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# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**





Applicant: silex technology, Inc.

2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto 619-0237,

Japan

Manufacturer: silex technology, Inc.

2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto 619-0237.

Japan

**Product Name:** AP-800AX

**Brand Name:** Silex Technology

AP-800AX Model No.:

**Model Difference:** N/A

**Report Number:** TERF2303000753ER

FCC ID N6C-AP800AX

IC: 4908A-AP800AX

Date of EUT Received: March 29, 2023

Date of Test: March 29, 2023~May 11, 2023

Issue Date: August 21, 2023

Approved By Blue Yang

### We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab 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 comply with FCC rule part §15.407, ISED RSS-247.

The results of this report relate only to the sample identified in this report.

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Revision History							
Report Number	Revision	Description	Issue Date	Revised By	Remark		
TERF2303000753ER	00	Original.	July 20, 2023	Susan Lin			
TERF2303000753ER	01	Update channel number in section 1.5	August 21, 2023	Susan Lin	*		

### Note:

1 The remark "\*" indicates modification of the report upon requests from certification body.

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## **GENERAL INFORMATION**

#### 1.1 **Product Description**

Product Name:	AP-800AX
Brand Name:	Silex Technology
Model No.:	AP-800AX
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	000001814
Power Supply:	12Vdc
Test Software (Name/Version):	QRCT v4.0.211.0

#### 1.2 **Modulation & Data Rate**

	64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation type:	256QAM for OFDM in 802.11ac
	256QAM,1024QAM for OFDMA in 802.11ax
	802.11 a: 6 - 54 Mbps
	802.11 n_20MHz: up to 144.4 Mbps
	802.11 n_40MHz: up to 300 Mbps
	802.11 ac_20MHz: up to 173.4 Mbps
Transition Rate:	802.11 ac_40MHz: up to 400 Mbps
	802.11 ac_80MHz: up to 866.6 Mbps
	802.11 ax_20MHz: up to 286.8 Mbps
	802.11 ax_40MHz: up to 573.6 Mbps
	802.11 ax_80MHz: up to 1201 Mbps

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## **Antenna Designation**

Antenna Type	Ch0/Ch1	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Directional Gain (dBi)
			5150~5250	1.1	4.11
	Ch0	- ANTDP-039A0	5250~5350	1.1	4.11
	CHO		5470~5725	1.2	4.21
Dinala			5725~5850	1.3	4.31
Dipole	Ch1		5150~5250	1.1	4.11
			5250~5350	1.1	4.11
	Ciri		5470~5725	1.2	4.21
			5725~5850	1.3	4.31

#### Note:

- 1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
- 2. Antenna information is provided by the applicant.

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## 1.4

Wi-Fi	Frequency Range	Channels	Rated Power(Avg) (dBm) (Worst Case)	Modulation Technology
a/	5180~5240	4	16.47 dBm	OFDMA
n_HT/	5260~5320	4	21.98 dBm	OFDMA
ac_VHT/ ax_HE	5500~5720	12	21.98 dBm	OFDM
20M	5745-5825	5	19.99 dBm	OFDM
n_HT	5190~5230	2	16.99 dBm	OFDM
ac_VHT/	5270~5310	2	21.98 dBm	OFDM
ax_HE 40M	5510~5710	6	21.99 dBm	OFDM
40101	5755-5795	2	22.99 dBm	OFDM
	5210	1	16.98 dBm	OFDMA
ac_VHT/ ax_HE 80M	5290	1	16.06 dBm	OFDM
	5530~5690	3	21.96 dBm	OFDM
	5775	1	22.86 dBm	OFDM

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WI AN 5 GHz for ISED (Master)

Wi-Fi	Frequency Range	Channels	EIRP/Avg	,	ver(EIRP/Avg) Vorst Case)	Modulation Technology
	5180~5240	4	EIRP	20.58	dBm	OFDMA
a/	5260~5320	4	Avg	21.98	dBm	OFDMA
n_HT/ ac_VHT/	(*)5500~5700	8	Avg	21.98	dBm	OFDM
ac_vH/ ax_HE	5720 (U-NII 2C)	1	Avg	19.62	dBm	OFDM
20M	5720 (U-NII 3)	1	Avg	15.03	dBm	OFDMA
	5745-5825	5	Avg	19.99	dBm	OFDM
	5190~5230	2	EIRP	21.10	dBm	OFDM
n_HT	5270~5310	2	Avg	21.98	dBm	OFDM
ac_VHT/	(*)5510~5670	3	Avg	21.99	dBm	OFDM
ax_HE 40M	5710 (U-NII 2C)	1	Avg	19.33	dBm	OFDM
40101	5710 (U-NII 3)	1	Avg	11.09	dBm	OFDMA
	5755-5795	2	Avg	22.99	dBm	OFDM
	5210	1	EIRP	21.09	dBm	OFDMA
	5290	1	Avg	16.06	dBm	OFDM
ac_VHT/	5530	1	Avg	21.96	dBm	OFDM
ax_HE 80M	5690 (U-NII 2C)	1	Avg	17.62	dBm	OFDM
	5690 (U-NII 3)	1	Avg	6.30	dBm	OFDM
	5775	1	Avg	22.86	dBm	OFDM

<sup>\*</sup>Note: TDWR frequencies are not available in Canada.

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## **Test Methodology of Applied Standards**

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 291074 D02 EMC Measurement v01

RSS-247 issue 2 Feb. 2017

RSS-Gen, issue 5 April, 2018

ANSI C63.10:2013

#### 1.7 **Test Facility**

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
		SAC 1		
		SAC 2		
		SAC 3		
	No.134, Wu Kung Road, New Taipei	Conduction 1		
	Industrial Park, Wuku District, New	Conducted 1	TW0027	TW3702
	Taipei City, Taiwan.	Conducted 2	1 00027	
		Conducted 3		
		Conducted 4		
		Conducted 5		
SGS Taiwan Ltd.		Conducted 6		
Central RF Lab.	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
(TAF code 3702)		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
	ladydair Oity, faiwair 555	Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

#### 1.8 **Special Accessories**

There are no special accessories used while test was conducted.

