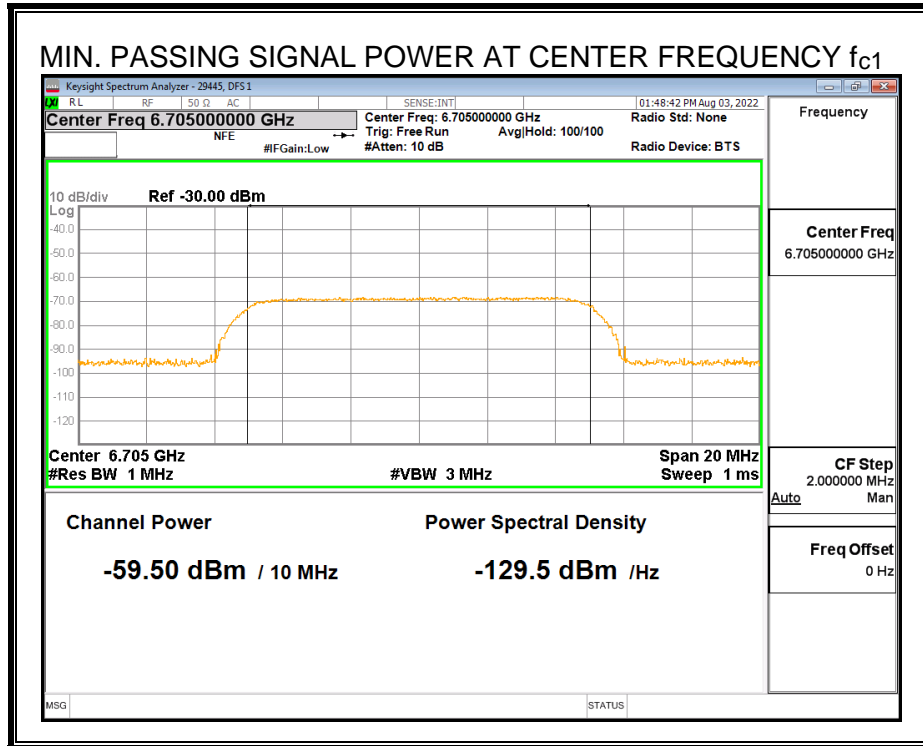


MINIMUM PASSING INCUMBENT SIGNAL POWER

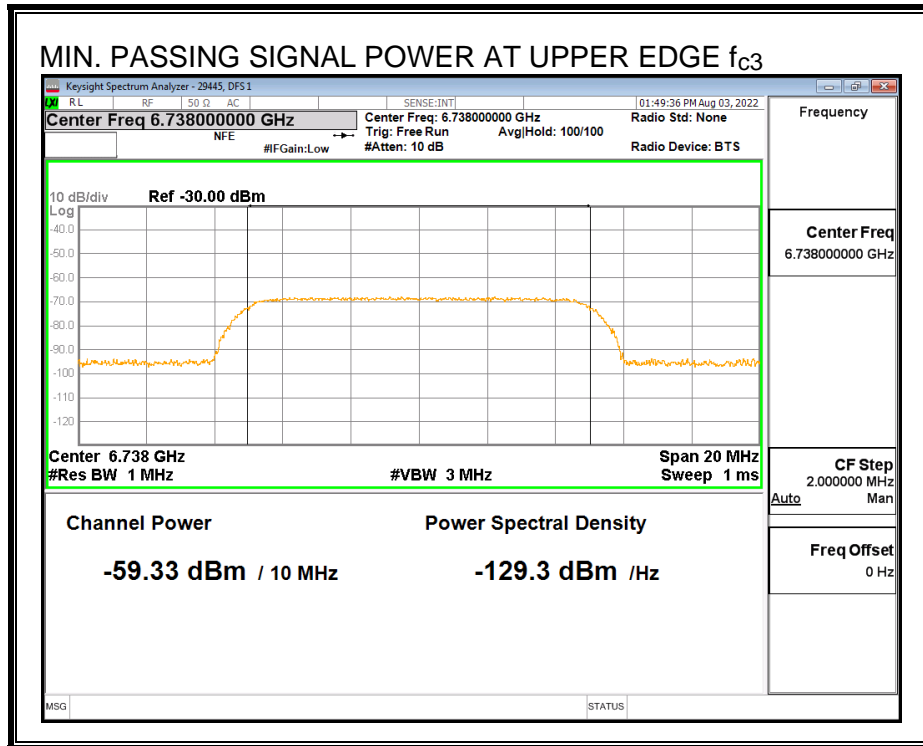
Lower Edge Incumbent Signal f_{c2} :



Center Frequency Incumbent Signal f_{c1} :



Upper Edge Incumbent Signal f_{c3} :



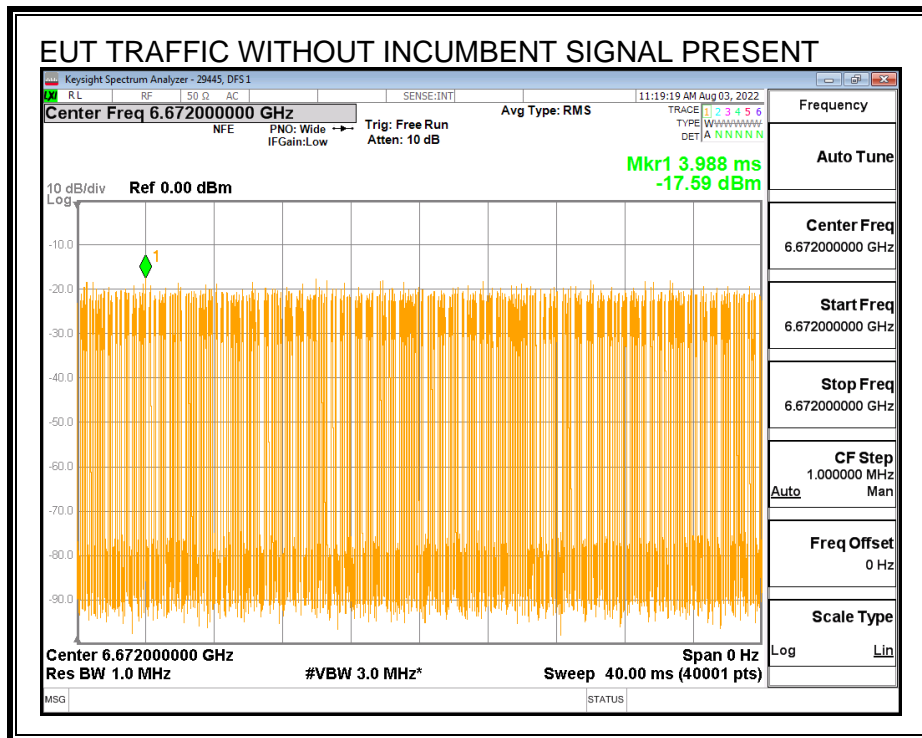
8.13.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

