FCC Test Report

Report No.: AGC13454230711FR03

FCC ID	:	2A94QVA-SP008
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Portable Smart Projector 480P
BRAND NAME	:	VAVA
MODEL NAME	:	VA-SP008
APPLICANT	:	Shenzhen Aspiron Technology Company Limited
DATE OF ISSUE	:	Sep. 08, 2023
STANDARD(S)	:	FCC Part 15 Subpart E §15.407
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 08, 2023	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	Shenzhen Aspiron Technology Company Limited
Address	3rd Floor, Yiben Building, No.1063 Chaguang Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China
Manufacturer	Shenzhen Aspiron Technology Company Limited
Address	3rd Floor, Yiben Building, No.1063 Chaguang Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China
Factory	Dongguan Jiadun Gaoshi Electronics Co., Ltd
Address	Room 401, No. 29, Shanglang Road, Chang'an Town, Dongguan, Guangdong Province, China
Product Designation	Portable Smart Projector 480P
Brand Name	VAVA
Test Model	VA-SP008
Date of receipt of test item	Jul. 31, 2023
Date of test	Jul. 31, 2023 to Sep. 08, 2023
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 requirement of FCC Part 15 Rules requirement.

Prepared By	Alan Duan (Project Engineer)	Sep. 08, 2023
Reviewed By	Calvin Liu (Reviewer)	Sep. 08, 2023
Approved By	Max Zhang Authorized Officer	Sep. 08, 2023

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

Equipment Type	☐ Outdoor access points ☐ Indoor access points ☐ Fixed P2P access points ☒ Client devices
Operation Frequency	☒ U-NII 1:5150MHz~5250MHz ☒ U-NII 2A: 5250MHz~5350MHz ☒ U-NII 2C:5470MHz~5725MHz ☒ U-NII 3: 5725MHz~5850MHz
DFS Design Type	☐ Master ☐ Slave with radar detection ☒ Slave without radar detection
TPC Function	☐ Yes ☒ No
Hardware Version	M1S MIAN V2.1
Software Version	20200513_V1.0.2
Test Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5270~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530~5690MHz, 5775MHz
Output Power	IEEE 802.11a(HT20):11.63dBm; IEEE 802.11n(HT20):10.58dBm; IEEE802.11n(HT40):10.45dBm; IEEE 802.11ac(VHT20):10.64dBm; IEEE802.11ac(VHT40):10.56dBm; IEEE802.11ac(VHT80):10.25dBm;
Output Power_ MIMO	IEEE 802.11nHT(20):13.52dBm;IEEE802.11n(HT40): 13.43dBm IEEE 802.11ac(VHT20):13.57dBm; IEEE802.11ac(VHT40):13.57dBm; IEEE802.11ac(VHT80):13.17dBm;
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ac :(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM
Data Rate	802.11a:6/9/12/18/24/36/48/54Mbps; 802.11n:up to 300Mbps; 802.11ac:up to 866.6Mbps;
Number of channels	7 channels of U-NII-1 Band 7 channels of U- NII-2A Band 12 channels of U-NII-2C Band 8 channels of U- NII 3 Band
Antenna Designation	FPC antenna
Antenna Gain	Refer to Chapter 2.8 of the report.
Power Supply	DC 7.6V by battery or DC 12V by adapter

2.2. TABLE OF CARRIER FREQUENCYS

For 5180~5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	--	--

For 5260~5320MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20) :

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40) :

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
58	5290 MHz	--	--

For 5500~5720MHz:

12 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	--	--

6 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	--	--

3 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

For 5745~5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20)):

Channel	Frequency	Channel	Frequency
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz	--	--

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
155	5775 MHz	--	--

2.3. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2A94QVA-SP008** filing to comply with the FCC Part 15 requirements.

2.4. TEST METHODOLOGY

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	662911 D01 Multiple Transmitter Output v02r01
5	KDB 789033	789033 D02 General U-NII Test Procedures New Rules v02r01

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7. 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 antennathat uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a brokenantenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
EUT Antenna:
The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna refer to Section 2.8 of the report

2.8. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna Type	Frequency Band (MHz)	TX Paths	Bandwidth (MHz)	Max Peak Gain (dBi)		Max Directional Gain (dBi)
				Ant 1	Ant 2	
5G WIFI FPC Antenna List (5GHz 2*2 MIMO)						
FPC Antenna	5150 ~ 5250	2	20,40,80	2.69	3.29	6.30
	5250 ~ 5350	2	20,40,80	2.69	3.29	6.30
	5470 ~ 5725	2	20,40,80	2.69	3.29	6.30
	5725 ~ 5850	2	20,40,80	2.69	3.29	6.30

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

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

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + 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 $N_{ANT} \leq 4$;

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

  Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20 MHz channel widths with $N_{ANT} \geq 5$.

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

2.9. DUTY CYCLE MEASUREMENT

5GHz WLAN (NII) operation is possible in 20MHz, 40MHz and 80MHz 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 = Peak. 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:

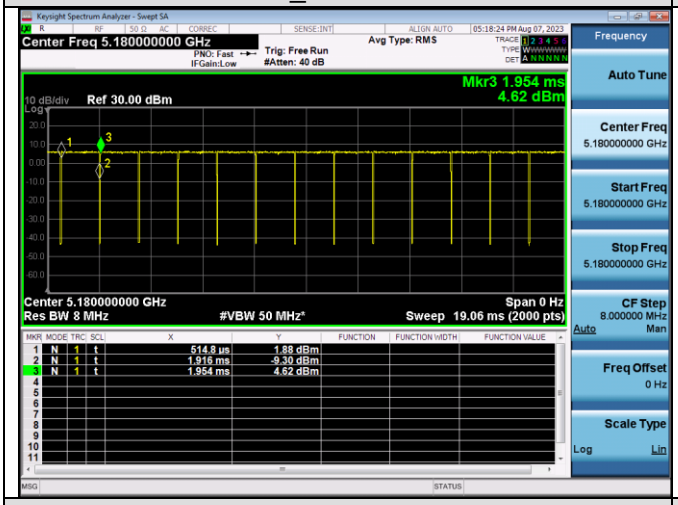
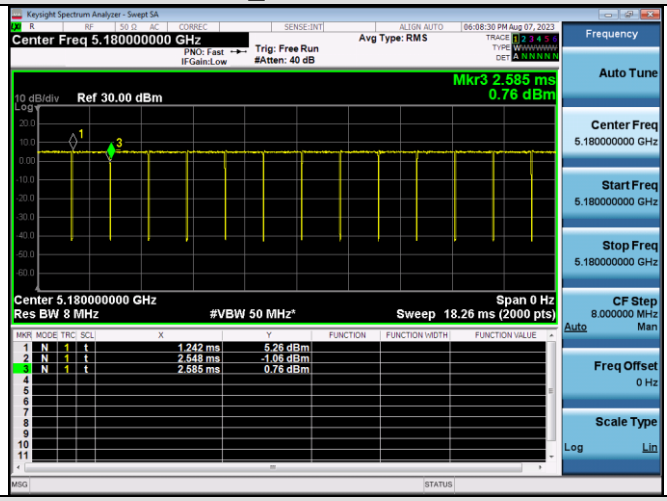
ANT1:

Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
For band 5.150-5.250 GHz:					
IEEE 802.11a	6	97	0.13	0.71	-0.26
IEEE 802.11n-HT20	MCS0	97	0.13	0.77	-0.26
IEEE 802.11n-HT40	MCS0	96	0.18	1.06	-0.35
IEEE 802.11ac-HT20	MCS0	94	0.27	1.53	-0.54
IEEE 802.11ac-HT40	MCS9	97	0.13	0.76	-0.26
IEEE 802.11ac-HT80	MCS9	90	0.46	3.08	-0.92
For band 5.250-5.350 GHz:					
IEEE 802.11a	6	97	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11n-HT40	MCS0	96	0.18	1.06	-0.35
IEEE 802.11ac-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11ac-HT40	MCS9	94	0.27	1.53	-0.54
IEEE 802.11ac-HT80	MCS9	89	0.51	3.08	-1.01
For band 5.470-5.725GHz:					
IEEE 802.11a	6	97	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	97	0.13	0.77	-0.26
IEEE 802.11n-HT40	MCS0	96	0.18	1.06	-0.35
IEEE 802.11ac-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11ac-HT40	MCS9	94	0.27	1.53	-0.54
IEEE 802.11ac-HT80	MCS9	89	0.51	3.09	-1.01
For band 5.725-5.850 GHz:					
IEEE 802.11a	6	97	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	97	0.13	0.77	-0.26
IEEE 802.11n-HT40	MCS0	96	0.18	1.05	-0.35
IEEE 802.11ac-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11ac-HT40	MCS9	95	0.22	1.52	-0.45
IEEE 802.11ac-HT80	MCS9	89	0.51	3.09	-1.01

Remark:

1. Duty Cycle factor = 10 * log (1/ Duty cycle) 2. Average factor = 20 log10 Duty Cycle
2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.
3. The measurement results involving the above compensation parameters have been compensated by soft ware to reflect the final results.
4. The duty cycle coefficient is automatically calculated into the final result by the software.

The test plots as follows:

U-NII 1_IEEE 802.11a	U-NII 1_IEEE 802.11n-HT20
	
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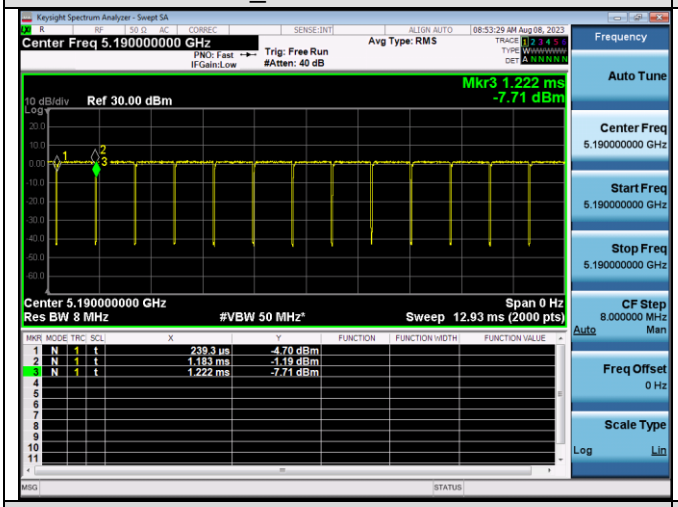	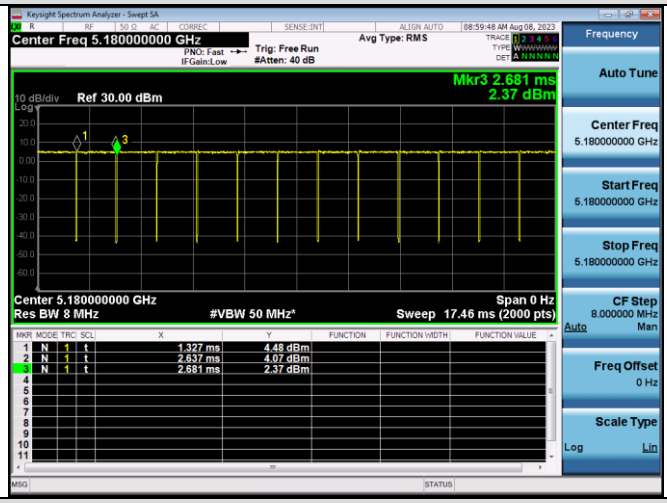
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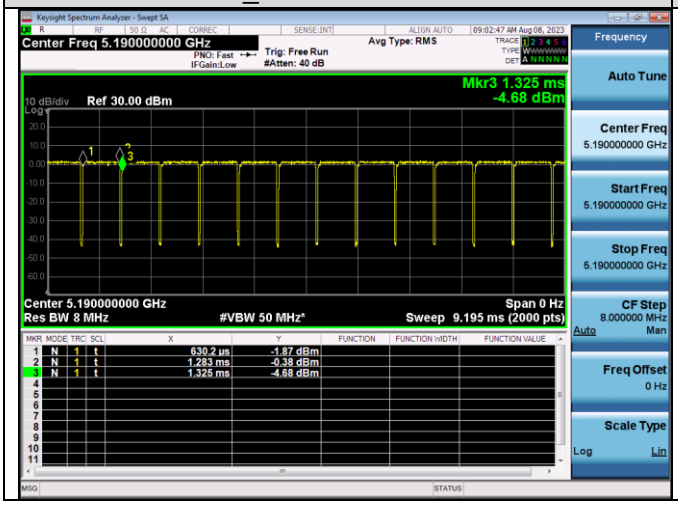	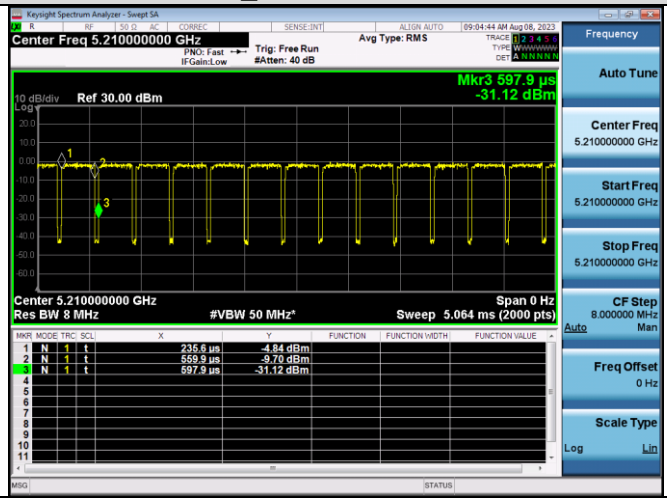