#### 1.9 **Equipment Modifications**

There was no modification incorporated into the EUT.

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## 2 SYSTEM TEST CONFIGURATION

## 2.1 EUT Configuration

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

#### 2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

#### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

## 2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

### 2.3.3 Radiated Emissions

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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## **Measurement Results Explanation Example**

#### 2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m\*6m\*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

#### 2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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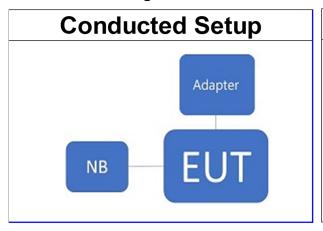
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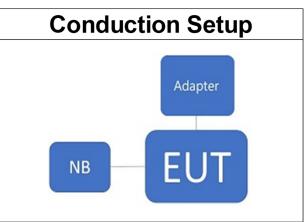


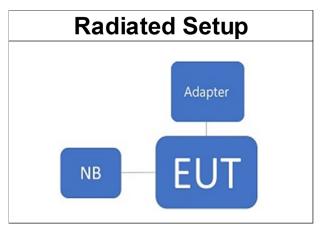
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#### 2.5 **Test Configuration**







#### 2.6 **Control Unit(s)**

Conducted Emission Test Site: Conducted 2					
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.					CAL DUE.
Notebook	DELL	Latitude 5590	3R9FST2	N/A	N/A
Adapter	ADAPTER	ATS036T-A120	N/A	N/A	N/A

AC Power-Line Conducted Emission Test Site: Conduction 1					
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.					
Notebook	DELL	Latitude 5590	3R9FST2	N/A	N/A
Adapter	ADAPTER	ATS036T-A120	N/A	N/A	N/A

Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.					
Notebook	DELL	Latitude 5590	3R9FST2	N/A	N/A
Adapter	ADAPTER	ATS036T-A120	N/A	N/A	N/A

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## SUMMARY OF TEST RESULT

FCC Rules	ISED Rules	Description Of Test	Result
§15.207	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.407(e)	RSS-Gen §6.7 RSS-247 §6.2.4.1	Emission Bandwidth	Compliant
§15.407(a)	RSS-247 §6.2.1~ 4 (1)	Maximum Conducted Output Power	Compliant
§15.407(a)	RSS-247 §6.2.1~ 4 (1)	Power Spectral Density	Compliant
§15.205 §15.209 §15.407(b)	RSS-247 §6.2.1~ 4 (2)	Undesirable Radiated Emissions	Compliant
§15.407(c)	RSS-247 §6.4	Transmission in case of Absence of Information	Compliant
§15.203	N/A	Antenna Requirement	Compliant

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## **DESCRIPTION OF TEST MODES**

## **Operating Frequencies**

Or	perated	band	in 5	150	MHz	~5250	MHz:
----	---------	------	------	-----	-----	-------	------

20 M							
СН	Freq (MHz)						
36	5180						
40	5200						
44	5220						
48	5240						

ı	ın 51	50 MHz	<u>~52</u> ;	OU MHZ:
	4	0 M		80 M
	СН	Freq (MHz)	СН	Freq (MHz)
	38	5190	42	5210
	46	5230		

## Operated band in 5250 MHz ~5350 MHz:

Operated barre							
20 M							
Freq (MHz)							
5260							
5280							
5300							
5320							

Ш	11 3230 1411 12								
	40 M								
	СН	Freq							
	T 4	(MHz)							
	54	5270							
	62	5310							

٠,									
	8	0 M							
	СН	Freq (MHz)							
	58	5290							

## Operated band in 5470 MHz

Operated ban								
20 M								
СН	Freq (MHz)							
100	5500							
104	5520							
108	5540							
112	5560							
116	5580							
120	5600							
124	5620							
128	5640							
132	5660							
136	5680							
140	5700							

<u>IN 5470 MHz ~5725 MHz:</u>								
4	M 0		80 M					
СН	Freq (MHz)	СН	Freq (MHz)					
102	5510	106	5530					
110	5550	122	5610					
118	5590	138	5690					
126	5630							
134	5670							

5710

20 M									
СН	Freq								
OH	(MHz)								
149	5745								
153	5765								
157	5785								

Operated band in 5725 MHz ~5850 MHz:										
20	M		4	0 M		80 M				
СН	Freq		CH	Freq (MHz)		CH	Freq (MHz			
5	(MHz)		5	(MHz)		5	(MHz			
149	5745		151	5755		155	5775			
153	5765		159	5795						
157	5785				•					
161	5805									
165	5825									

<b>o</b>	80 M								
	СН	Freq (MHz)							
	155	5775							

#### Note:

144

5720

- 5850~5895 MHz is not available for operation in Canada.
- Operating in 5600~5650MHz is prohibited in Canada for Master device.

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## The Worst Test Modes and Channel Details

- The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case. The given UE is pre-scanned among below modes.

