

FCC Test Report

Report No.: AGC12060240301FR03

FCC ID : 2AY4C-GAX01

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION: Mini PC

BRAND NAME : GEEKOM, geeknuc

AX8 Max, XT***Pro, XT***Max, A***, A***Pro, A***Max, AX***, AX***Pro, AX***Max, AE***, AE***Pro, AE***Max, GT***, GT***Max, GT***Pro, XU***, XU***Pro, XU***Max,

MODEL NAME : AG^{**} Pro, AG^{***} Max, GT^{***} Ultra, GT^{***} Mega, U^{***} Ultra,

U*** Mega, XT***Ultra, XT***Mega, IT***Ultra,

 $IT^{***}Mega(*= 0-9,A-Z,a-z,""-"or blank)$

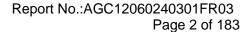
APPLICANT: Shenzhen Jiteng Network Technology Co., Ltd

DATE OF ISSUE : Jul. 11, 2024

STANDARD(S) : FCC Part 15 Subpart C §15.247

REPORT VERSION: V

Attestation of Global Compliance (Shenzhen) Co., Ltd





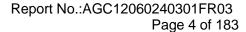
Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 11, 2024	Valid	Initial Release



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1. General Information

Applicant	Shenzhen Jiteng Network Technology Co., Ltd					
	Floor 7, Building B, Boton Science and Technology Park, Chaguang Road, Xili					
Address	Street, Nanshan District, Shenzhen, China					
Manufacturer	Shenzhen Jiteng Network Technology Co., Ltd					
Address	Floor 7, Building B, Boton Science and Technology Park, Chaguang Road, Xili					
Address	Street, Nanshan District, Shenzhen, China					
Factory	China Greatwall Technology Group Co., Ltd.Shiyan Branch					
Address	Great-Wall Computer Industry Park, Baoshi East Rd.Shiyan County, Baoan,					
Address	Shenzhen, P.R.China					
Product Designation	Mini PC					
Brand Name GEEKOM, geeknuc						
Test Model	AX8 Max					
	XT***Pro, XT***Max, A***, A***Pro, A***Max, AX***, AX***Pro, AX***Max, AE***,					
Sorios Model(s)	AE***Pro, AE***Max, GT***, GT***Max, GT***Pro, XU***, XU***Pro, XU***Max,					
Series Model(s)	AG***Pro, AG***Max, GT***Ultra, GT***Mega, U***Ultra, U*** Mega, XT***Ultra,					
	XT***Mega, IT***Ultra, IT***Mega(*= 0-9,A-Z,a-z,""-"or blank)					
Difference Description	Please review the manufacturer's model difference statement					
Date of receipt of test item	Mar. 14, 2024					
Date of Test	Mar. 14, 2024~Jul. 11, 2024					
Deviation from Standard	No any deviation from the test method					
Condition of Test Sample	Normal					
Test Result	Pass					
Test Report Form No	AGCER-FCC-2.4GWLAN-V1					

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Alan Duan	
	Alan Duan (Project Engineer)	Jul. 11, 2024
Reviewed By	Calin Liu	
	Calvin Liu (Reviewer)	Jul. 11, 2024
Approved By	Max Zhang	
	Max Zhang Authorized Officer	Jul. 11, 2024



2. Product Information

2.1 Product Technical Description

Equipment Type	WLAN 2.4G		
Frequency Band	2400MHz ~ 2483.5MHz		
Operation Frequency	2412MHz ~ 2462MHz		
	IEEE 802.11b:14.14dBm; IEEE 802.11g:13.09dBm;		
Output Power (Average)	IEEE 802.11n(HT20):12.17dBm; IEEE 802.11n(HT40):12.77dBm		
	IEEE 802.11ax (HE20):12.30dBm; IEEE 802.11ax (HE40):12.50dBm		
	IEEE 802.11b:16.65dBm; IEEE 802.11g:20.85dBm;		
Output Power (Peak)	IEEE 802.11n(HT20):19.72dBm; IEEE 802.11n(HT40):20.43dBm		
	IEEE 802.11ax (HE20):20.69dBm; IEEE 802.11ax (HE40):21.13dBm		
Output Power (MIMO- Average)	IEEE 802.11n(HT20):15.27dBm; IEEE 802.11n(HT40):15.77dBm		
Cutput r ower (willing riverage)	IEEE 802.11ax (HE20):15.51dBm; IEEE 802.11ax (HE40):15.84dBm		
Output Power (MIMO- Peak)	IEEE 802.11n(HT20):23.11dBm; IEEE 802.11n(HT40):23.67dBm		
Output I ower (immo- I eak)	IEEE 802.11ax (HE20):24.19dBm; IEEE 802.11ax (HE40):24.69dBm		
	802.11b:(DQPSK, DBPSK, CCK) DSSS		
Modulation	802.11g/n:(64-QAM,16-QAM, QPSK, BPSK) OFDM		
	802.11ax:(1024-QAM,256-QAM,64-QAM,16-QAM,QPSK,BPSK)OFDMA		
	802.11b:1/2/5.5/11Mbps		
Data Rate	802.11g: 6/9/12/18/24/36/48/54Mbps		
Bata Nate	802.11n: up to 300Mbps		
	802.11ax: up to 574Mbps		
Number of channels	11		
Hardware Version	NUCPN01_MB_V20		
Software Version	Windows 11		
Antonio Desimation	Chain A: Iron Antenna(MAIN ANT)		
Antenna Designation	Chain B: Iron Antenna(AUX ANT)		
Antenna Gain	Please refer to report section 2.9 description		
Number of transmit chain	2(802.11b/g/n all used two antennas,802.11b/g/n/ax support MIMO)		
Power Supply	DC 19V for by adapter		



2.2 Table of Carrier Frequency For 2412-2462MHz:

11 channels are provided for 802.11b/g/n(HT20)/ax(HE20):

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz		

7 channels are provided for 802.11n(HT40)/ax(HE40):

Channel	Frequency	Channel	Frequency	Channel	Frequency
01		02		03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10		11			



2.3 IEEE 802.11n Modulation Scheme

MCS				N _{CBPS}		N_{DBPS}		Data Rate(Mbps)		
Index	Nss	Modulation	R	N _{BPSC}	0	DF3		БРЭ	800	nsGl
Паох					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

Symbol	Explanation	
NSS	Number of spatial streams	
R	Code rate	
NBPSC	Number of coded bits per single carrier	
NCBPS	Number of coded bits per symbol	
NDBPS	Number of data bits per symbol	
GI	Guard interval	



2.4 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: **2AY4C-GAX01**, filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.5 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
4	KDB 662911	KDB 662911 D01 Multiple Transmitter Output v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
5	KDB 558074	KDB 558074 D01 15.247 Meas Guidance v05r02 Guidance for compliance measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum system, and Hybrid system devices operating under Section 15.247 of the FCC rules

2.6 Special Accessories

Refer to section 4.4.

2.7 Equipment Modifications

Not available for this EUT intended for grant.

2.8 Antenna Requirement

Standard Requirement

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi

EUT Antenna:

The non-detachable antenna inside the device cannot be replaced by the user at will. For the antenna gain, please refer to the description in Chapter 2.9 of the report.



2.9 Description of Available Antennas

Antenna	Frequency	TX	Bandwidth Max Peak Gain (dBi)		Max Directional Gain			
Type	Band (MHz)	Paths	(MHz)	Ant 1	Ant 2	(dBi)		
	2.4GWIFI Iron Antenna List (2.4GHz 2*2 MIMO)							
Iron Antenna	2400~2483.5	2	20, 40	3.09	1.63	6.10		

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11n/ax mode.

Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain, Gant, Directional gain = Gant + Array Gain, where Array Gain is as follows.

• For power spectral density (PSD) measurements on devices:

Array Gain = $10 \log (N_{ANT}/N_{SS}) dB = 3.01$;

For power measurements on IEEE 802.1devices:

Array Gain = 0 dB for $N_{ANT} \le 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥40 MHz for any Nant;

Array Gain = 5 log(Nant/Nss) dB or 3 dB, whichever is less, for 20 MHz channel widths with Nant ≥ 5.

If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with Gant set equal to the gain of the antenna having the highest gain.

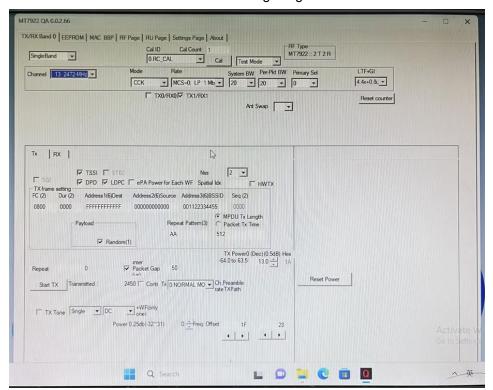


2.10 Description of Test Software

For IEEE 802.11 mode:

The test utility software used during testing was "MT7922 QA", and the version was "0.0.2.66".

Software Setting Diagram



Test Mode	Channel	Power Index		
rest wode	Channel	Chain A	Chain B	
802.11b	L/M/H	13	13	
802.11g	L/M/H	13	13	
802.11n-HT20	L/M/H	13	13	
802.11ax-HE20	L/M/H	13	13	
802.11n-HT40	L/M/H	13	13	
802.11ax-HE40	L/M/H	13	13	



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3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

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

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.



3.3 Environmental Conditions

	Normal Conditions
Temperature range (℃)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106
Power supply	DC 19V

3.4 Measurement Uncertainty

The reported uncertainty of measurement y±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty		
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 2.9 \text{ dB}$		
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$		
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$		
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$		
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$		
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$		
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$		



3.5 List of Equipment Used

• R	RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)	
\boxtimes	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2023-06-01	2024-05-31	
	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-05-24	2025-05-23	
	AGC-ER-E061	Spectrum Analyzer	Agilent	N9020A	MY52090123	2023-06-03	2024-06-02	
\boxtimes	AGC-ER-E061	Spectrum Analyzer	Agilent	N9020A	MY52090123	2024-05-28	2025-05-27	
	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2024-02-01	2025-01-31	
	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2024-02-01	2025-01-31	
	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08	
	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2023-06-01	2024-05-31	
	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2024-05-23	2025-05-22	
\boxtimes	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A	
	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A	

• F	Radiated Spurious Emission								
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)		
	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2024-02-01	2025-01-31		
\boxtimes	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023-06-03	2024-06-02		
\boxtimes	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23		
\boxtimes	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31		
\boxtimes	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-05-28	2025-05-27		
\boxtimes	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04		
\boxtimes	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10		
\boxtimes	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-04-02	2024-04-01		
\boxtimes	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2024-03-31	2025-03-30		
\boxtimes	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23		
\boxtimes	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03		
\boxtimes	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2023-06-01	2024-05-31		
\boxtimes	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2024-05-23	2025-05-22		
\boxtimes	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08		
	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08		

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.



• A	AC Power Line Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)	
\boxtimes	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023-06-03	2024-06-02	
\boxtimes	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2024-05-28	2025-05-27	
	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2025-06-08	
	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023-06-03	2024-06-02	
	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2024-05-28	2025-05-27	

• Tes	Test Software						
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information		
\boxtimes	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71		
\boxtimes	AGC-EM-S003	RE Test System	FARA	EZ-EMC	VRA-03A		
\boxtimes	AGC-ER-S012	BT/WIFI Test System	Tonscend	JS1120-2	2.6		
\boxtimes	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0		



4.System Test Configuration

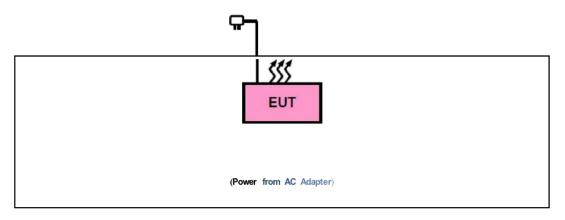
4.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of Tested System

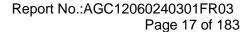


4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

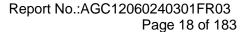
☐ Test Accessories Come From The Laboratory

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Earphone	CXT	N/A	N/A	1.2m unshielded
2	Keyboard	Dell	SK-8120	N/A	1.8m,unshielded
3	Mouse	Dell	EMS-537A	N/A	1.7m,unshielded
4	U Disc	Kingston	DT100G3	32G	N/A





No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Adapter 1#	Shenzhen Hyleton Technology Co., Ltd.	Hyleton-120W-19063 20	Input: AC 100-240V 50/60Hz, 2A Output: DC 19V 6.32A	3.5m
2	Adapter 2#	SHENZHEN BSY TECHNOLOGY CO.,LTD.	BSY120S1906323D	Input: AC 100-240V 50/60Hz, 2.5A Output: DC 19V 6.32A	3.5m
3	Adapter 3#	FSP Group Inc.	FSP120-ABBU3	Input: AC 100-240V 50/60Hz, 1.4A Output: DC 19V 6.32A	3.5m





4.5 Summary of Test Results

Item	FCC Rules	Description of Test	Result
1	§15.203&15.247(b)(4)	Antenna Equipment	Pass
2	§15.247 (b)(1)	RF Output Power	Pass
3	§15.247 (a)(1)	6 dB Bandwidth	Pass
4	§15.247 (e)	Power Spectral Density	Pass
5	§15.247 (d)	Conducted Band Edge and Out-of-Band Emissions	Pass
6	§15.247 (d)&15.209	Radiated Spurious Emission	Pass
7	§15.207	AC Power Line Conducted Emission	Pass



5. Description of Test Modes

	Summary table of Test Cases
Took Itam	Data Rate / Modulation
Test Item	2.4G WLAN – 802.11b/g/n/ax (DSSS/OFDM/OFDMA)
Radiated & Conducted Test Cases	Mode 1: 802.11b_TX CH01_2412 MHz_1 Mbps (AC/DC adapter) Mode 2: 802.11b_TX CH06_2437 MHz_1 Mbps (AC/DC adapter) Mode 3: 802.11b_TX CH11_2462 MHz_1 Mbps (AC/DC adapter) Mode 4: 802.11g_TX CH01_2412 MHz_6 Mbps (AC/DC adapter) Mode 5: 802.11g_TX CH06_2437 MHz_6 Mbps (AC/DC adapter) Mode 6: 802.11g_TX CH01_2412 MHz_6 Mbps (AC/DC adapter) Mode 7: 802.11n-HT20_TX CH01_2412 MHz_MCS0 Mbps (AC/DC adapter) Mode 8: 802.11n-HT20_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter) Mode 9: 802.11n-HT20_TX CH11_2462 MHz_ MCS0 Mbps (AC/DC adapter) Mode 10: 802.11ax-HE20_TX CH01_2412 MHz_MCS0 Mbps (AC/DC adapter) Mode 11: 802.11ax-HE20_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter) Mode 12: 802.11ax-HE20_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter) Mode 13: 802.11n-HT40_TX CH03_2422 MHz_MCS0 Mbps (AC/DC adapter) Mode 14: 802.11n-HT40_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter) Mode 15: 802.11n-HT40_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter) Mode 16: 802.11ax-HE40_TX CH09_2452 MHz_ MCS0 Mbps (AC/DC adapter) Mode 17: 802.11ax-HE40_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter) Mode 17: 802.11ax-HE40_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter) Mode 18: 802.11ax-HE40_TX CH06_2437 MHz_ MCS0 Mbps (AC/DC adapter)
AC Conducted Emission	Mode 1: 2.4G WLAN Link from AC/DC Adapter 1# Mode 2: 2.4G WLAN Link from AC/DC Adapter 2# Mode 3: 2.4G WLAN Link from AC/DC Adapter 3#

