FCC RADIO TEST REPORT

Applicant	:	Beijing Xiaomi Electronics Co.,Ltd
Address	:	Room 707,7F,Building 5,No 58,Jinghai Wulu Road, Beijing economic and Technological Development Zone,100176 Beijing City,China
Equipment	:	XIAOMI TV Stick
Model No.	:	MDZ-27-AA
Trade Name	:	Xiaomi
FCC ID.	:	2AIMRMITVMDZ27AA
Standard	:	FCC part 15 Subpart C §15.247

I HEREBY CERTIFY THAT :

The sample was received on Oct. 28, 2022 and the testing was completed on Nov. 01, 2022 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Leevin Li /Supervisor

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History of this test report

Report No.	Issue Date	Description
DEFI2209018	Nov. 09, 2022	Initial Issue

1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart C §15.247

FCC Rule	. Description of Test	Result
FCC CFR Title 47 Part 15 Subpart C: Section 15.203/15.247 (b)	. Antenna Requirement	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.207	. AC Power Line Conducted Emission	N/A
FCC CFR Title 47 Part 15 Subpart C: Section 15.205/15.209	. Spurious Emission(Radiated)	N/A
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(d)	. Spurious Emission(Conducted)	N/A
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(a)(2)	. 6dB Bandwidth	N/A
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(b)	. Maximum Peak Output Power	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(e)	. Power Spectral Density	Pass

Deviations Yes ☐ No ■

Note:

1: The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement.

2: "N/A" denotes test is not applicable in this test report.

3: This is the amended report application basing on the original report DEFI2107060. The differences between them as following:

1) Reduced WiFi power by software.

After the evaluation, Maximum Peak Output Power and Power Spectral Density need to be retested and reported in this report. More information about the test data please refer to the original report.

2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Equipment	XIAOMI TV Stick
Model Name	MDZ-27-AA
Model Discrepancy	N/A
Frequency Range	BT/BLE/ WIFI 2.4G: 2400MHz-2483.5MHz WIFI 5G: 5150MHz-5350MHz, 5470-5725MHz, 5725MHz -5850MHz
Modulation Type	BT: GFSK, π/4-DQPSK, 8DPSK BLE: GFSK 802.11b: CCK, DQPSK, DBPSK 802.11a/g: 64-QAM,16-QAM, QPSK, BPSK 802.11n: 64-QAM,16-QAM, QPSK, BPSK 802.11ac: 256-QAM,64-QAM,16-QAM, QPSK, BPSK
Data Rate	BT: GFSK:1Mbps, π/4-DQPSK: 2Mbps, 8DPSK:3Mbps BLE: GFSK: 1Mbps WIFI 2.4G: 802.11b: 1, 2 ,5.5,11Mbps 802.11g: 6,9,12,18,24,36,48,54Mbps 802.11n: HT20 reach up to 144.4Mbps, HT40 reach up to 300Mbps WIFI 5G: 802.11a: 6,9,12,18,24,36,48,54Mbps 802.11n: HT20 reach up to 144.4Mbps, HT40 reach up to300Mbps 802.11ac: VHT20 reach up to 173.3Mbps, VHT40 reach up to 400Mbps, VHT80 reach up to 866.7Mbps
Antenna Type	BT/BLE:PCB Antenna WIFI 2.4G/5G: PCB Antenna for Antenna A; PCB Antenna for Antenna B
Power Source	POWER ADAPTER A319-050100U-US1 Input:100-240V~ 50/60Hz 0.2A Max. Output:5V⎓1A

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT 20 (2412MHz~2462MHz)

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

802.11n HT40 (2422MHz~2452MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
***03**	**2422**	***09**	**2452**
04	2427	---	---
05	2432	---	---
***06**	**2437**	---	---

Note: Channels remarked * are selected to perform test.