N	Modulation		,	Traı	nsmiss	sion	Chain		Tra	Single ansmission Spatial	Tra	Multiple ansmission Spatial
V	802.11 a	٧	Ch0	٧	Ch1		Ch2	Ch3		1TX	٧	2TX
V	802.11 n	٧	Ch0	٧	Ch1		Ch2	Ch3		1TX	٧	2TX
V	802.11 ac	٧	Ch0	٧	Ch1		Ch2	Ch3		1TX	٧	2TX
V	802.11 ax	٧	Ch0	٧	Ch1		Ch2	Ch3		1TX	٧	2TX
	802.11 be		Ch0		Ch1		Ch2	Ch3		1TX		2TX

4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

	CONDUCTED TEST									
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA				
MODE	BAND (MHz)	CHANNEL	CHANNEL	WIODULATION	(Mbps)	PORT				
	5180~5240	36 to 48	36,44,48							
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	2TX				
002.11a	5500~5720	100 to 144	100,116,140,144	OFDINI	O	217				
	5745~5825	149 to 165	149,157,165							
	5180~5240	36 to 48	36,44,48							
802.11n_HT20	5260~5320	52 to 64	52,60,64	OFDM	MCS0	2TX				
002.1111_11120	5500~5720	100 to 144	100,116,140,144			ZIX				
	5745~5825	149 to 165	149,157,165							
	5190~5230	38 to 46	38,46							
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	2TX				
002.1111_11140	5510~5670	102 to 142	102,110,134,142	OI DIVI	WOSO	ZIX				
	5755~5795	151 to 159	151,159							
	5210	42	42							
802.11ac_VHT80	5290	58	58	OFDM	MCS0	2TX				
002.11ac_V11100	5530~5610	106 to 138	106,122,138	OI DIWI	WOSU	217				
	5775	155	155							

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	CONDUCTED TEST									
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	RU	DATA RATE	ANTENNA			
WIODE	BAND (MHz)	CHANNEL	CHANNEL	MODULATION	CONFIGURATION	(Mbps)	PORT			
	5180~5240	36 to 48	36,44,48		FULL RU					
802.11ax HE20	5260~5320	52 to 64	52,60,64	OFDMA	26/0,26/8	MCS0	2TX			
002.11ax_11L20	5500~5720	100 to 144	100,116,140,144	OFDIVIA	52/37,52/40 106/53,106/54	IVICSU	ZIX			
	5745~5825	149 to 165	149,157,165							
	5190~5230	38 to 46	38,46		FULL RU 242/61,242/62	MCS0	2TX			
802.11ax HE40	5270~5310	54 to 62	54,62	OFDMA						
002.11ax_11L40	5510~5670	102 to 142	102,110,134,142	OI DIVIA						
	5755~5795	151 to 159	151,159							
	5210	42	42							
902 11av HE90	5290	58	58	OFDMA	FULL RU	MCS0	2TX			
802.11ax_HE80	5530~5610	106 to 138	106,122,138	OI DIVIA	484/65,484/66	IVICOU	217			
	5775	155	155							

	RADIATED EMISSION TEST (BELOW 1 GHz)									
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA				
WIODE	BAND (MHz)	CHANNEL	CHANNEL	MODULATION	(Mbps)	PORT				
	5180~5240	36 to 48	44							
902 110	5260~5320	52 to 64	60	OFDM	G	2TX				
802.11a	5500~5720	100 to 144	116	OFDIVI	0	217				
	5745~5825	149 to 165	157							

	RADIATED EMISSION TEST (ABOVE 1 GHz)									
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA				
MODE	BAND (MHz)	CHANNEL	CHANNEL	WODULATION	(Mbps)	PORT				
	5180~5240	36 to 48	36,44,48							
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	2TX				
002.11a	5500~5720	100 to 144	100,116,140,144	OFDIVI	0	217				
	5745~5825	149 to 165	149,157,165							
	5180~5240	36 to 48	36,44,48							
802.11n_HT20	5260~5320	52 to 64	52,60,64	- OFDM	MCS0	2TX				
002.1111_11120	5500~5720	100 to 144	100,116,140,144			217				
	5745~5825	149 to 165	149,157,165							
	5190~5230	38 to 46	38,46							
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	2TX				
002.1111_11140	5510~5710	102 to 142	102,110,134,142	OFDIN	WCSU	217				
	5755~5795	151 to 159	151,159							
	5210	42	42							
802.11ac_VHT80	5290	58	58	OFDM	MCS0	2TX				
002.11aU_VH100	5530~5690	106 to 138	106,122,138		WC30	217				
	5775	155	155							

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	RADIATED EMISSION TEST (ABOVE 1 GHz)									
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	RU	DATA RATE	ANTENNA			
WODE	BAND (MHz)	CHANNEL	CHANNEL	MODULATION	CONFIGURATION	(Mbps)	PORT			
	5180~5240	36 to 48	36,44,48							
902 11ov UE20	5260~5320	52 to 64	52,60,64	OFDMA	FULL RU	MCS0	2TX			
802.11ax_HE20	5500~5720	100 to 144	100,116,140,144	OFDIVIA	FULL RU	IVICSU	217			
	5745~5825	149 to 165	149,157,165							
	5190~5230	38 to 46	38,46		FULL RU	MCS0	2TX			
902 11ov UE40	5270~5310	54 to 62	54,62	OEDMA						
802.11ax_HE40	5510~5710	102 to 142	102,110,134,142	OFDMA						
	5755~5795	151 to 159	151,159							
	5210	42	42				OTV			
802.11ax_HE80	5290	58	58	OFDMA	FULL RU	MCCO				
	5530~5690	106 to 138	106,122,138	OFDIVIA	FULL RU	MCS0	2TX			
	5775	155	155	]						

### Note:

The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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## **MEASUREMENT UNCERTAINTY**

Test Items	Un	certain	ty
AC Power Line Conducted Emission	+/-	2.32	dB
Output Power measurement	+/-	1	dB
Emission Bandwidth	+/-	1.53	Hz
Undesignable radiated emission measure- ment	+/-	1.68	dB
Peak Power Density	+/-	2.16	dB
Temperature	+/-	0.7	Ĉ
Humidity	+/-	3	%
DC / AC Power Source	+/-	1	%