Note:

- 1. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 2. For Conducted Test method, a temporary antenna connector is provided by the manufacture.
- 3. The 802.11ax only supports the Full RU test configuration.
- 4. Radiation test evaluation: The main test model and series models are pre-tested with 3 adapters, and the appearance of the main test model (model: AX8 Max) and the 3 adapters is recorded as the worst result; the difference in the shell of the power supply end interference part is ignored and only the appearance of the main test model (model: AX8 Max) and the 3 adapters is recorded as the worst result.
- All modes and antennas in the radiation spurious test are pre-scanned. When there is no MIMO technology mode, antenna 1 is evaluated. When there is MIMO technology mode, antenna 1 + antenna 2 are evaluated as the worst data.
- 6. Regarding Radiated Band Edge, as the worst result, only the main test appearance (model: AX8 Max) is r eflected with adapter 1#.



6. Duty Cycle Measurement

2.4GHz WLAN (DTS) operation is possible in 20MHz, and 40MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = AVG. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100.

The duty cycles are as follows: Chain A

Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
IEEE 802.11b	1	96	0.18	0.12	-0.35
IEEE 802.11g	6	68	1.67	1.41	-3.35
IEEE 802.11n-HT20	MCS0	67	1.74	1.48	-3.48
IEEE 802.11n-HT40	MCS0	52	2.84	2.87	-5.68
IEEE 802.11ax-HE20	MCS0	39	4.09	4.91	-8.18
IEEE 802.11ax-HE40	MCS0	37	4.32	4.92	-8.64

The duty cycles are as follows: Chain B

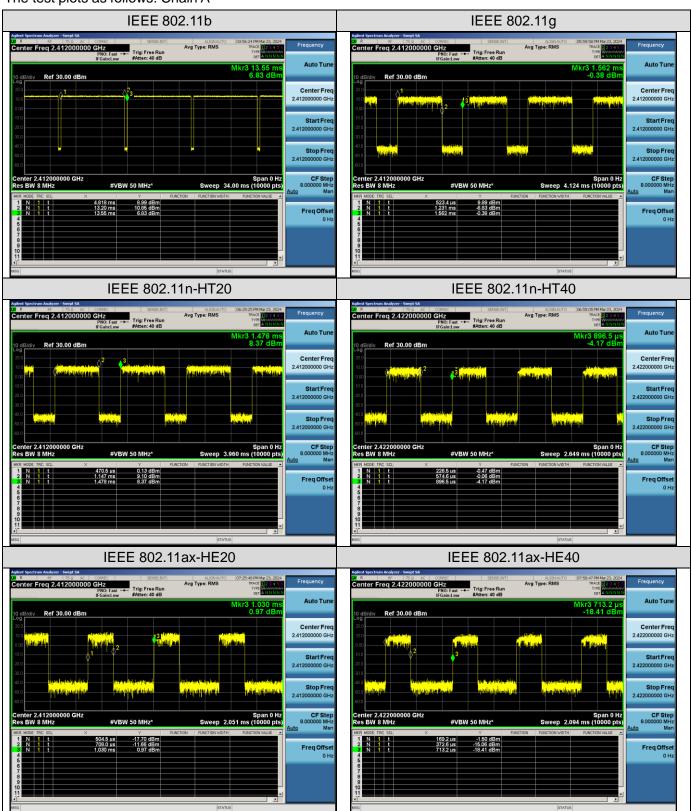
Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
IEEE 802.11b	1	93	0.32	0.23	-0.63
IEEE 802.11g	6	68	1.67	1.41	-3.35
IEEE 802.11n-HT20	MCS0	67	1.74	1.48	-3.48
IEEE 802.11n-HT40	MCS0	52	2.84	2.87	-5.68
IEEE 802.11ax-HE20	MCS0	39	4.09	4.92	-8.18
IEEE 802.11ax-HE40	MCS0	39	4.09	4.90	-8.18

Remark:

- 1. Duty Cycle factor = 10 * log (1/ Duty cycle)
- 2. Average factor = 20 log10 Duty Cycle
- 3. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.

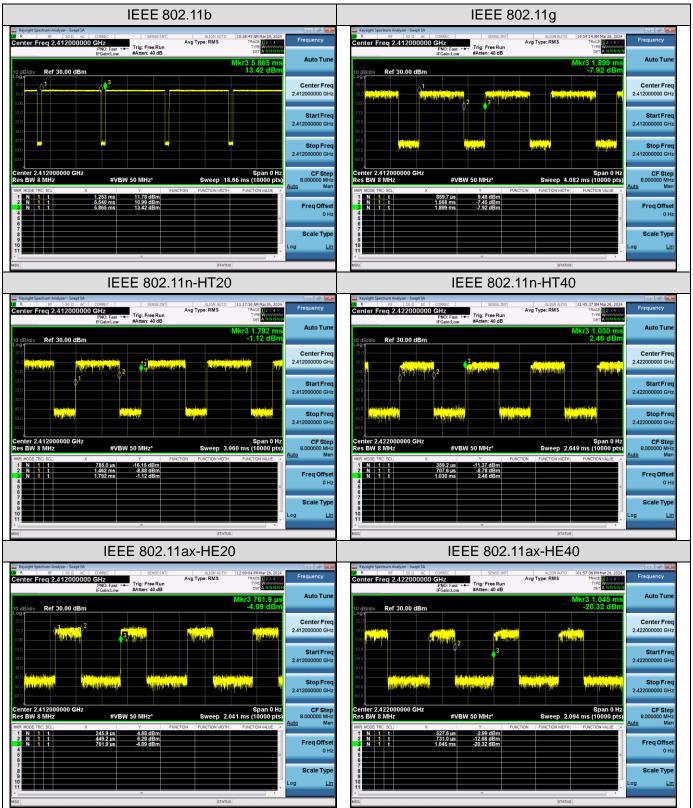


The test plots as follows: Chain A





The test plots as follows: Chain B





7. RF Output Power Measurement

7.1 Provisions Applicable

For DTSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W.

7.2 Measurement Procedure

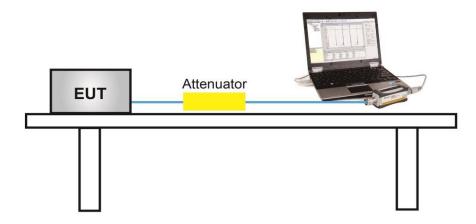
Method PM is Measurement using an RF Peak power meter. The procedure for this method is as follows:

- 1. The testing follows the ANSI C63.10 Section 11.9.1.3
- The maximum peak conducted output power may be measured using a broadband peak RF power meter.
 The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

- 1. The testing follows the ANSI C63.10 Section 11.9.2.3
- 2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
- 3. The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
- 4. At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
- 5. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- 6. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
- 7. Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
- 8. Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle {e.g., [10 log (1 / 0.25)], if the duty cycle is 25%}.
- 9. Record the test results in the report.