2.3 Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10.
b. The complete test system included Notebook, LCD Monitor, Adapter and EUT for RF test.
c. An executive program, ”cmd.exe” under Windows 7 system was executed to transmit and receive data via WLAN.
d. The following test modes were performed for the test:

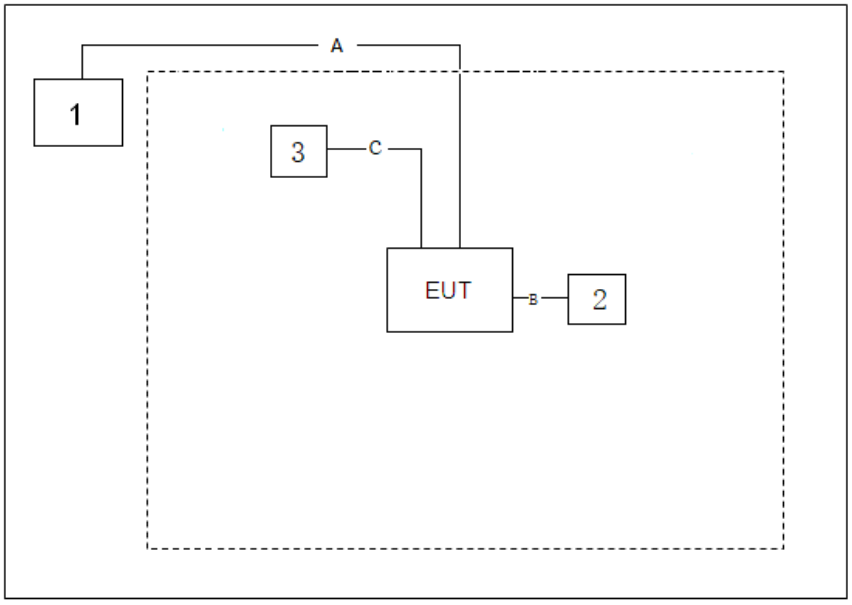
RF Conducted	
Test Mode	Operating Description
1	802.11b (1Mbps)
2	802.11g (6Mbps)
3	802.11n HT20 (6.5Mbps)
4	802.11n HT40 (13.5Mbps)
caused “Test Mode 1~4” generated the worst case, they were reported as the final data.	

Modulation Type	TX CONFIGURATION
802.11b	2TX
802.11g	2TX
802.11n HT20	2TX
802.11n HT40	2TX

2.4 Description of Test System

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Dell	Latitude 3500	N/A	Non-Shielded, 1.8m
2	LCD Monitor	DELL	U2713HMt	N/A	Non-Shielded, 1.8m
3	Adapter	XIAOMI	A319-050100U-US1	N/A	N/A

Connection Diagram



Signal Cable Type		Quantity	Signal cable Description
A	USB Cable	1	5.0m Shielding
B	HDMI Cable (Accessory)	1	0.3m Shielding
C	Micro USB Cable (Accessory)	1	0.8m Non Shielding

2.5 General Information of Test

Test Site	**Cerpass Technology Corporation(Cerpass Laboratory)** Address: Room 102, No. 5, Xing'an Road, Chang'an Town, Dongguan City, Guangdong Province Tel: +86-769-8547-1212 Fax: +86-769-8547-1912
FCC Designation No.:	CN1288
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 25,000MHz
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.

Test Item	Test Site	Test period	Environmental Conditions	Tested By
RF Conducted	RFCON01-DG	2022/11/01	23°C / 55%	Amos Zhang

2.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2).

Measurement Item	Uncertainty
AC Power Line Conduction(150K~30MHz)	±3.17dB
Radiated Spurious Emission(9KHz~30MHz)	±4.99dB
Radiated Spurious Emission(30MHz~1GHz)	±4.39dB
Radiated Spurious Emission(1GHz~18GHz)	±5.36dB
Radiated Spurious Emission(18GHz~40GHz)	±5.43dB
6dB Bandwidth&20dB Bandwidth	±4.4%
Occupied Bandwidth	±4.4%
Peak Output Power(Conducted Power Meter)	±0.57 dB
Power Spectral Density	±1.01 dB
Dwell Time / Deactivation Time	±1.1%