Radiated Spurious Emission Measurement Uncertainty						
Polarization: Vertical	+/-	2.8	dB	9kHz~30MHz		
	+/-	4.82	dB	30MHz - 1000MHz		
	+/-	4.37	dB	1GHz - 18GHz		
	+/-	4.21	dB	18GHz - 40GHz		
	+/-	2.8	dB	9kHz~30MHz		
Polarization: Horizontal	+/-	4.54	dB	30MHz - 1000MHz		
Polarization: Horizontal	+/-	4.37	dB	1GHz - 18GHz		
	+/-	4.21	dB	18GHz - 40GHz		

### Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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## **MEASUREMENT EQUIPMENT USED**

#### 6.1 **Emission from AC power line**

AC Power-Line Conducted Emission Test Site: Conduction 1										
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.										
EMI Test Receiver	R&S	ESR 7	102525	02/18/2023	02/17/2024					
Pulse Limiter	SCHWARZBECK	VTSD 9561F-N	793	06/22/2022	06/21/2023					
LISN	SCHWARZBECK	NSLK 8127	01040	08/23/2022	08/22/2023					
Coaxial Cables	EMC Instruments Corp.	EMCCFD300-BM- BM-3000	161207	06/22/2022	06/21/2023					
Test Software	audix	e3	Ver. 9 210322	N.C.R	N.C.R					

#### 6.2 **Condcuted Measurement**

Conducted Emission Test Site: Conducted 2										
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE										
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071541	07/14/2022	07/13/2023					
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R					
Power Meter	Anritsu	ML2496A	2132007	09/21/2022	09/20/2023					
Power Sensor	Anritsu	MA2411B	1911391	09/21/2022	09/20/2023					
Power Sensor	Anritsu	MA2411B	1911392	09/21/2022	09/20/2023					
Attenuator	Mini-Circuit	BW-S10W2+	4	12/13/2022	12/12/2023					
DC Block	Mini-Circuits	BLK-18-S+	1	12/13/2022	12/12/2023					

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### 6.3 Radiated Measurement

Radiated Emission Test Site: SAC 3									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/30/2022	12/29/2023				
Horn Antenna	SCHWARZBECK	BBHA9120D	1441	09/27/2022	09/26/2023				
Bi-log Antenna	SCHWARZBECK	VULB9168	378	08/15/2022	08/14/2023				
Loop Antenna	ETS.LINDGREN	6502	148045	10/05/2022	10/04/2023				
Spectrum Analyzer	Agilent	E4446A	MY51100003	10/28/2022	10/27/2023				
EMI Test Receiver	R&S	ESCI 7	100759	08/22/2022	08/21/2023				
Pre-Amplifier	EMC Instruments	EMC118A45SEE	980868	12/13/2022	12/12/2023				
Pre-Amplifier	EMC Instruments	EMC184045B	980135	10/27/2022	10/26/2023				
Pre-Amplifier	HP	8447D	2944A07676	12/13/2022	12/12/2023				
Attenuator	Mini-Circuit	BW-S10W2+	4	12/13/2022	12/12/2023				
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	12/13/2022	12/12/2023				
Filter 5470-5725 MHz	Micro-Tronics	BRM50704	1	12/13/2022	12/12/2023				
Filter 5725-5875 MHz	Micro-Tronics	BRM50705	1	12/13/2022	12/12/2023				
High Pass Filter	WI	WHKX7.0/18G-8SS	45	12/13/2022	12/12/2023				
Coaxial Cable	Huber Suhner	SUCOFLEX 104PEA	MY4251/4PEA	12/13/2022	12/12/2023				
Coaxial Cable	EMC Instruments	EMC 107-SM-SM- 500	221104	12/13/2022	12/12/2023				
Coaxial Cable	EMC Instruments	EMC 107-SM-SM- 1000	221103	12/13/2022	12/12/2023				
Coaxial Cable	EMC Instruments	EMC 107-SM-SM- 1500	221110	12/13/2022	12/12/2023				
Coaxial Cable	EMC Instruments	EMC 107-SM-SM- 8000	221109	12/13/2022	12/12/2023				
Site Cal	SGS	SAC 3	N/A	01/01/2023	12/31/2023				
Test Software	audix	e3	Ver. 9 210322	N.C.R	N.C.R				

NOTE: N.C.R refers to Not Calibrated Required.

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## **CONDUCTED EMISSION TEST**

#### 7.1 Standard Applicable

Frequency range within 150 kHz to 30 MHz shall not exceed the Limit table as below.

	Li	mits
Frequency range	(dl	BuV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

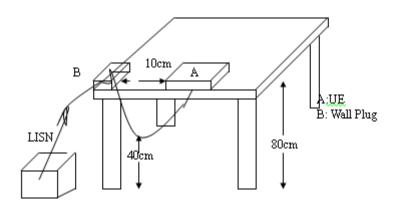
#### Note

- 1. The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

#### 7.2 **EUT Setup**

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz power source.

#### 7.3 **Test SET-UP**



#### 7.4 **Measurement Procedure**

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed.

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#### **Measurement Result**

Note: Refer to next page for measurement data and plots.

Note2: The \* reveals the worst-case results that closest to the limit.

