CERTIFICATION TEST REPORT

Report Number. : 4789901731-FR4V2

Applicant	:	Kaonbroadband CO., LTD. 884-3, Seongnam-daero, Bundang-gu, Seongnam-si Gyeonggi-do, South Korea
Model	:	AR1344P, AR1344, AR1344E, EVO6700AP
FCC ID	:	2AXCW-AP6700
EUT Description	:	Wi-Fi Extender with DTS/UNII a/b/g/n/ac/ax
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
August 11, 2021

Prepared by:
UL Korea, Ltd.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

ACCREDITED
Testing Laboratory
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	08/05/21	Initial issue	Robby Lee
V2	08/11/21	Updated to address about the TCB's comments	Robby Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	Kaonbroadband CO., LTD.
EUT DESCRIPTION:	Wi-Fi Extender with DTS/UNII a/b/g/n/ac/ax
MODEL NUMBER:	AR1344P, AR1344, AR1344E, EVO6700AP
SERIAL NUMBER:	Proto type (CONDUCTED) Proto type (RADIATED);
DATE TESTED:	MAY 03, 2021 – AUG 05, 2021;

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

Anthony Kim
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Robby Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 789033 D02 General UNII Test Procedures New Rules v02r01
4. ANSI C63.10-2013.
5. KDB 662911 D01 v02r01

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1
☐ Chamber 2
☒ Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

UL Korea, Ltd. is accredited by National Radio Research Agency, Designation Number KR0161, for all testing performed within the scope of this report.

ISED CABID	ISED Company Number	FCC Registration
KR0161	2324L	644529

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

28.9 dBuV/m = 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.87 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.49 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.82 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.49 dB

Uncertainty figures are valid to a confidence level of 95%.

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Accuracy Method specified in Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Wi-Fi Extender with DTS/UNII a/b/g/n/ac/ax.
This test report addresses the 802.11ax WLAN (UNII) operational mode.

This report covers the models AR1344P and AR1344, AR1344E, EVO6700AP
The difference between these models is only the momory size.

Model	Memory size
AR1344P, EVO6700AP	256MB/512MB (FLASH MEMORY / SDRAM)
AR1344, AR1344E	128MB/256MB (FLASH MEMORY / SDRAM)

The model AR1344P was set for final test.

WiFi Operating mode

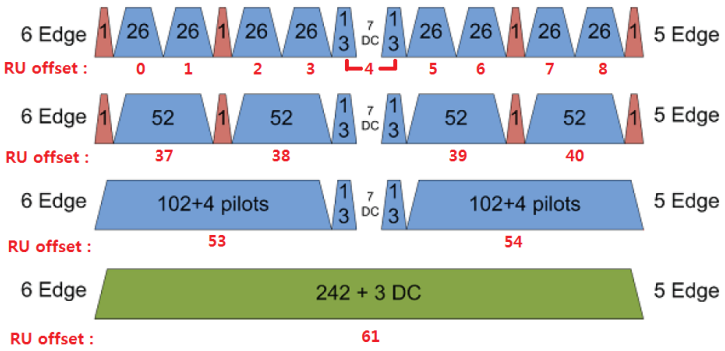
Frequency rage	Mode	Antenna 1	Antenna 2	Antenna 3	Antenna 4
5GHz (5180 MHz ~ 5825 MHz)	802.11ax(HE20) SISO	TX/RX	TX/RX	TX/RX	TX/RX
	802.11ax(HE20) MIMO	TX/RX	TX/RX	TX/RX	TX/RX
	802.11ax(HE40) SISO	TX/RX	TX/RX	TX/RX	TX/RX
	802.11ax(HE40) MIMO	TX/RX	TX/RX	TX/RX	TX/RX
	802.11ax(HE80) SISO	TX/RX	TX/RX	TX/RX	TX/RX
	802.11ax(HE80) MIMO	TX/RX	TX/RX	TX/RX	TX/RX

Simultaneous TX Condition

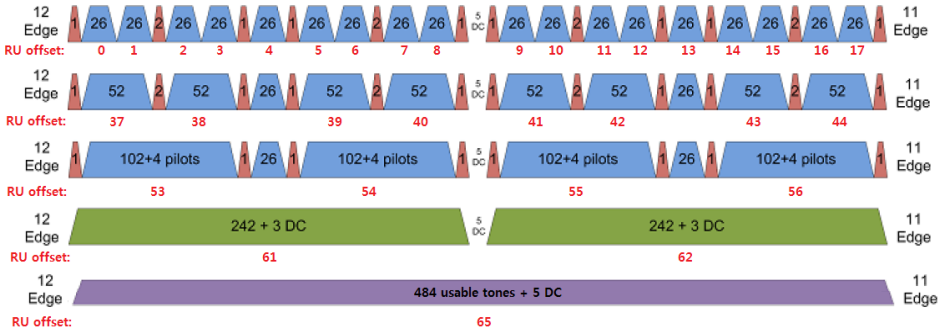
Simultaneous Tx Condition - RSDB

Mode	# of TX	5GHz WLAN		2.4GHz WLAN		Test Case
		ANT1	ANT2	ANT1	ANT2	
2.4GHz + 5GHz RSDB MIMO	4	**O**	**O**	**O**	**O**	**O**

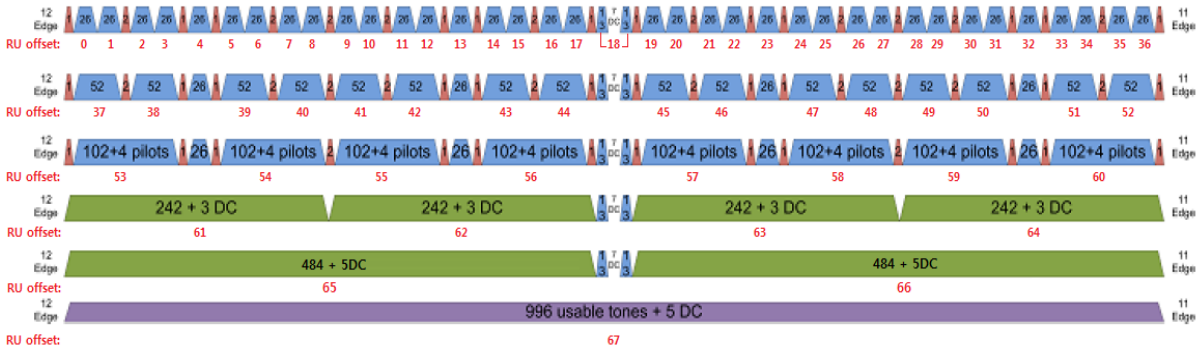
802.11ax RU allocations



- HE 20 Mode -



- HE 40 Mode -



- HE 80 Mode -

- HE 160 Mode (80 MHz + 80 MHz) -

Test RU offset for tones in each modes

Mode	Tones	RU offset
HE20	26T	0
		4
		8
	52T	37
		38
		40
	106T	53
		54
	242T / SU Note 1	61 / -
HE40	26T	0
		9
		17
	52T	37
		41
		44
	106T	53
		54
		56
	242T	61
		62
	484T / SU Note 1	63 / -
HE80	26T	0
		18
		36
	52T	37
		45
		52
	106T	53
		57
		60
	242T	61
		62
		64
	484T	65
		66
	996T / SU Note 1	67 / -
HE160	Note 2	

Note1: Full RU(Resource Unit) mode and SU(Single Unit) mode have no difference in physical waveform. This report has been reported the SU mode with highest output power in SISO and the SU mode with highest output power in MIMO.
Note2: It is used by being bonded to 80MHz + 80MHz, and refer to 80MHz for RU index configuration.