3. Test Equipment and Ancillaries Used for Tests

RF Conducted					
Test Site	RFCON01-DG				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
MXA Signal Analyzer	KEYSIGHT	N9020A	US46220290	2022.05.07	2023.05.06
EXA Signal Analyzer	KEYSIGHT	N9010A	MY53400169	2022.05.07	2023.05.06
ESG VECTOR SIGNAL GENERATOR	Agilent	E4438C	MY45092582	2022.05.07	2023.05.06
MXG VECTOR SIGNAL GENERATOR	Agilent	N5182B	MY53050127	2022.05.07	2023.05.06
USB Wideband Power Sensor	Boonton	55006	9778	2022.01.08	2023.01.07
Temperature/ Humidity Meter	mingle	ETH529	N/A	2022.01.08	2023.01.07

4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2 Antenna Construction and Directional Gain

WIFI 2.4G:

Antenna Type	PCB Antenna for Antenna A; PCB Antenna for Antenna B
Antenna Gain	Antenna A: 1.3dBi Antenna B: 0.6dBi

(Non-Beamforming)

2412-2462MHz

For Power directional gain= G_{ant}= 1.3 dBi

For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 /NANT]$

= 3.97 (dBi)

5. Maximum Peak Output Power

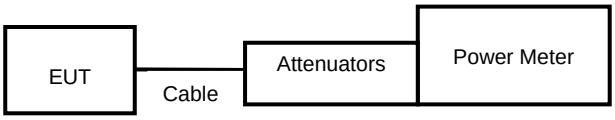
5.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

5.2 Test Procedures

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

5.3 Test Setup Layout



5.4 Test Result and Data

Setting	Modulation Type	Channel	Frequency (MHz)	Conducted(peak) output power (dBm)		Total peak power (dBm)	Total peak power (mW)	Power Limit (dBm)
				ANT 1	ANT 2			
13	11b	1	2412	14.91	13.78	17.39	54.84	30.00
13		6	2437	15.02	14.02	17.56	57.00	30.00
13		11	2462	14.84	13.84	17.38	54.71	30.00
13	11g	1	2412	19.62	20.03	22.84	192.45	30.00
13		6	2437	19.41	19.65	22.54	179.47	30.00
13		11	2462	19.48	20.10	22.81	191.02	30.00
13	11n HT20	1	2412	19.91	20.31	23.12	205.25	30.00
13		6	2437	19.71	19.94	22.84	192.19	30.00
13		11	2462	20.12	20.23	23.18	208.17	30.00
13	11n HT40	3	2422	20.01	20.56	23.30	213.89	30.00
13		6	2437	19.74	20.19	22.98	198.55	30.00
13		9	2452	20.31	20.47	23.40	218.75	30.00

6. Power Spectral Density

6.1 Test Limit

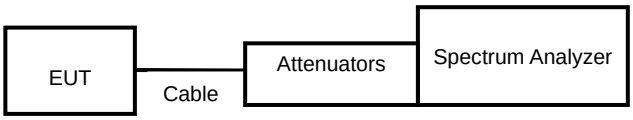
The Maximum of Power Spectral Density Measurement is 8dBm.

If transmitting antennas of directional gain greater than 6 dBi are used, the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

6.2 Test Procedures

a. The transmitter output was connected to spectrum analyzer.
b. The spectrum analyzer's resolution bandwidth were set at 3kHz RBW and 10KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
c. The power spectral density was measured and recorded.