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## AC POWER LINE CONDUCTED EMISSION TEST DATA

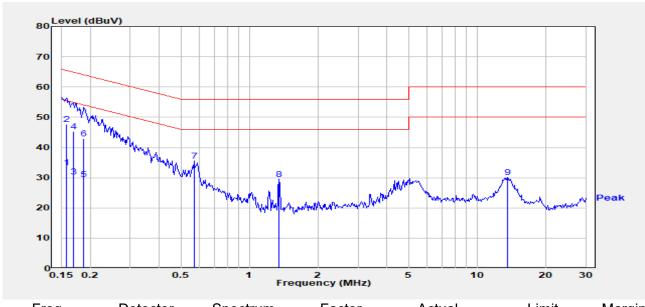
Report Number :TERF2303000753ER Test Site :Conduction 1

Test Mode :Operation (WLAN5G) **Test Date** :2023-04-21

:120V/60Hz Temp./Humi. :26.5/55 Power

Probe :L Engineer :Nick Lin

Note:



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS		
MHz	PK/QP/AV	dΒμV	dB	dΒμV	dΒμV	dB
0.157	Average	23.18	10.25	33.43	55.62	-22.19
0.157	QP	37.36	10.25	47.61	65.62	-18.01
0.168	Average	20.12	10.25	30.37	55.04	-24.67
0.168	QP	35.06	10.25	45.31	65.04	-19.73
0.187	Average	19.13	10.25	29.38	54.15	-24.77
0.187	QP	32.66	10.25	42.91	64.15	-21.24
0.571	Peak	25.25	10.27	35.52	56.00	-20.48
1.349	Peak	18.74	10.67	29.41	56.00	-26.59
13.603	Peak	19.34	10.77	30.11	60.00	-29.89

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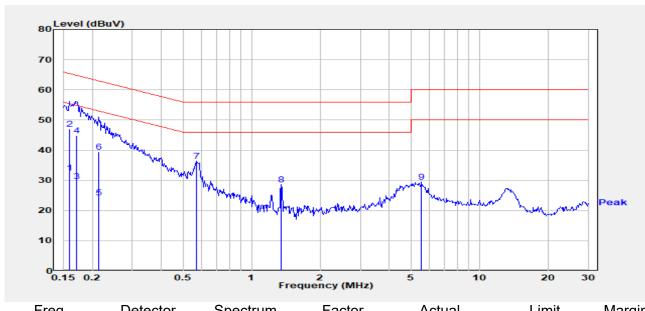
Report Number :TERF2303000753ER Test Site :Conduction 1

**Test Mode** :Operation (WLAN5G) **Test Date** :2023-04-21

:120V/60Hz Power Temp./Humi. :26.5/55

Probe :N Engineer :Nick Lin

Note:



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dΒμV	dB	dΒμV	dΒμV	dB
0.158	Average	22.32	10.25	32.57	55.55	-22.98
0.158	QP	36.72	10.25	46.97	65.55	-18.58
0.171	Average	19.43	10.25	29.68	54.92	-25.24
0.171	QP	34.56	10.25	44.81	64.92	-20.11
0.214	Average	14.08	10.25	24.33	53.07	-28.74
0.214	QP	29.22	10.25	39.47	63.07	-23.60
0.575	Peak	26.14	10.27	36.41	56.00	-19.59
1.349	Peak	17.99	10.67	28.67	56.00	-27.33
5.582	Peak	18.88	10.57	29.44	60.00	-30.56

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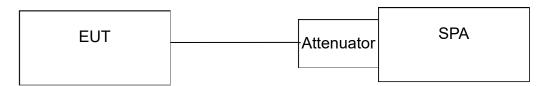
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### 8 EMISSION BANDWIDTH MEASUREMENT

## 8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C. The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3.

## 8.2 Test Setup



#### 8.3 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
  - 3.a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto,

Detector = Peak,

Trace Mode = Max Hold,

Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.

- 3.b. Mark the peak frequency and -26dB (upper and lower) frequency.
- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
- 5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
  - a. Set the spectrum analyzer as

RBW = 100 kHz,

VBW = 3\*RBW,

Span = large enough to capture all products of the modulation process,

Detector=Peak.

Sweep=auto

- b. Mark the peak frequency and -6dB (upper and lower) frequency.
- 6. For 99% Bandwidth: Set the spectrum analyzer as

**RBW** = 1%.

VBW = 3\*RBW.

Span = large enough to capture all products of the modulation process,

Detector=Sample,

Sweep=auto.

- 7. Turn on the 99% bandwidth function, max reading.
- 8. Repeat above procedures until all frequency of interest measured was complete.

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#### 8.4 **Measurement Result**

#### 8.4.1 **FCC Occupied Bandwidth**

802.11a Ch0

802.11a Ch1

002.118_0110			002.110_0111			
Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	
5180	19.66	12.940	5180	20.08	13.030	
5220	20.05	13.020	5220	20.71	13.160	
5240	19.62	12.930	5240	20.01	13.010	
5260	19.88	12.980	5260	20.62	13.140	
5300	19.29	12.850	5300	20.01	13.010	
5320	20.34	13.080	5320	20.11	13.030	
5500	20.25	13.060	5500	20.09	13.030	
5580	19.68	12.940	5580	19.90	12.990	
5700	20.17	13.050	5700	19.61	12.920	
5720(U-NII 2C)	15.22	11.820	5720(U-NII 2C)	15.11	11.790	
5720(U-NII 3)	5.22	7.170	5720(U-NII 3)	5.11	7.090	

802.11a\_Ch0

802.11a\_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	15.96	12.030	5745	16.38	12.140
5785	14.45	11.600	5785	16.35	12.140
5825	15.70	11.960	5825	16.32	12.130

802.11a\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.19	< 5250
5745	5736.78	> 5725

802.11a Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)		
5240	5248.19	< 5250		
5745	5736.79	> 5725		

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#### 802.11n\_HT20\_Ch0

#### 802.11n\_HT20\_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	21.04	13.230	5180	20.94	13.210
5220	21.04	13.230	5220	20.50	13.120
5240	20.74	13.170	5240	21.08	13.240
5260	21.18	13.260	5260	20.20	13.050
5300	20.15	13.040	5300	21.19	13.260
5320	20.82	13.180	5320	20.95	13.210
5500	20.91	13.200	5500	20.99	13.220
5580	20.70	13.160	5580	20.66	13.150
5700	21.21	13.270	5700	21.13	13.250
5720(U-NII 2C)	15.13	11.800	5720(U-NII 2C)	15.48	11.900
5720(U-NII 3)	5.13	7.100	5720(U-NII 3)	5.48	7.390

