FCC CERTIFICATION TEST REPORT

FOR

Applicant	:	Formovie (Chongqing) Innovative Technology Co., Ltd.
Address	:	4-401, #2 Longgang Road, Guojiatuo Area, Jiangbei District, Chongqing, China
Equipment under Test	:	Laser Projector
Model No.	:	L065FGE, L065******* (*=0-9, a-z, A-Z, - or blank, indicates for different market purposes)
Trade Mark	:	WEMAX, FORMOVIE
FCC ID	:	2AZNP-L065FGE
Manufacturer	:	Formovie (Chongqing) Innovative Technology Co., Ltd.
Address	:	4-401, #2 Longgang Road, Guojiatuo Area, Jiangbei District, Chongqing, China

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

Tel.: +86-0769-38826678, **E-mail:** ddt@dgddt.com, http://www.dgddt.com

REPORT

Table of Contents

Test Report Declare

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Address	:	4-401, #2 Longgang Road, Guojiatuo Area, Jiangbei District, Chongqing, China

Test Standard Used:

FCC Rules and Regulations Part 15.247.

Test procedure used:

ANSI C63.10:2013, 558074 D01 15.247 Meas Guidance v05r02, 662911 D01 Multiple Transmitter Output v02r01

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	DDT-R22011701-2E03		
Date of Receipt:	Jan. 18, 2022	**Date of Test:**	Jan. 18, 2022 ~ Feb. 25, 2022

Prepared By: ***Approved By:***

Johnny Wang

Johnny Wang/Engineer ***Damon Hu/EMC Manager***

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Feb. 25, 2022	

1. Summary of Test Results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	**Standard**	**Verdict**
6dB Bandwidth and 99% Bandwidth	FCC 15.247 (a)	Pass
Conducted Output Power	FCC 15.247 (b) (3)	Pass
Power Spectral Density	FCC 15.247 (e)	Pass
Band-edge and Spurious Emissions (Conducted)	FCC 15.247 (d)	Pass
Radiated Spurious Emissions	FCC 15.247 (d) FCC 15.209 FCC 15.205	Pass
Radiated Band Edge Compliance	FCC 15.247 (d) FCC 15.209 FCC 15.205	Pass
Power Line Conducted Emission	FCC 15.207	Pass
Antenna Requirement	FCC 15.203	Pass

2. General Test Information

2.1. Description of EUT

EUT* Name	:	Laser Projector
Model Number	:	L065FGE, L065******* (*=0-9, a-z, A-Z, - or blank, indicates for different market purposes)
Difference of models	:	Above models are identical in schematic and structure, only the model name is different for different market purposes, therefore the test performed on the model L065FGE.
EUT Function Description	:	Please reference user manual of this device
Power Supply	:	Input: 100-240V ~ 50/60Hz 1.5A
Radio Technology	:	IEEE 802.11b/g/n
FCC Operation Frequency	:	IEEE 802.11b: 2412MHz-2462MHz IEEE 802.11g: 2412MHz-2462MHz IEEE 802.11n HT20: 2412MHz-2462MHz IEEE 802.11n HT40: 2422MHz-2452MHz
Modulation	:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK, BPSK)
Transmitter Rate	:	IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78, 104, 117, 130 Mbps IEEE 802.11n HT40: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 216, 243, 270 Mbps
Antenna Gain	:	Antenna 1: Maximum PK gain: 1.82 dBi Antenna 2: Maximum PK gain: 2.09 dBi
Sample Type	:	Series production
Serial Number	:	N/A

Note: EUT is the ab. of equipment under test.

Antenna information			
	Ant1 gain	Ant2 gain	MIMO
IEEE 802.11b	1.82	2.09	/
IEEE 802.11g	1.82	2.09	/
IEEE 802.11n HT20	1.82	2.09	4.97
IEEE 802.11n HT40	1.82	2.09	4.97

Channel information					
CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

2.2. Accessories of EUT

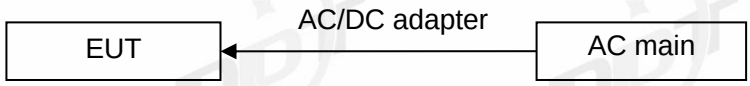
Assistant equipment	Manufacturer	Model number	EMC Compliance	SN

AC/DC ADAPTER	N/A	AY65AA-W-CH	N/A	Input: 100-240V ~ 50/60Hz 1.5A Output: PD3.0: 5V3A, 9V3A, 12V3A, 15V3A, 20V3.25A 65WVMax
Remote Control	Formovie (Chongqing)	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
N/A	N/A	N/A	N/A	N/A

2.4. Block diagram of EUT configuration for test



Test software: Putty.exe
The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

Tested mode, channel, and data rate information				
Mode	Setting Tx Power Ant	data rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11b	/	11	LCH: CH1	2412
	/	11	MCH: CH6	2437
	/	11	HCH: CH11	2462
IEEE 802.11g	/	54	LCH: CH1	2412
	/	54	MCH: CH6	2437
	/	54	HCH: CH11	2462
IEEE 802.11n HT20	/	MCS 15	LCH: CH1	2412
	/	MCS 15	MCH: CH6	2437
	/	MCS 15	HCH: CH11	2462
IEEE 802.11n HT40	/	MCS 15	LCH: CH3	2422
	/	MCS 15	MCH: CH6	2437
	/	MCS 15	HCH: CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.				

2.5. Deviations of test standard

No Deviation

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25℃
Humidity range:	40-75%
Pressure range:	86-106kPa

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

Tel.: +86-0769-38826678, http://www.dgddt.com, Email: ddt@dgddt.com

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, G-20118

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7 x 10^{-8} (Antenna couple method)
	5.5 x 10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.40 dB (3.6 GHz ≤ f < 8 GHz)
	1.66 dB (8 GHz≤ f < 22 GHz)
Uncertainty for radio frequency (RBW<20 kHz)	3×10^{-8}
Temperature	.4℃
Humidity	2%
Uncertainty for Radiation Emission test (30 MHz-1 GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz-40 GHz)	4.10 dB (1-6 GHz)
	4.40 dB (6 GHz-18 GHz)
	3.54 dB (18 GHz-26 GHz)
	4.30 dB (26 GHz-40 GHz)
Uncertainty for Power line conduction emission test	3.32 dB (150 kHz-30 MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

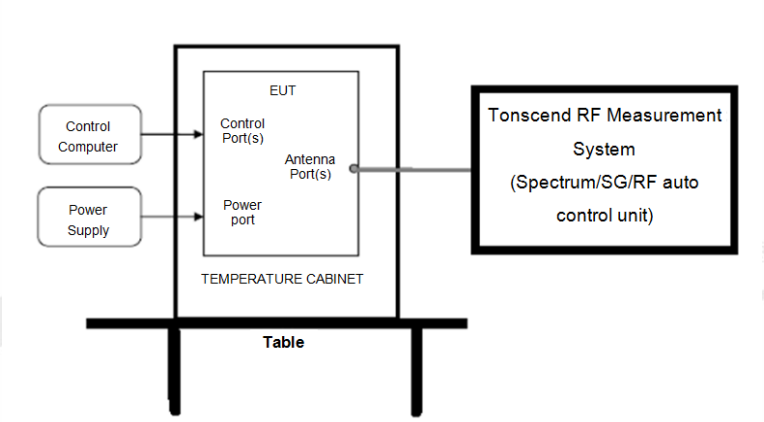
3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☐RF Connected Test (Tonscend RF Measurement System 1#)					
Spectrum analyzer	R&S	FSU26	200071	Sep. 02, 2021	1 Year
Wideband Radio Communication tester	R&S	CMW500	120259	Sep. 02, 2021	1 Year
Vector Signal Generator	Agilent	E8267D	US49060192	Sep. 18, 2021	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180737	Jun. 01, 2021	1 Year
RF Control Unit	Tonsend	JS0806-2	158060010	Jun. 01, 2021	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	Jun. 01, 2021	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.2.6.77.0518	N/A	N/A
☐RF Connected Test (Tonscend RF Measurement System 3#)					
Signal analyzer	R&S	FSQ26	101272	Jun. 01, 2021	1 Year
Wideband Radio Communication tester	R&S	CMW500	117491	Jun. 01, 2021	1 Year
Vector Signal Generator	Agilent	N5182A	MY19060405	Jun. 01, 2021	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180912	Jun. 01, 2021	1 Year
RF Control Unit	Tonsend	JS0806-2	DDT-ZC01449	Jun. 01, 2021	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	Jun. 01, 2021	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.2.6.77.0518	N/A	N/A
☒RF Connected Test (Tonscend RF Measurement System 4#)					
MXA Signal Analyzer	Agilent	N9020A	MY49100362	Sep. 02, 2021	1 Year
Wideband Radio Communication tester	R&S	CMW500	120259	Jun. 01, 2021	1 Year
MXG Vector Signal Generator	Agilent	N5182B	MY59100192	Jun. 01, 2021	1 Year
Vector Signal Generator	Agilent	E8267D	US49060192	Sep. 18, 2021	1 Year
RF Control Unit	Tonsend	JS0806-2	21I8060485	Oct. 18, 2021	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	Jun. 01, 2021	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.2.6.88.0346	N/A	N/A
☒Radiation 3#chamber					
EMI Test Receiver	R&S	ESU	100472	Jun. 01, 2021	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	Jun. 01, 2021	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 19, 2021	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	01429	Aug. 07, 2021	1 Year
Double Ridged Horn Antenna	Schwarzbeck	BBHA9120	02108	Jul. 17, 2021	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	May 08, 2021	1 Year
Pre-amplifier	COM-POWER	PAM-118A	18040084	Sep. 02, 2021	1 Year