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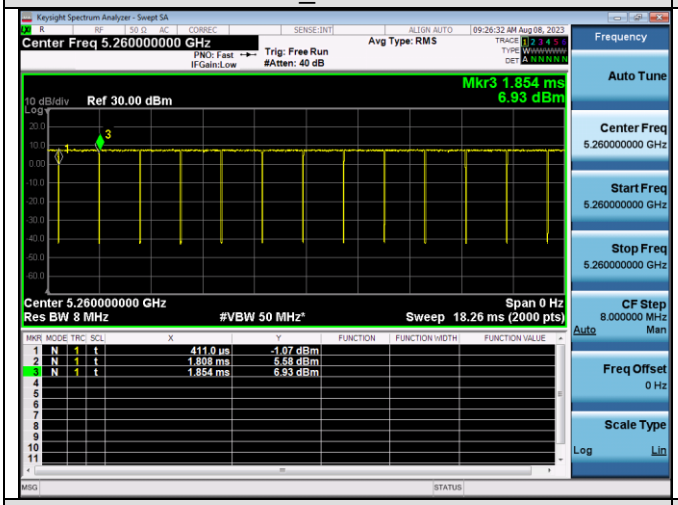	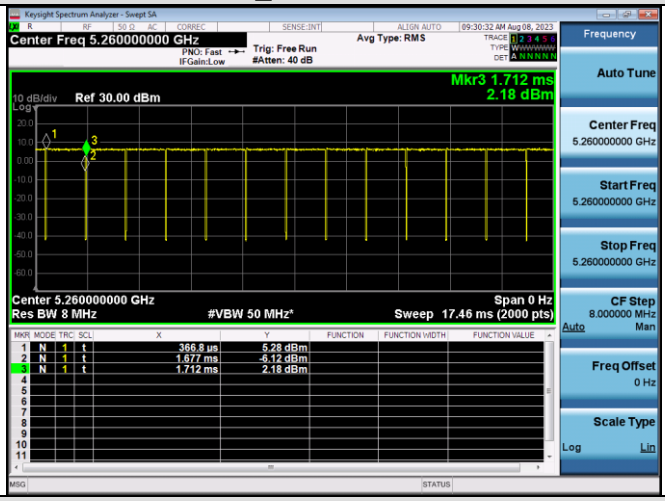
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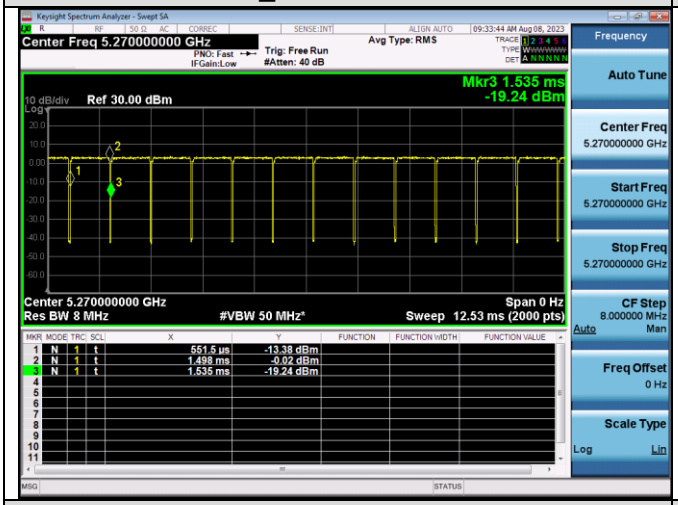	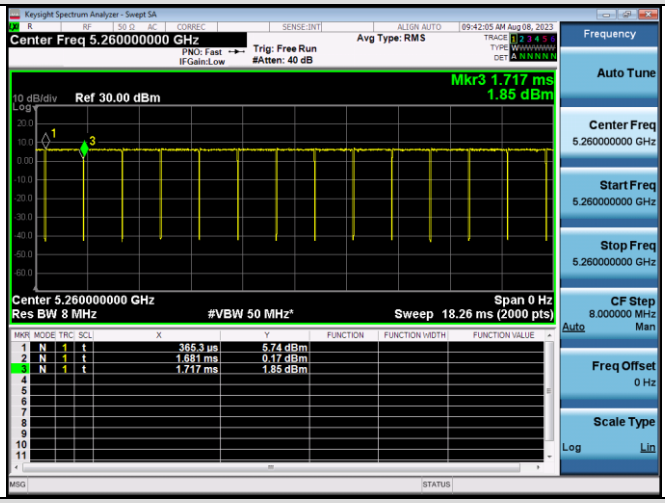
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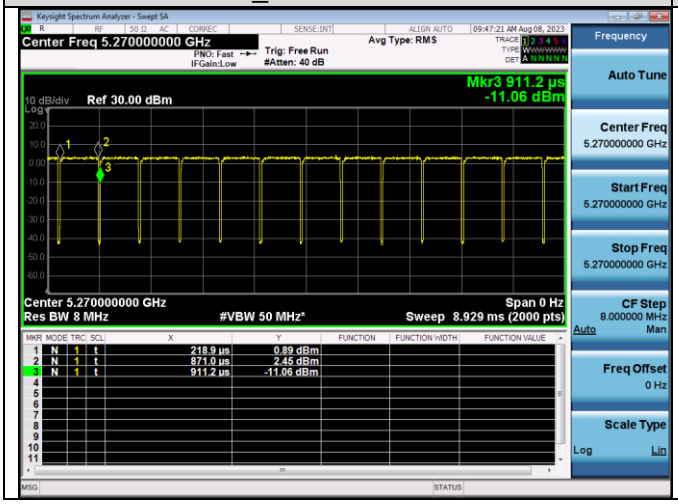	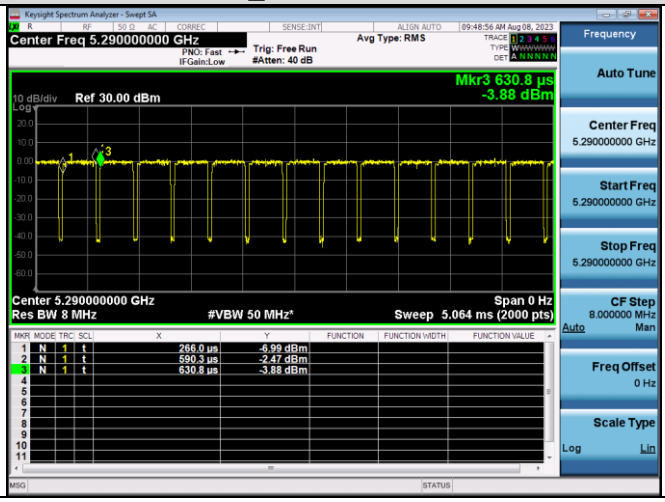