### 802.11n\_HT20\_Ch0

## 802.11n\_HT20\_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.93	12.290	5745	17.12	12.340
5785	17.67	12.470	5785	17.23	12.360
5825	17.56	12.450	5825	16.94	12.290

### 802.11n\_HT20\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.79	< 5250
5745	5736.17	> 5725

### 802.11n\_HT20\_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.77	< 5250
5745	5736.17	> 5725

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#### 802.11n\_HT40\_Ch0

#### 802.11n\_HT40\_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	39.91	16.010	5190	39.86	16.010
5230	40.42	16.070	5230	40.06	16.030
5270	40.07	16.030	5270	39.96	16.020
5310	40.66	16.090	5310	40.06	16.030
5510	40.04	16.020	5510	39.79	16.000
5550	40.06	16.030	5550	39.90	16.010
5670	39.92	16.010	5670	40.19	16.040
5710(U-NII 2C)	35.36	15.490	5710(U-NII 2C)	34.86	15.420
5710(U-NII 3)	5.36	7.290	5710(U-NII 3)	4.86	6.870

## 802.11n\_HT40\_Ch0

## 802.11n\_HT40\_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	36.36	15.610	5755	36.36	15.610
5795	35.73	15.530	5795	35.98	15.560

## 802.11n\_HT40\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.06	< 5250
5755	5736.87	> 5725

## 802.11n\_HT40\_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	
5230	5248.01	< 5250	
5755	5736.99	> 5725	

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#### 802.11ac\_VHT80\_Ch0

#### 802.11ac\_VHT80\_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)			10 Log (B) (dB)
5210	81.07	19.090	5210	80.61	19.060
5290	81.90	19.130	5290	80.12	19.040
5530	80.89	19.080	5530	80.92	19.080
5610	80.60	19.060	5610	80.59	19.060
5690(U-NII 2C)	75.77	18.800	5690(U-NII 2C)	75.34	18.770
5690(U-NII 3)	5.77	7.620	5690(U-NII 3)	5.34	7.280

#### 802.11ac\_VHT80\_Ch0

#### 802.11ac\_VHT80\_Ch1

Freq. (MHz)	40.81	10 Log (B) (dB)	Freq. (MHz)	40.24	10 Log (B) (dB)
5775	75.78	18.800	5775	73.82	18.680

### 802.11ac\_VHT80\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5247.69	< 5250
5775	5737.14	> 5725

### 802.11ac\_VHT80\_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	
5210	5247.66	< 5250	
5775	5737.23	> 5725	

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#### 802.11ax\_HE20\_Ch0

#### 802.11ax\_HE20\_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5180	full	20.74	13.170	5180	full	20.52	13.120
5220	full	21.11	13.240	5220	full	20.52	13.120
5240	full	20.82	13.180	5240	full	20.94	13.210
5260	full	20.50	13.120	5260	full	21.21	13.270
5300	full	20.96	13.210	5300	full	20.77	13.170
5320	full	21.04	13.230	5320	full	20.89	13.200
5500	full	20.82	13.180	5500	full	20.61	13.140
5580	full	20.65	13.150	5580	full	20.65	13.150
5700	full	20.85	13.190	5700	full	20.96	13.210
5720 (U-NII 2C)	full	15.63	11.940	5720 (U-NII 2C)	full	15.28	11.840
5720 (U-NII 3)	full	5.63	7.510	5720 (U-NII 3)	full	5.28	7.230

#### 802.11ax\_HE20\_Ch0

### 802.11ax\_HE20\_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5745	full	17.17	12.350	5745	full	17.35	12.390
5785	full	16.72	12.230	5785	full	16.43	12.160
5825	full	17.60	12.460	5825	full	18.65	12.710

#### 802.11ax\_HE20\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.45	< 5250
5745	5735.51	> 5725

#### 802.11ax\_HE20\_Ch1

	_	
Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.49	< 5250
5745	5735.52	> 5725

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#### 802.11ax\_HE40\_Ch0

#### 802.11ax\_HE40\_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5190	full	40.46	16.070	5190	full	39.94	16.010
5230	full	40.81	16.110	5230	full	40.24	16.050
5270	full	40.99	16.130	5270	full	41.12	16.140
5310	full	40.54	16.080	5310	full	40.48	16.070
5510	full	40.27	16.050	5510	full	40.43	16.070
5550	full	40.64	16.090	5550	full	40.26	16.050
5670	full	40.78	16.100	5670	full	40.86	16.110
5710 (U-NII 2C)	full	35.39	15.490	5710 (U-NII 2C)	full	35.22	15.470
5710 (U-NII 3)	full	5.39	7.320	5710 (U-NII 3)	full	5.22	7.170

#### 802.11ax\_HE40\_Ch0

#### 802.11ax\_HE40\_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5755	full	38.10	15.810	5755	full	37.87	15.780
5795	full	37.98	15.800	5795	full	37.89	15.790

## 802.11ax HE40 Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	
5230	5248.81	< 5250	
5755	5736.05	> 5725	

### 802.11ax\_HE40\_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	
5230	5248.84	< 5250	
5755	5736.07	> 5725	

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#### 802.11ax\_HE80\_Ch0

#### 802.11ax\_HE80\_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5210	full	81.37	19.100	5210	full	81.42	19.110
5290	full	81.45	19.110	5290	full	80.80	19.070
5530	full	81.45	19.110	5530	full	81.90	19.130
5610	full	81.45	19.110	5610	full	81.61	19.120
5690 (U-NII 2C)	full	75.52	18.780	5690 (U-NII 2C)	full	75.44	18.780
5690 (U-NII 3)	full	5.52	7.420	5690 (U-NII 3)	full	5.44	7.350

