

FCC Test Report

Report No.: AGC02115210401FE05

FCC ID : 2AG6IMPPUA

APPLICATION PURPOSE: Original Equipment

PRODUCT DESIGNATION: PARROT SKYCONTROLLER USA

BRAND NAME : PARROT

MODEL NAME : MPPUA

APPLICANT: PARROT DRONE SAS

DATE OF ISSUE : Jul. 23, 2021

STANDARD(S)

TEST PROCEDURE(S)

FCC Part 15.247

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes	
V1.0	/	Jul. 23, 2021	Valid	Initial Release	

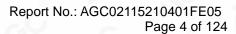
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1. VERIFICATION OF CONFORMITY

Applicant	PARROT DRONE SAS
Address	174 quai de jemmapes 75010 Paris France
manufacturer	ACTIA
Address	10, avenue Edouard Serres, 31772 COLOMIERS cedex FRANCE
Factory	ACTIA
Address	10, avenue Edouard Serres, 31772 COLOMIERS cedex FRANCE
Product Designation	PARROT SKYCONTROLLER USA
Brand Name	PARROT
Test Model	MPPUA
Date of test	Apr. 19, 2021~Jul. 23, 2021
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BGN/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Prepared By	Jonjon Ausorg	
	Donjon Huang (Project Engineer)	Jul. 23, 2021
Reviewed By	Max Zhang	
	Max Zhang (Reviewer)	Jul. 23, 2021
Approved By	Formesticis	
yC _gc	Forrest Lei (Authorized Officer)	Jul. 23, 2021

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as "PARROT SKYCONTROLLER USA". It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.412 GHz~2.462GHz
Output Power (Average-10MHz)	CCK: 25.105dBm; OFDM(6Mbps):24.72dBm; OFDM(MCS0):24.22dBm
Output Power MIMO (Average-10MHz)	OFDM(MCS0): 27.00dBm
Output Power (Average-20MHz)	802.11b:25.09dBm, 802.11g:24.58dBm, 802.11n20:24.31dBm
Output Power MIMO (Average-20MHz)	802.11n20:27.11dBm
Modulation(10MHz)	CCK, OFDM
Modulation(20MHz)	DSSS(DBPSK/DQPSK/CCK); OFDM(BPSK/QPSK/16-QAM/64-QAM)
Data Rate	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps
Number of channels	11
Hardware Version	HW02
Software Version	3.0.1
Antenna Designation	Integral antenna (Comply with requirements of the FCC part 15.203)
Antenna Gain	Refer to Chapter 2.9 of the report
Power Supply	DC 7.2V by battery or DC 5V by adapter

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2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
100	1	2412 MHZ
·	2	2417 MHZ
	3	2422 MHZ
	4	2427 MHZ
	5	2432 MHZ
2400~2483.5MHZ	6	2437 MHZ
	C 7	2442 MHZ
0	8	2447 MHZ
100 CC	9	2452 MHZ
	10	2457 MHZ
	11	2462 MHZ

Note: For 10MHZ bandwidth system use Channel 1 to Channel 11. For 20MHZ bandwidth system use Channel 1 to Channel 11.

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2.3. IEEE 802.11N MODULATION SCHEME

MCS Index	Nss	Modulation	R			NBPSC	S NDBPS		rate(I	ata Mbps) nsGl
					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	<u></u> 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: 2AG6IMPPUA** filing to comply with the FCC Part 15 requirements.

2.5. TEST METHODOLOGY

KDB 558074 D01 15.247 Meas Guidance v05: Guidance for compliance measurements on Digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules

ANSI C63.10:2013: American National Standard for Testing Unlicensed Wireless Devices

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2.6. SPECIAL ACCESSORIES

Refer to section 5.2.