Band portion of RU allocation about straddle channels

Mode	Channel	Tones	RU offset	Portion
HE20	Straddle 5720 MHz	26T	4	UNII 2C & UNII 3
		242T / SU	61 / -	
HE40	Straddle 5710 MHz	26T	9	UNII 2C & UNII 3
		484T / SU	65 / -	
HE80	Straddle 5690 MHz	26T	18	UNII 2C & UNII 3
		996T / SU	67 / -	

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Frequency Range [MHz]	Mode	Output Power [dBm]				Output Power [mW]			
		ANT1	ANT2	ANT3	ANT4	ANT1	ANT2	ANT3	ANT4
5180 - 5240	802.11ax HE20 SISO	19.67	19.76	19.03	19.69	92.68	94.62	79.98	93.11
	802.11ax HE20 MIMO	18.14				65.16			
5190 – 5230	802.11ax HE40 SISO	18.36	18.47	18.18	18.59	68.55	70.31	65.77	72.28
	802.11ax HE40 MIMO	19.71				93.54			
5210	802.11ax HE80 SISO	16.25	14.55	16.67	13.89	42.17	28.51	46.45	24.49
	802.11ax HE80 MIMO	18.60				72.44			
5250	802.11ax(VHT160) SISO	16.23	14.45	14.45	13.54	41.98	27.86	27.86	22.59
	802.11ax(VHT160) MIMO	18.52				71.12			
5260 - 5320	802.11ax HE20 SISO	18.62	18.46	18.75	18.49	72.78	70.15	74.99	70.63
	802.11ax HE20 MIMO	19.59				90.99			
5270 - 5310	802.11ax HE40 SISO	17.56	17.46	17.56	18.38	57.02	55.72	57.02	68.87
	802.11ax HE40 MIMO	15.69				37.07			
5290	802.11ax HE80 SISO	16.42	14.37	16.40	16.39	43.85	27.35	43.65	43.55
	802.11ax HE80 MIMO	18.22				66.37			
5500 - 5720	802.11ax HE20 SISO	17.64	17.44	17.41	16.57	58.08	55.46	55.08	45.39
	802.11ax HE20 MIMO	19.29				84.92			
5510 - 5710	802.11ax HE40 SISO	17.57	17.44	17.45	17.41	57.15	55.46	55.59	55.08
	802.11ax HE40 MIMO	20.63				115.61			
5530 - 5690	802.11ax HE80 SISO	17.26	16.50	16.34	15.77	53.21	44.67	43.05	37.74
	802.11ax HE80 MIMO	17.26				53.21			
5570	802.11ax(VHT160) SISO	14.64	14.42	14.48	13.36	29.11	27.67	28.05	21.68
	802.11ax(VHT160) MIMO	19.24				83.95			
5745 - 5825	802.11ax HE20 SISO	19.67	19.67	19.52	19.46	92.68	92.68	89.54	88.31
	802.11ax HE20 MIMO	23.68				233.35			
5755 - 5795	802.11ax HE40 SISO	18.46	18.35	17.43	19.52	70.15	68.39	55.34	89.54
	802.11ax HE40 MIMO	23.55				226.46			
5775	802.11ax HE80 SISO	18.41	18.54	16.39	19.43	69.34	71.45	43.55	87.70
	802.11ax HE80 MIMO	22.50				177.83			

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The internal antenna was Permanently attached.
Therefore this E.U.T Complies with the requirement of §15.203.

The radio utilizes a internal antenna, with a maximum gain of:

Frequency Band [MHz]	ANT1 Gain [dBi]	ANT2 Gain [dBi]	ANT3 Gain [dBi]	ANT4 Gain [dBi]	Correlated Chains Directional Gain [dBi]
UNII 1 5150 - 5250	1.98	1.98	1.98	1.98	8.00
UNII 2A 5250 - 5350	1.97	1.97	1.97	1.97	7.99
UNII 2C 5470 - 5725	1.94	1.94	1.94	1.94	7.96
UNII 3 5725 - 5850	1.86	1.86	1.86	1.86	7.88

5.4. List of test reduction and modes covering other modes:

The output power on covered modes is equal to or less than one referenced.

Authorized Frequency Band			
Mode	**Antenna Stream**	**Mode**	**Covered by**
802.11ax HE 20	SISO	802.11ax HE20 RU(242T) 1TX	802.11ax HE20 SU 1TX
	MIMO	802.11ax HE20 RU(242T) 4TX	802.11ax HE20 SU 4TX
802.11ax HE 40	SISO	802.11ax HE40 RU(484T) 1TX	802.11ax HE40 SU 1TX
	MIMO	802.11ax HE40 RU(484T) 4TX	802.11ax HE40 SU 4TX
802.11ax HE 80	SISO	802.11ax HE80 RU(996T) 1TX	802.11ax HE80 SU 1TX
	MIMO	802.11ax HE80 RU(996T) 4TX	802.11ax HE80 SU 4TX
802.11ax HE 160	SISO	802.11ax HE160 RU(996T+996T) 1TX	802.11ax HE160 SU 1TX
	MIMO	802.11ax HE160 RU(996T+996T) 4TX	802.11ax HE160 SU 4TX

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1 GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1 GHz was performed with the EUT set to transmit low/mid/high channels.

For UNII-1, radiated emission tests were performed with higher power than reported power.

For SISO, the fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

For MIMO, the fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Worst-case selection criteria for test items :

- For the radiated band-edge test, the test data for RU was only reported in this test report because SU mode is same with 802.11n/ac mode. And the PSD of 26RU is highest across all RU tones.

- For the spurious emissions, it was tested at the bandwidth/RU allocation with highest power and bandwidth/RU allocation with highest PSD for each bandwidth.
  (The test data for RU was only reported in this test report because SU mode is same or lower than n/ac mode. And the PSD of 26RU is highest across all RU tones)
  Partial RU allocations(26RU) are the same across all channels and share the same nominal output power. Therefore testing are performed once to cover the equivalent RU allocation across all channel bandwidths.

- For the spurious emissions, all bandwidth were investigated, test result of 802.11ax HE20 were worst case. so the test data for 802.11ax HT20 mode were only reported in this test report.

- For the 6dB Bandwidth, it was tested at the RU allocation with lowest tones number for each bandwidth.