7.3 Measurement Setup (Block Diagram of Configuration)





7.4 Measurement Result

7.4 measurement result						
Test Data of Conducted Output Power-Chain A						
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Limits (dBm)	Pass or Fail	
	2412	14.13	16.65	≤30	Pass	
802.11b	2437	14.14	16.51	≤30	Pass	
	2462	14.13	16.47	≤30	Pass	
	2412	13.05	20.85	≤30	Pass	
802.11g	2437	13.06	20.82	≤30	Pass	
	2462	13.09	20.71	≤30	Pass	
	2412	11.86	19.72	≤30	Pass	
802.11n20	2437	12.12	19.72	≤30	Pass	
	2462	12.17	19.70	≤30	Pass	
	2422	12.52	20.31	≤30	Pass	
802.11n40	2437	12.77	20.43	≤30	Pass	
	2452	12.20	20.20	≤30	Pass	
802.11ax20	2412	12.30	20.69	≤30	Pass	
	2437	12.26	20.56	≤30	Pass	
	2462	12.21	20.51	≤30	Pass	
	2422	12.79	21.08	≤30	Pass	
802.11ax40	2437	12.79	21.13	≤30	Pass	
	2452	12.50	20.93	≤30	Pass	



Test Data of Conducted Output Power-Chain B						
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Limits (dBm)	Pass or Fail	
	2412	14.61	17.24	≤30	Pass	
802.11b	2437	14.49	17.06	≤30	Pass	
	2462	14.14	16.69	≤30	Pass	
	2412	13.66	21.50	≤30	Pass	
802.11g	2437	13.50	21.35	≤30	Pass	
	2462	13.16	21.01	≤30	Pass	
	2412	12.54	20.44	≤30	Pass	
802.11n20	2437	12.39	20.19	≤30	Pass	
	2462	11.98	19.88	≤30	Pass	
	2422	12.90	20.99	≤30	Pass	
802.11n40	2437	12.74	20.85	≤30	Pass	
	2452	12.54	20.56	≤30	Pass	
	2412	12.70	21.62	≤30	Pass	
802.11ax20	2437	12.47	20.86	≤30	Pass	
	2462	12.12	20.80	≤30	Pass	
802.11ax40	2422	12.87	22.21	≤30	Pass	
	2437	12.74	22.12	≤30	Pass	
	2452	12.62	21.77	≤30	Pass	



Test Data of Conducted Output Power-Total						
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Limits (dBm)	Pass or Fail	
	2412	15.22	23.11	≤30	Pass	
802.11n20	2437	15.27	22.97	≤30	Pass	
	2462	15.09	22.80	≤30	Pass	
	2422	15.72	23.67	≤30	Pass	
802.11n40	2437	15.77	23.66	≤30	Pass	
	2452	15.38	23.39	≤30	Pass	
802.11ax20	2412	15.51	24.19	≤30	Pass	
	2437	15.38	23.72	≤30	Pass	
	2462	15.18	23.67	≤30	Pass	
802.11ax40	2422	15.84	24.69	≤30	Pass	
	2437	15.78	24.66	≤30	Pass	
	2452	15.57	24.38	≤30	Pass	

Note:

- The Total Average Conducted Output Power (dBm) = $10*\log\{10^{(Chain\ A\ AVG\ /10)} + 10^{(Chain\ B\ AVG\ /10)}\}$. The Total Peak Conducted Output Power (dBm) = $10*\log\{10^{(Chain\ A\ PK\ /10)} + 10^{(Chain\ B\ PK\ /10)}\}$. 1.



8. 6dB Bandwidth Measurement

8.1 Provisions Applicable

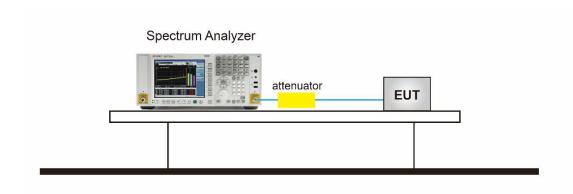
The minimum 6dB bandwidth shall be 500 kHz.

8.2 Measurement Procedure

The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).

- 1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- 3. For 6dB Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement.
- For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the OBW and set the Video bandwidth (VBW) ≥ 3 * RBW.
- 5. Detector = peak
- 6. Trace mode = max hold.
- 7. Sweep = auto couple.
- 8. Allow the trace to stabilize.
- 9. Measure and record the results in the test report.

8.3 Measurement Setup (Block Diagram of Configuration)





8.4 Measurement Result

Test Data of Occupied Bandwidth and DTS Bandwidth-China A						
Test Mode	Test Frequency (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	DTS Bandwidth Limits (MHz)	Pass or Fail	
	2412	12.504	8.055	≥0.5	Pass	
802.11b	2437	12.465	7.563	≥0.5	Pass	
	2462	12.464	7.537	≥0.5	Pass	
	2412	16.719	16.243	≥0.5	Pass	
802.11g	2437	16.742	15.635	≥0.5	Pass	
	2462	16.719	15.508	≥0.5	Pass	
	2412	17.795	17.141	≥0.5	Pass	
802.11n20	2437	17.872	16.535	≥0.5	Pass	
	2462	17.870	16.896	≥0.5	Pass	
	2422	36.190	35.120	≥0.5	Pass	
802.11n40	2437	36.293	35.115	≥0.5	Pass	
	2452	36.235	35.104	≥0.5	Pass	
	2412	18.885	18.192	≥0.5	Pass	
802.11ax20	2437	19.027	17.833	≥0.5	Pass	
	2462	18.999	17.854	≥0.5	Pass	
802.11ax40	2422	37.644	35.121	≥0.5	Pass	
	2437	37.741	35.116	≥0.5	Pass	
	2452	37.698	35.118	≥0.5	Pass	



Test Data of Occupied Bandwidth and DTS Bandwidth-China B						
Test Mode	Test Frequency (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	DTS Bandwidth Limits (MHz)	Pass or Fail	
	2412	12.418	8.035	≥0.5	Pass	
802.11b	2437	12.393	8.032	≥0.5	Pass	
	2462	12.399	8.053	≥0.5	Pass	
	2412	16.796	16.029	≥0.5	Pass	
802.11g	2437	16.783	15.652	≥0.5	Pass	
	2462	16.804	15.781	≥0.5	Pass	
	2412	17.825	16.892	≥0.5	Pass	
802.11n20	2437	17.904	15.974	≥0.5	Pass	
	2462	17.916	16.509	≥0.5	Pass	
	2422	36.201	35.120	≥0.5	Pass	
802.11n40	2437	36.283	35.111	≥0.5	Pass	
	2452	36.284	35.117	≥0.5	Pass	
	2412	18.903	17.652	≥0.5	Pass	
802.11ax20	2437	19.063	15.139	≥0.5	Pass	
	2462	19.033	16.327	≥0.5	Pass	
802.11ax40	2422	37.621	36.352	≥0.5	Pass	
	2437	37.677	36.346	≥0.5	Pass	
	2452	37.677	36.353	≥0.5	Pass	



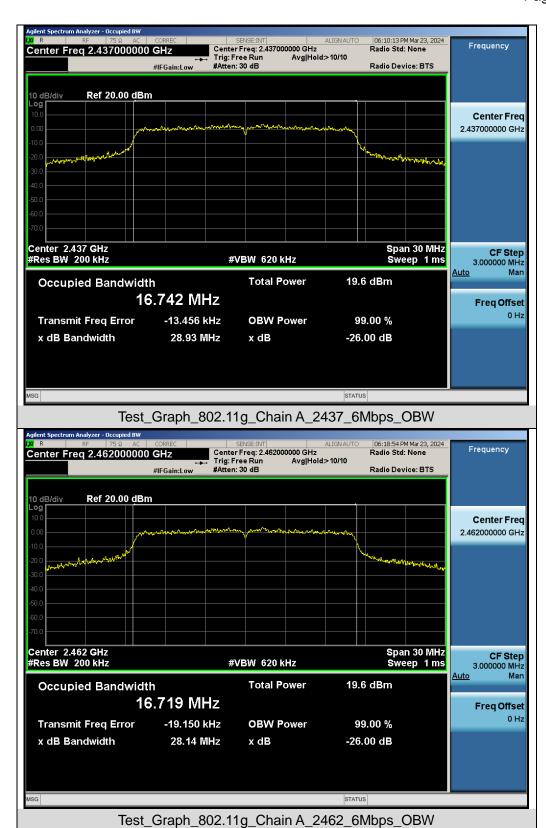
Test Graphs of Occupied Bandwidth-China A