Pre-amplifier	COM-POWER	PAM-840A	461369	Mar. 15, 2021	1 Year
Test software	Audix	E3	V 6.1.1.1	N/A	N/A
☒Power Line Conducted Emissions Test 1#					
Test Receiver	R&S	ESCI	100551	Sep. 02, 2021	1 Year
LISN 1	R&S	ENV216	101109	Sep. 02, 2021	1 Year
LISN 2	R&S	ESH2-Z5	100309	Sep. 02, 2021	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Sep. 02, 2021	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Sep. 02, 2021	1 Year
LISN 3	SCHWARZBECK	NSLK 8163	00017	Sep. 02, 2021	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
☐Power Line Conducted Emissions Test 2#					
Test Receiver	R&S	ESCI	101028	Sep. 02, 2021	1 Year
LISN 1	R&S	ENV216	101170	Sep. 02, 2021	1 Year
Pulse Limiter	R&S	KH43101	431011801568-12#	Jun. 01, 2021	1 Year
CE Cable 2	HUBSER	RG214-5	N/A	Jun. 01, 2021	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A

4. 6dB Bandwidth and 99% Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

4.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) 99% Bandwidth set the spectrum analyzer as follows:

RBW:	500 KHz/1M
VBW:	2 MHz/3M
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) 6dB Bandwidth set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(4) Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.4. Test result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	8.560	2407.480	2416.040	0.5	Pass
	Ant2	2412	9.040	2407.480	2416.520	0.5	Pass
	Ant1	2437	9.080	2432.440	2441.520	0.5	Pass
	Ant2	2437	9.040	2432.480	2441.520	0.5	Pass
	Ant1	2462	9.040	2457.480	2466.520	0.5	Pass
	Ant2	2462	9.040	2457.480	2466.520	0.5	Pass
11G	Ant1	2412	15.680	2404.440	2420.120	0.5	Pass
	Ant2	2412	15.440	2404.440	2419.880	0.5	Pass
	Ant1	2437	15.120	2429.440	2444.560	0.5	Pass
	Ant2	2437	15.120	2429.440	2444.560	0.5	Pass
	Ant1	2462	15.360	2454.200	2469.560	0.5	Pass
	Ant2	2462	15.400	2454.440	2469.840	0.5	Pass
11N20MIMO	Ant1	2412	16.040	2404.440	2420.480	0.5	Pass
	Ant2	2412	16.320	2403.840	2420.160	0.5	Pass
	Ant1	2437	16.000	2429.440	2445.440	0.5	Pass
	Ant2	2437	16.040	2429.160	2445.200	0.5	Pass
	Ant1	2462	16.040	2454.440	2470.480	0.5	Pass
	Ant2	2462	16.080	2454.120	2470.200	0.5	Pass
11N40MIMO	Ant1	2422	35.120	2404.400	2439.520	0.5	Pass
	Ant2	2422	35.040	2404.480	2439.520	0.5	Pass
	Ant1	2437	35.120	2419.400	2454.520	0.5	Pass
	Ant2	2437	35.040	2419.480	2454.520	0.5	Pass
	Ant1	2452	35.200	2434.400	2469.600	0.5	Pass
	Ant2	2452	35.040	2434.480	2469.520	0.5	Pass

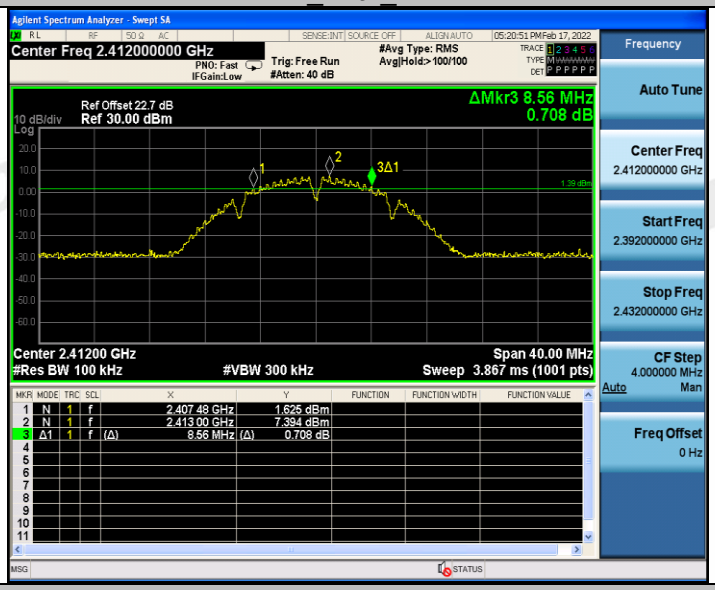
Test Mode	Antenna	Channel	OCB [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	14.164	2404.893	2419.057	---	Pass
	Ant2	2412	14.187	2404.910	2419.097	---	Pass
	Ant1	2437	14.109	2429.924	2444.033	---	Pass
	Ant2	2437	14.155	2429.910	2444.065	---	Pass
	Ant1	2462	14.207	2454.906	2469.113	---	Pass
	Ant2	2462	14.174	2454.905	2469.079	---	Pass
11G	Ant1	2412	16.716	2403.658	2420.374	---	Pass
	Ant2	2412	16.600	2403.728	2420.328	---	Pass
	Ant1	2437	16.761	2428.632	2445.393	---	Pass
	Ant2	2437	16.621	2428.718	2445.339	---	Pass
	Ant1	2462	16.669	2453.645	2470.314	---	Pass
	Ant2	2462	16.688	2453.686	2470.374	---	Pass
11N20MIMO	Ant1	2412	17.758	2403.134	2420.892	---	Pass
	Ant2	2412	17.743	2403.106	2420.849	---	Pass
	Ant1	2437	17.785	2428.104	2445.889	---	Pass
	Ant2	2437	17.765	2428.121	2445.886	---	Pass
	Ant1	2462	17.790	2453.138	2470.928	---	Pass
	Ant2	2462	17.714	2453.197	2470.911	---	Pass
11N40MIMO	Ant1	2422	36.231	2403.883	2440.114	---	Pass
	Ant2	2422	36.282	2403.851	2440.133	---	Pass

	Ant1	2437	36.263	2418.871	2455.134	---	Pass
	Ant2	2437	36.372	2418.831	2455.203	---	Pass
	Ant1	2452	36.300	2433.871	2470.171	---	Pass
	Ant2	2452	36.391	2433.822	2470.213	---	Pass

4.5. original test data

6dB Bandwidth:

11B_Ant1_2412



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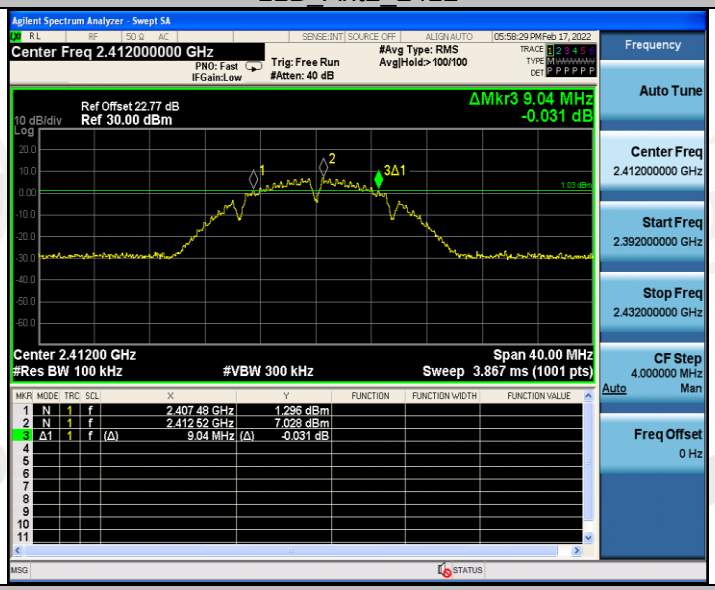