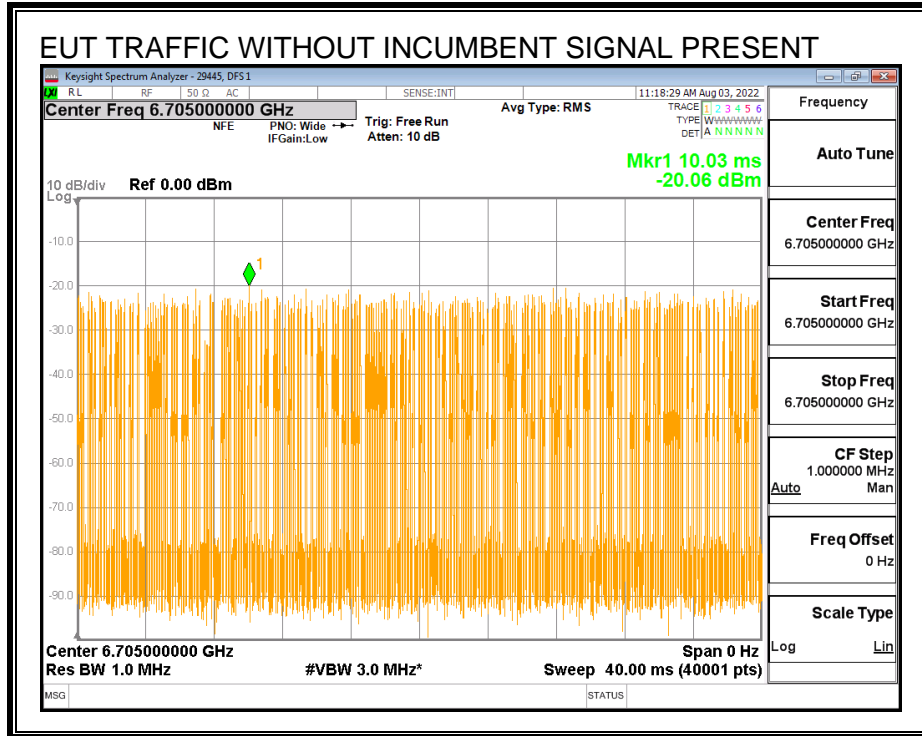
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 76.824 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

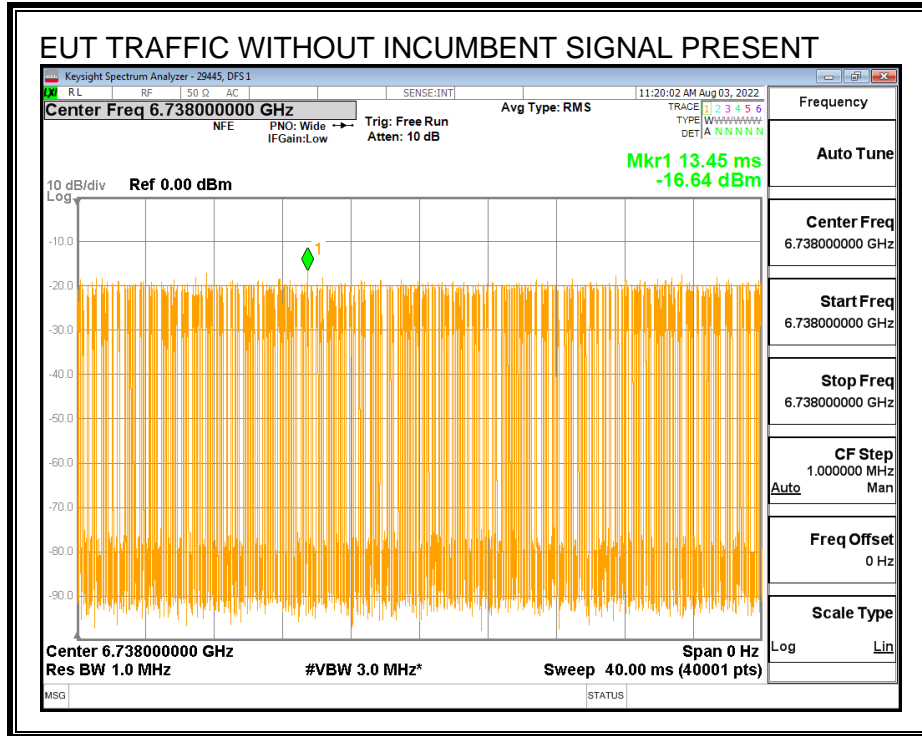
Lower Edge f_{c2} :



Center Frequency f_{c1} :



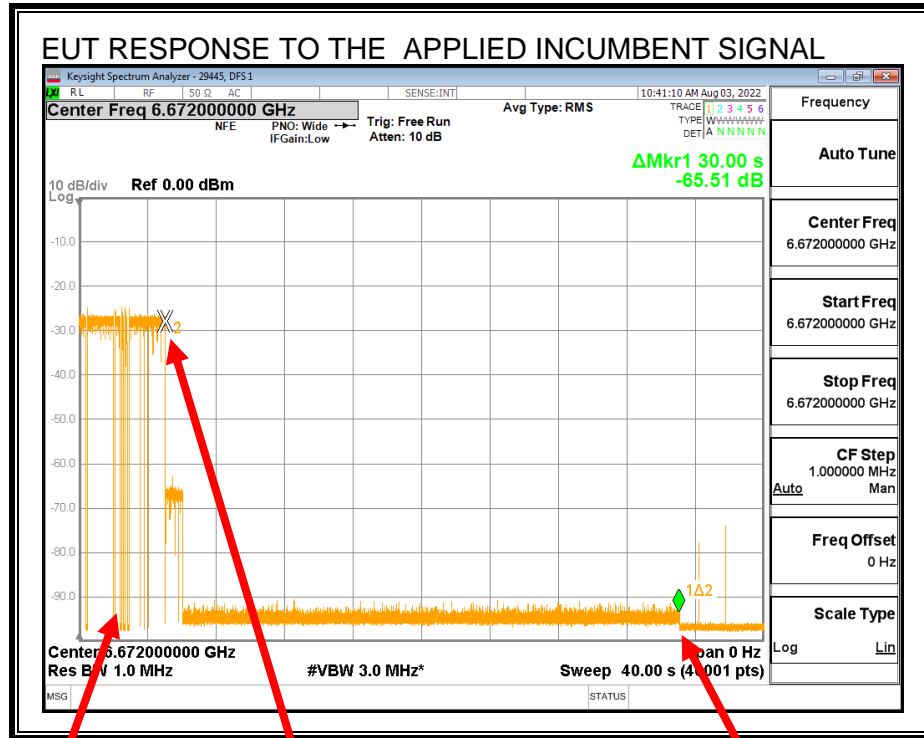
Upper Edge f_{c2} :



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 f_{c2} :



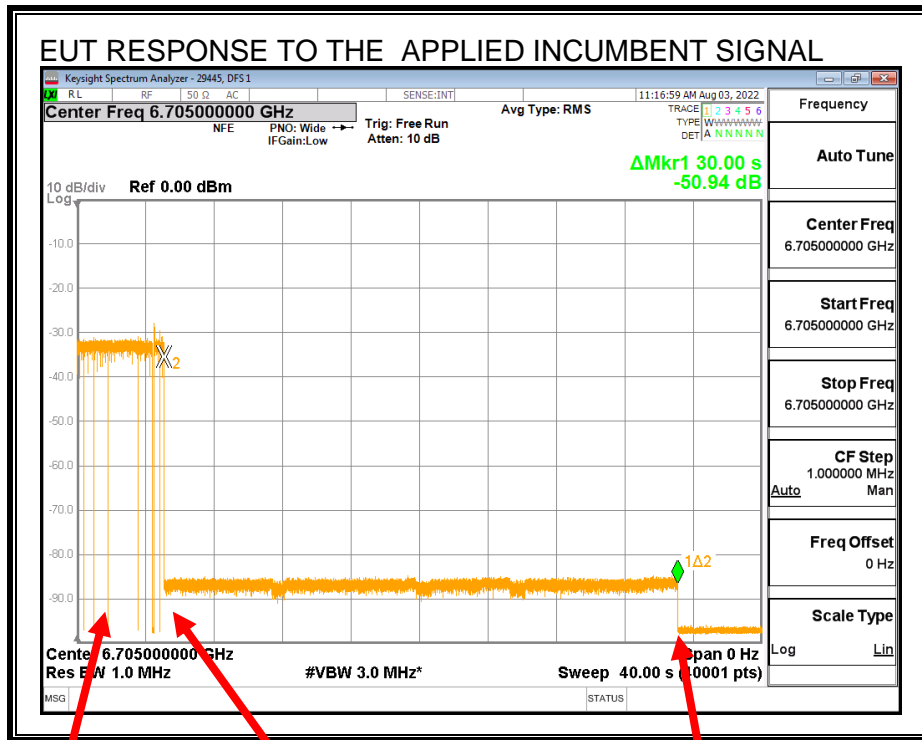
Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