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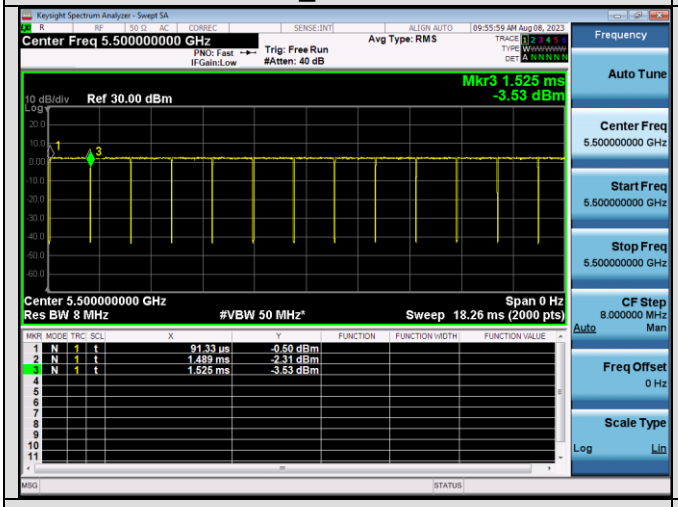	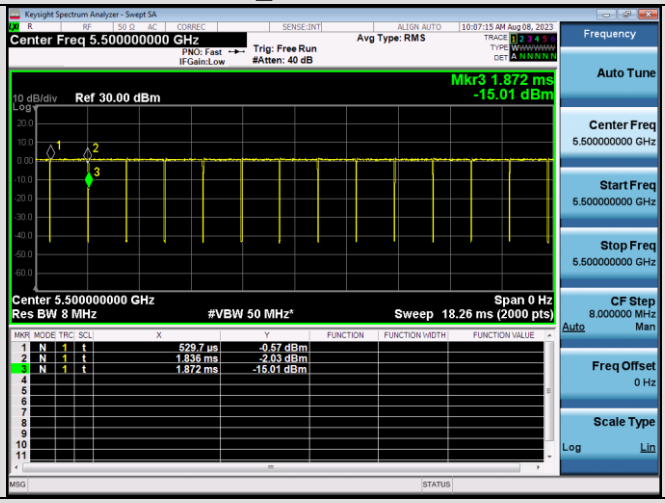
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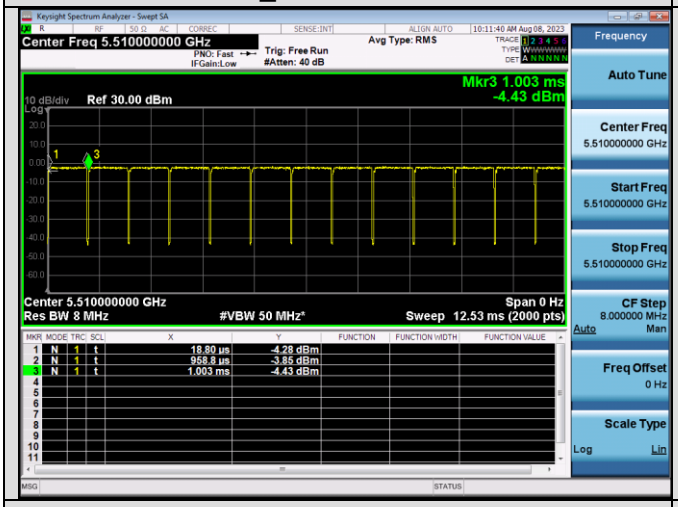	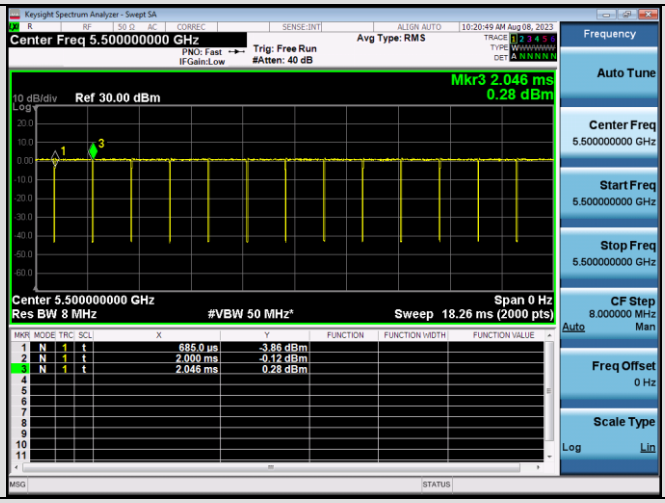
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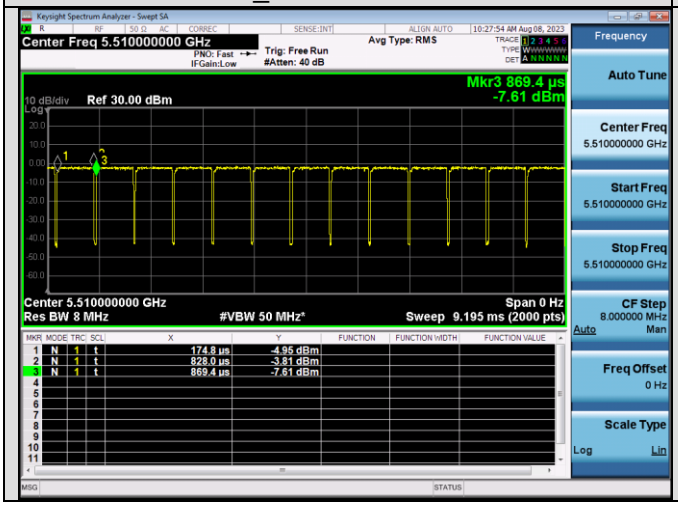	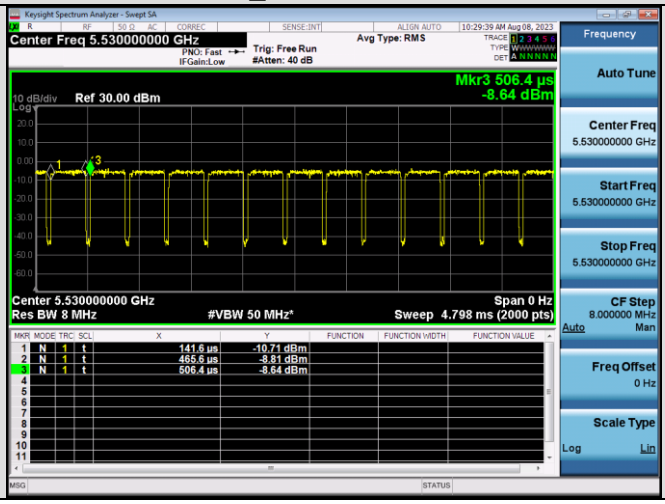