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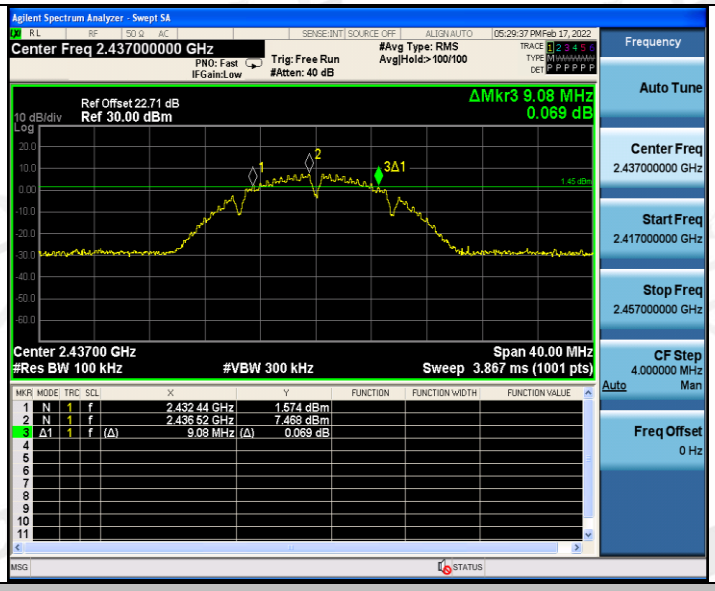
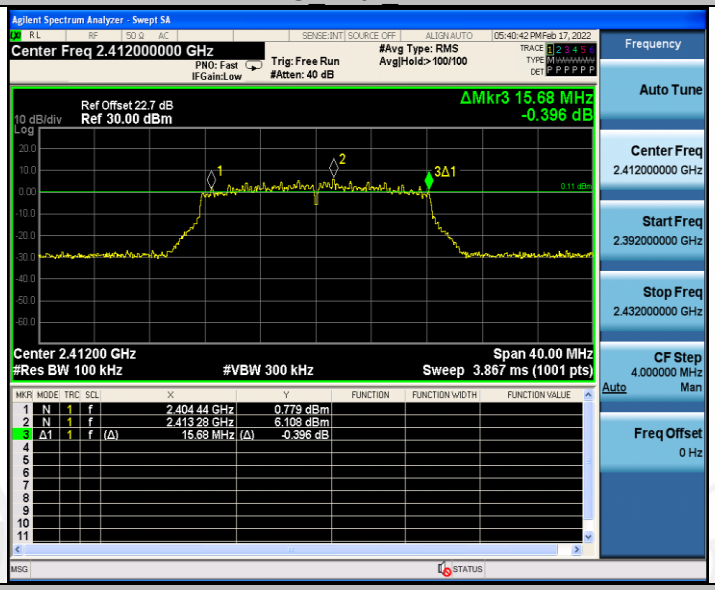


11B_Ant2_2437

11B_Ant1_2462

11B_Ant2_2462

11G_Ant1_2412



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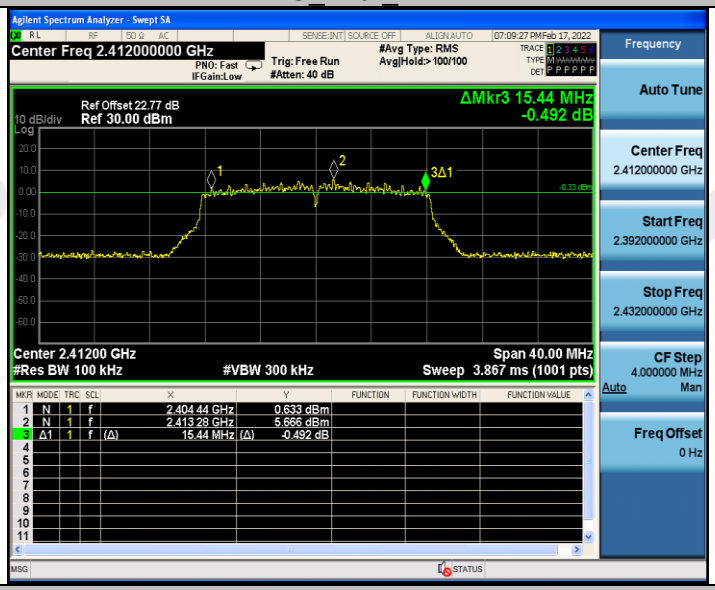

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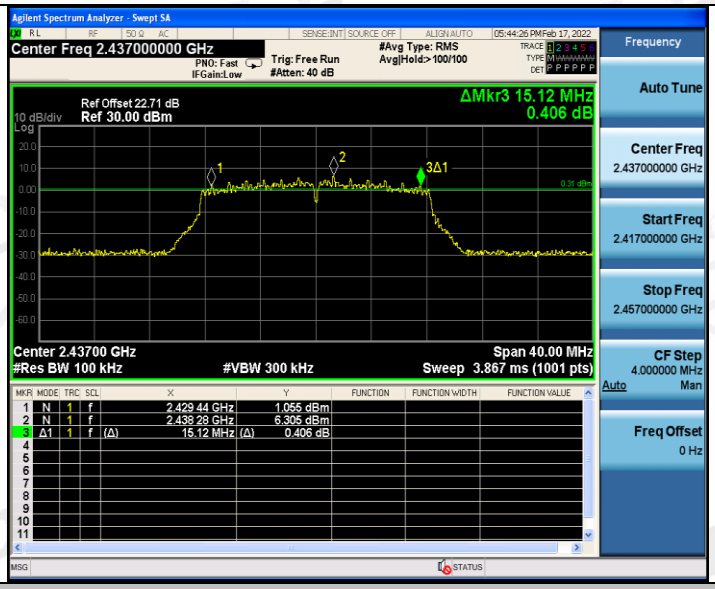

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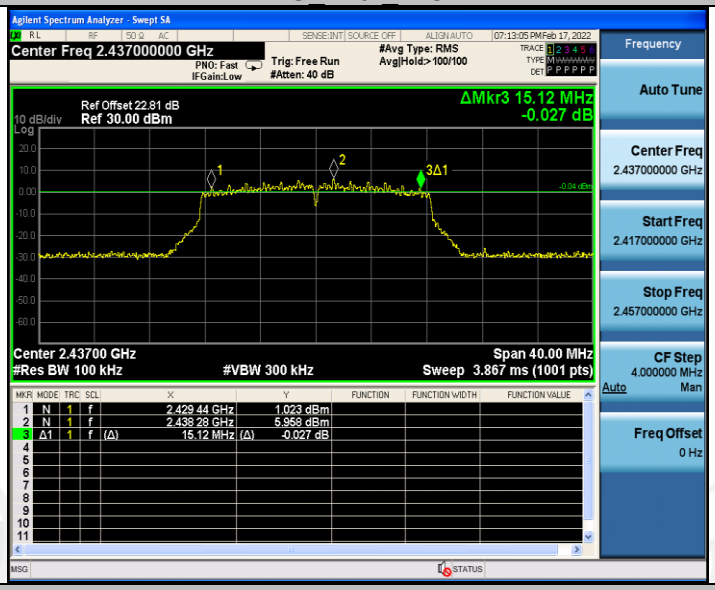