Center Frequency Incumbent Signal f_{c1} :



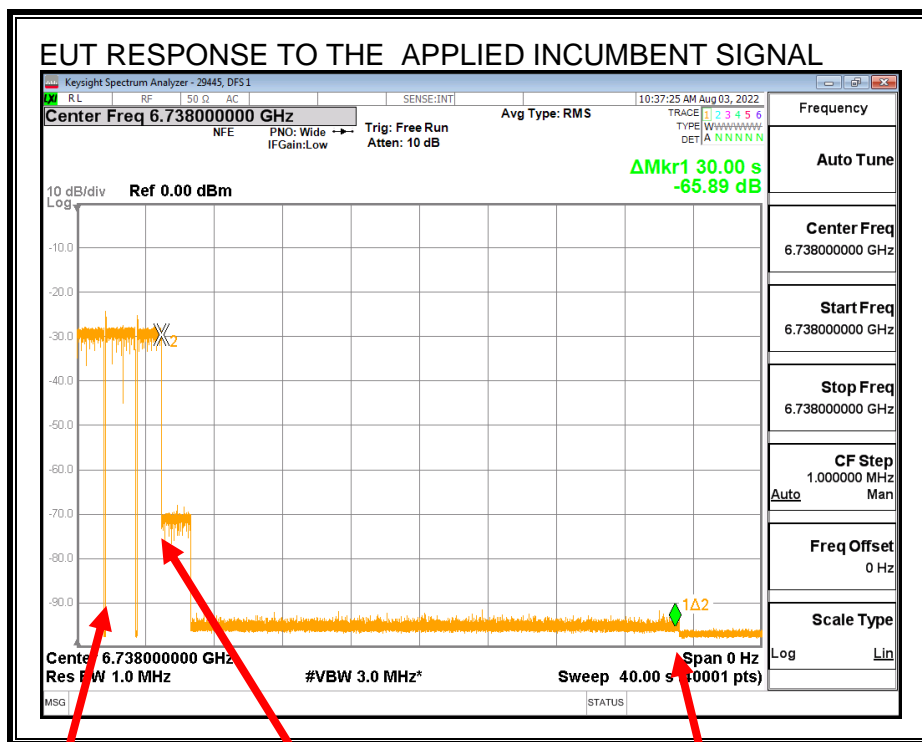
Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Association to Companion Lost

Transmissions cease while the Incumbent AWGN Signal is present and does not resume after it is removed due to the loss of the association to the Companion Device.

Upper Edge Incumbent Signal f_{c3} :



Normal Traffic

Application of Incumbent
 Transmissions Ceased

Incumbent Removed
 Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

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)	76.8
EUT 99% OBW Lower Edge, F_L (MHz)	6666.60
EUT 99% OBW Upper Edge, F_H (MHz)	6743.40
99% Occupied Bandwidth of the Incumbent Signal (MHz)	9.98
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)	3.0
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-59.0
Lowest Passing Measured Incumbent Signal Amplitude at f_{c2} (dBm)	
	-64.82
Margin (dBm)	-5.82
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c1} (dBm)	
	-59.5
Margin (dBm)	-0.50
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c3} (dBm)	
	-59.33
Margin (dBm)	-0.33
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

Trial	AWGN Detected (Yes / No)		
	Incumbent AWGN at f_{c2}	Incumbent AWGN at f_{c1}	Incumbent AWGN at 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: 08/03/22

Tested by: 29445

Test location: DFS 1

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

8.13.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c2} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-64.82	3.0	0	-67.82	-62	Ceased
-76.9	3.0	0	-79.9	-62	Minimal
-79.64	3.0	0	-82.64	-62	Normal

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-59.5	3.0	0	-62.5	-62	Ceased
-66.33	3.0	0	-69.33	-62	Minimal
-72.25	3.0	0	-75.25	-62	Normal

Incumbent AWGN at f_{c3} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-59.33	3.0	0	-62.33	-62	Ceased
-77.72	3.0	0	-80.72	-62	Minimal
-79.09	3.0	0	-82.09	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1

8.14. U-NII 8 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.

8.15. U-NII 8 BAND TEST CONDITION 2 RESULTS

TEST CONDITION 2 CRITERIA

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

8.15.1. TEST CHANNEL

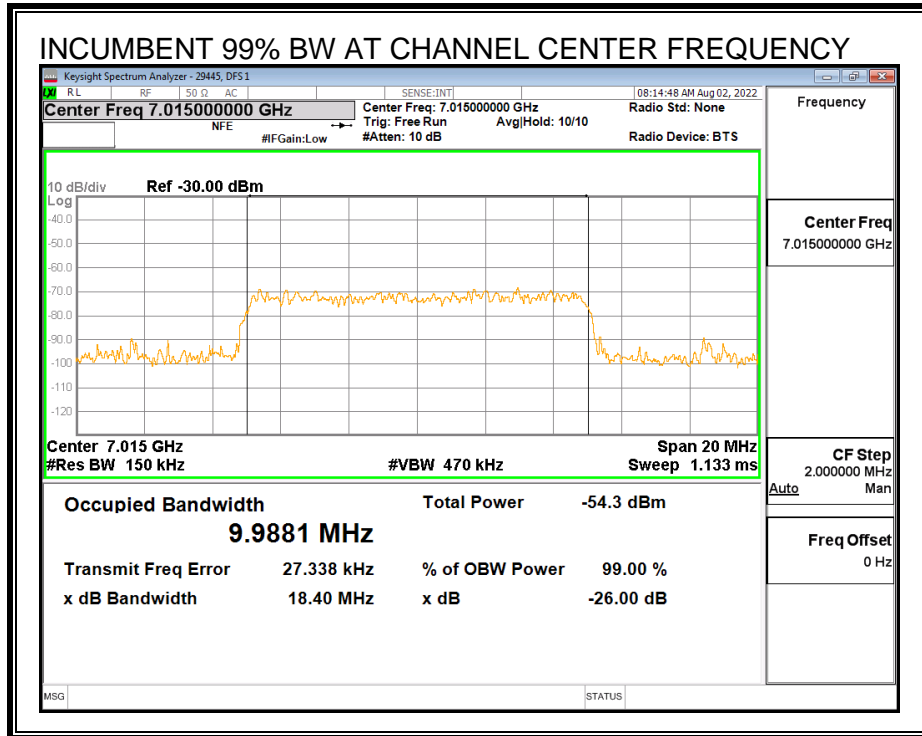
All tests were performed with the EUT set to a channel center frequency of 7015 MHz and a nominal channel bandwidth of 20 MHz.