Based on the baseline scan, the worst-case data rates were:
802.11ax HE20 mode: MCS0 1Tx/4Tx
802.11ax HE40 mode: MCS0 1Tx/4Tx
802.11ax HE80 mode: MCS0 1Tx/4Tx
802.11ax HE160 mode: MCS0 1Tx/4Tx

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Switching mode Power Adaptor	CHENZHOU FRECOM ELECTRONICS	F18L16-120150SPAU	N/A	N/A

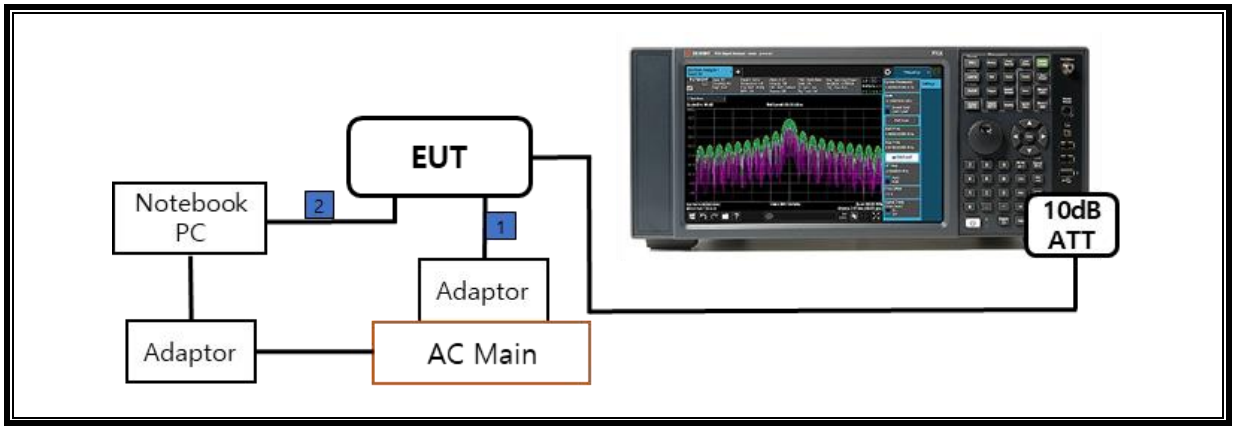
I/O CABLE

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	Pin	Shielded	1.5m	N/A
2	LAN	2	RJ-45	Shielded	2.0m	N/A

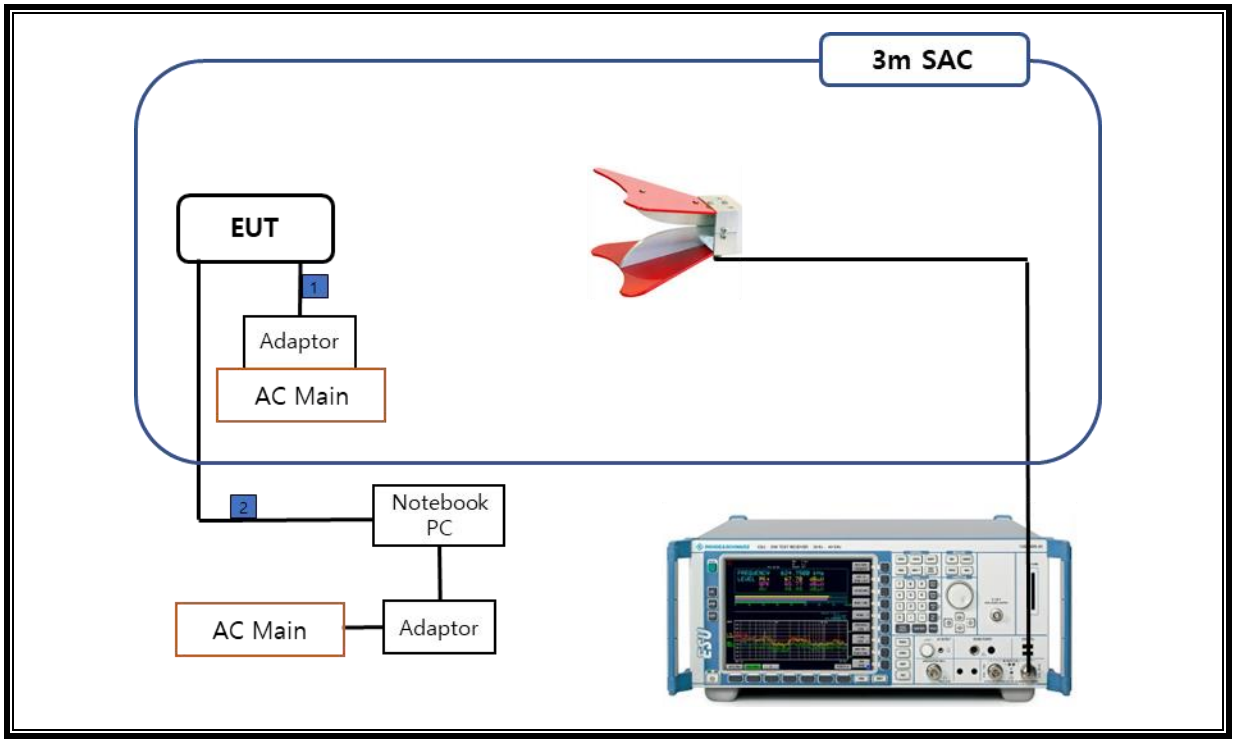
TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software exercised the EUT to enable NII mode.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2022-08-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022-08-13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022-08-13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022-07-27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022-07-27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022-08-15
Antenna, Horn, 18 GHz	ETS	3117	00218957	2023-01-15
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2023-01-15
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2021-10-02
Preamplifier	ETS	3116C-PA	00168841	2021-08-06
Preamplifier, 1000 MHz	Sonoma	310N	341282	2021-08-03
Preamplifier, 1000 MHz	Sonoma	310N	351741	2021-08-03
Preamplifier, 1000 MHz	Sonoma	310N	370599	2021-08-06
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2021-08-03
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2021-08-03
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2021-08-04
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	2021-08-06
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY60070693	2021-09-15
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143717	2022-01-13
*Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143652	2022-01-13
EMI Test Receiver, 44 GHz	R&S	ESW44	101590	2021-08-04
Average Power Sensor	Agilent / HP	U2000	MY54270007	2021-08-05
Power Sensor	R&S	NRP-Z91	102681	2021-08-05
Attenuator	PASTERNACK	PE7087-10	A001	2021-08-03
Attenuator	PASTERNACK	PE7087-10	A008	2021-08-03
Attenuator	PASTERNACK	PE7004-10	2	2021-08-04
Attenuator	PASTERNACK	PE7087-10	A009	2021-08-05
*Attenuator	WEINSCHEL	54A-10	74560	2021-08-07
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2021-08-03
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2021-08-03
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2021-08-03
EMI Test Receive, 3 GHz	R&S	ESR3	102592	2021-08-06
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2021-08-03
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2021-08-03
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	2021-08-04
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2021-08-03
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	2021-08-03
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2021-08-04
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2021-08-03
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	2021-08-03
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	2021-08-04
LISN	R&S	ENV-216	101837	2021-08-06
LISN	R&S	ENV216	102478	2021-08-07
OPEN SWITCH AND CONTROL	R&S	OSP220	101437	N/A
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2021-10-02
Termination	WEINSCHEL	M1406A	T01	2021-08-05
Attenuator	WEINSCHEL	WA76-30-21	A015	2021-08-05
UL Software				
Description	**Manufacturer**	**Model**	**Version**	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	R&S	EMC32	Ver 10.60.10	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

Note: On August 5, only equipment marked with an asterisk(*) was used.