2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.8. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

2.9. DESCRIPTION OF AVAILABLE ANTENNAS

Ant	enna	Frequency	TX	Bandwidth	Max Pea	k Gain (dBi)	Max Directional Gain
Ту	ype	Band (MHz)	Paths	(MHz)	Ant 1	Ant 2	(dBi)
2.40	WIFI	nternal Antenna I	List (2.4G	Hz 2*2 MIM	10)		
	ernal enna	2400~2483.5	2	10,20	6	6	6

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

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3. 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	$U_c = \pm 3.1 \text{ dB}$		
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 4.0 \text{ dB}$		
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.8 \text{ dB}$		
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 = ±2 %		
Uncertainty of Occupied Channel Bandwidth	U _c = ±2 %		

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4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel transmitting (TX)
2	Middle channel transmitting (TX)
3	High channel transmitting (TX)
Note:	

Transmit by 2.4G 10MHz CCK with Date rate (1/2/5.5/11)

Transmit by 2.4G 10MHz OFDM with Date rate (6/9/12/18/24/36/48/54)

Transmit by 2.4G 10MHz OFDM with Date rate (6.5/13/19.5/26/39/52/58.5/65)

Transmit by 802.11b with Date rate (1/2/5.5/11)

Transmit by 802.11g with Date rate (6/9/12/18/24/36/48/54)

Transmit by 802.11n (20MHz) with Date rate (6.5/13/19.5/26/39/52/58.5/65)

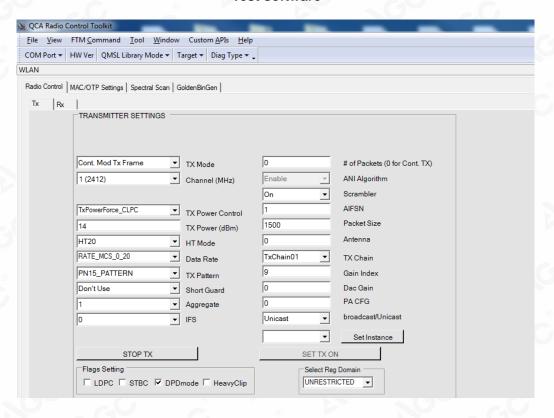
The test channel for 10MHZ bandwidth system is channel 1, 6 and 11.

The test channel for 20MHZ bandwidth system is channel 1, 6 and 11.

Note:

- 1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency Individually, and the EUT is operating at its maximum duty cycle>or equal 98%
- 2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
- 3. For battery operated equipment, the battery is full charged during test.

Test software



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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure:

	NO.	
EUT		AE

5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	PARROT SKYCONTROLLER USA	MPPUA	2AG6IMPPUA	EUT
2	Adapter	TY0500100E1MN	N/A	AE
3	Type-C line	N/A	N/A	AE
4	Load	RX24-50W	N/A	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	RULES DESCRIPTION OF TEST	
§15.247	Output Power	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.247	Maximum Conducted Output Power Spectral Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd				
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China				
Designation Number	CN1259				
FCC Test Firm Registration Number	975832				
A2LA Cert. No.	5054.02				
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA				

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2021
TEST RECEIVER	R&S	ESPI	101206	May 13, 2021	May 12, 2022
LISN	R&S	ESH2-Z5	100086	Jul. 03,2020	Jul. 02,2021
LISN	R&S	ESH2-Z5	100086	Jun. 09, 2021	Jun. 08, 2022
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
TEST RECEIVER	R&S	ESCI	10096	May 13, 2021	May 12, 2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
Power sensor	Aglient	U2021XA	MY54110007	Sep. 10, 2019	Sep. 09, 2020
2.4GHz Fliter	Micro-tronics	087	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	Weinachel Corp	58-30-33	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.21, 2019	Sep. 20, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	00034609	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 15, 2021	May 14, 2023
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 20, 2019	Sep. 19, 2021
Test software	FARA	EZ-EMC(Ver.RA-03 A)	N/A	N/A compliano	N/A

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7. OUTPUT POWER

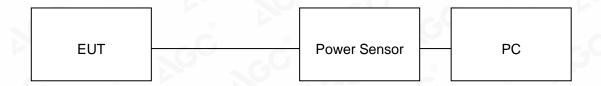
7.1. MEASUREMENT PROCEDURE

For average power test:

- 1. Connect EUT RF output port to power sensor through an RF attenuator.
- 2. Connect the power sensor to the PC.
- 3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 4. Record the maximum power from the software.