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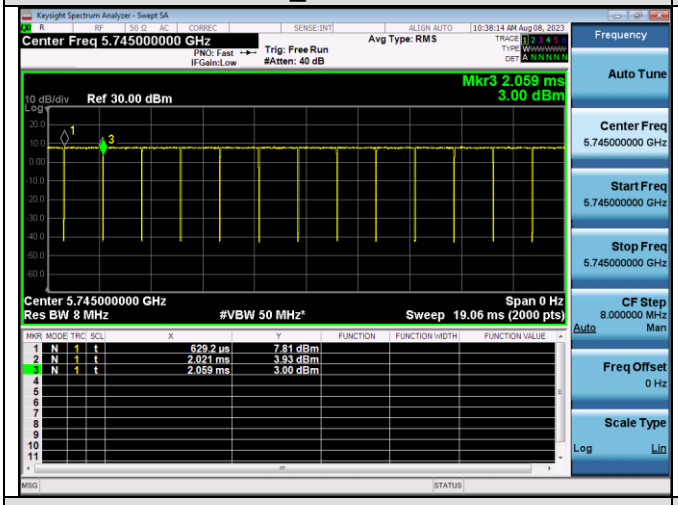	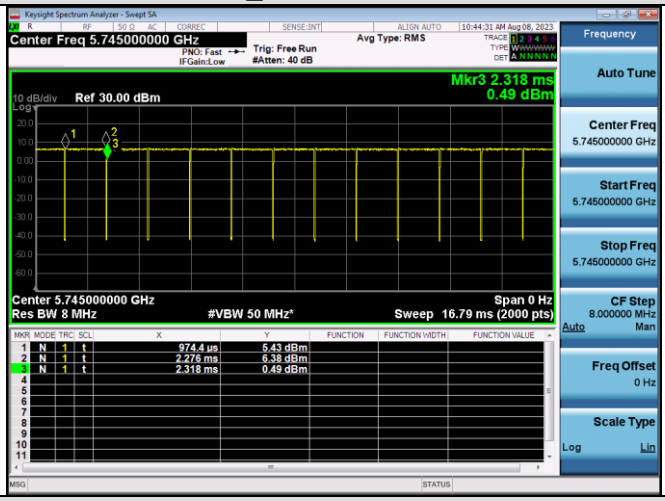
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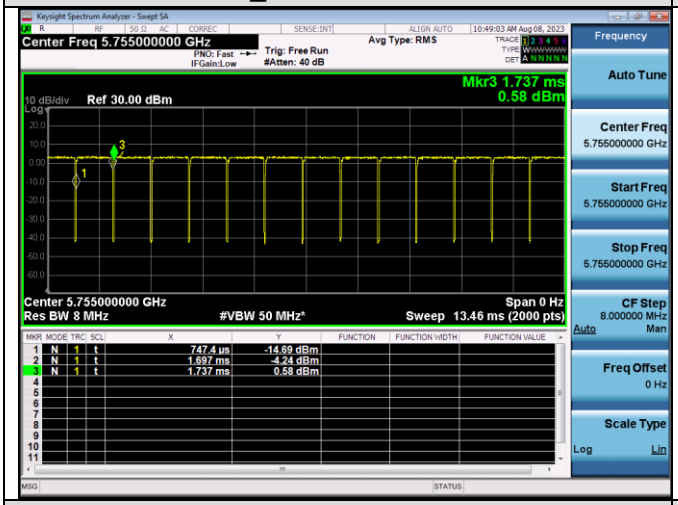	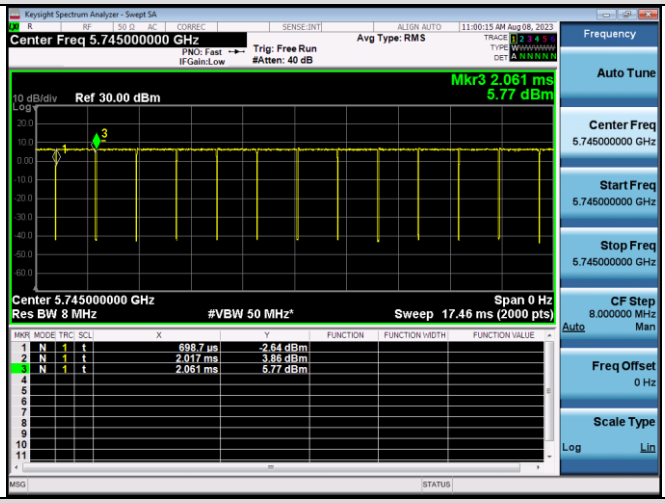
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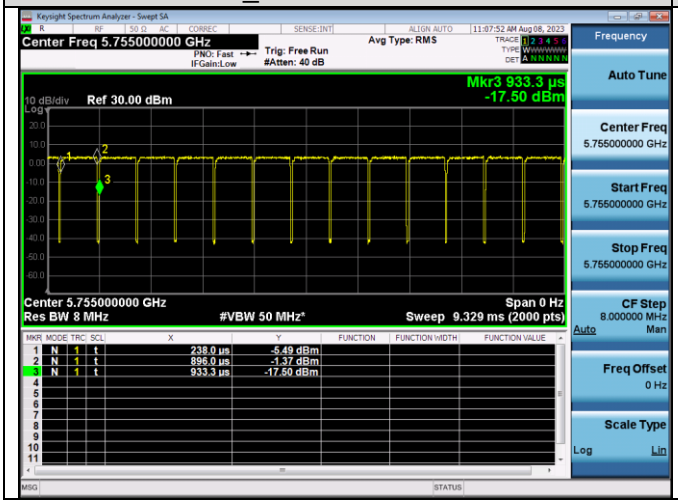
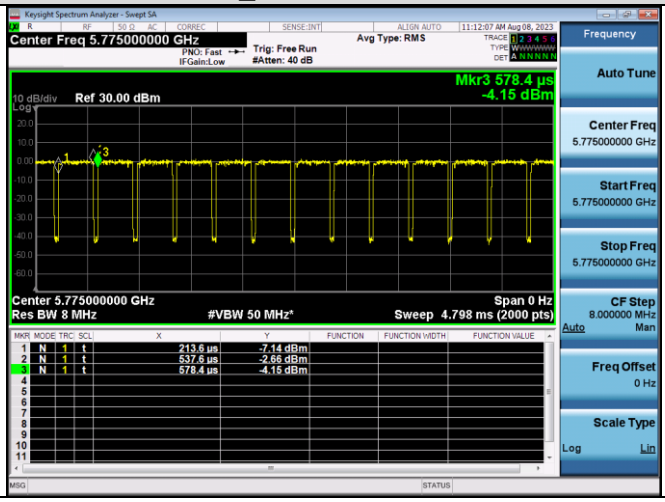
	