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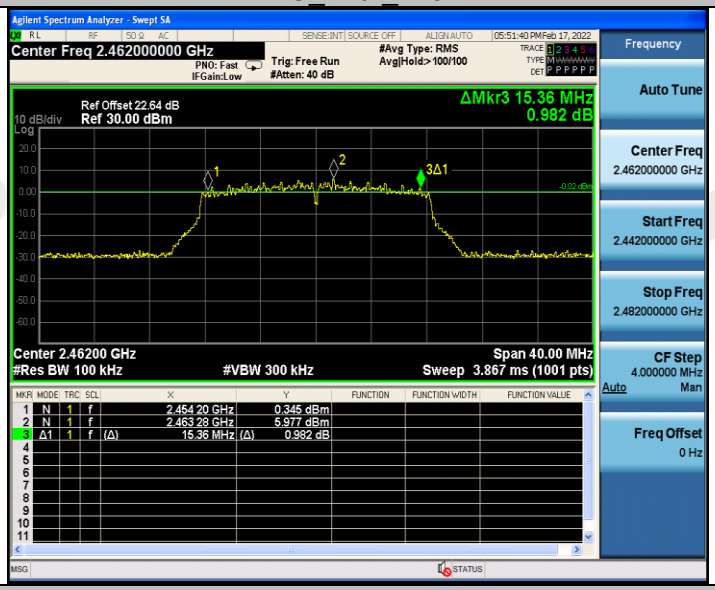

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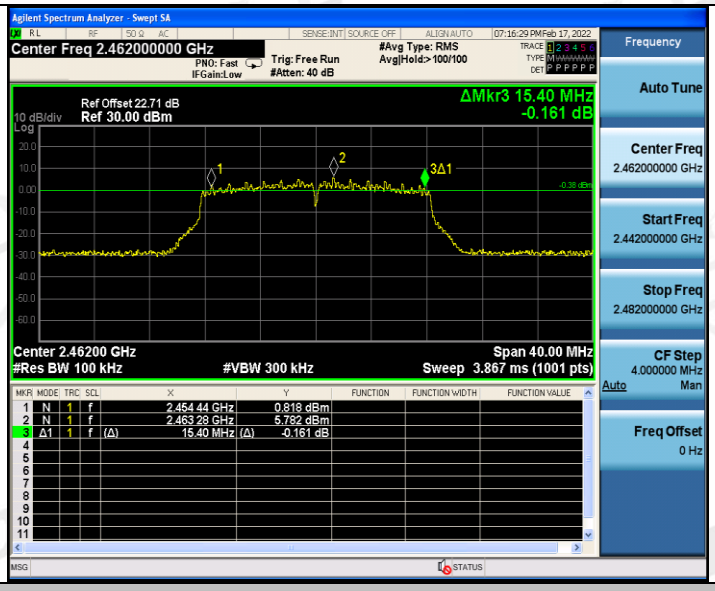

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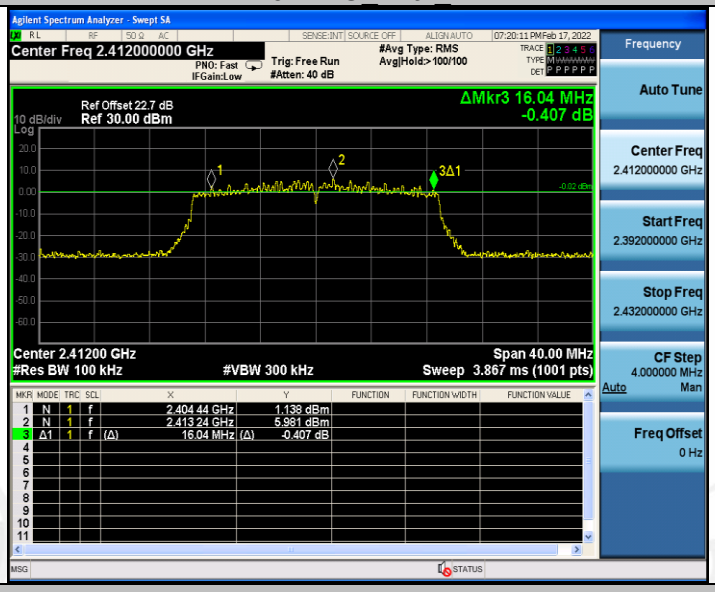

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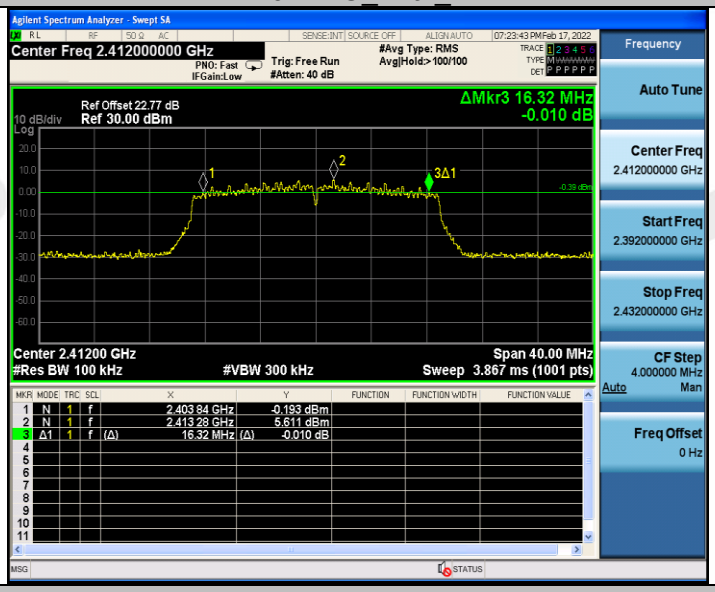

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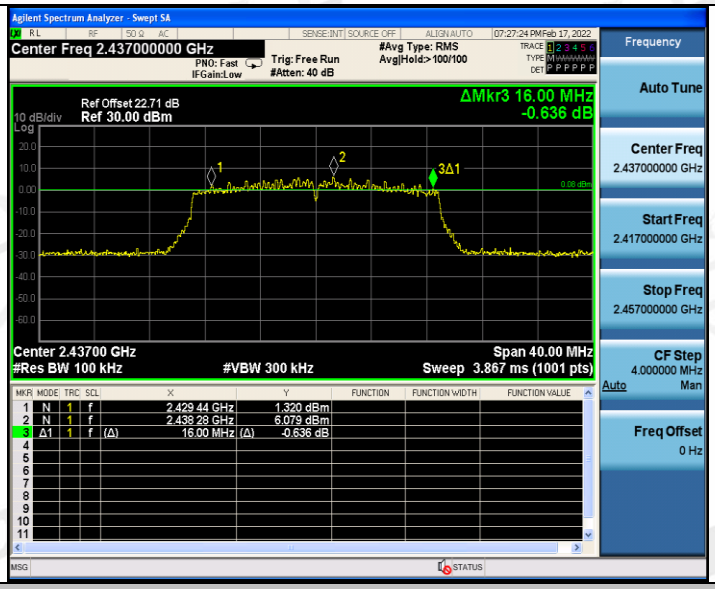

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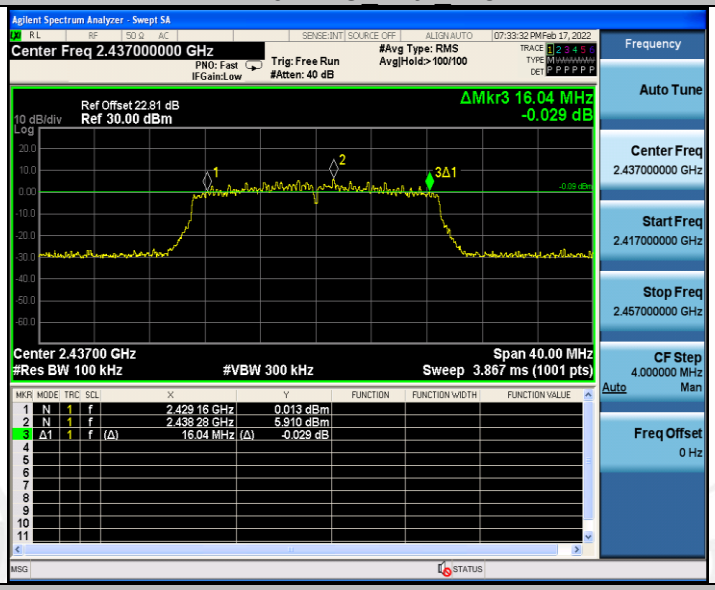
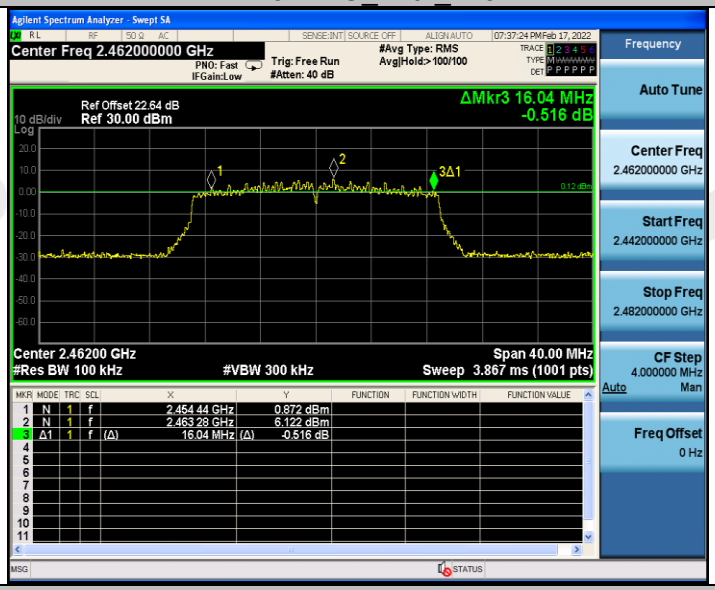