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

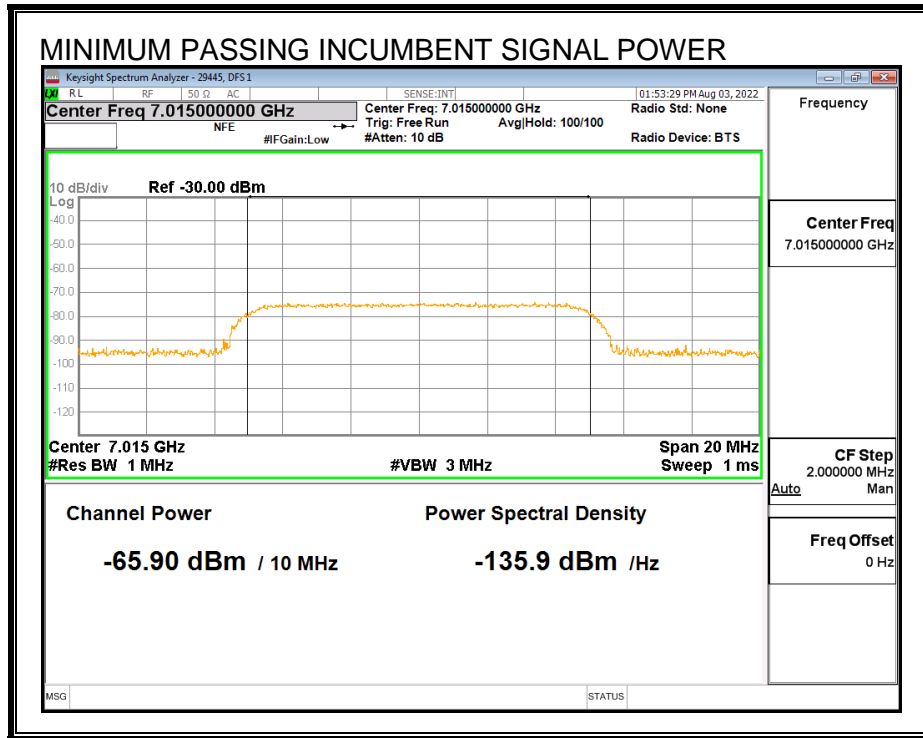
8.15.2. INCUMBENT SIGNAL PLOTS

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



MINIMUM PASSING INCUMBENT SIGNAL POWER

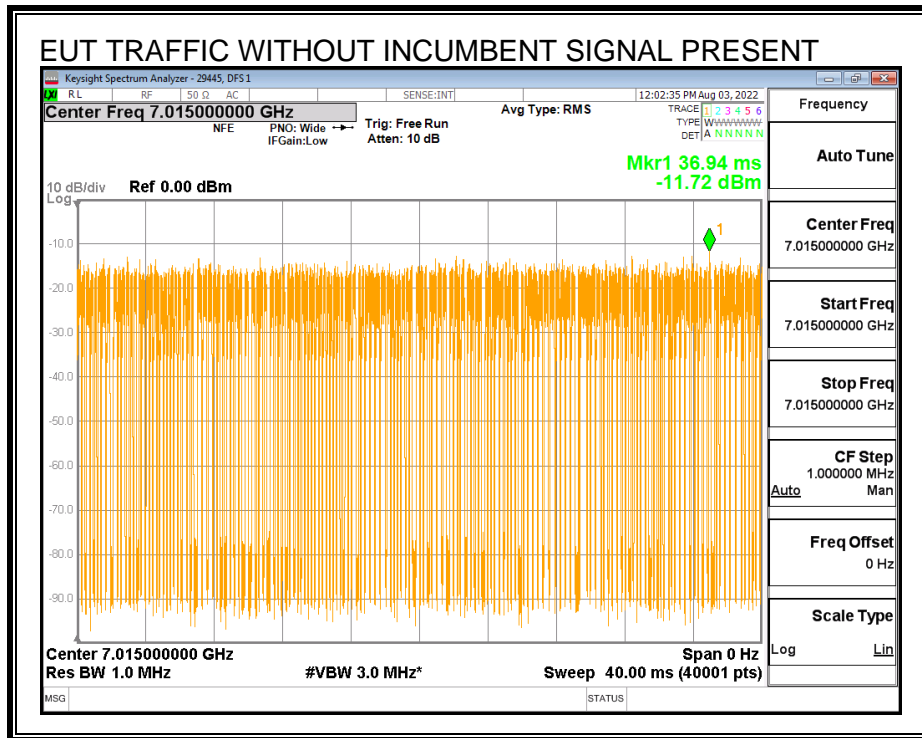


8.15.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

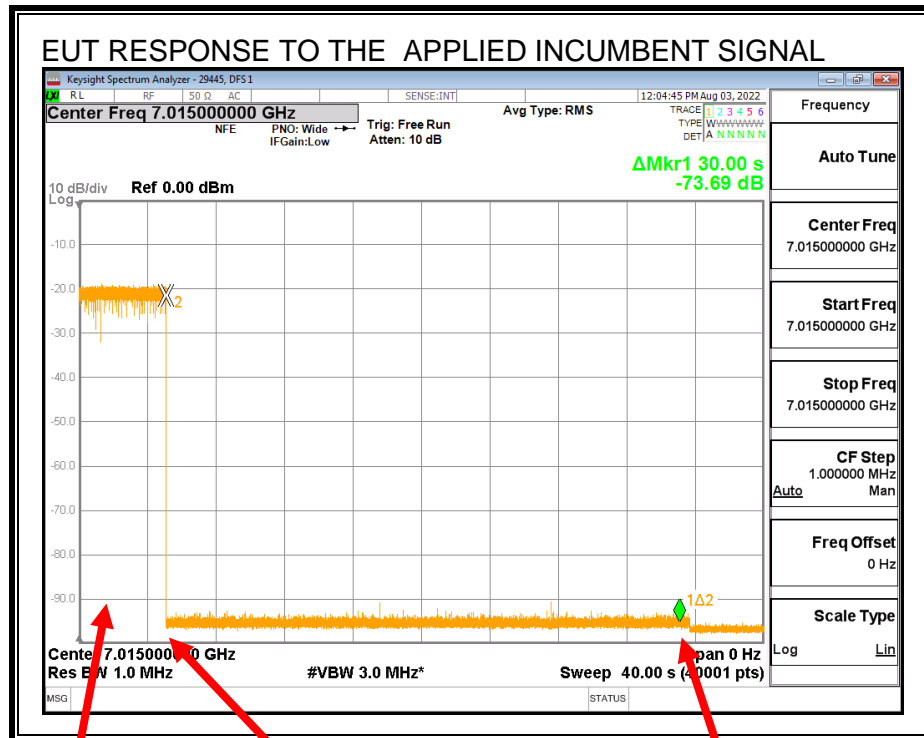
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 19.086 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT



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.



Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Transmissions Resume

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

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)	18.9
EUT 99% OBW Lower Edge, F_L (MHz)	7005.55
EUT 99% OBW Upper Edge, F_H (MHz)	7024.45
Test Frequency of Incumbent Signal (MHz)	7015
Maximum Allowed Incumbent Amplitude at Antenna (dBm)	-62
Minimum Antenna Gain (dBi)	3.5
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-58.5
Lowest Passing Measured Incumbent Signal Amplitude (dBm)	
	-65.9
Margin (dBm)	-7.40
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

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

Test Date: 08/03/22

Tested by: 29445

Test location: DFS 1

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

8.15.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-65.9	3.5	0	-69.4	-62	Ceased
-75.22	3.5	0	-78.72	-62	Minimal
-77.35	3.5	0	-80.85	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1

8.16. U-NII 8 BAND TEST CONDITION 3 RESULTS

TEST CONDITION 3 CRITERIA

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

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

8.17. U-NII 8 BAND TEST CONDITION 4 RESULTS

TEST CONDITION 4 CRITERIA

$$99\% BW_{EUT} > 4 \times 99\% BW_{INC}$$

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.