Note: The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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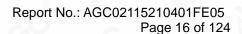
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7.3. LIMITS AND MEASUREMENT RESULT

	Test Data of Conducted Output Power- Bandwidth 10 MHz of antenna 1					
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail		
	2412	24.01	≤30	Pass		
CCK	2437	24.20	≤30	Pass		
GC .	2462	25.05	≤30	Pass		
	2412	23.62	≤30	Pass		
OFDM 6Mbps	2437	23.77	≤30	Pass		
	2462	24.19	≤30	Pass		
	2412	23.76	≤30	Pass		
OFDM MCS0	2437	23.62	≤30	Pass		
	2462	23.74	≤30	Pass		

Test Data of Conducted Output Power- Bandwidth 10 MHz of antenna 2					
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail	
_ c.C	2412	24.10	≤30	Pass	
ССК	2437	24.37	≤30	Pass	
0	2462	24.99	≤30	Pass	
G	2412	24.08	≤30	Pass	
OFDM 6Mbps	2437	23.96	≤30	Pass	
	2462	24.72	≤30	Pass	
- 6	2412	23.71	≤30	Pass	
OFDM MCS0	2437	23.93	≤30	Pass	
	2462	24.22	≤30	Pass	

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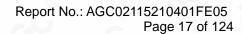




Test Data of Conducted Output Power- Bandwidth 10 MHz of antenna 1+2					
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail	
	2412	26.75	≤30	Pass	
OFDM MCS0	2437	26.79	≤30	Pass	
560	2462	27.00	≤30	Pass	

Test Data of Conducted Output Power- Bandwidth 20 MHz of antenna 1					
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail	
8	2412	24.50	≤30	Pass	
802.11b	2437	24.09	≤30	Pass	
	2462	24.69	≤30	Pass	
®	2412	24.42	≪30	Pass	
802.11g	2437	24.37	≤30	Pass	
· (C	2462	24.58	≤30	Pass	
©	2412	23.83	≤30	Pass	
802.11n20	2437	24.05	≤30	Pass	
60	2462	23.14	≤30	Pass	

	Test Data of Conducted Output Power- Bandwidth 20 MHz of antenna 2					
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail		
69	2412	24.09	≤30	Pass		
802.11b	2437	24.38	≤30	Pass		
0	2462	25.09	≤30	Pass		
	2412	24.26	≤30	Pass		
802.11g	2437	24.12	≤30	Pass		
	2462	24.26	≤30	Pass		
8	2412	24.07	≤30	Pass		
802.11n20	2437	24.15	≤30	Pass		
	2462	24.31	≤30	Pass		





	Test Data of Conducted Output Power- Bandwidth 20 MHz of antenna 1+2					
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail		
	2412	26.96	≤30	Pass		
802.11n20	2437	27.11	≤30	Pass		
z.C	2462	26.77	≤30	Pass		



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8. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

6dB bandwidth:

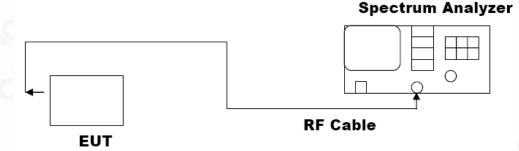
- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 kHz, VBW≥3×RBW.
- 4. Set SPA Trace 1 Max hold, then View.