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.407 (a)	Emission Bandwidth (26dB Bandwidth)	N/A	Condcuted	N/A
15.407(e)	6dB Band width (5.8Ghz)	500 kHz		PASS
15.407 (a)(2)	TX Cond. Power 5.15-2.25, 5.25-5.35 & 5.47-5.725	<24dBm or 11+10Log(26dB BW)		PASS
15.407 (a)(3)	TX Cond. Power 5.725-5.825	< 30dBm		PASS
15.407 (a)(5)	PSD (5.2,5.3,5.5GHz)	<11dBm		PASS
15.407 (a)(5)	PSD (5.8GHz)	30dBm per 500 kHz		PASS
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line Conducted	Refer to the UNII 802.11a_n_ac WLAN Test report (No.:4789901731-FR3)
15.407 (b) & 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	PASS
15.407 (h)(2)	Dynamic Frequency Selection	N/A		Refer to the UNII WLAN DFS Test report (No.:13785976-E1)

8. MEASUREMENT METHODS

On-Time and Duty Cycle : KDB 789033 D02 v02r01, Section II.B.

6dB Emission BW : KDB 789033 D02 v02r01, Section II.C.2.

26dB Emission BW : KDB 789033 D02 v02r01, Section II.C.1.

99% Occupied BW : KDB 789033 D02 v02r01, Section II.D.

Conducted Output Power : KDB 789033 D02 v02r01, Section II.E.3.b(Method PM-G)

Conducted Output Power for Straddle Channel (ch144/142/138 for 20/40/80MHz BW):
KDB 789033 D02 v02r01, Section II.E.2.b(Method SA-1)

Power Spectral Density : KDB 789033 D02 v02r01, Section II.F.

Unwanted emissions in restricted bands : KDB 789033 D02 v02r01, Section II.G.3 – II.G.6.

Unwanted emissions in non-restricted bands : KDB 789033 D02 v02r01, Section II.G.3 – II.G.6.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2.

9. REFERENCE MEASUREMENTS RESULTS

9.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ANT	Tone	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor [dB]
802.11ax HE20	Single	26T	3.082	3.115	0.99	98.94	0.00
		52T	2.944	2.977	0.99	98.89	0.00
		106T	2.863	2.897	0.99	98.83	0.00
		242T	2.815	2.849	0.99	98.81	0.00
		SU	3.311	3.342	0.99	99.07	0.00
	ALL	26T	3.082	3.114	0.99	98.97	0.00
		52T	2.945	2.977	0.99	98.93	0.00
		106T	2.863	2.897	0.99	98.83	0.00
		242T	2.815	2.849	0.99	98.81	0.00
		SU	3.312	3.342	0.99	99.10	0.00
802.11ax HE40	Single	26T	3.085	3.118	0.99	98.94	0.00
		52T	2.944	2.977	0.99	98.89	0.00
		106T	2.863	2.897	0.99	98.83	0.00
		242T	2.816	2.849	0.99	98.84	0.00
		484T	2.801	2.836	0.99	98.77	0.00
		SU	2.500	2.530	0.99	98.81	0.00
	ALL	26T	3.090	3.123	0.99	98.94	0.00
		52T	2.945	2.977	0.99	98.93	0.00
		106T	2.863	2.897	0.99	98.83	0.00
		242T	2.816	2.849	0.99	98.84	0.00
		484T	2.802	2.834	0.99	98.87	0.00
		SU	2.499	2.529	0.99	98.81	0.00
802.11ax HE80	Single	26T	3.078	3.112	0.99	98.91	0.00
		52T	2.980	2.981	1.00	99.97	0.00
		106T	2.867	2.901	0.99	98.83	0.00
		242T	2.820	2.853	0.99	98.84	0.00
		484T	2.806	2.840	0.99	98.80	0.00
		996T	2.806	2.838	0.99	98.87	0.00
		SU	2.466	2.499	0.99	98.68	0.00
	ALL	26T	3.078	3.110	0.99	98.97	0.00
		52T	2.948	2.981	0.99	98.89	0.00
		106T	2.867	2.901	0.99	98.83	0.00
		242T	2.820	2.852	0.99	98.88	0.00
		484T	2.806	2.839	0.99	98.84	0.00
		996T	2.806	2.839	0.99	98.84	0.00
		SU	2.466	2.499	0.99	98.68	0.00
802.11ax HE160	Single	26T	4.396	4.477	0.98	98.19	0.00
		52T	4.253	4.329	0.98	98.24	0.00
		106T	4.175	4.250	0.98	98.24	0.00
		242T	4.147	4.202	0.99	98.69	0.00
		484T	4.179	4.220	0.99	99.03	0.00
		996T	4.175	4.197	0.99	99.48	0.00
		996T+996T	2.809	2.842	0.99	98.84	0.00
		SU	1.651	1.683	0.98	98.10	0.00
	ALL	26T	4.395	4.477	0.98	98.17	0.00
		52T	4.253	4.332	0.98	98.18	0.00
		106T	4.176	4.251	0.98	98.24	0.00
		242T	4.137	4.204	0.98	98.41	0.00
		484T	4.161	4.195	0.99	99.19	0.00
		996T	4.175	4.198	0.99	99.45	0.00
		996T+996T	2.808	2.841	0.99	98.84	0.00
		SU	3.082	3.115	0.99	98.94	0.00

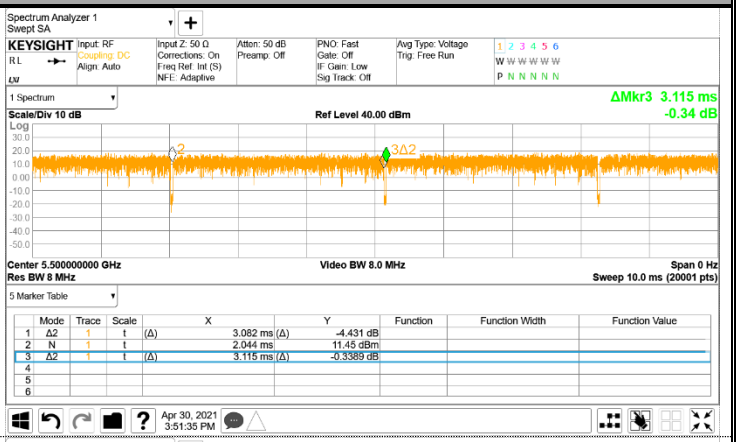
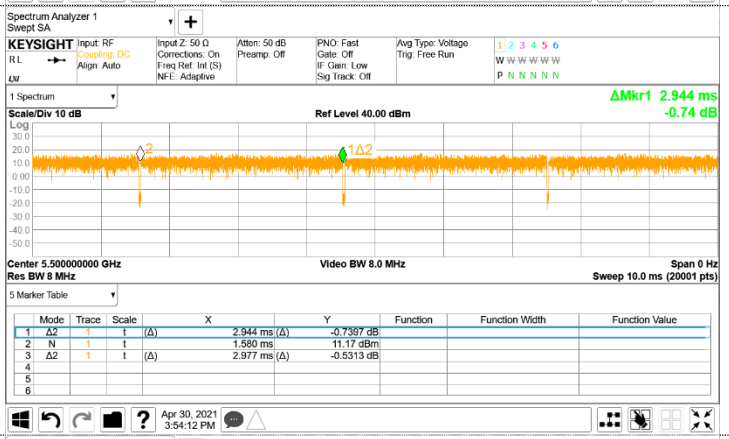
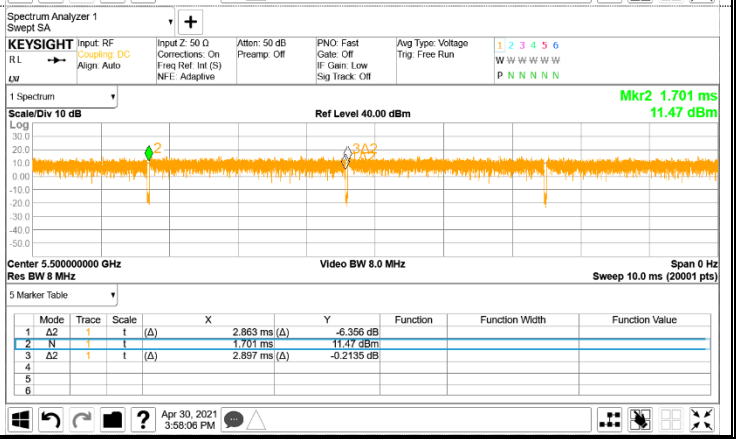
LIMITS