11N20MIMO_Ant1_2462



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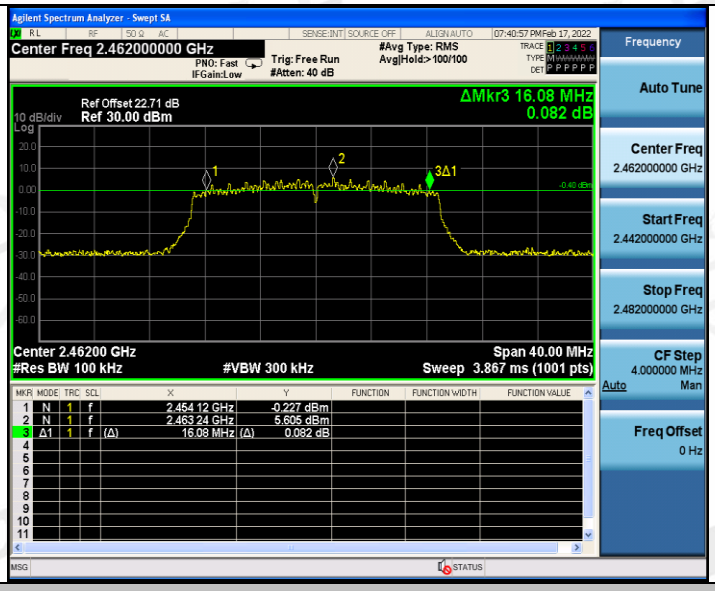

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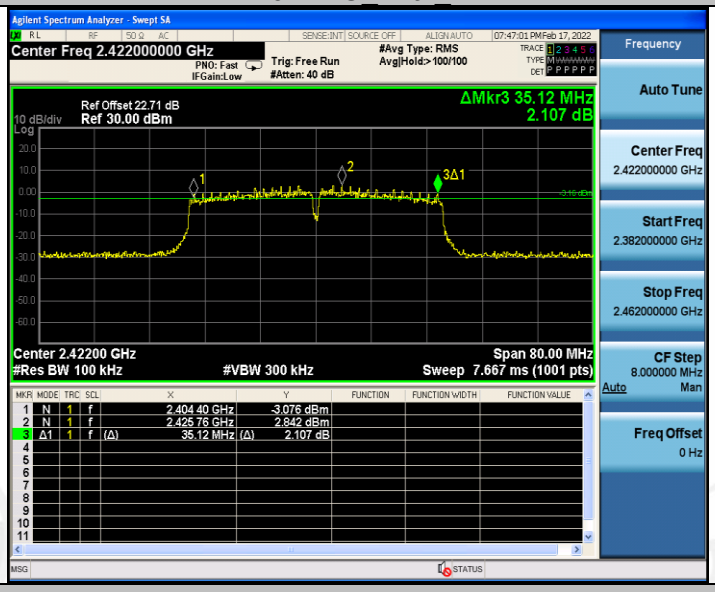

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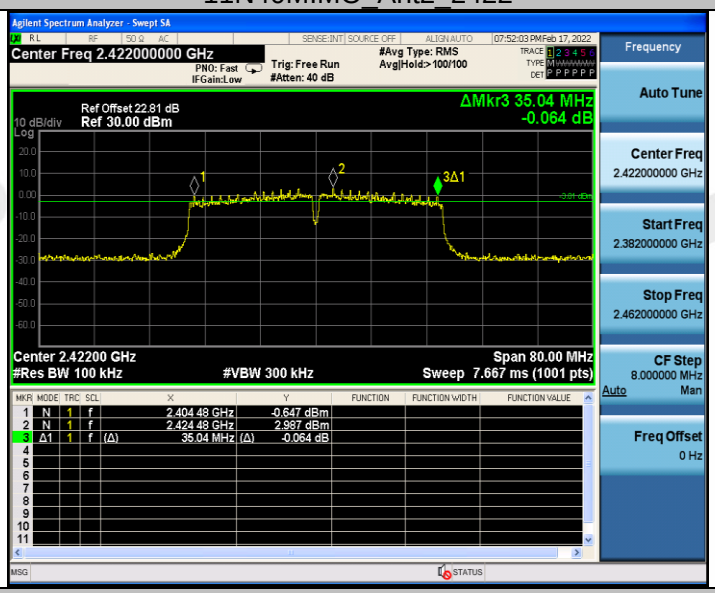

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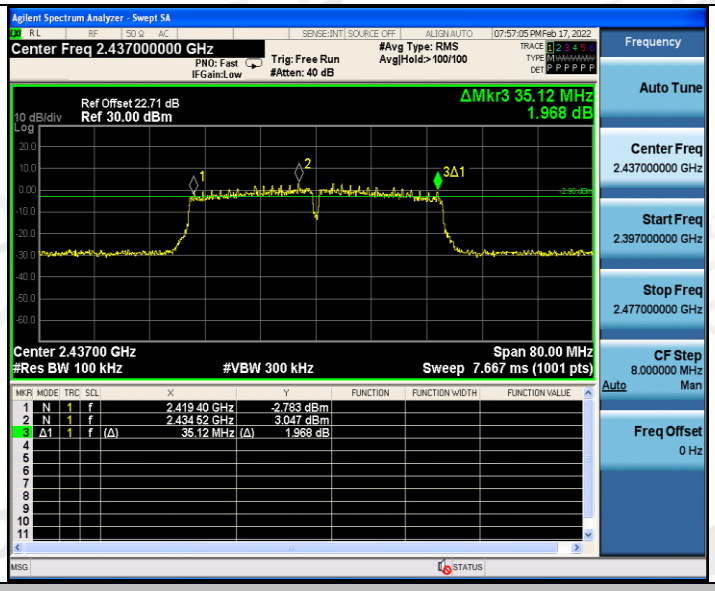

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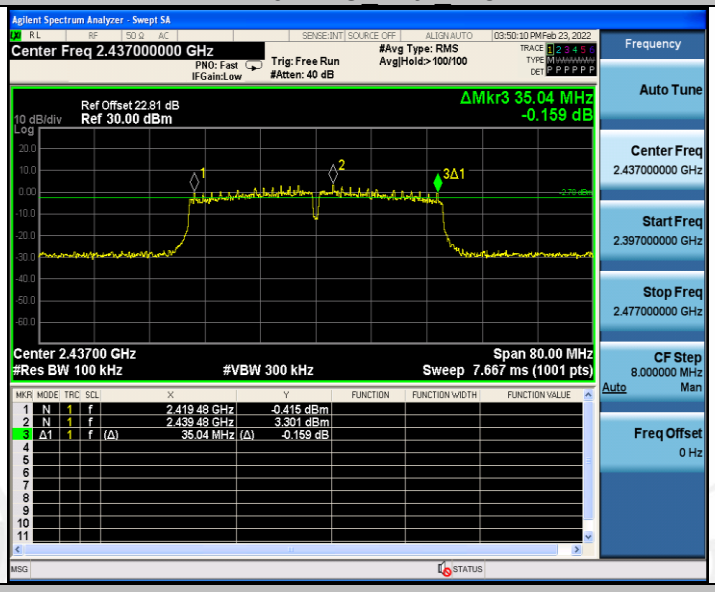