Occupied bandwidth:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hoping channel
 The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video
 bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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8.3. LIMITS AND MEASUREMENT RESULTS

Test Data of Occupied Bandwidth and DTS Bandwidth- Bandwidth 10 MHz of antenna 1					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-6dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
ССК	2412	6.812	4.285	≥0.5	Pass
	2437	6.977	4.302	≥0.5	Pass
	2462	7.457	4.776	≥0.5	Pass
OFDM 6Mbps	2412	8.387	8.170	≥0.5	Pass
	2437	8.659	8.172	≥0.5	Pass
	2462	9.867	8.168	≥0.5	Pass
OFDM MCS0	2412	8.954	8.639	≥0.5	Pass
	2437	9.130	8.618	≥0.5	Pass
	2462	10.266	8.684	≥0.5	Pass

Test Data of Occupied Bandwidth and DTS Bandwidth- Bandwidth 10 MHz of antenna 2					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-6dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
8	2412	6.560	4.063	≥0.5	Pass
ССК	2437	6.764	4.290	≥0.5	Pass
	2462	7.183	4.543	≥0.5	Pass
0	2412	8.366	8.172	≥0.5	Pass
OFDM 6Mbps	2437	8.505	8.179	≥0.5	Pass
	2462	9.784	8.115	≥0.5	Pass
OFDM MCS0	2412	8.925	8.638	≥0.5	Pass
	2437	9.071	8.655	≥0.5	Pass
	2462	10.100	8.667	≥0.5	Pass

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Test Data of Occupied Bandwidth and DTS Bandwidth- Bandwidth 20 MHz of antenna 1					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-6dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
	2412	12.672	7.546	≥0.5	Pass
802.11b	2437	13.743	8.536	≥0.5	Pass
	2462	14.436	8.564	≥0.5	Pass
802.11g	2412	16.334	15.141	≥0.5	Pass
	2437	16.603	16.316	≥0.5	Pass
	2462	16.986	15.722	≥0.5	Pass
802.11n20	2412	17.604	16.266	≥0.5	Pass
	2437	17.874	16.487	≥0.5	Pass
	2462	18.891	16.338	≥0.5	Pass

Test Data of Occupied Bandwidth and DTS Bandwidth- Bandwidth 20 MHz of antenna 2					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-6dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11b	2412	13.347	8.054	≥0.5	Pass
	2437	13.928	8.573	≥0.5	Pass
	2462	14.538	8.526	≥0.5	Pass
802.11g	2412	16.589	16.314	≥0.5	Pass
	2437	16.935	16.323	≥0.5	Pass
	2462	18.736	15.711	≥0.5	Pass
802.11n20	2412	17.605	15.730	≥0.5	Pass
	2437	17.832	16.657	≥0.5	Pass
	2462	18.781	16.324	≥0.5	Pass

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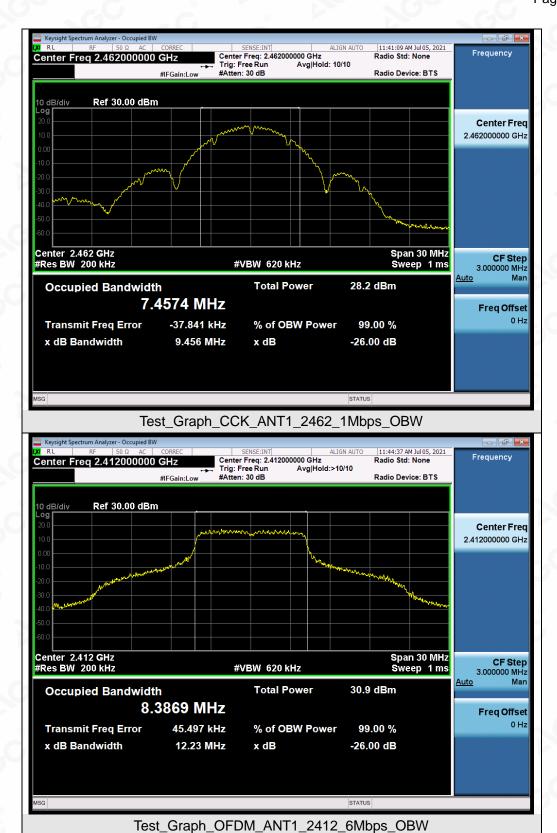