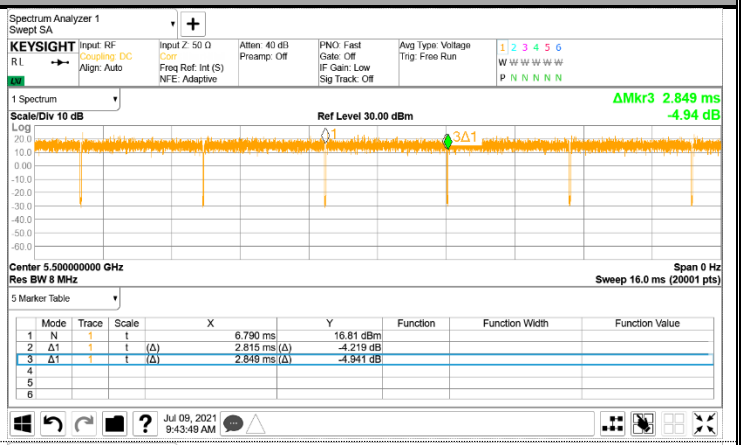
None; for reporting purposes only.

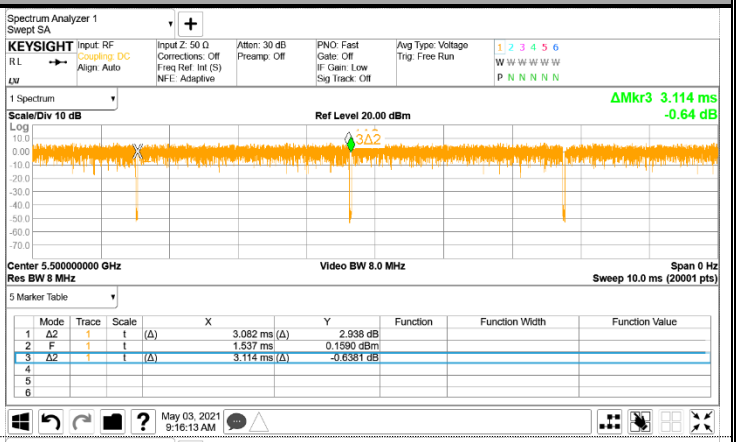
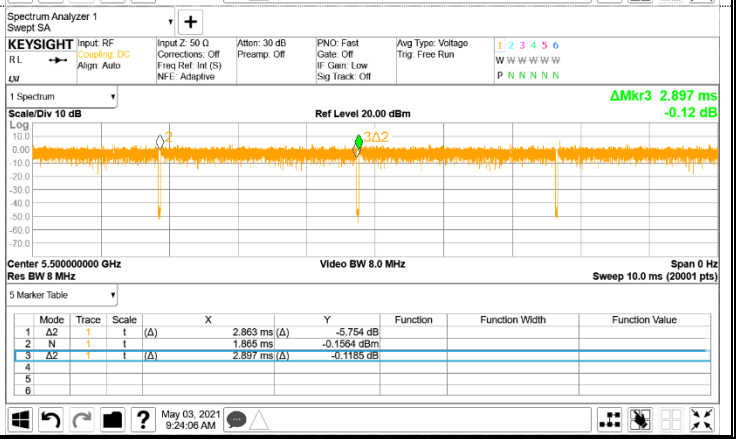
PROCEDURE

KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

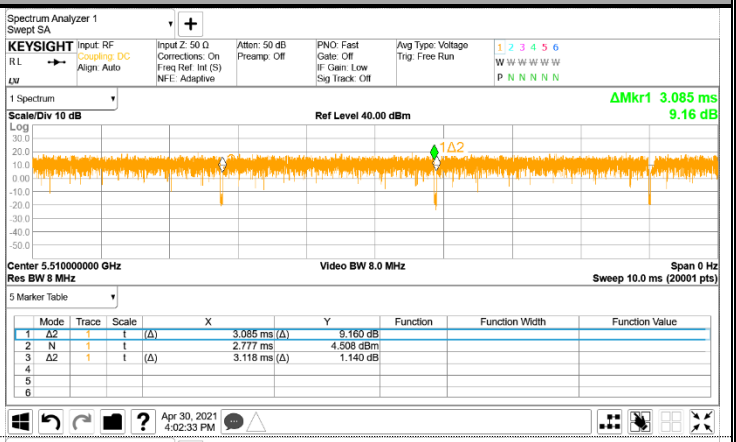
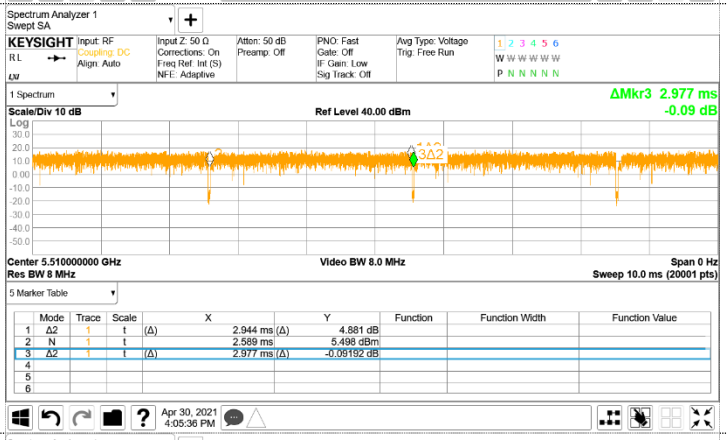
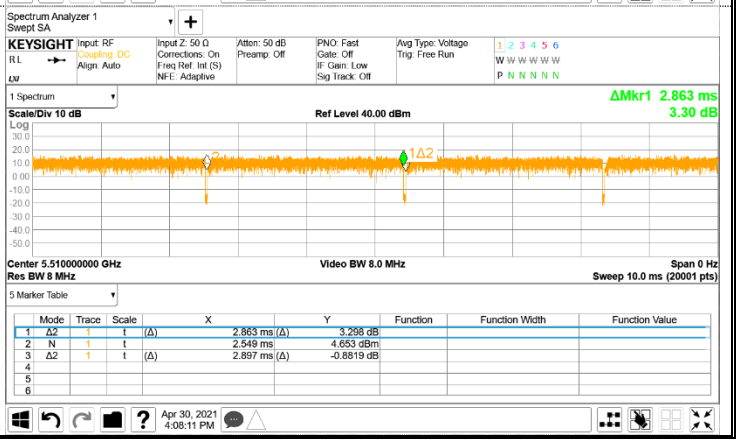
DUTY CYCLE PLOTS