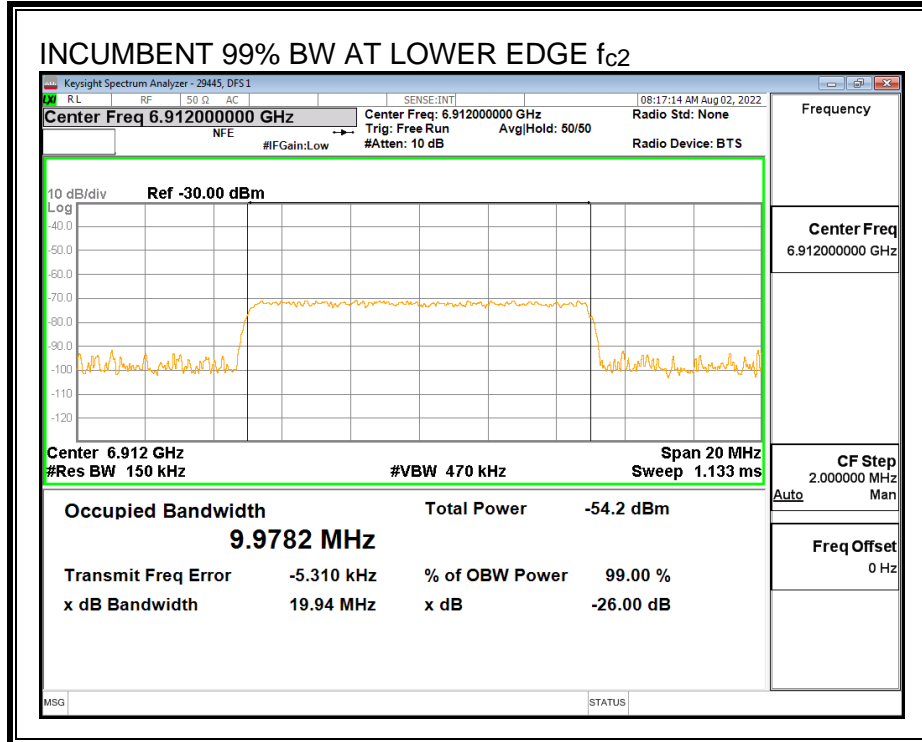
Only the lowest and highest supported channel bandwidths are required to be tested.

8.17.2. INCUMBENT SIGNAL PLOTS

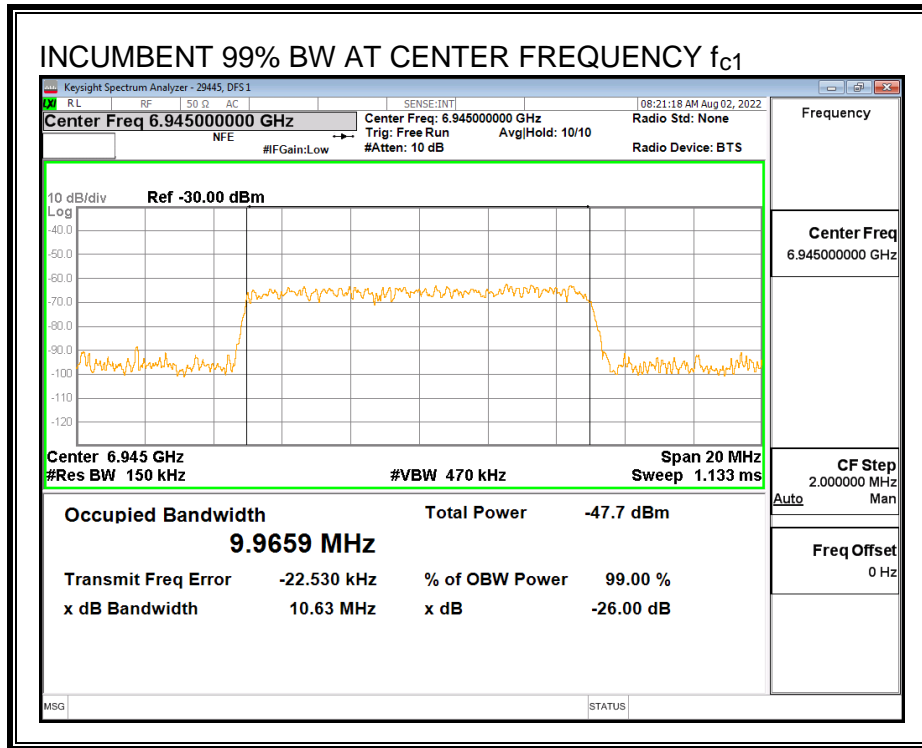
All tests were performed with the Incumbent Signal frequency set to the test channel center frequency and a nominal 99% Occupied Power Bandwidth of 10 MHz.

INCUMBENT SIGNAL 99% OCCUPIED POWER BANDWIDTH

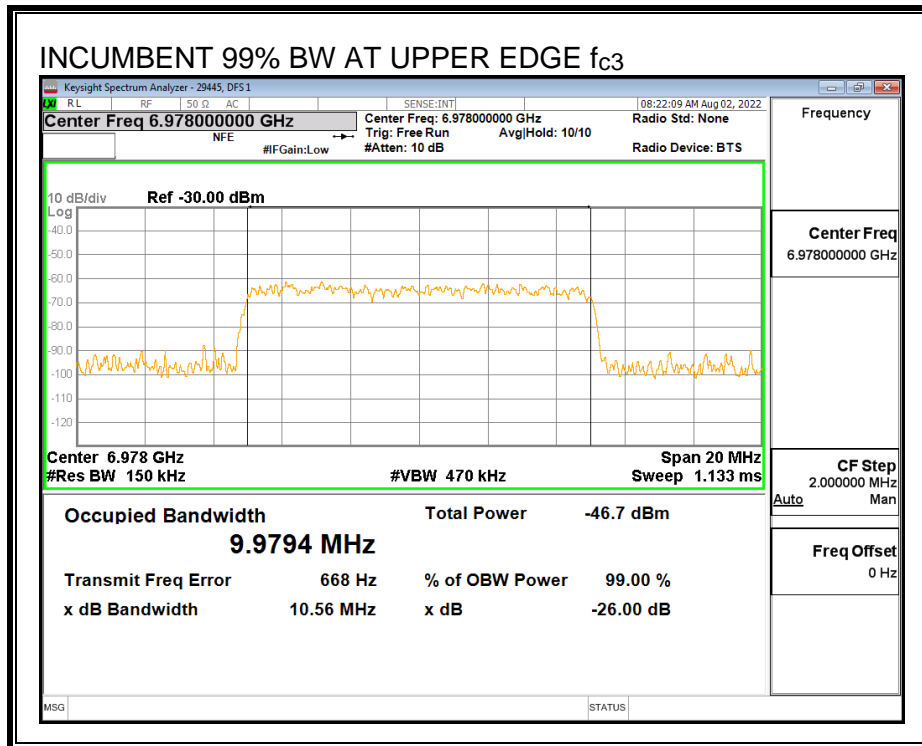
Lower Edge Incumbent Signal f_{c2} :



Center Frequency Incumbent Signal f_{c1} :