#### 802.11ax\_HE80\_Ch0

#### 802.11ax\_HE80\_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5775	full	76.08	18.810	5775	full	75.24	18.760

#### 802.11ax\_HE80\_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	
5210	5248.42	< 5250	
5775	5736.32	> 5725	

### 802.11ax\_HE80\_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	
5210	5248.62	< 5250	
5775	5736.49	> 5725	

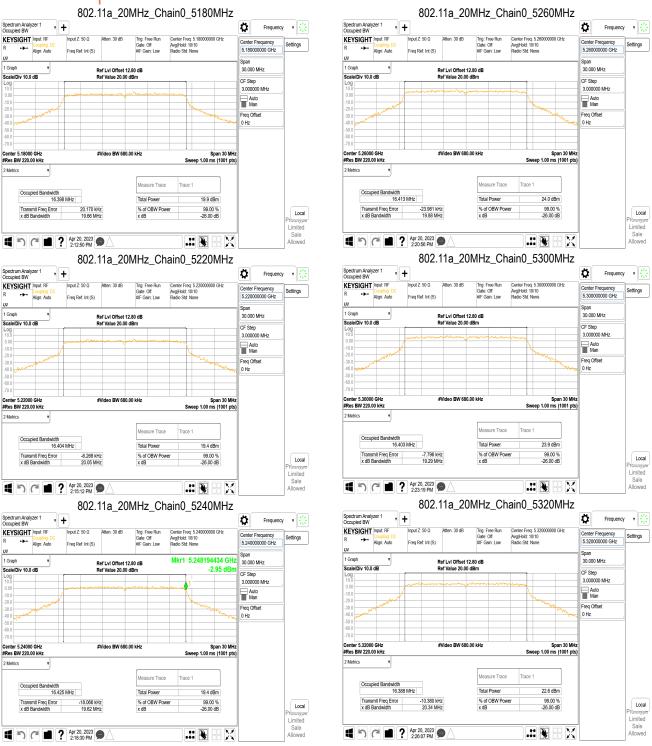
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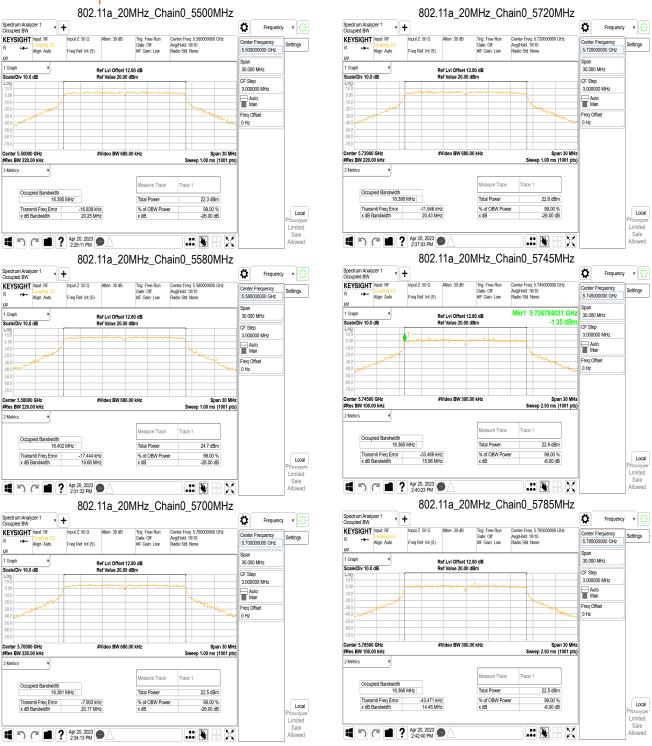