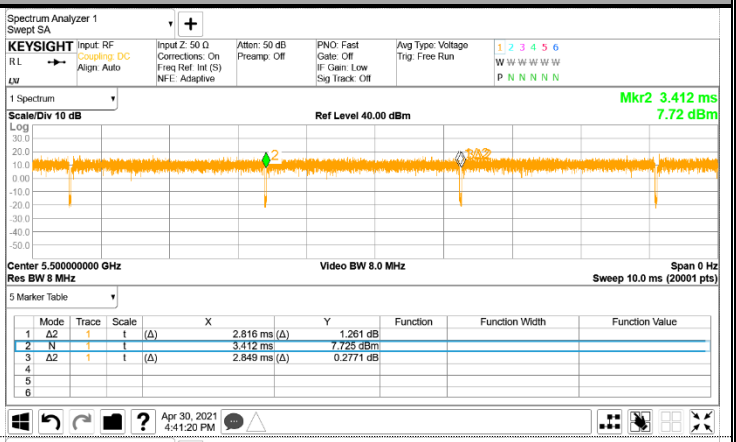
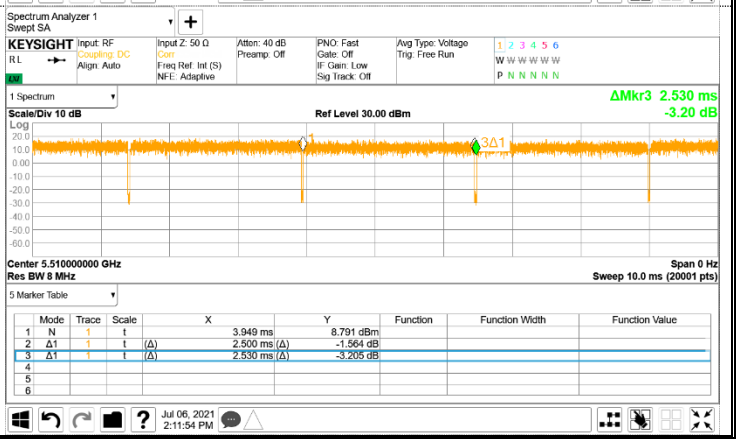
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE20	Single	26T	
		52T	
		106T	

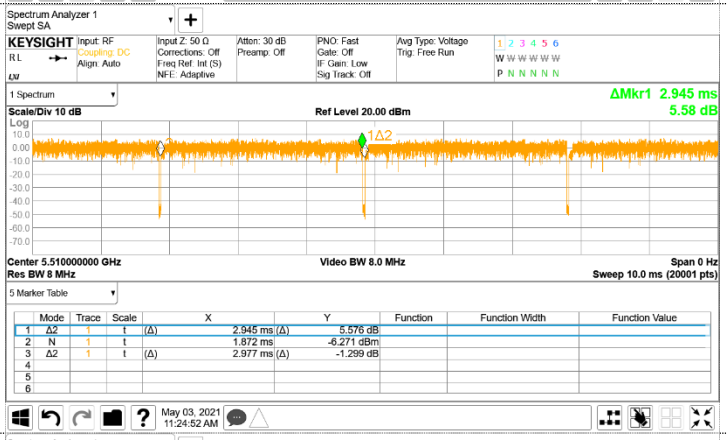
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE20	Single	242T	
		SU	

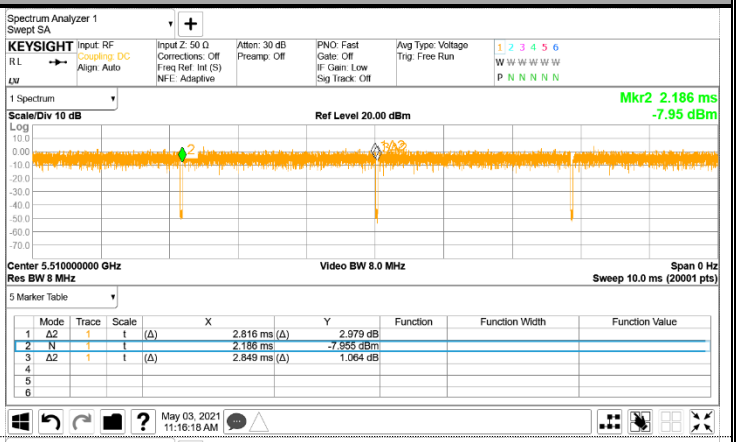
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE20	ALL	26T	
		52T	
		106T	

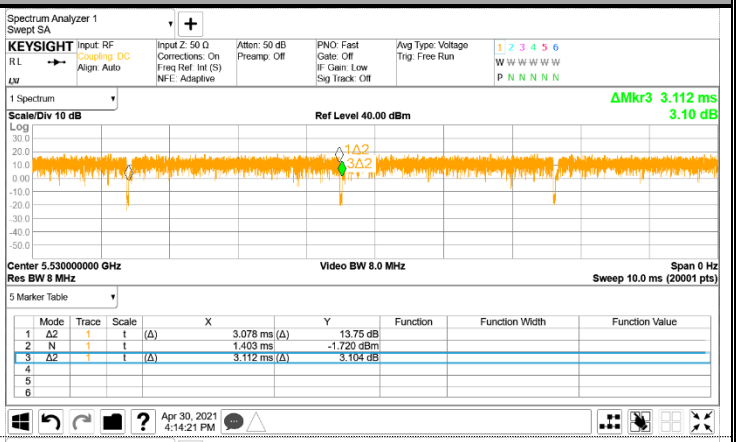
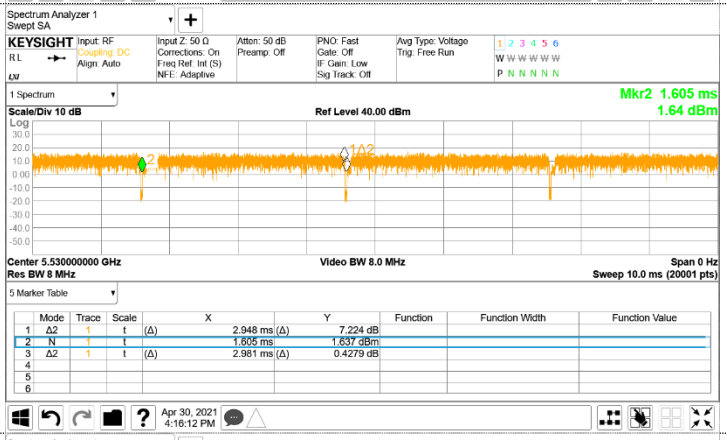
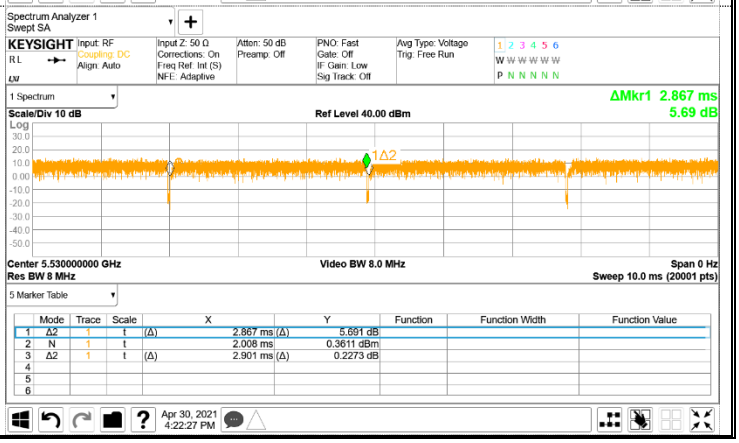
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE20	ALL	242T	
		SU	