Test Graphs of Occupied Bandwidth- Bandwidth 10 MHz-Ant 1



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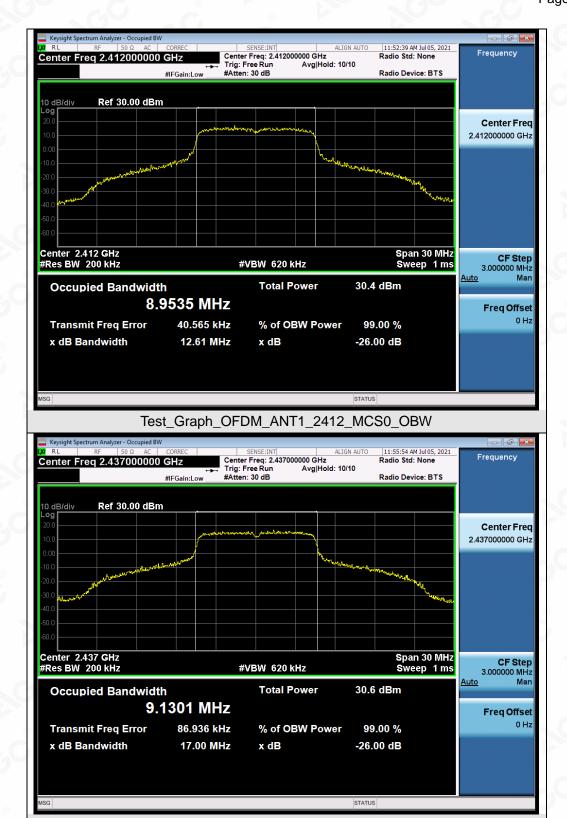