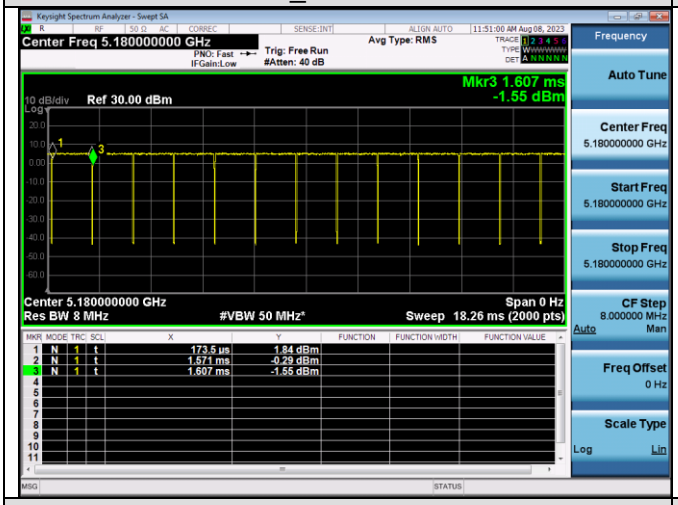
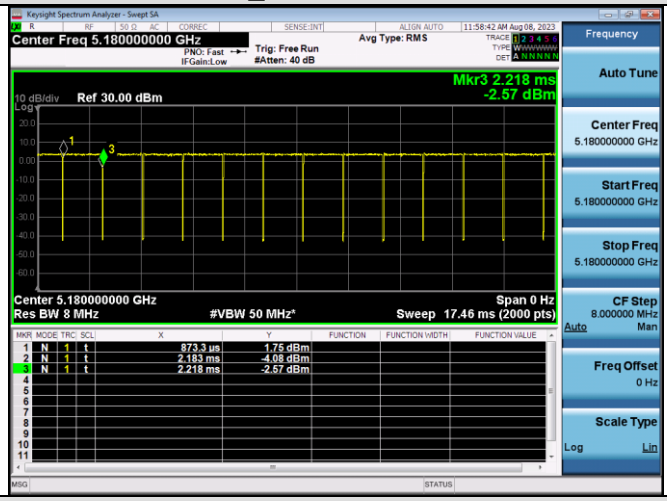
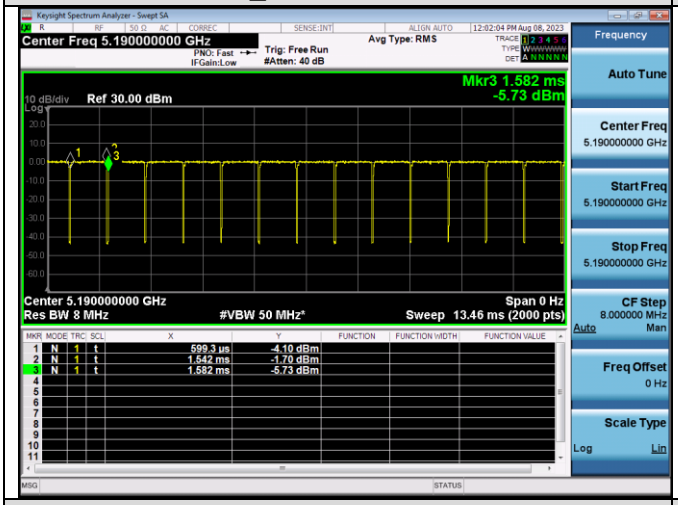
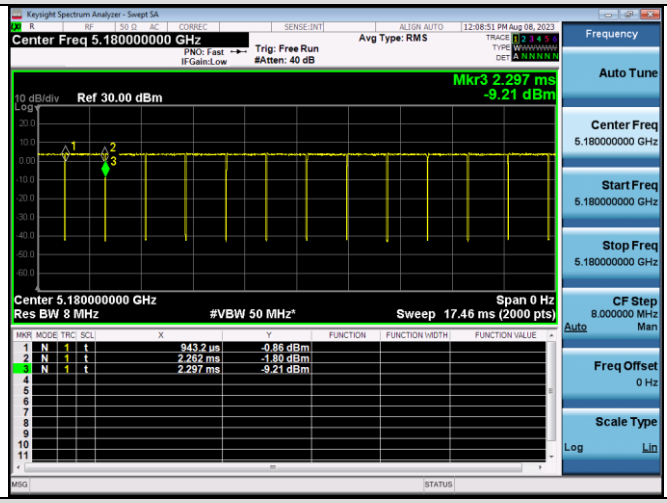
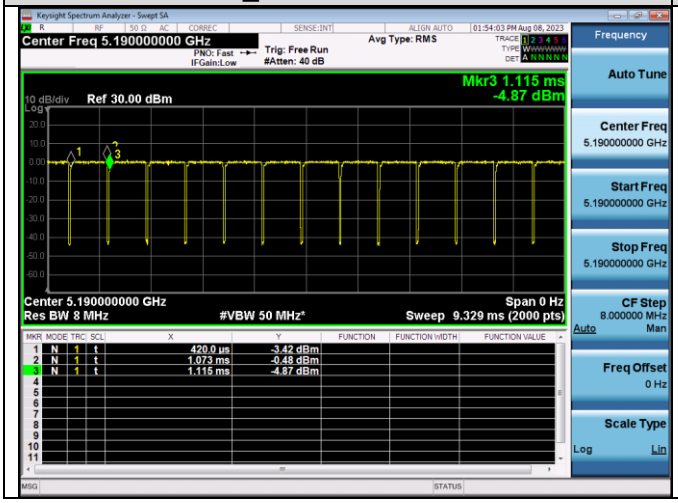
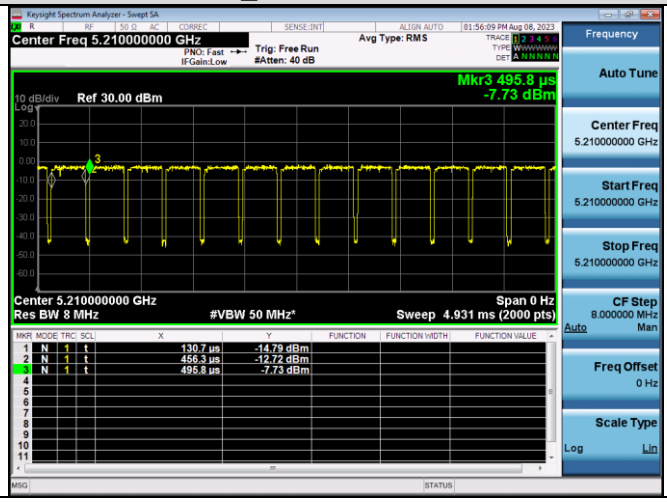
ANT2:

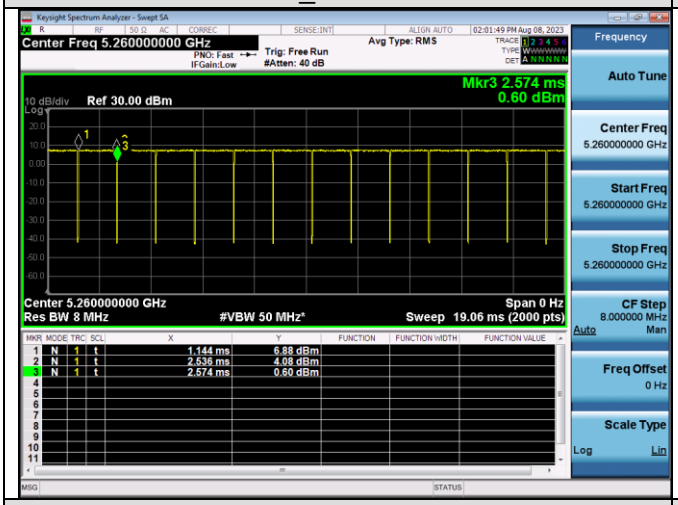
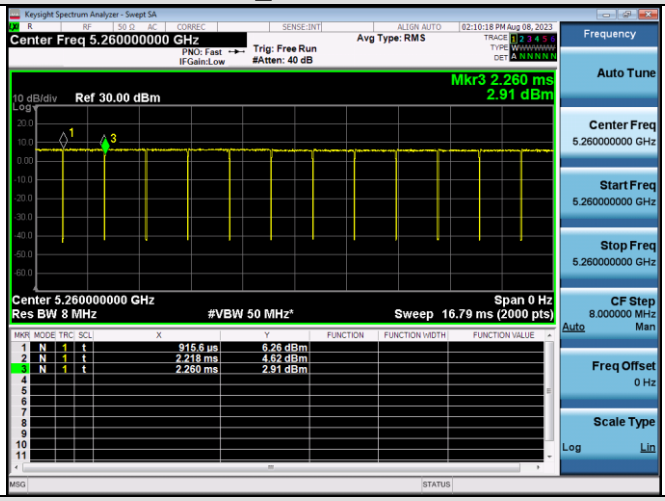
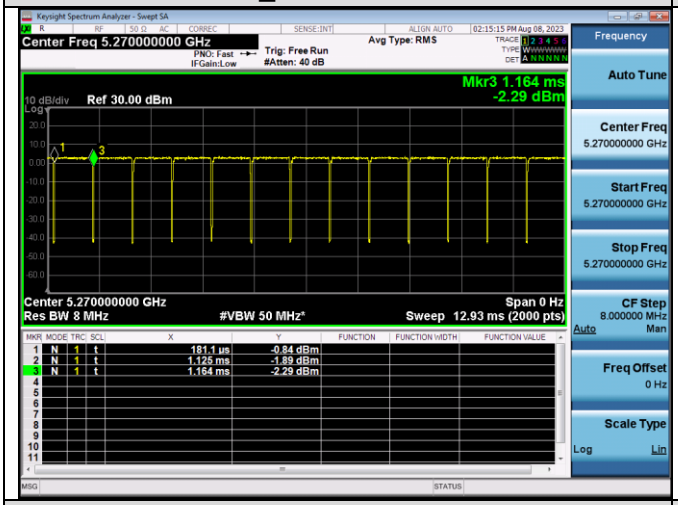
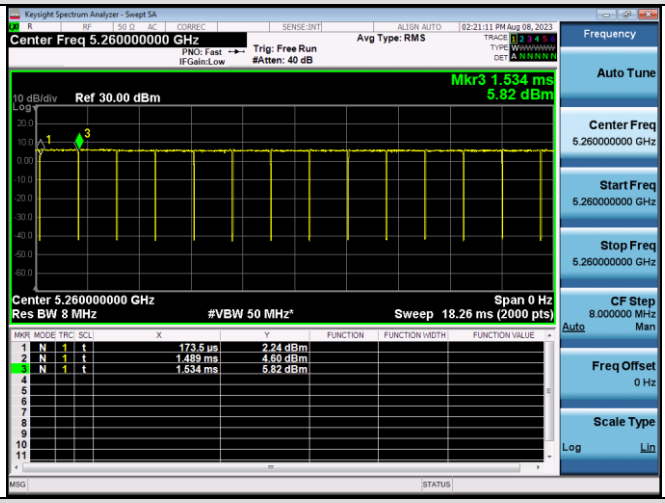
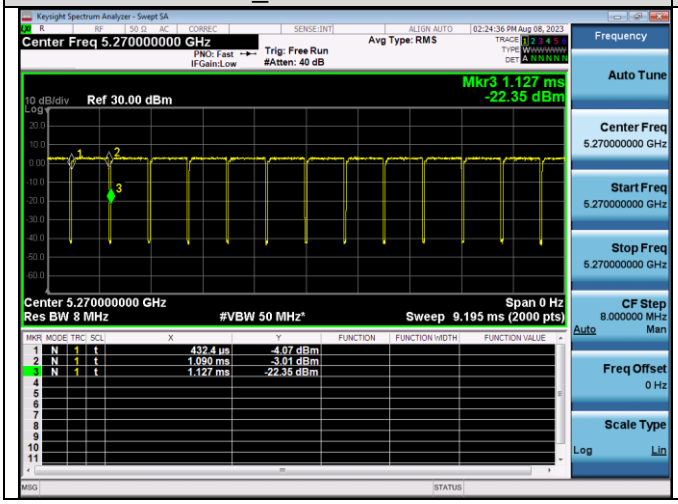
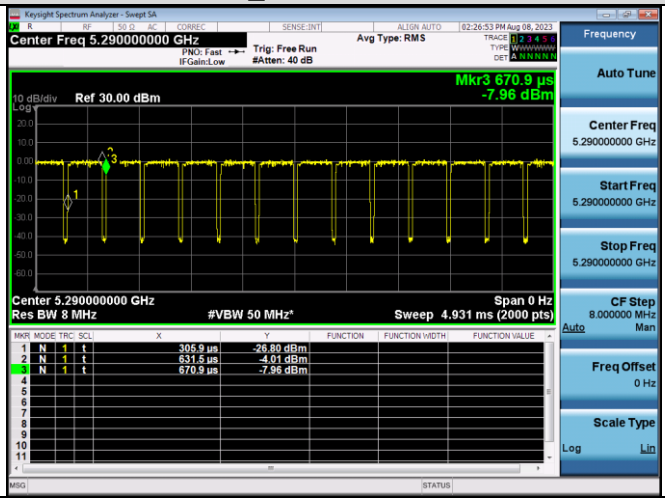
Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
For band 5.150-5.250 GHz:					
IEEE 802.11a	6	97	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11n-HT40	MCS0	96	0.18	1.06	-0.35
IEEE 802.11ac-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11ac-HT40	MCS9	94	0.27	1.53	-0.54
IEEE 802.11ac-HT80	MCS9	89	0.51	3.07	-1.01
For band 5.250-5.350 GHz:					
IEEE 802.11a	6	97	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	97	0.13	0.77	-0.26
IEEE 802.11n-HT40	MCS0	96	0.18	1.06	-0.35
IEEE 802.11ac-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11ac-HT40	MCS9	95	0.22	1.52	-0.45
IEEE 802.11ac-HT80	MCS9	89	0.51	3.07	-1.01
For band 5.470-5.725GHz:					
IEEE 802.11a	6	97	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	96	0.18	0.77	-0.35
IEEE 802.11n-HT40	MCS0	96	0.18	1.06	-0.35
IEEE 802.11ac-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11ac-HT40	MCS9	94	0.27	1.52	-0.54
IEEE 802.11ac-HT80	MCS9	89	0.51	3.06	-1.01
For band 5.725-5.850 GHz:					
IEEE 802.11a	6	97	0.13	0.72	-0.26
IEEE 802.11n-HT20	MCS0	97	0.13	0.77	-0.26
IEEE 802.11n-HT40	MCS0	96	0.18	1.05	-0.35
IEEE 802.11ac-HT20	MCS0	97	0.13	0.76	-0.26
IEEE 802.11ac-HT40	MCS9	95	0.22	1.52	-0.45
IEEE 802.11ac-HT80	MCS9	89	0.51	3.07	-1.01