6.3 Test Setup Layout



6.4 Test Result and Data

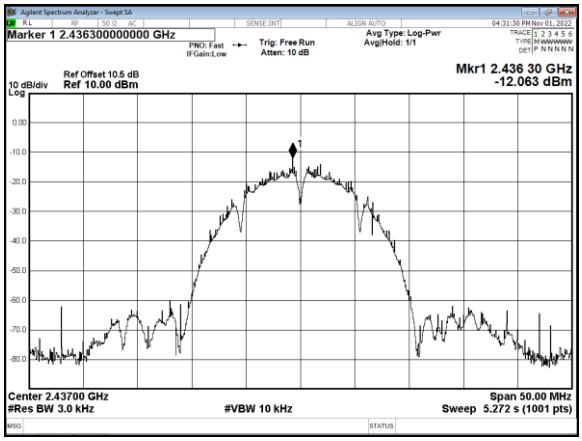
Modulation Type	Channel	Frequency (MHz)	Maximum Power Density of 3KHz Bandwidth(dBm)		Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
			ANT 1	ANT 2				
11b	1	2412	-15.571	-13.573	-11.45	0.00	-11.45	8.00
	6	2437	-12.063	-12.473	-9.25	0.00	-9.25	8.00
	11	2462	-14.169	-12.087	-9.99	0.00	-9.99	8.00
11g	1	2412	-11.898	-13.51	-9.62	0.00	-9.62	8.00
	6	2437	-14.355	-14.745	-11.54	0.00	-11.54	8.00
	11	2462	-14.401	-13.673	-11.01	0.00	-11.01	8.00
11n HT20	1	2412	-13.226	-13.25	-10.23	0.00	-10.23	8.00
	6	2437	-14.388	-14.291	-11.33	0.00	-11.33	8.00
	11	2462	-13.002	-12.804	-9.89	0.00	-9.89	8.00
11n HT40	3	2422	-16.66	-16.208	-13.42	0.00	-13.42	8.00
	6	2437	-16.775	-20.803	-15.33	0.00	-15.33	8.00
	9	2452	-16.689	-15.864	-13.25	0.00	-13.25	8.00

ANT 1

Modulation Type: 802.11b

CH01

CH06



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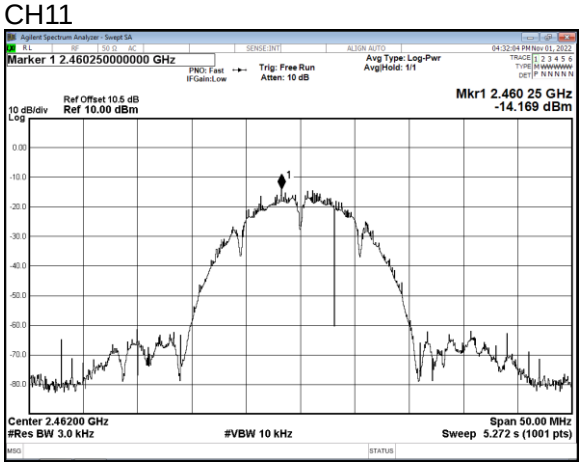
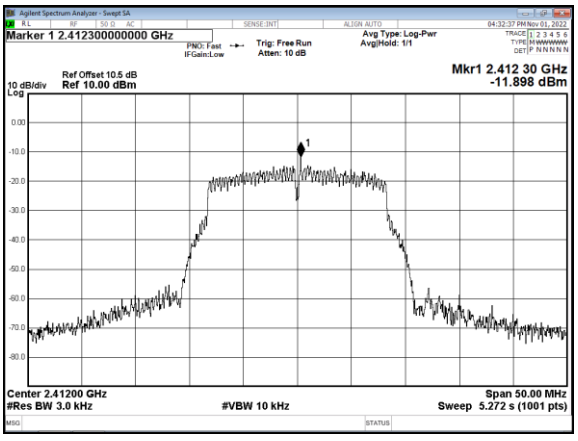


Modulation Type: 802.11g

CH01



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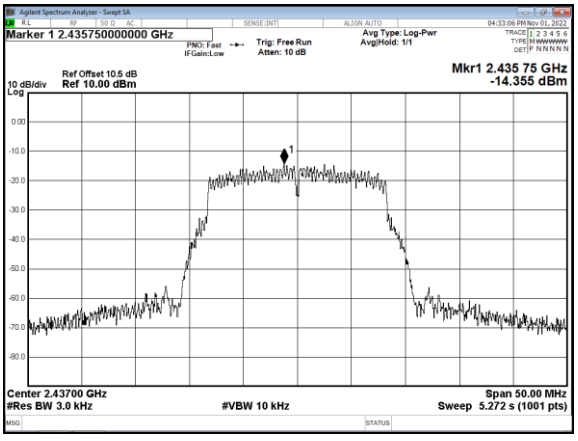