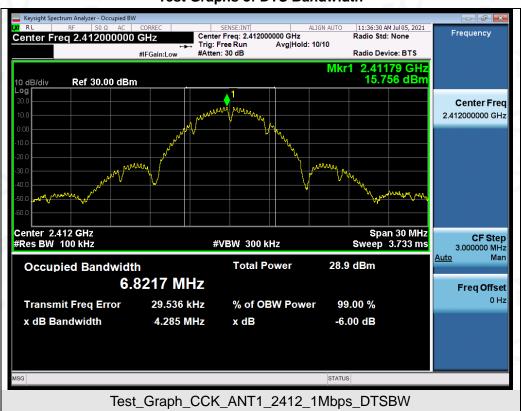


Test_Graph_OFDM_ANT1_2437_MCS0_OBW





Test Graphs of DTS Bandwidth

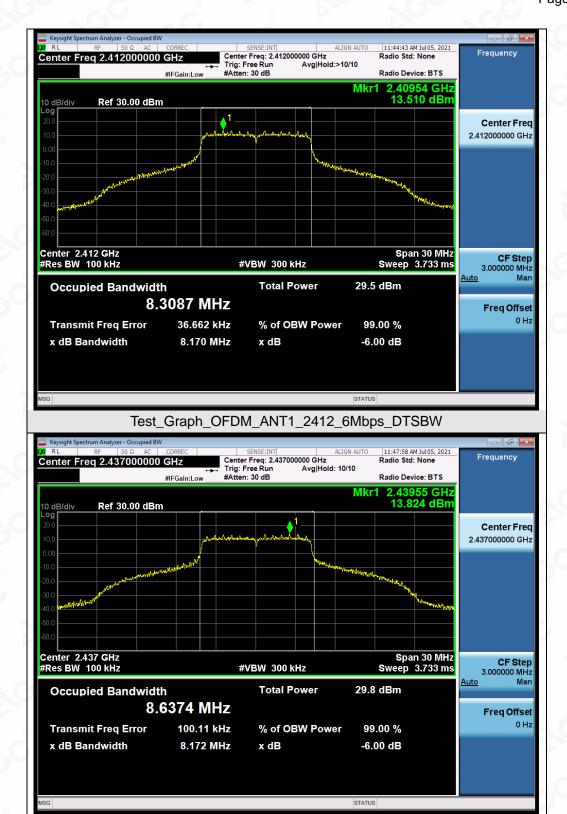


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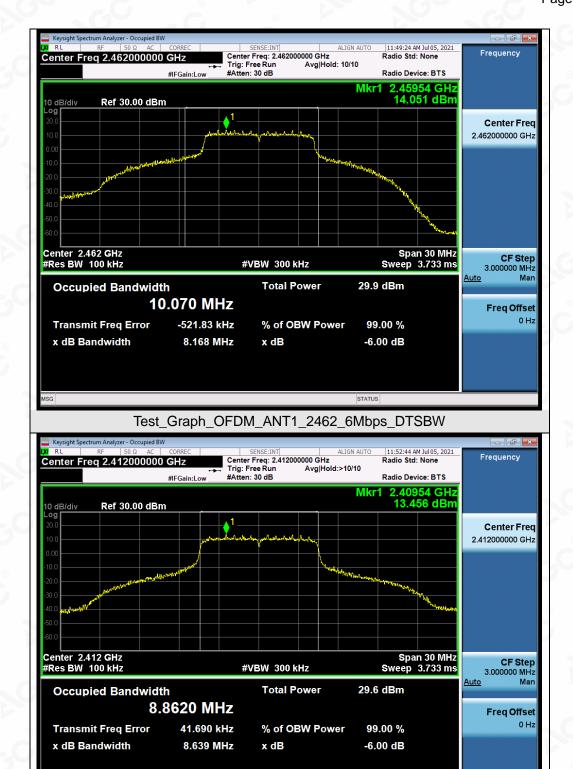






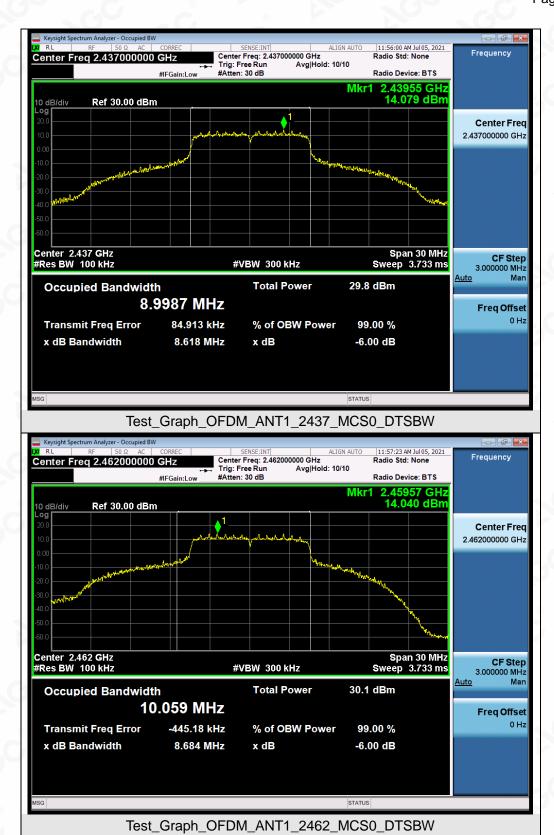
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Test_Graph_OFDM_ANT1_2412_MCS0_DTSBW