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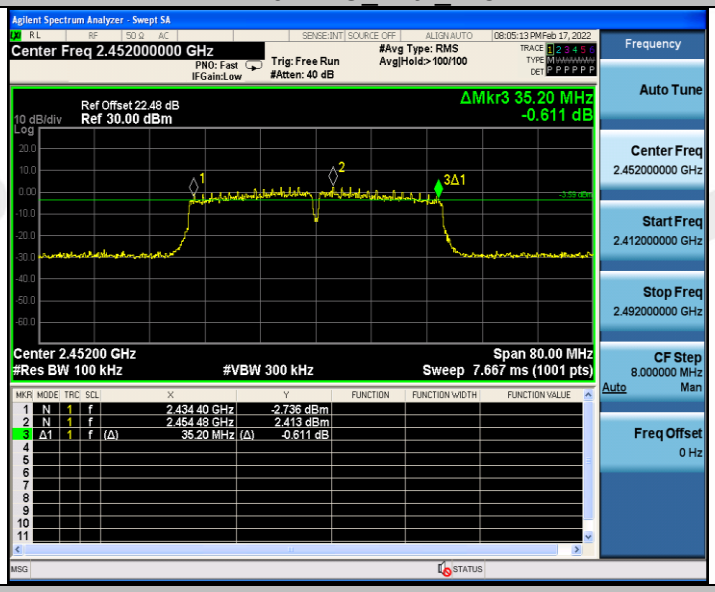

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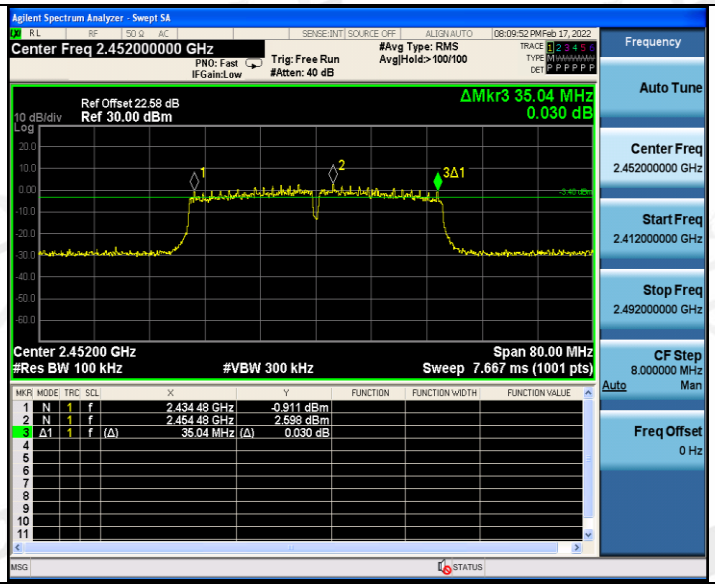
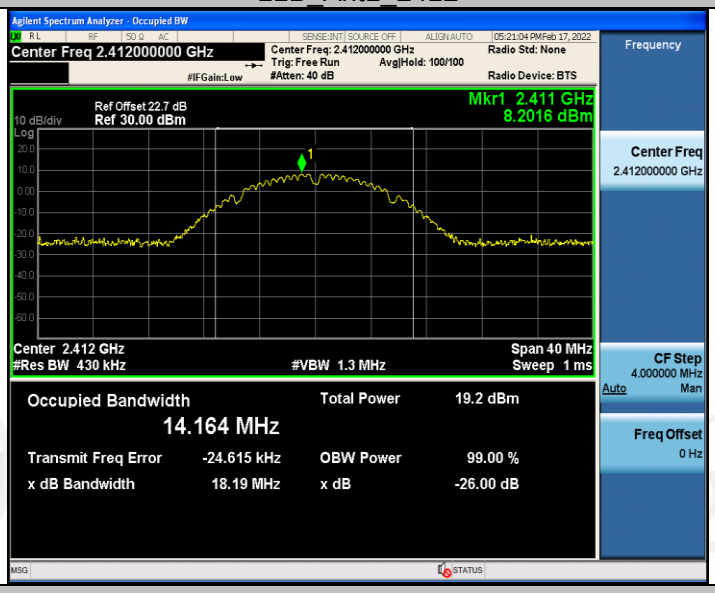


99% Bandwidth

11B_Ant1_2412



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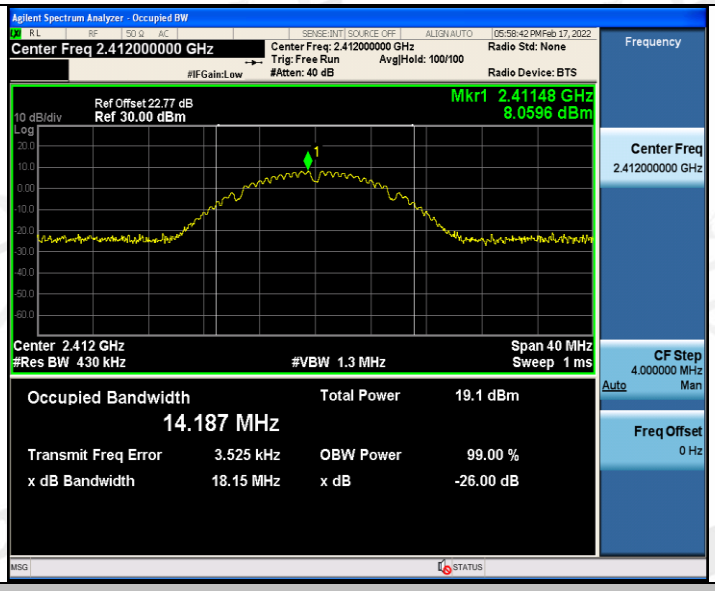

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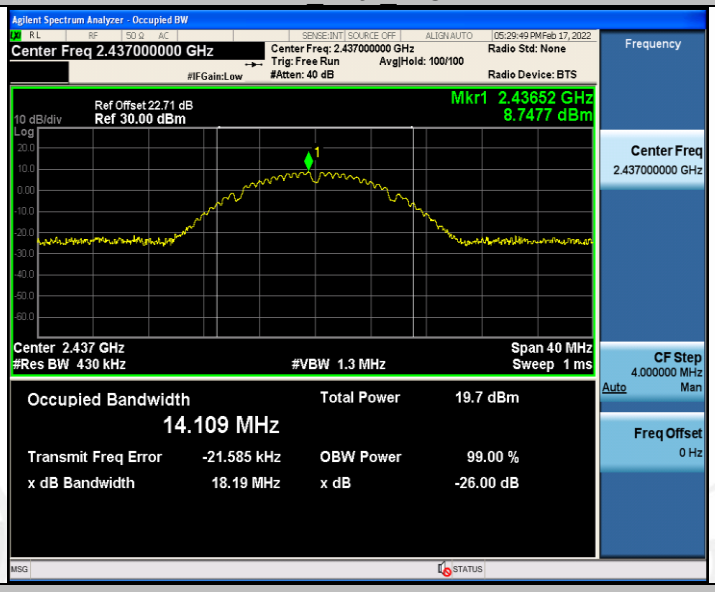

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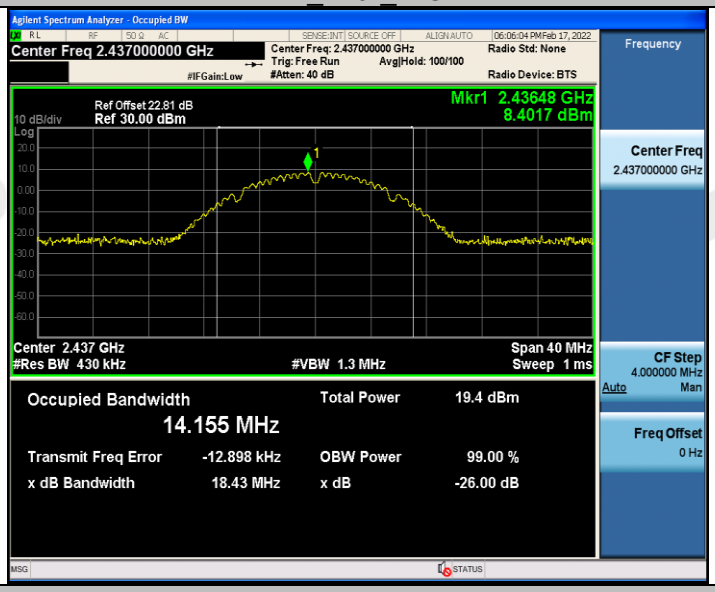