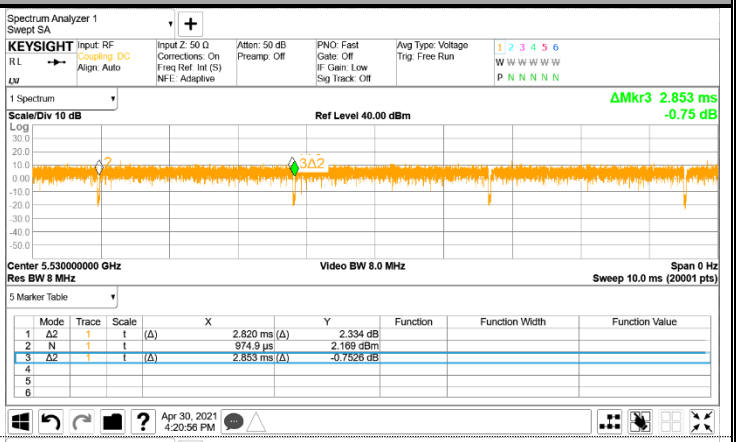
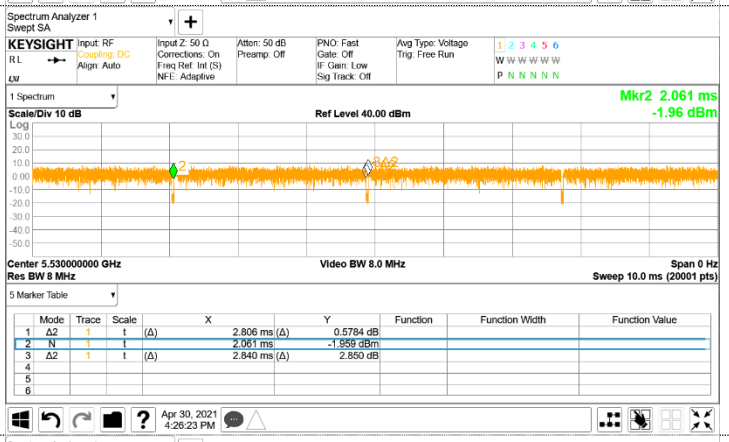
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE40	Single	26T	
		52T	
		106T	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE40	Single	242T	
		484T	
		SU	

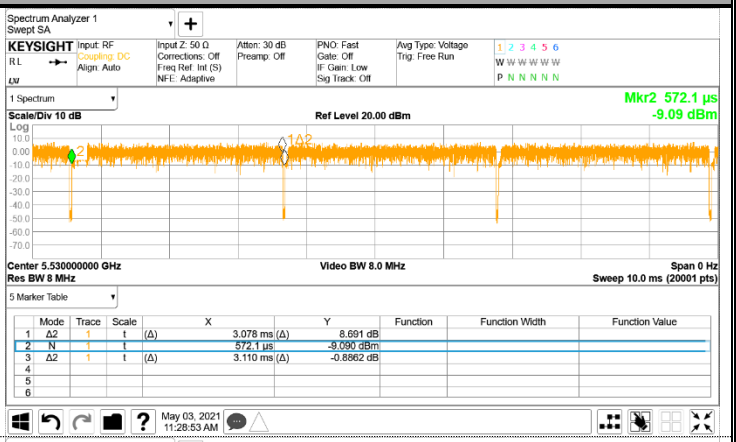
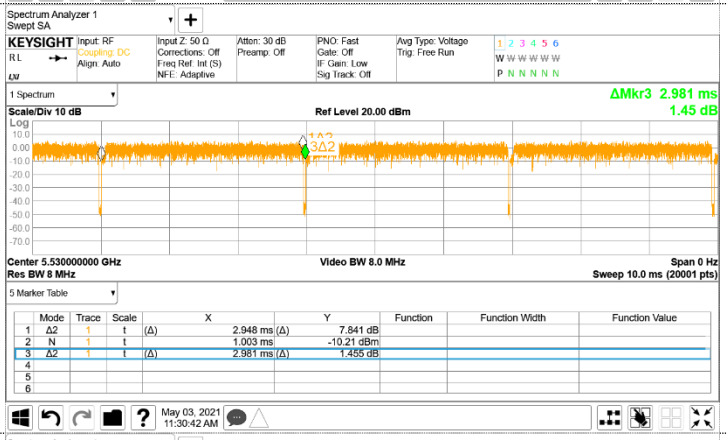
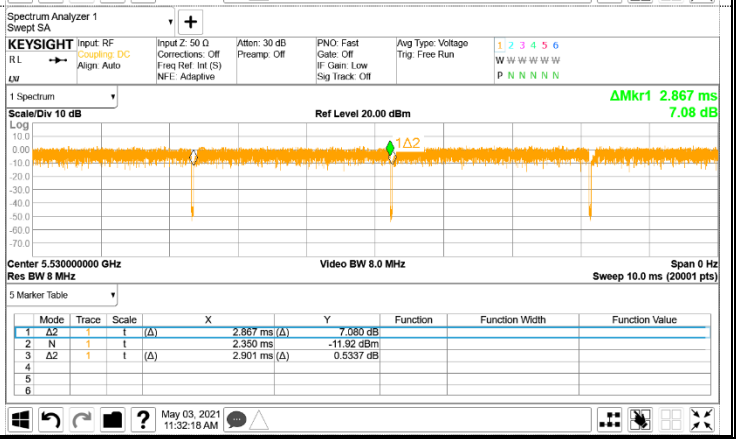
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE40	ALL	26T	
		52T	
		106T	