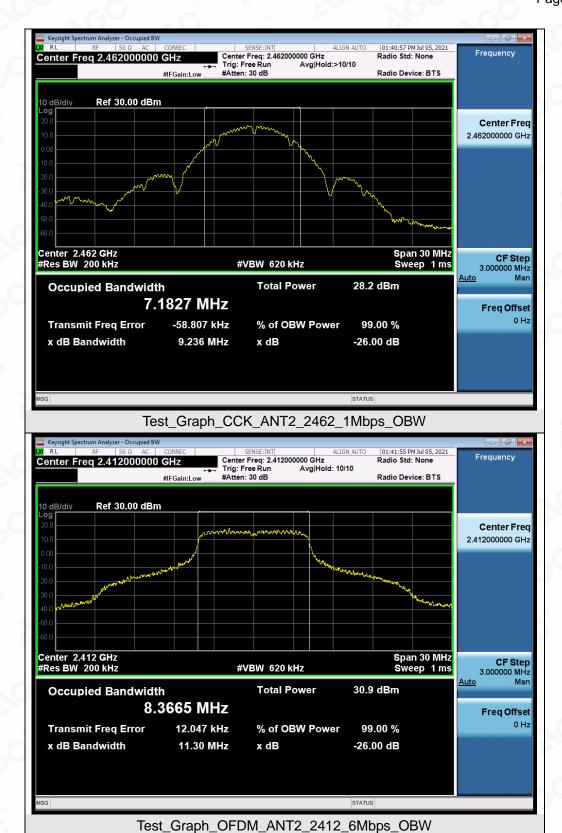


Test Graphs of Occupied Bandwidth- Bandwidth 10 MHz-Ant 2



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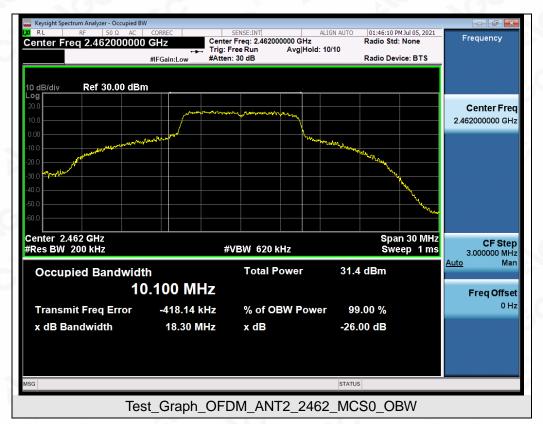
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Test_Graph_OFDM_ANT2_2437_MCS0_OBW