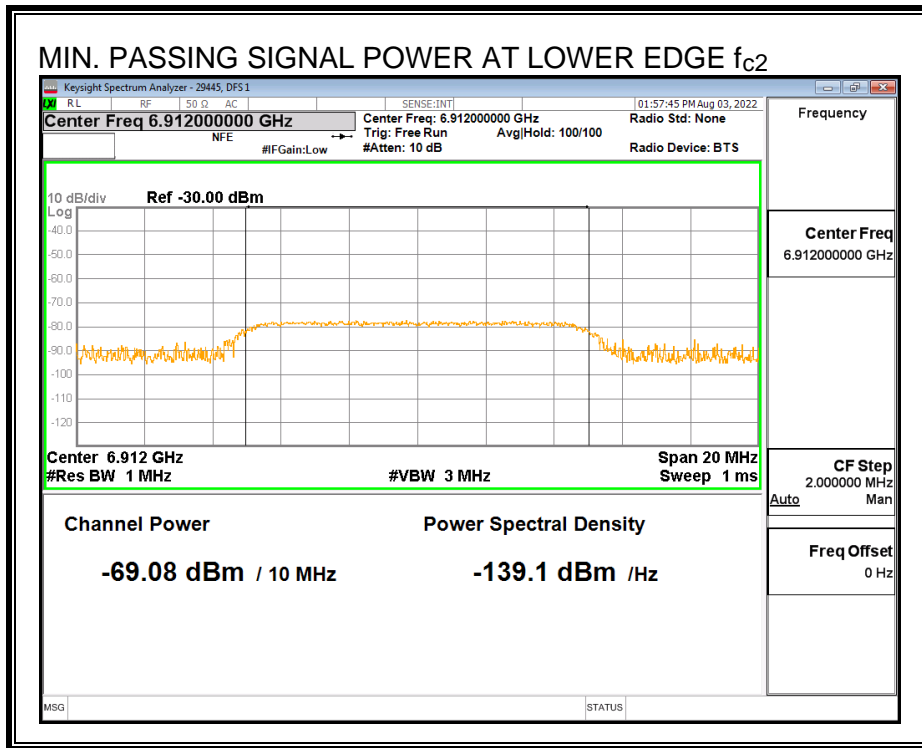


Upper Edge Incumbent Signal f_{c3} :

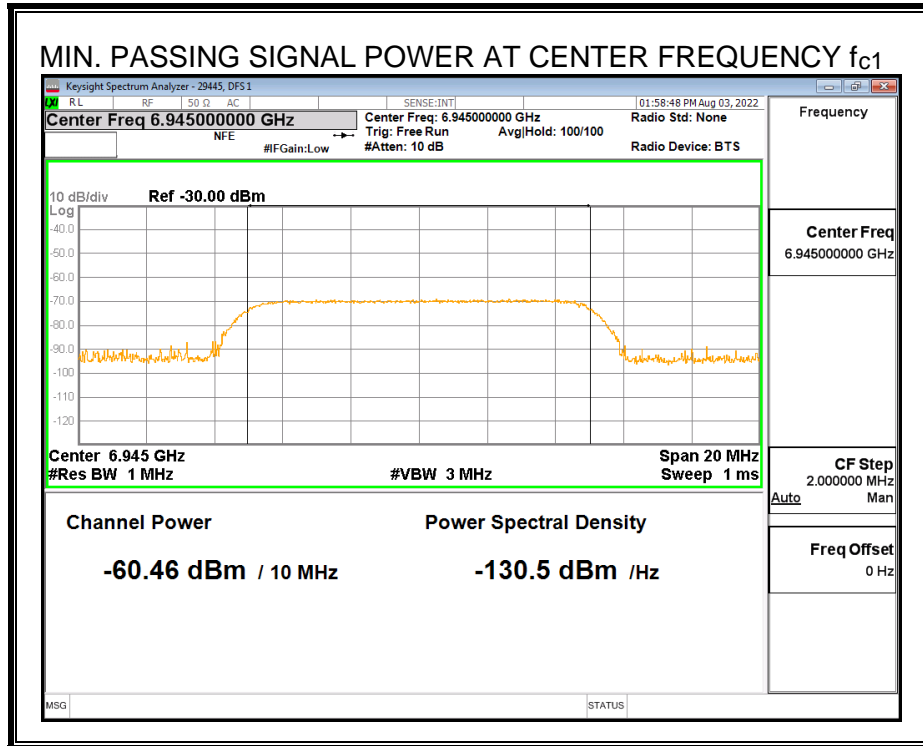


MINIMUM PASSING INCUMBENT SIGNAL POWER

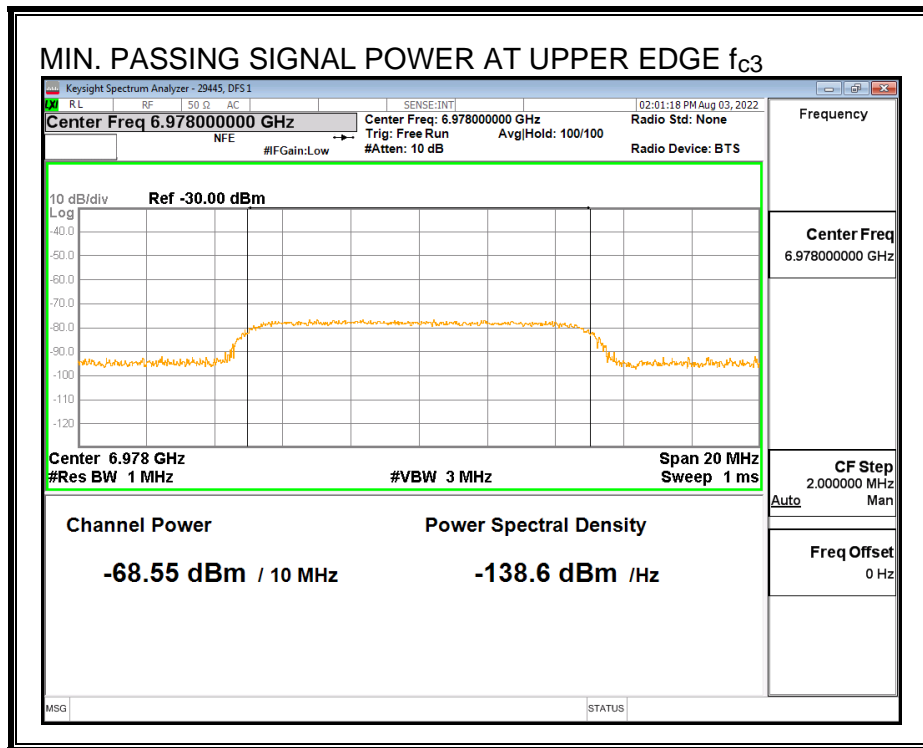
Lower Edge Incumbent Signal f_{c2} :



Center Frequency Incumbent Signal f_{c1} :



Upper Edge Incumbent Signal f_{c3} :