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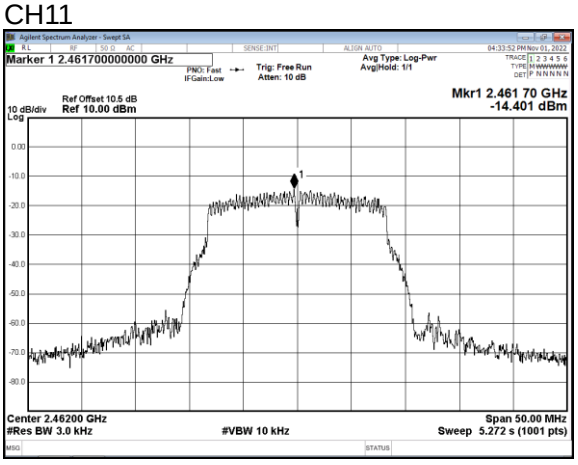
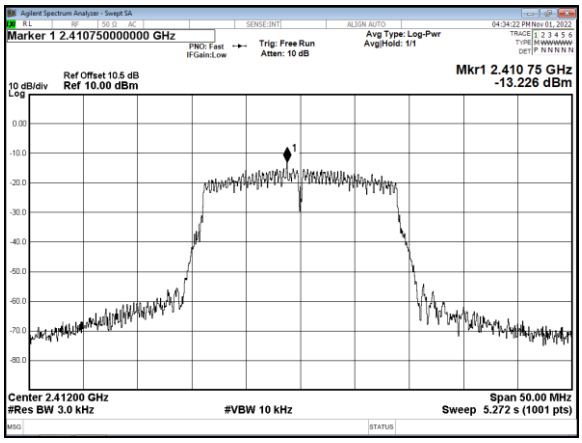


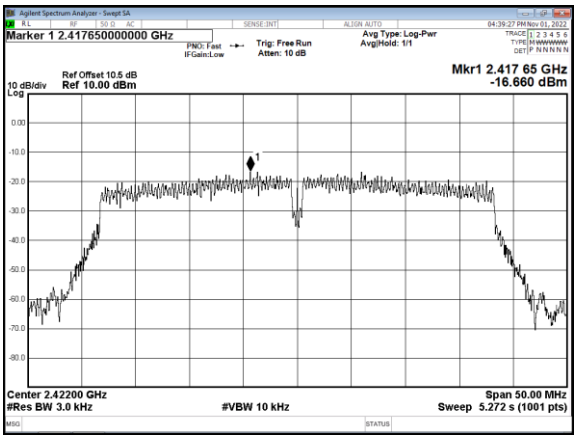
Modulation Type: 802.11n HT20

CH01



Modulation Type: 802.11n HT40

CH03



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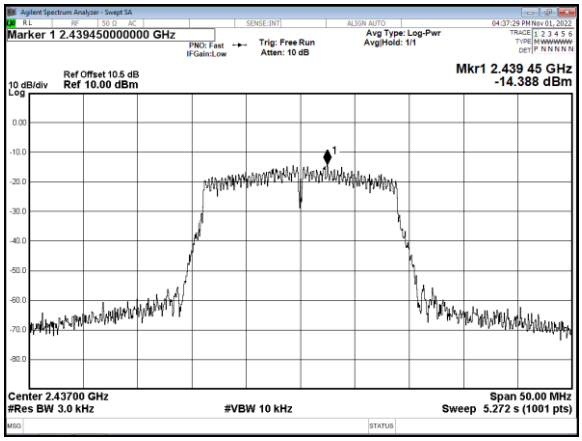

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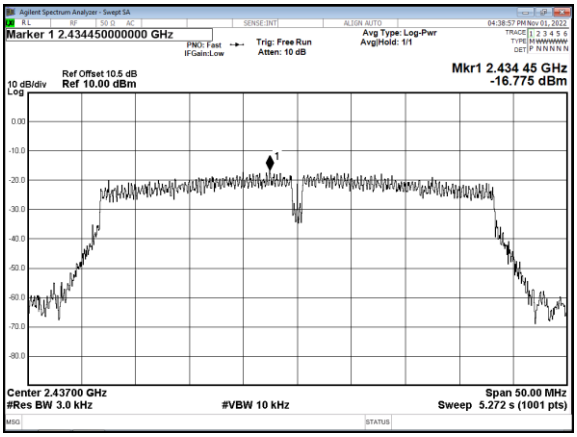