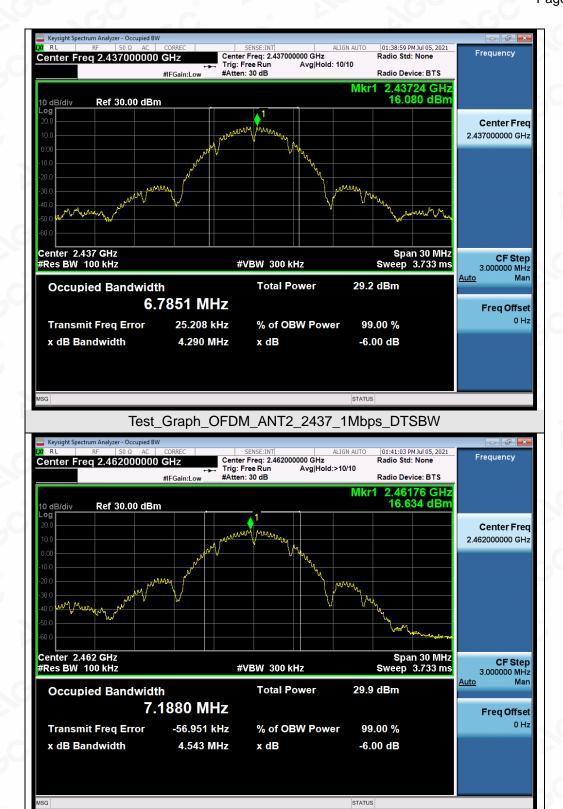


Test Graphs of DTS Bandwidth



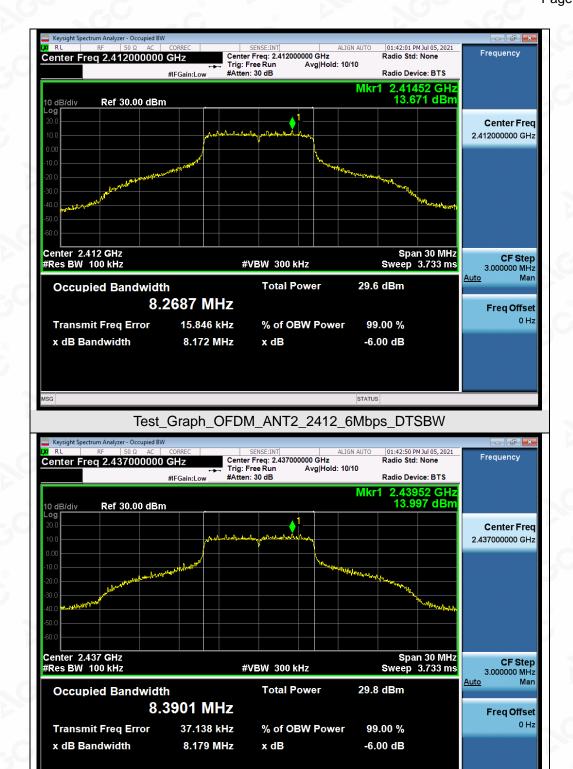
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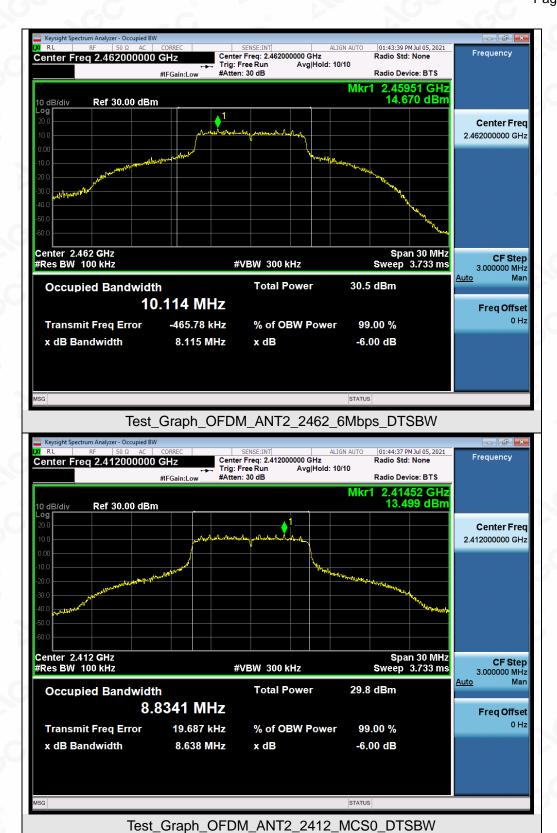
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Test_Graph_OFDM_ANT2_2437_6Mbps_DTSBW



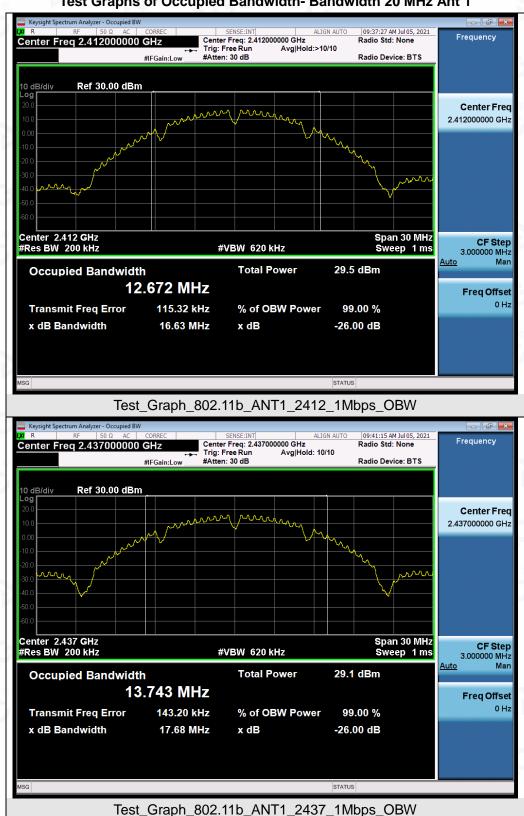








Test Graphs of Occupied Bandwidth- Bandwidth 20 MHz Ant 1



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