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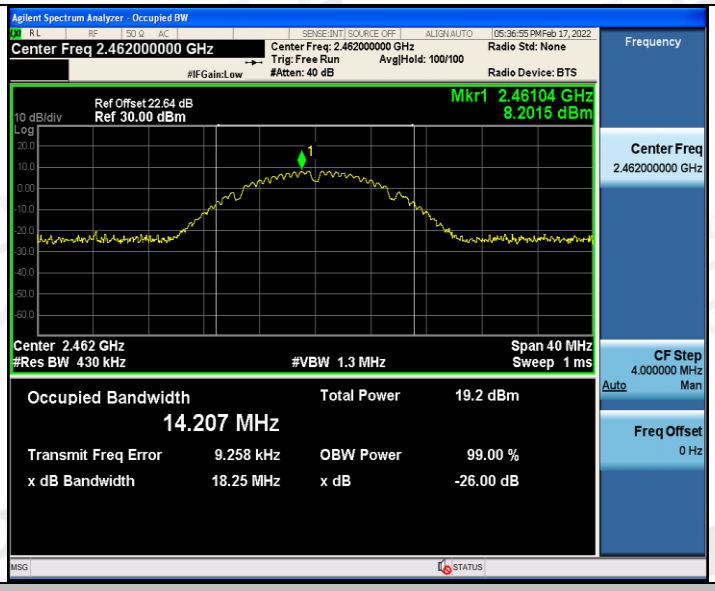

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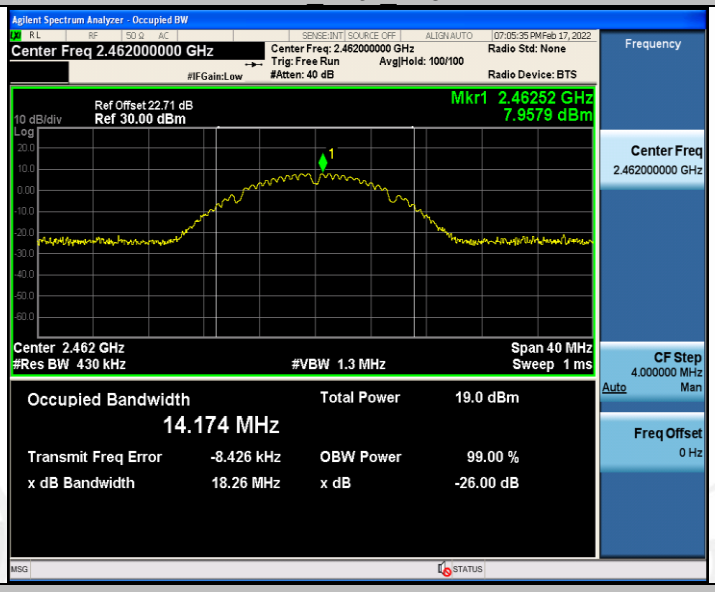

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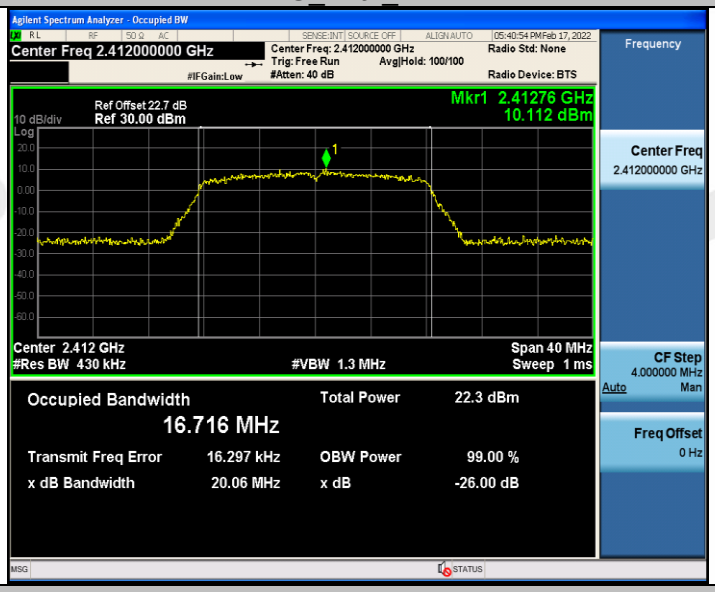

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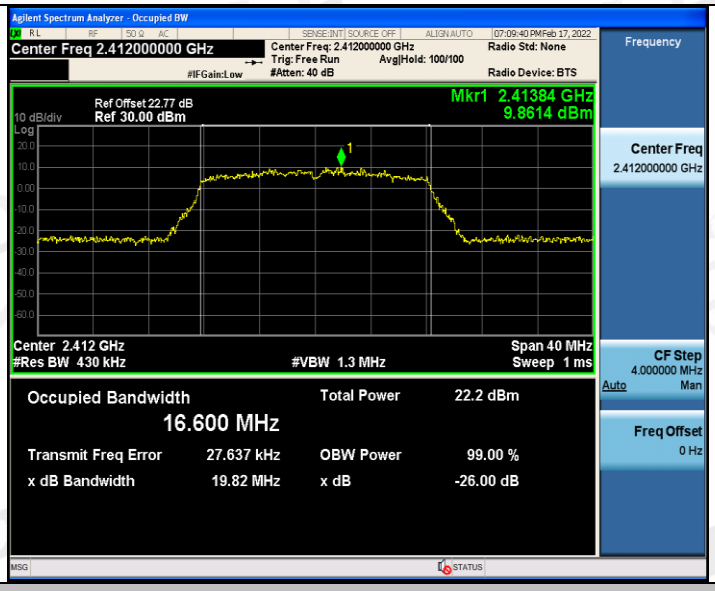

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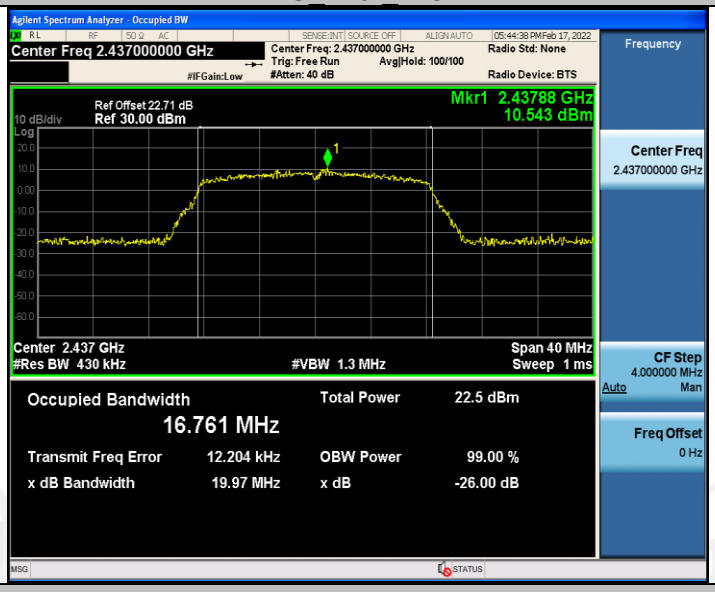

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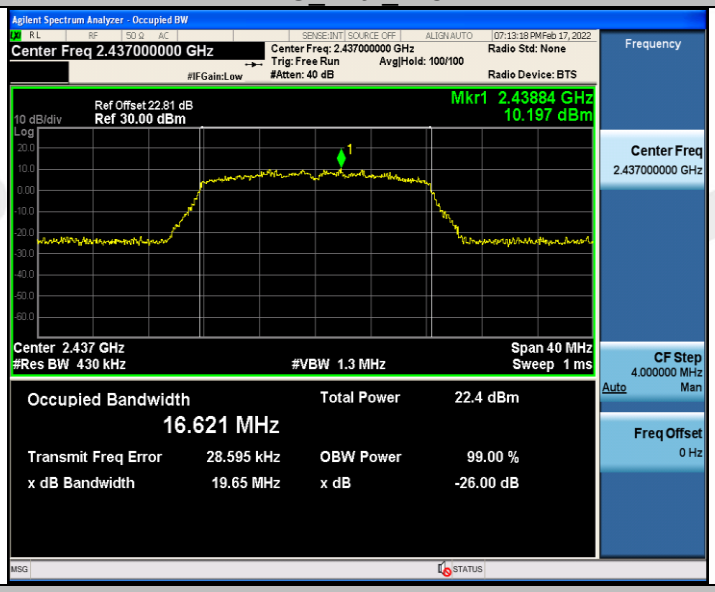