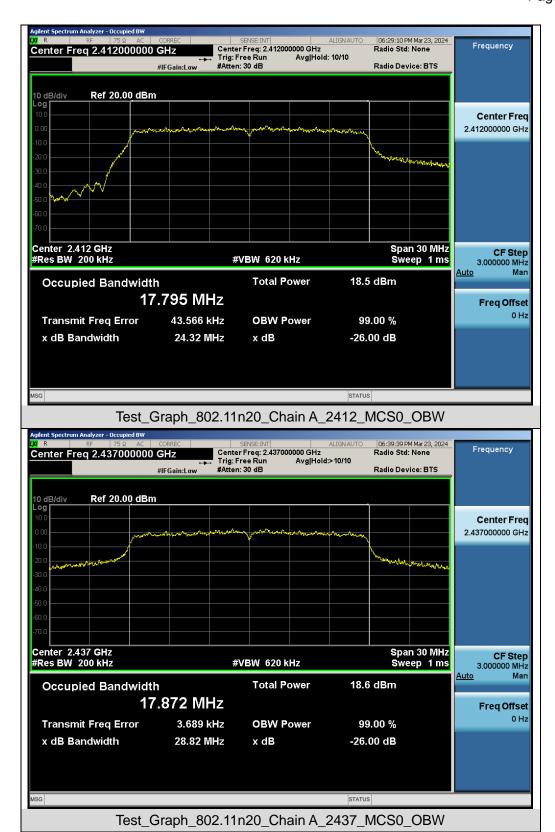




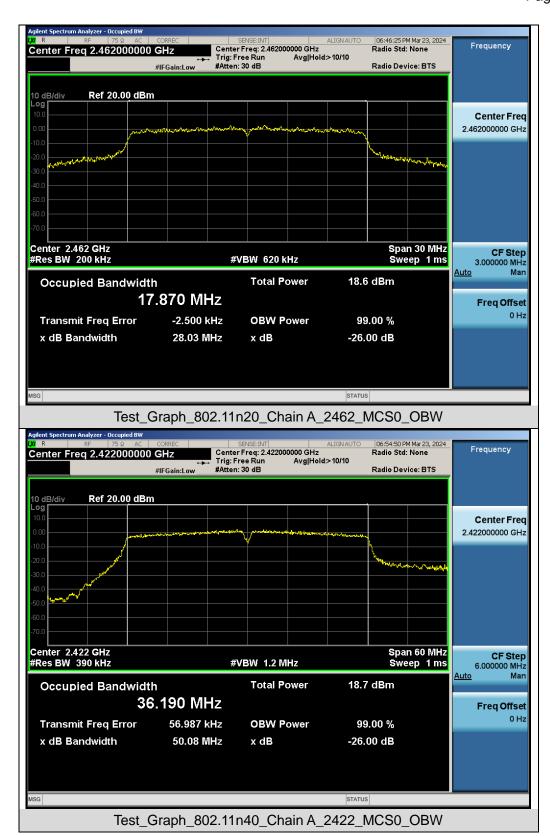








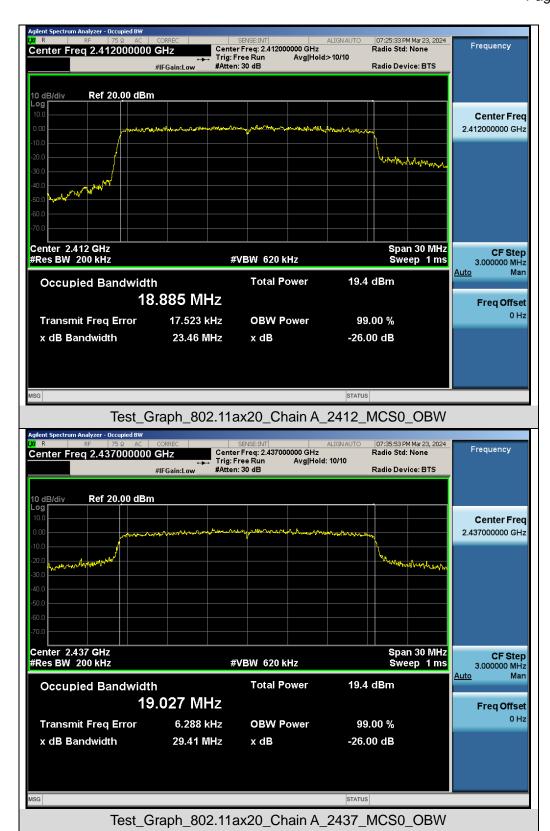




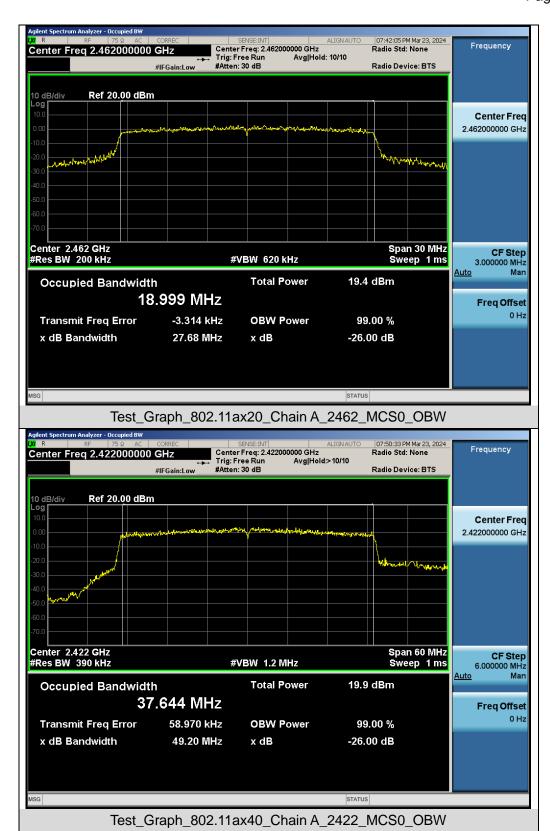




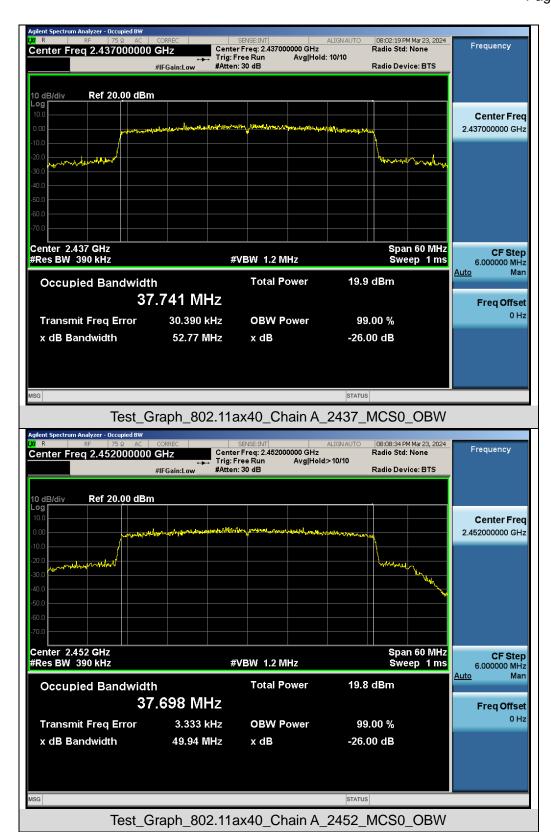














Test Graphs of DTS Bandwidth-China A

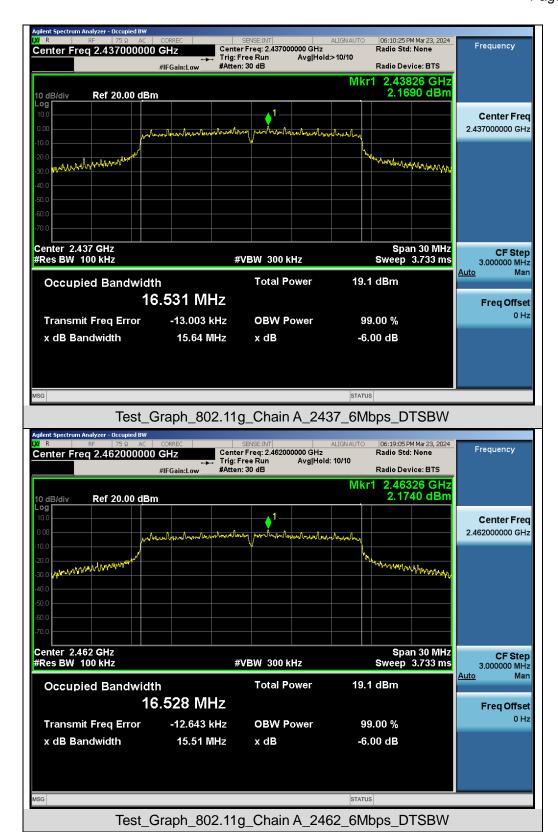


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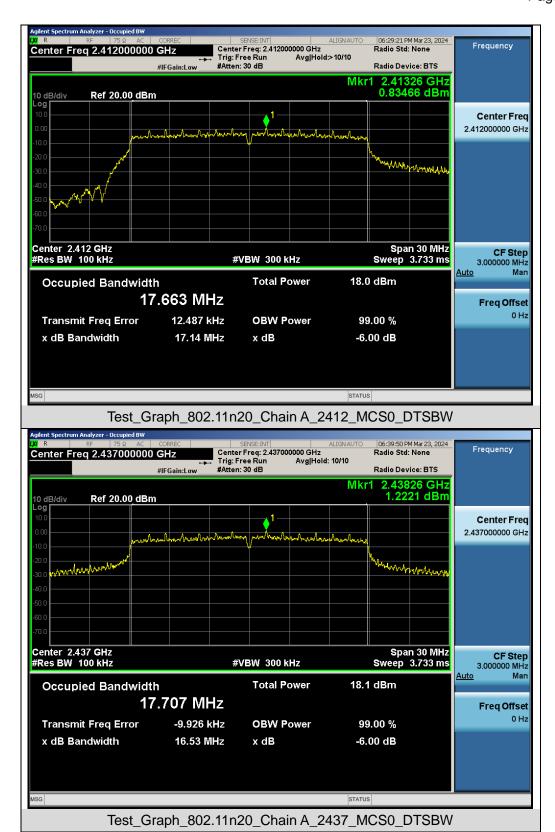