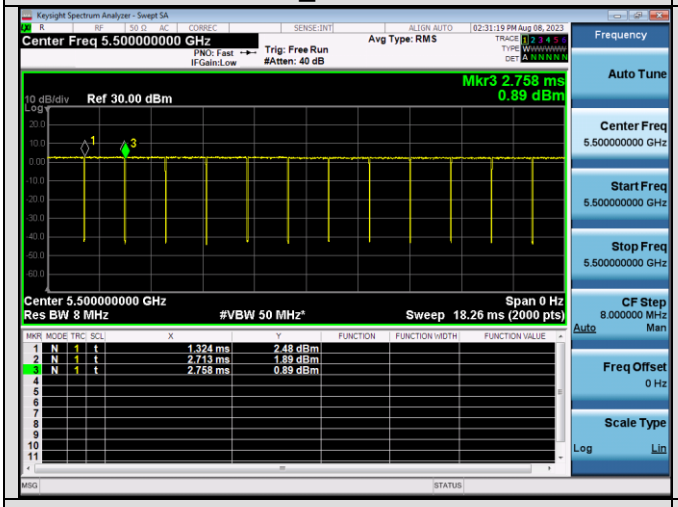
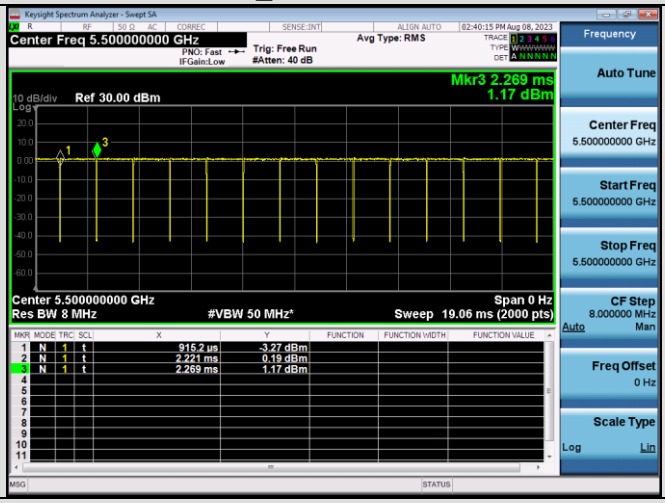
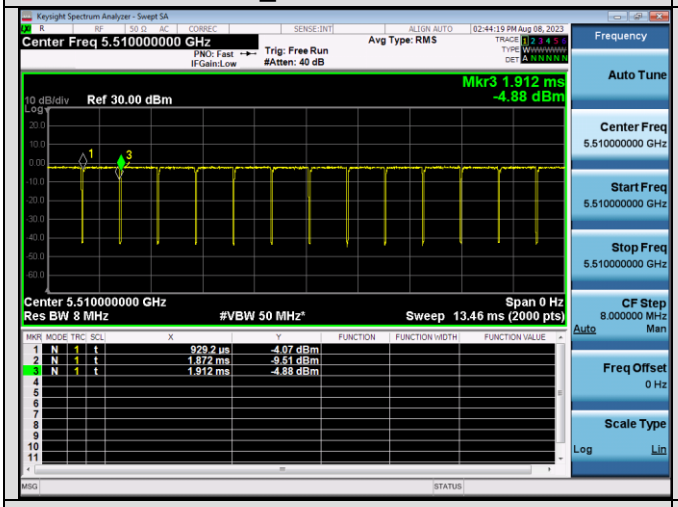
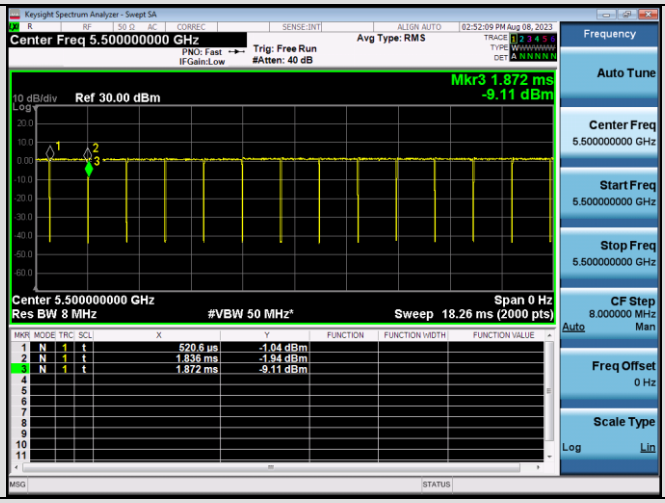
Remark:

5. Duty Cycle factor = 10 * log (1/ Duty cycle) 2. Average factor = 20 log10 Duty Cycle
6. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.
7. The measurement results involving the above compensation parameters have been compensated by soft ware to reflect the final results.
8. The duty cycle coefficient is automatically calculated into the final result by the software

The test plots as follows:

U-NII 1_IEEE 802.11a	U-NII 1_IEEE 802.11n-HT20
	
U-NII 1_IEEE 802.11n-HT40	**U-NII 1_IEEE 802.11ac-HT20**
	
U-NII 1_IEEE 802.11ac-HT40	**U-NII 1_IEEE 802.11ac-HT80**
	

U-NII 2A_IEEE 802.11a	U-NII 2A_IEEE 802.11n-HT20
	
U-NII 2A_IEEE 802.11n-HT40	**U-NII 2A_IEEE 802.11ac-HT20**
	
U-NII 2A_IEEE 802.11ac-HT40	**U-NII 2A_IEEE 802.11ac-HT80**
	

U-NII 2C_IEEE 802.11a	U-NII 2C_IEEE 802.11n-HT20
	
U-NII 2C_IEEE 802.11n-HT40	**U-NII 2C_IEEE 802.11ac-HT20**
	
U-NII 2C_IEEE 802.11ac-HT40	**U-NII 2C_IEEE 802.11ac-HT80**