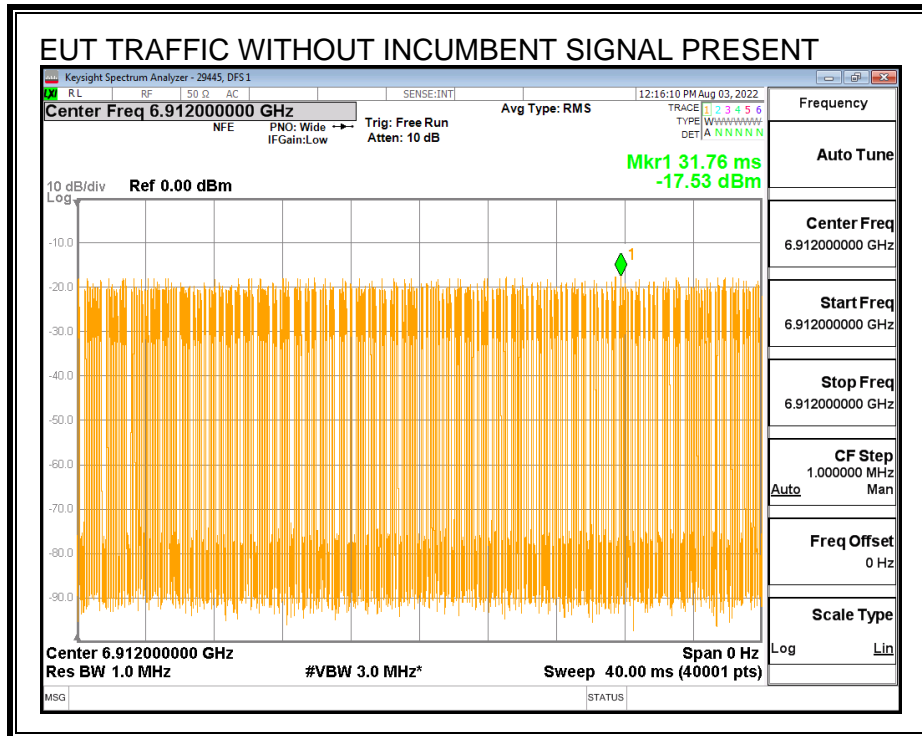
8.17.3. EUT TRANSMISSION PLOTS

EUT 99% OCCUPIED POWER BANDWIDTH

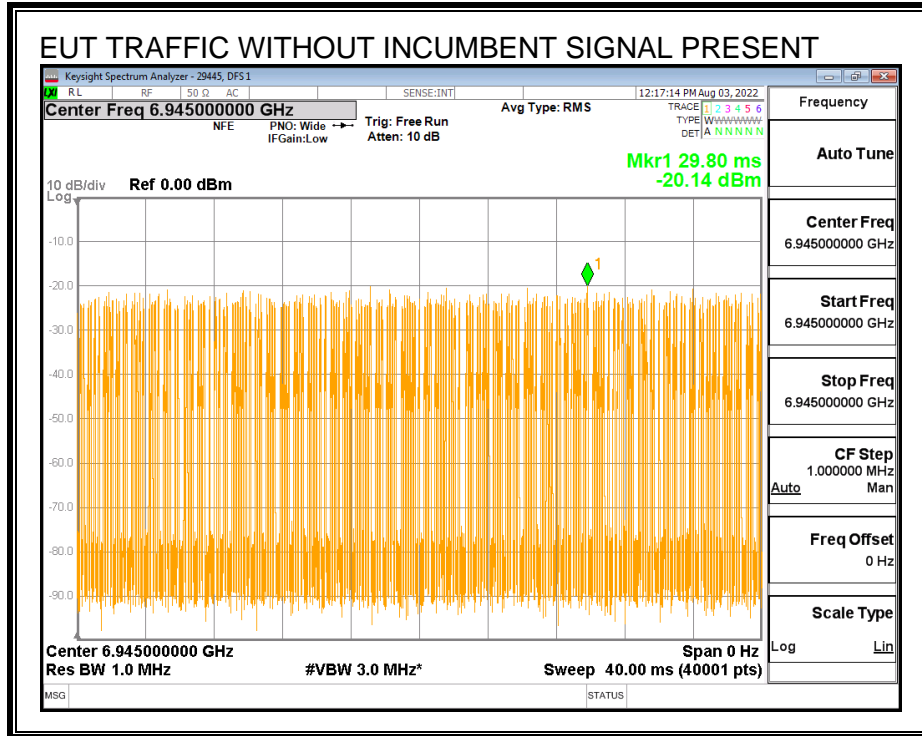
The manufacturer has declared that the maximum 99% Occupied Channel Bandwidth is 76.771 MHz.

TRAFFIC WITHOUT THE INCUMBENT SIGNAL PRESENT

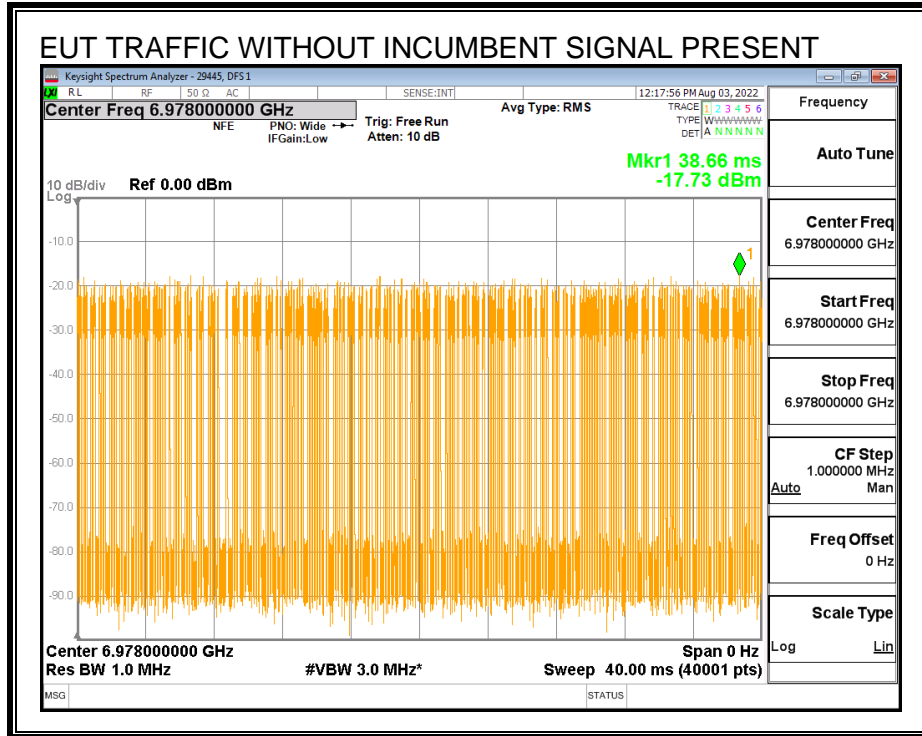
Lower Edge f_{c2} :



Center Frequency f_{c1} :



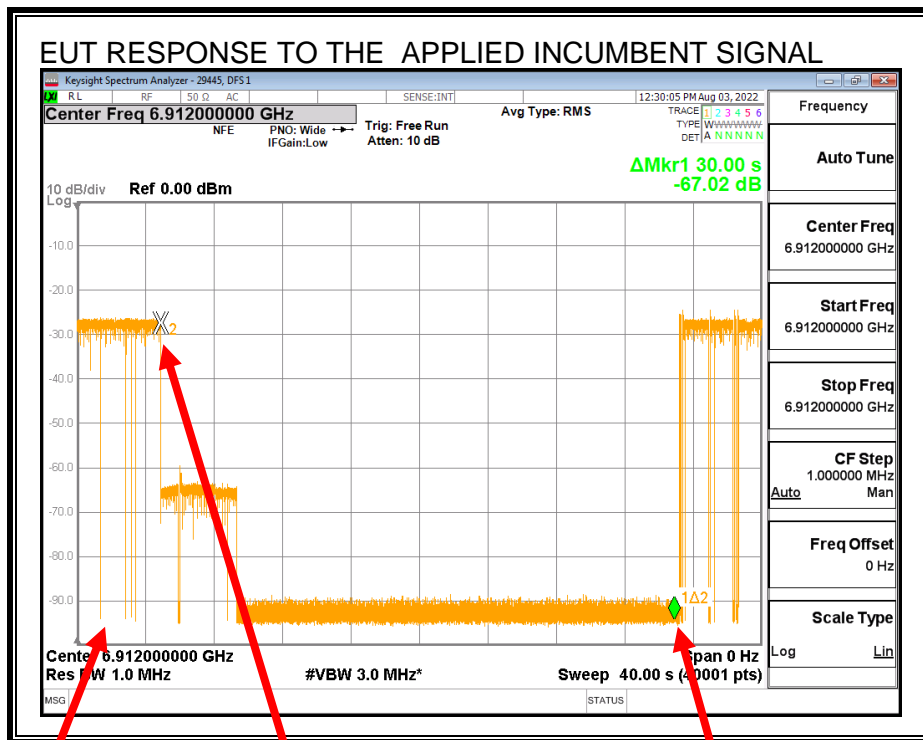
Upper Edge f_{c2} :