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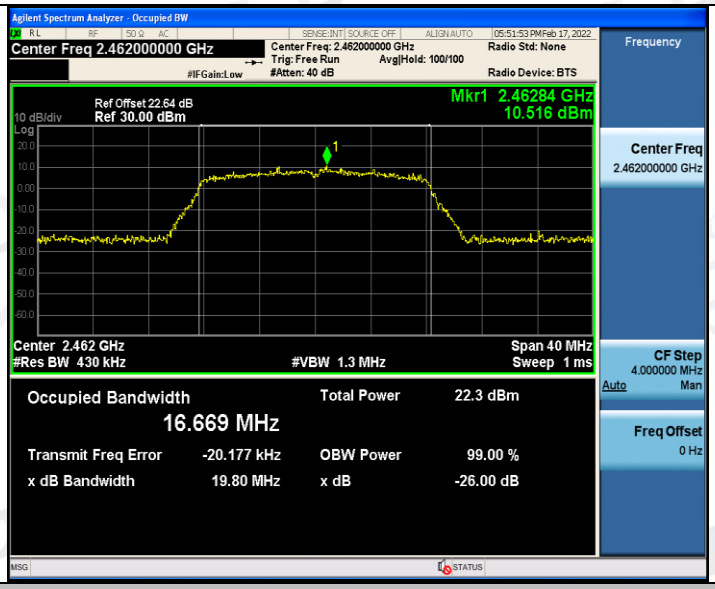

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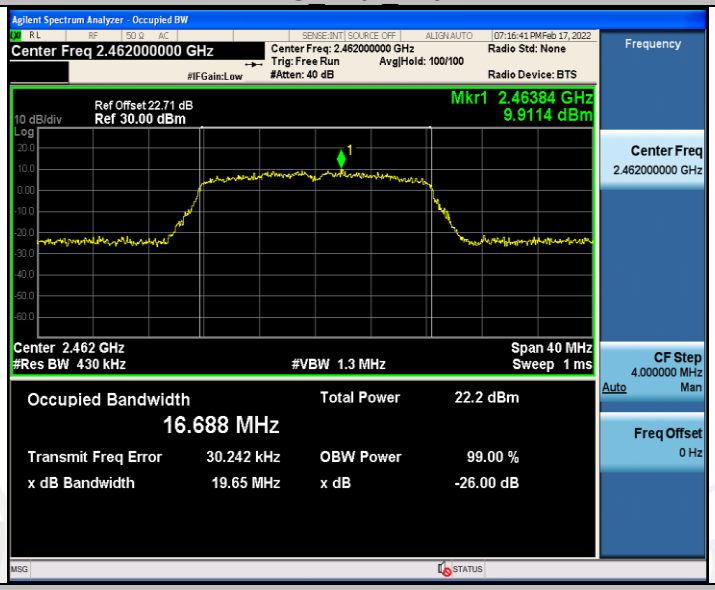

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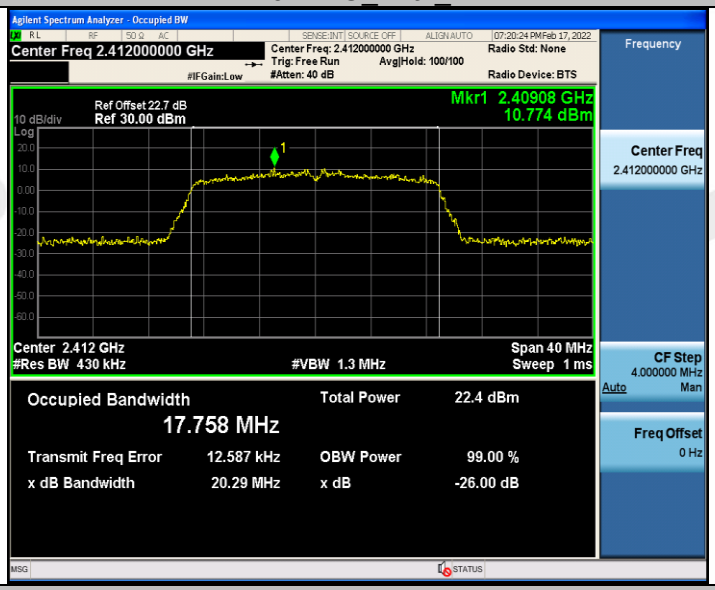

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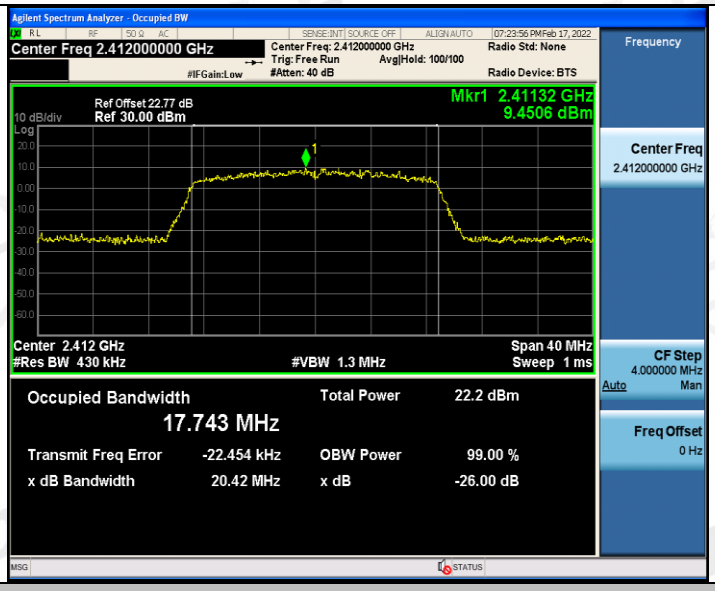

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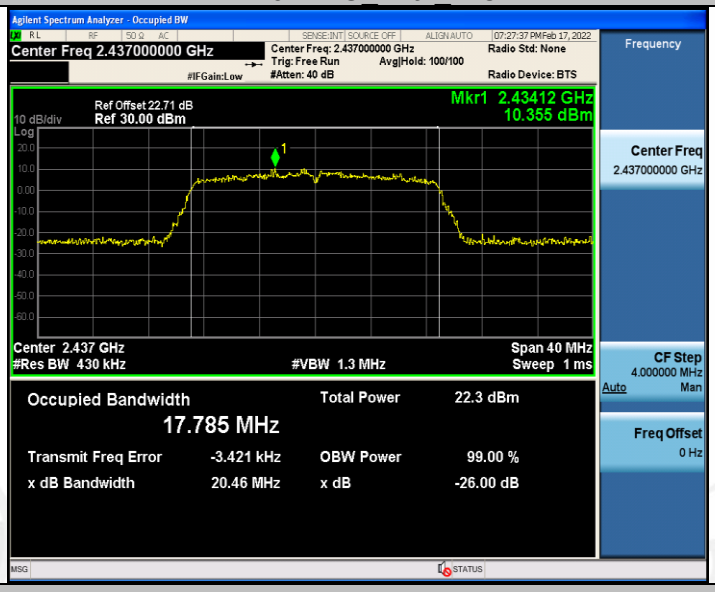

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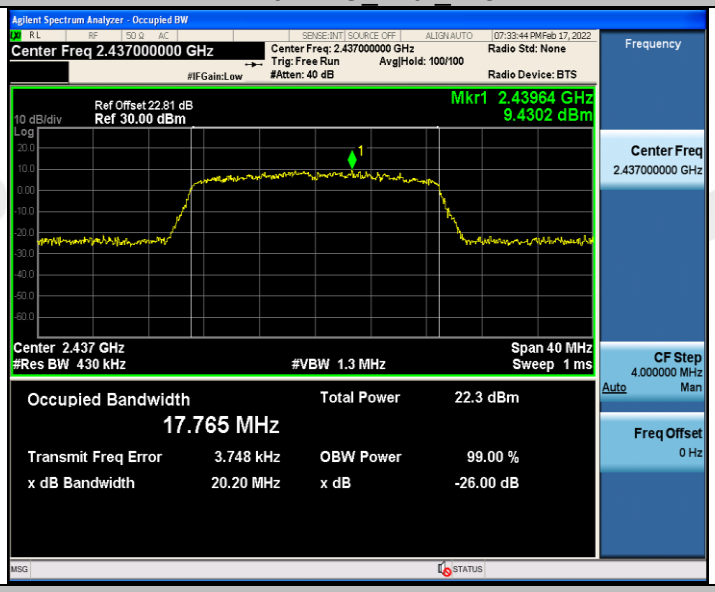

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