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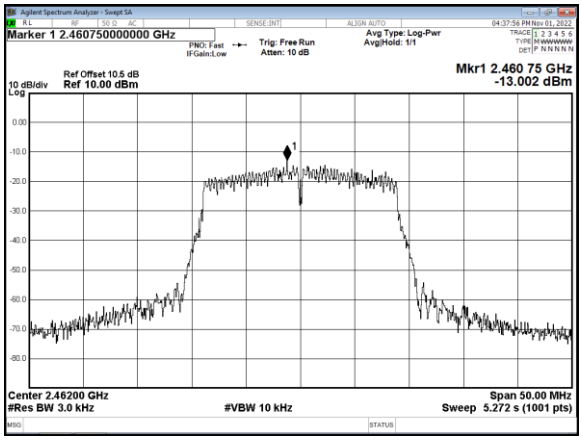

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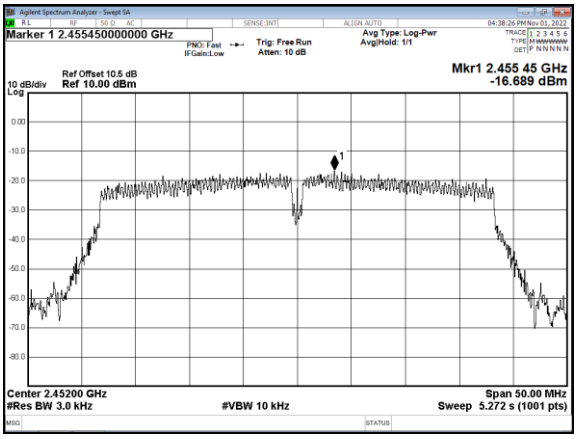
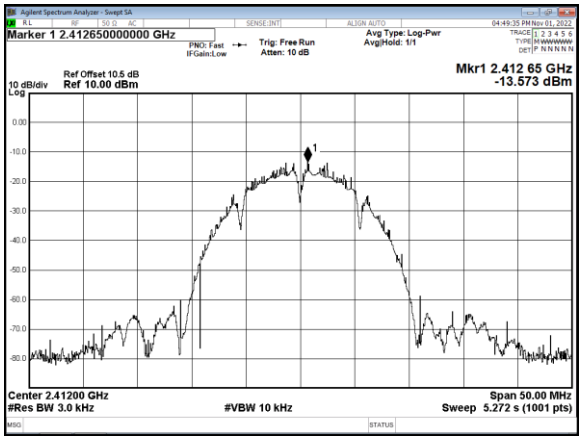


ANT 2

Modulation Type: 802.11b

CH01



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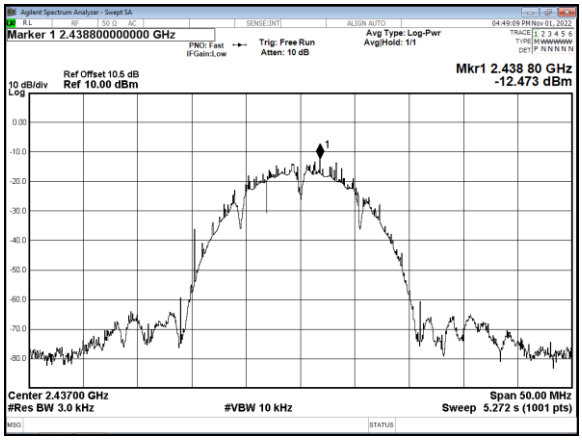

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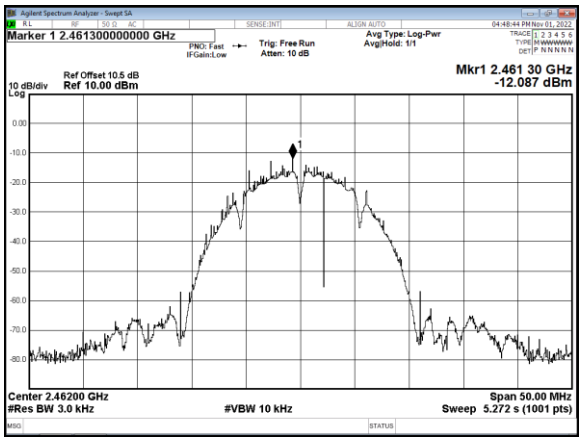