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 f_{c2} :



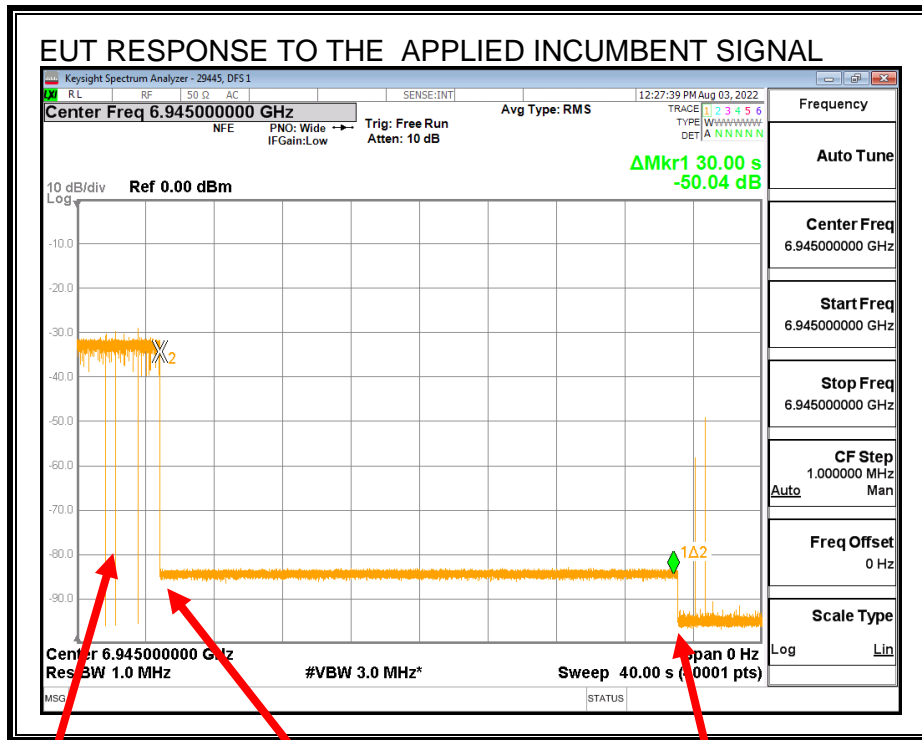
Normal Traffic

Application of Incumbent
 Transmissions Ceased

Incumbent Removed
 Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

Center Frequency Incumbent Signal f_{c1} :



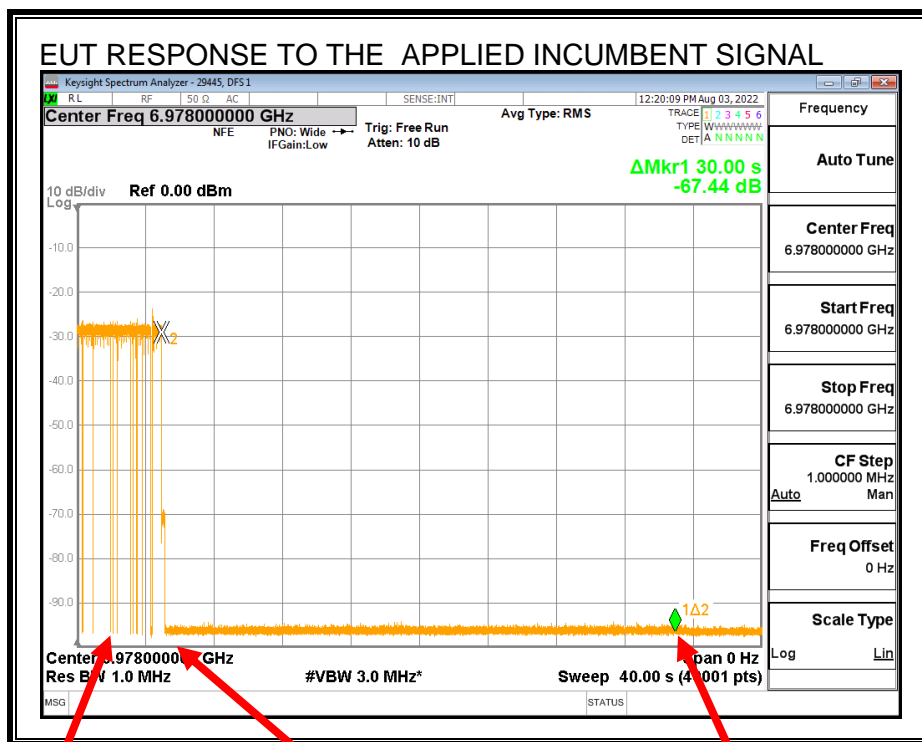
Normal Traffic

Application of Incumbent
Transmissions Ceased

Incumbent Removed
Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

Upper Edge Incumbent Signal f_{c3} :



Normal Traffic

Application of Incumbent
 Transmissions Ceased

Incumbent Removed
 Transmissions Resume

Transmissions cease while the Incumbent AWGN Signal is present and resume after it is removed. Lower amplitude transmissions observed after the application of the Incumbent AWGN Signal is applied are signals from adjacent 20 MHz sub-channel which is not required to cease transmissions.

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)	76.8
EUT 99% OBW Lower Edge, F_L (MHz)	6906.60
EUT 99% OBW Upper Edge, F_H (MHz)	6983.40
99% Occupied Bandwidth of the Incumbent Signal (MHz)	9.98
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)	3.50
Maximum Allowed Incumbent Amplitude at Radio Port (dBm)	-58.5
Lowest Passing Measured Incumbent Signal Amplitude at f_{c2} (dBm)	
	-69.08
Margin (dBm)	-10.58
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c1} (dBm)	
	-60.46
Margin (dBm)	-1.96
Result (PASS / FAIL)	PASS
Lowest Passing Measured Incumbent Signal Amplitude at f_{c3} (dBm)	
	-68.55
Margin (dBm)	-10.05
Result (PASS / FAIL)	PASS

Test Date: 08/02 and 03/22

Tested by: 29445

Test location: DFS 1

INCUMBENT SIGNAL DETECTION CERTAINTY RATE

Trial	AWGN Detected (Yes / No)		
	Incumbent AWGN at f_{c2}	Incumbent AWGN at f_{c1}	Incumbent AWGN at f_{c3}
1	Yes	Yes	Yes
2	Yes	No	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: 08/03/22

Tested by: 29445

Test location: DFS 1

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

8.17.5. Tx OPERATIONAL STATUS TEST RESULTS

Incumbent AWGN at f_{c2} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-69.08	3.5	0	-72.58	-62	Ceased
-76.57	3.5	0	-80.07	-62	Minimal
-78.13	3.5	0	-81.63	-62	Normal

Incumbent AWGN at f_{c1} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-60.46	3.5	0	-63.96	-62	Ceased
-67.79	3.5	0	-71.29	-62	Minimal
-73.03	3.5	0	-76.53	-62	Normal

Incumbent AWGN at f_{c3} :

Measured AWGN Power at the EUT Radio Port (dBm)	Antenna Gain (dBi)	Antenna Cable Path Loss (dB)	Adjusted Radiated Power at the Antenna (dBm)	Detection Limit (dBm)	EUT Tx Status
-68.55	3.5	0	-72.05	-62	Ceased
-76.45	3.5	0	-79.95	-62	Minimal
-78.36	3.5	0	-81.86	-62	Normal

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

Test Date: 10/24/22

Tested by: 29445

Test location: DFS 1