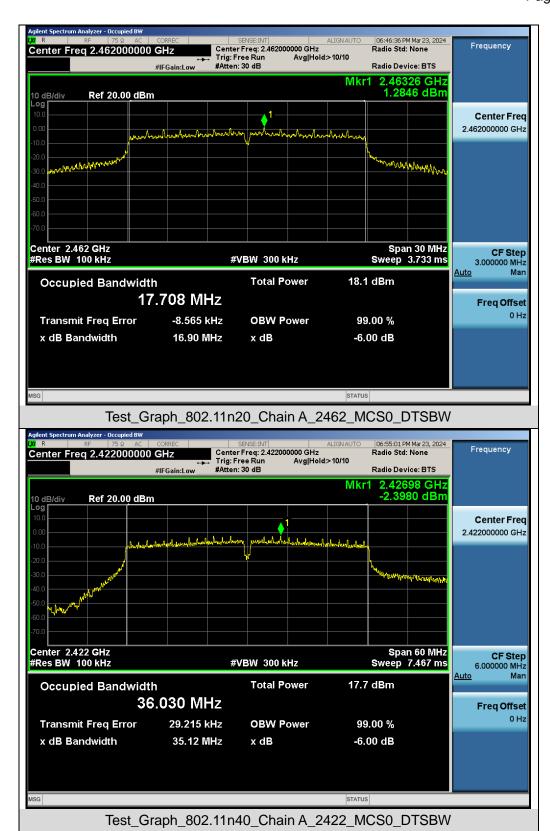




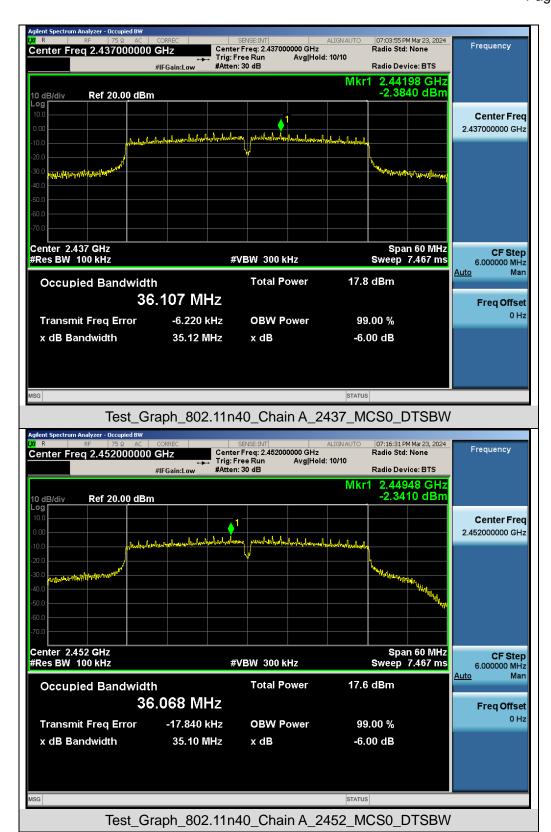




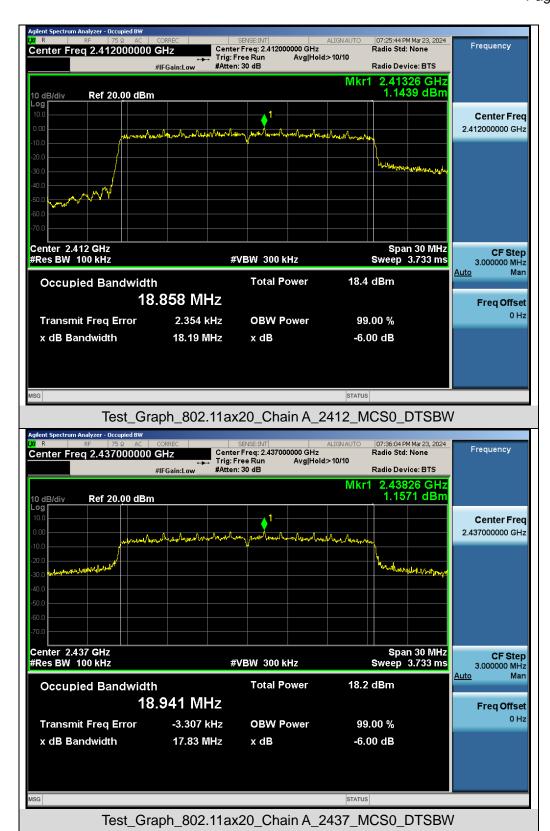




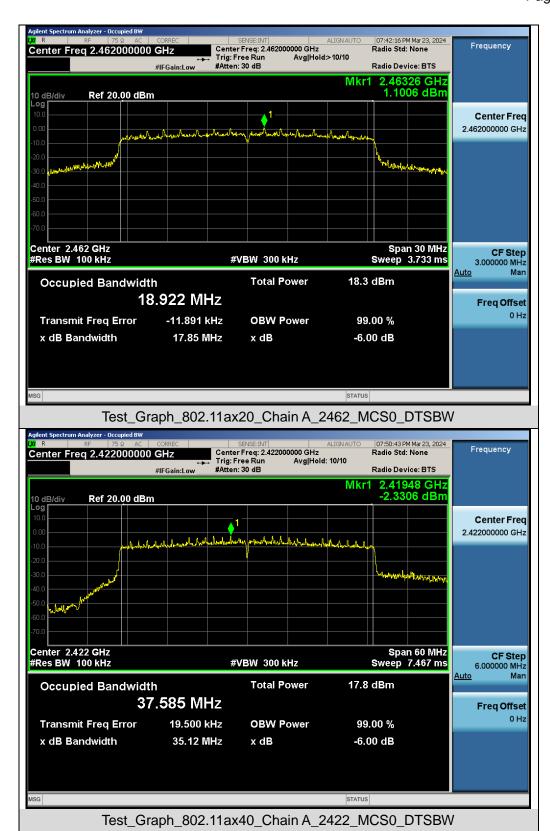




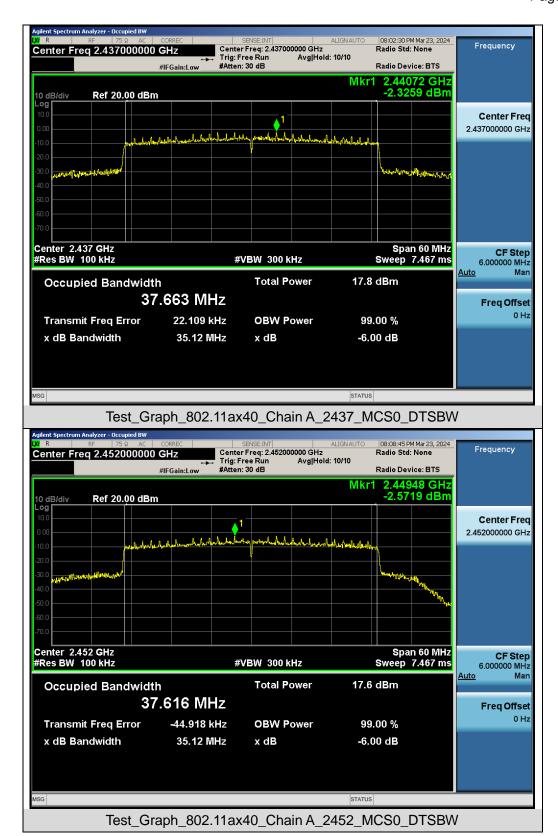






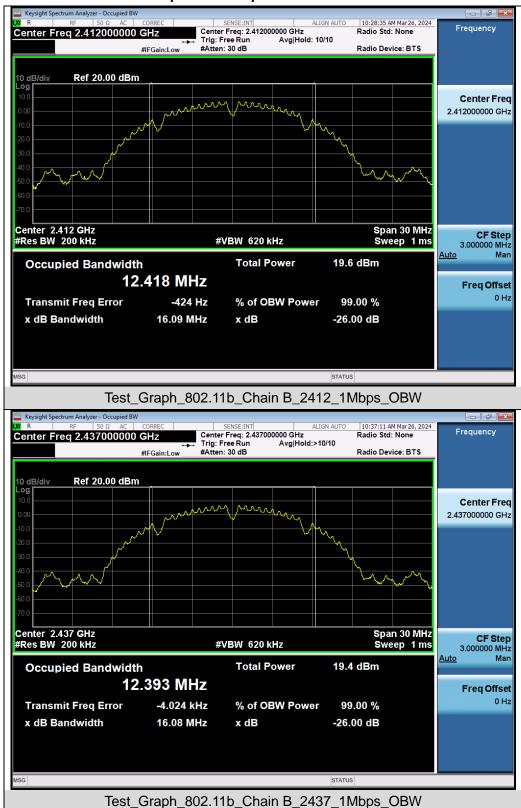