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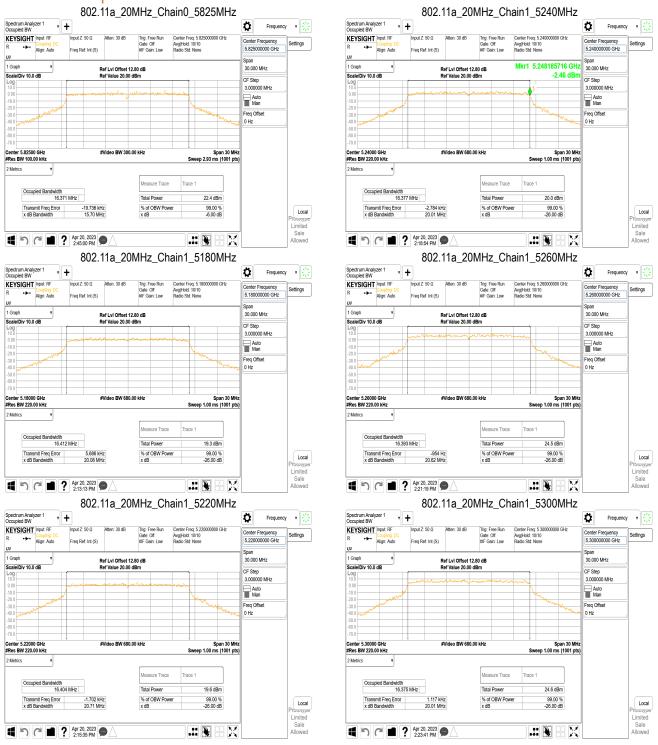
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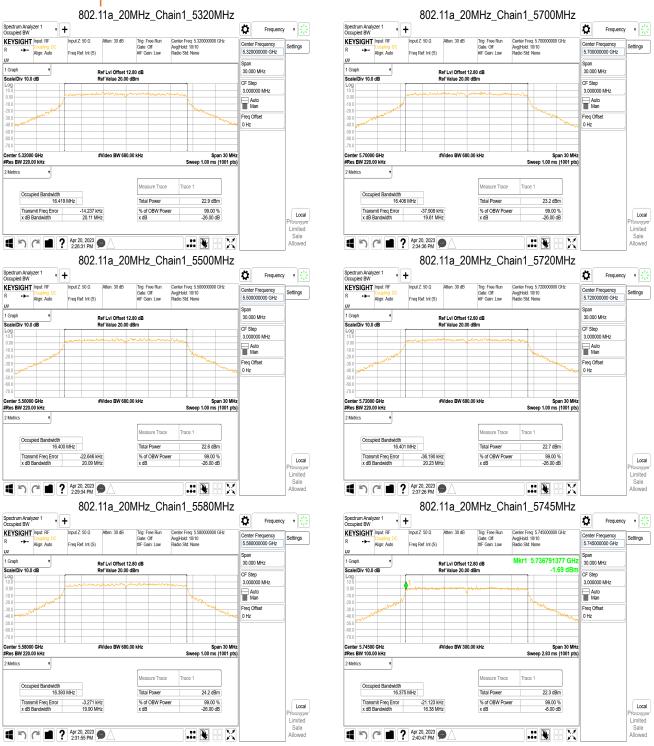
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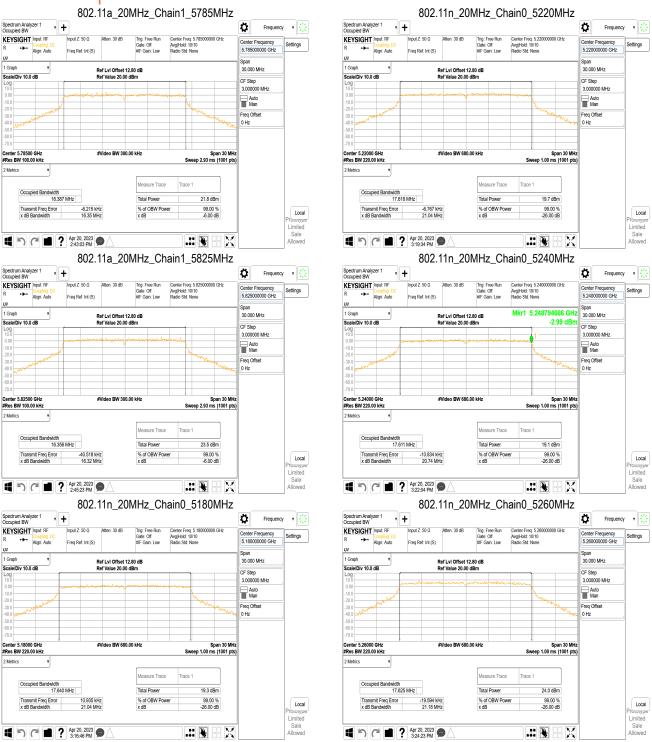
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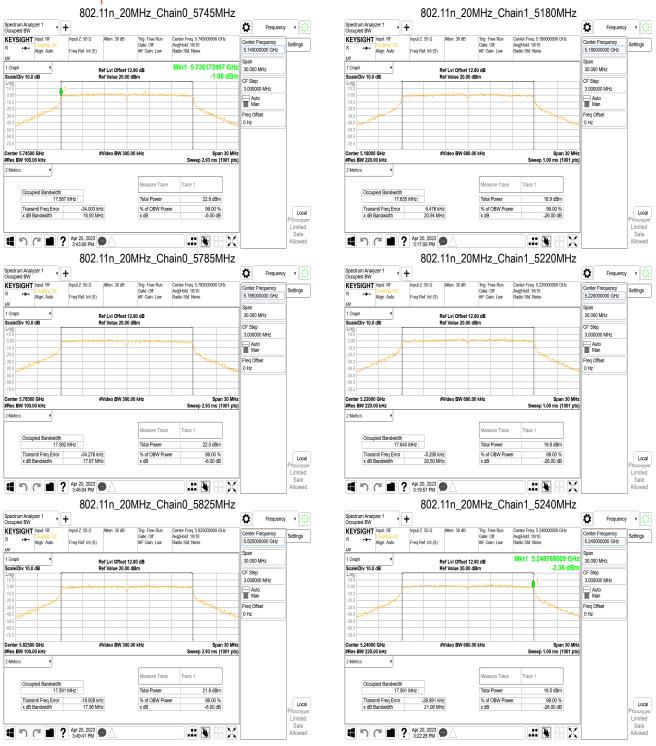
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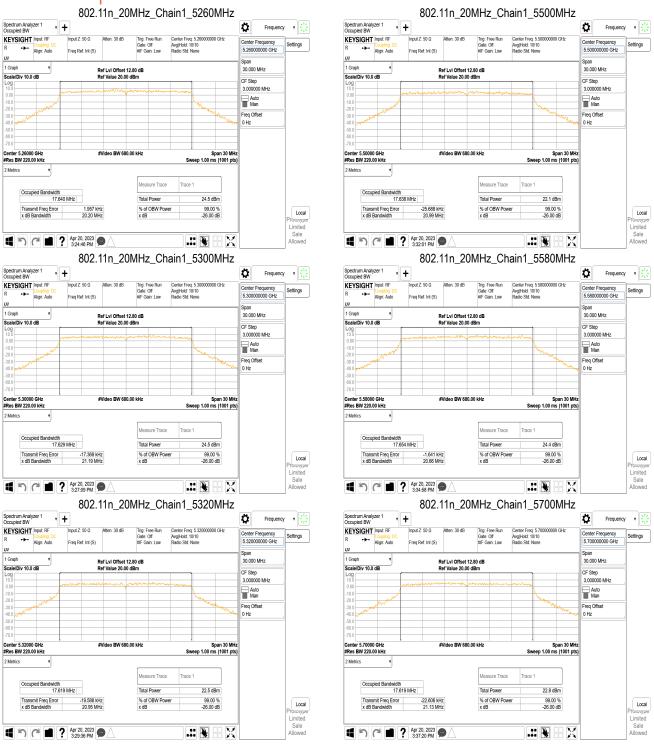
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