Modulation Type: 802.11g

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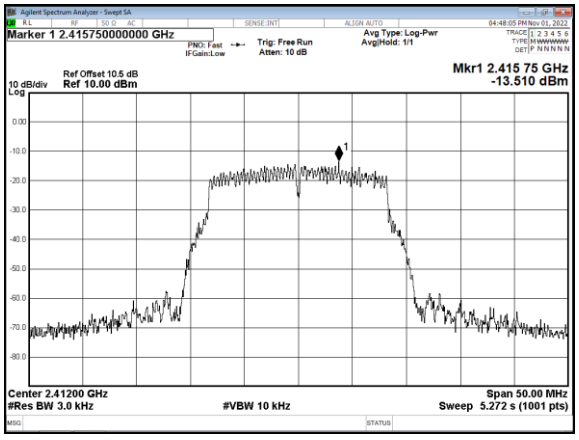

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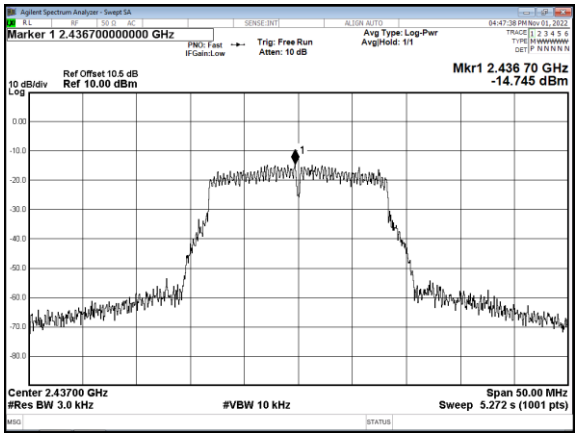

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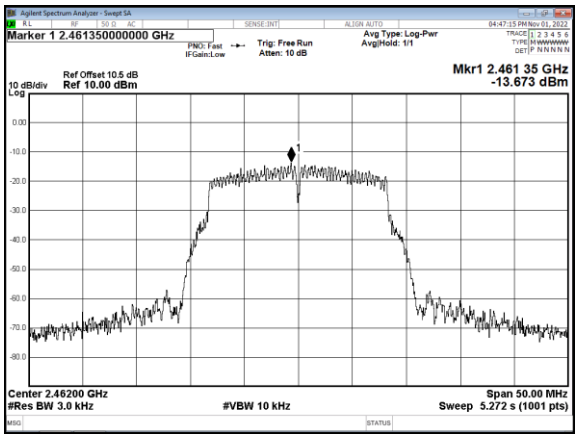

Modulation Type: 802.11n HT20

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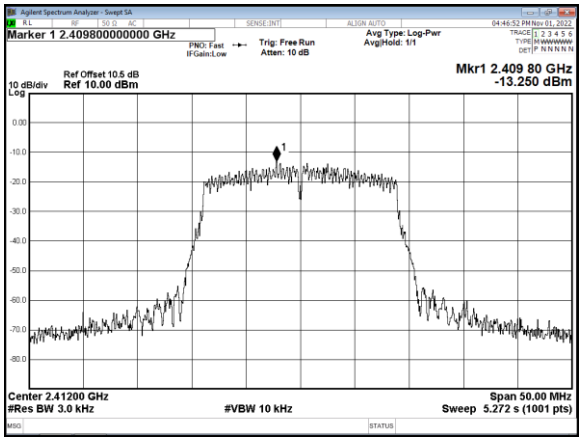