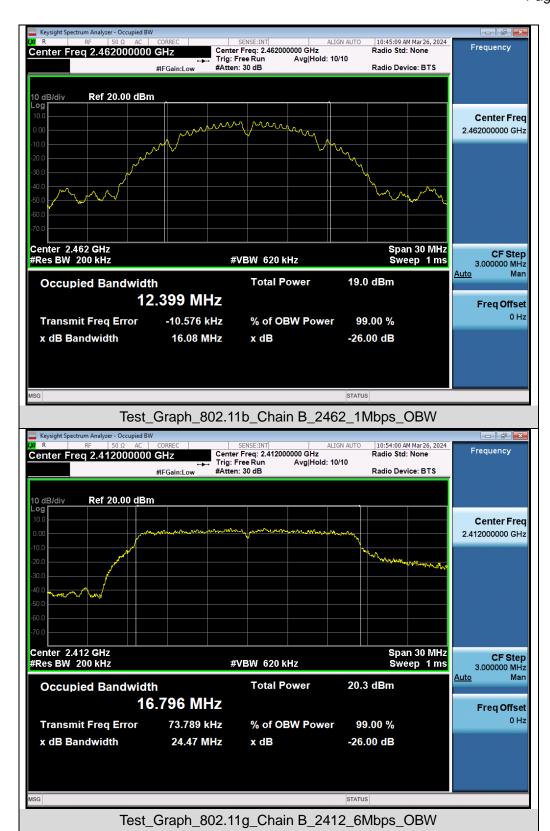


Test Graphs of Occupied Bandwidth-China B

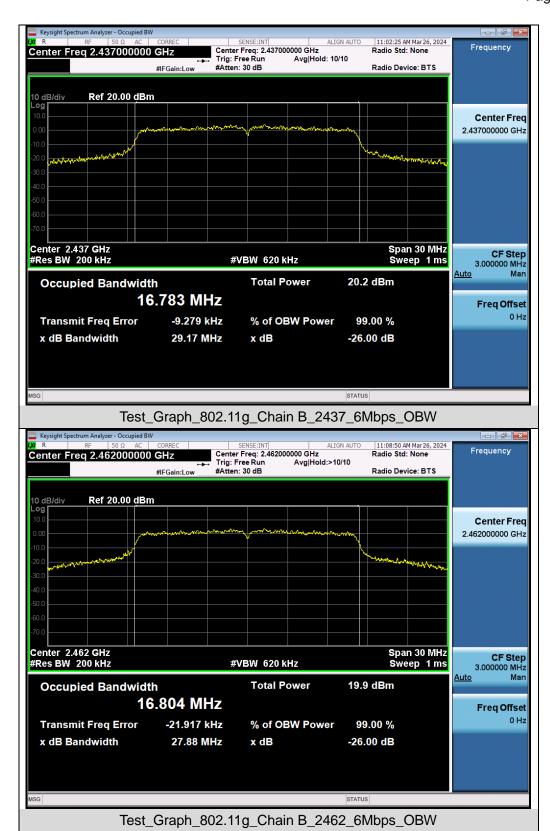


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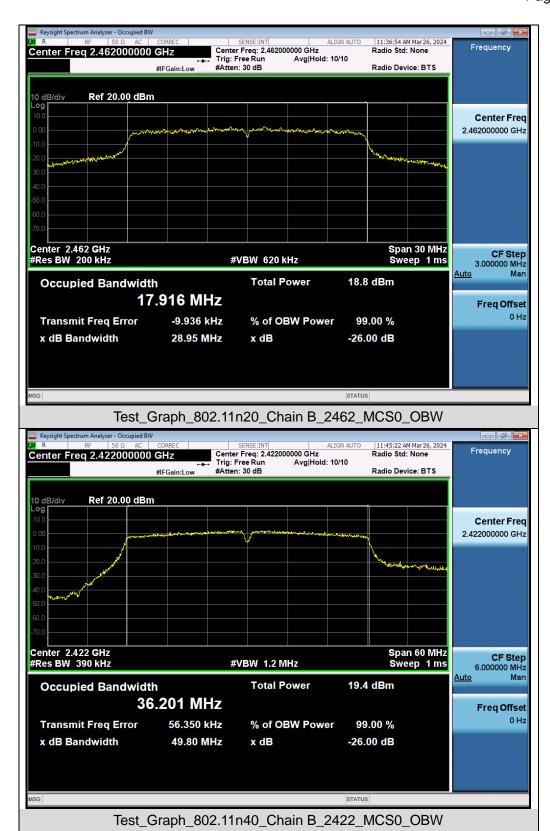




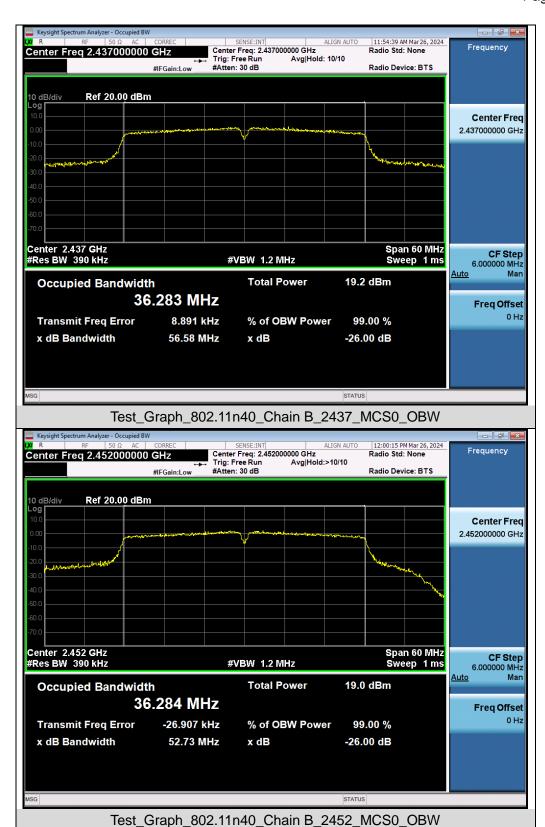








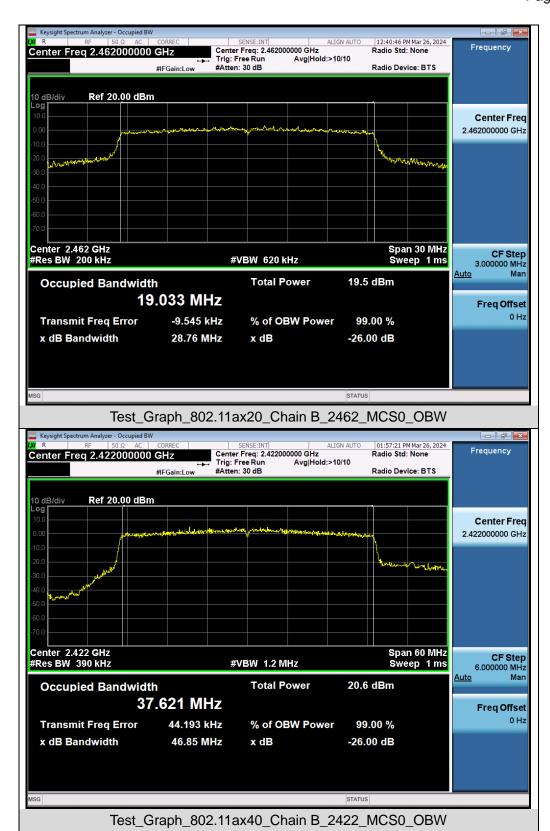




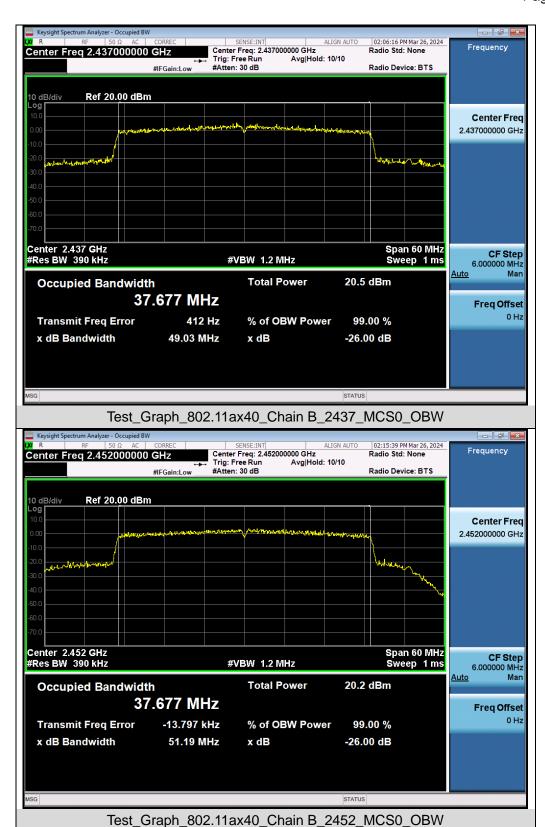






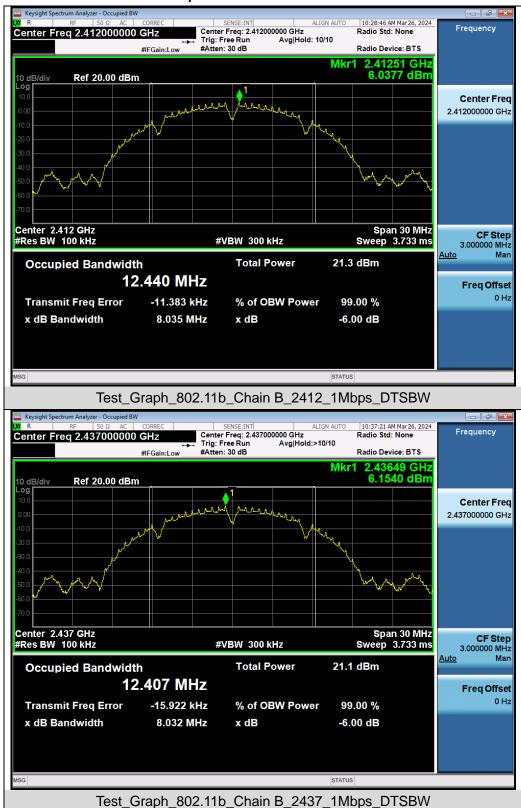








Test Graphs of DTS Bandwidth-Chain B



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