Modulation Type: 802.11n HT40

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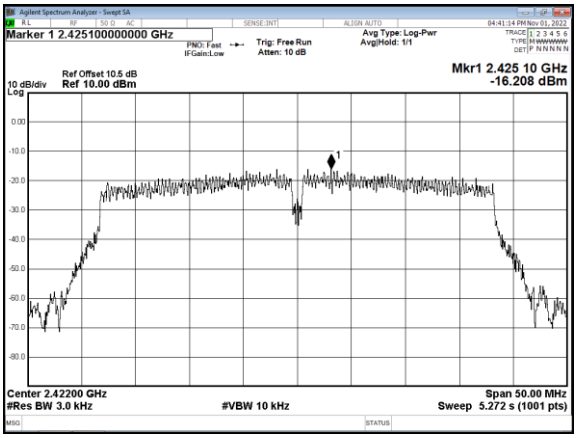

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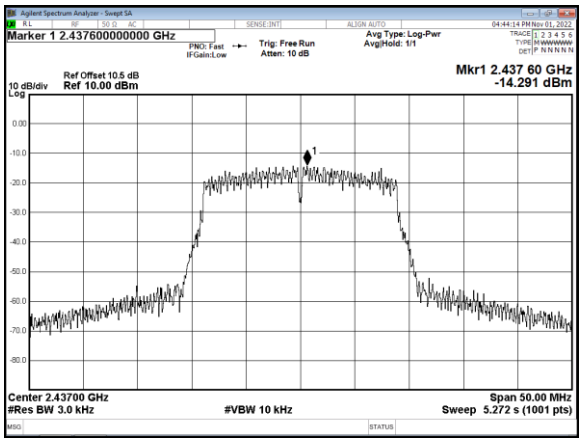

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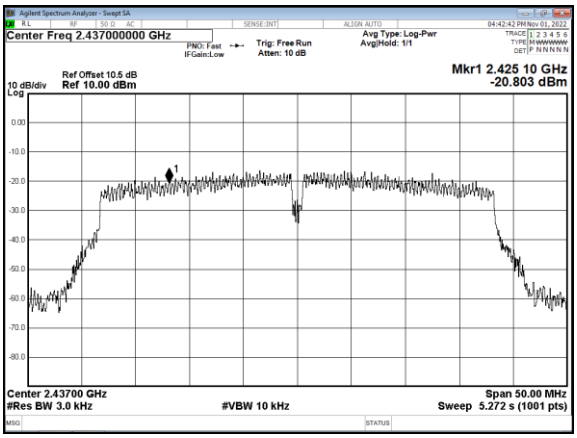

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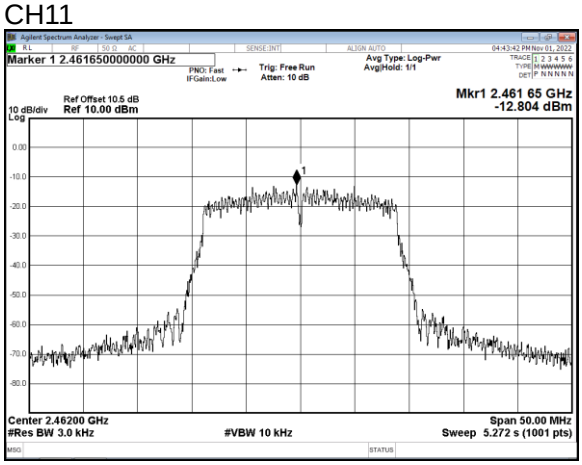

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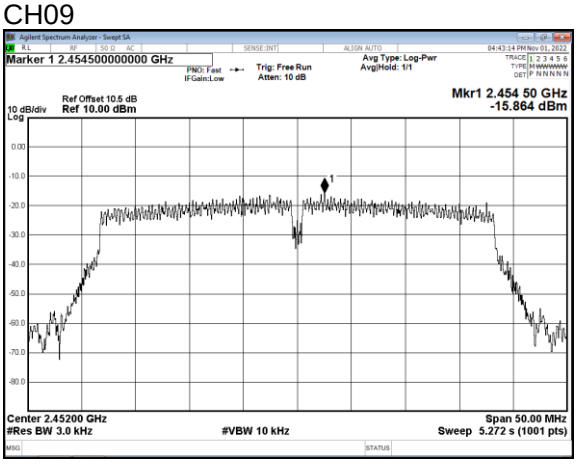

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