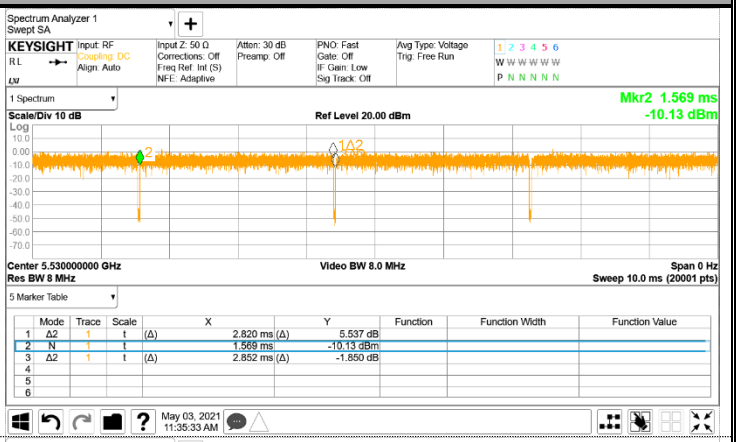
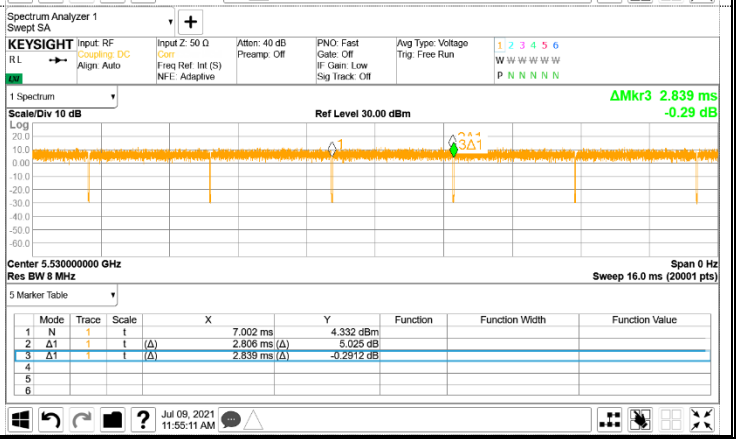
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE40	ALL	242T	
		484T	
		SU	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE80	Single	26T	
		52T	
		106T	

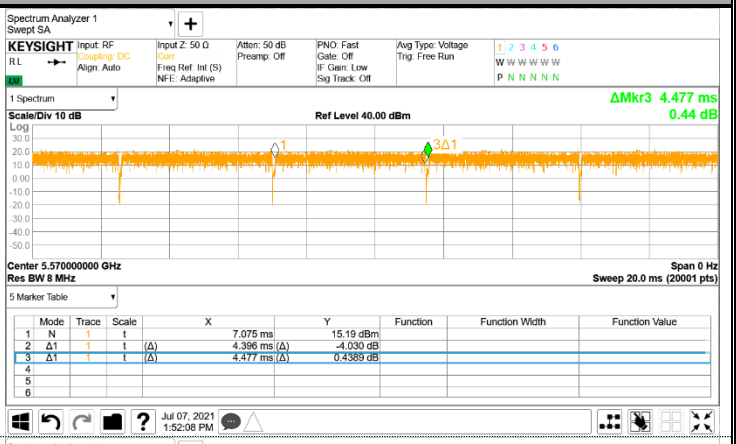
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE80	Single	242T	
		484T	
		996T	

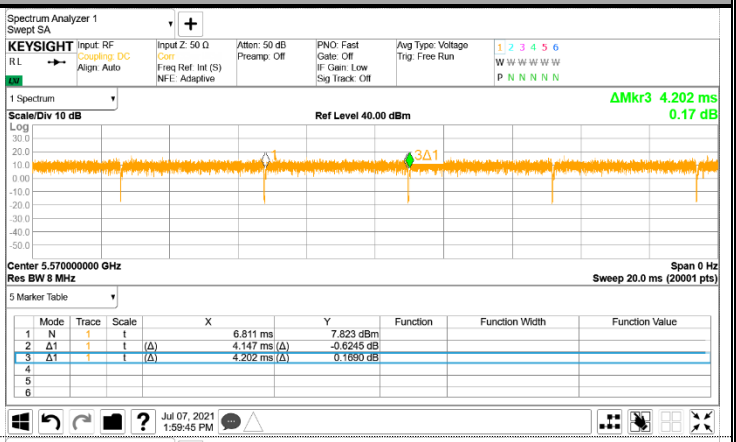
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE80	Single	SU	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE80	ALL	26T	
		52T	
		106T	

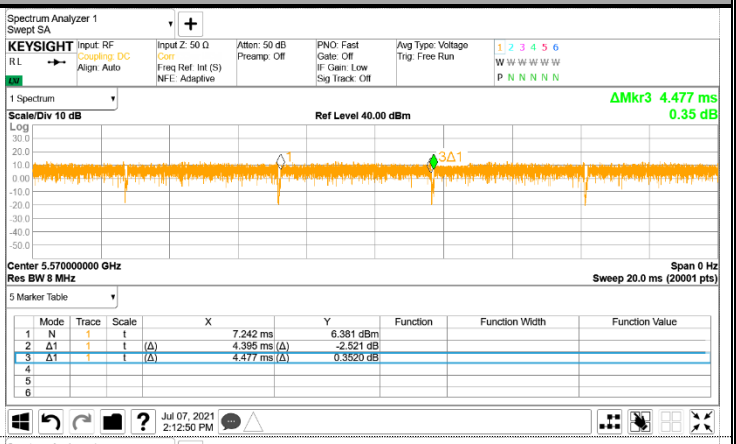
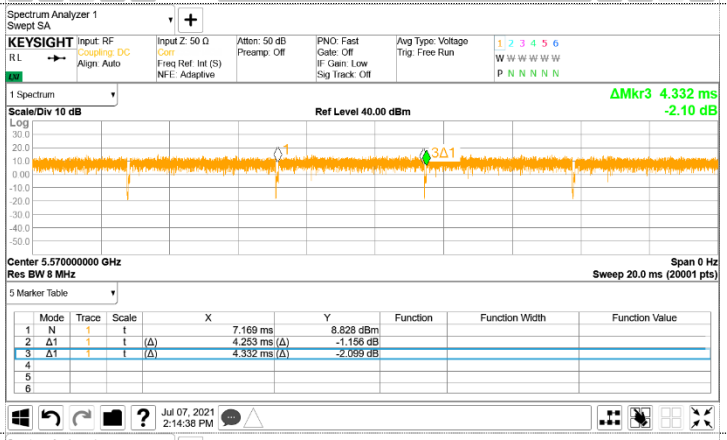
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE80	ALL	242T	
		484T	
		996T	

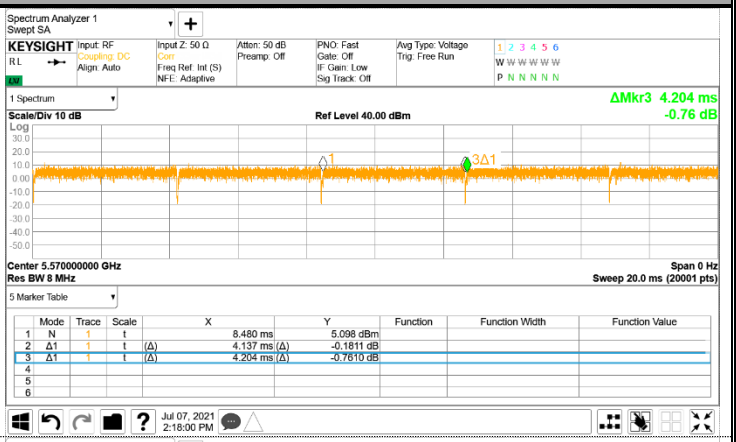
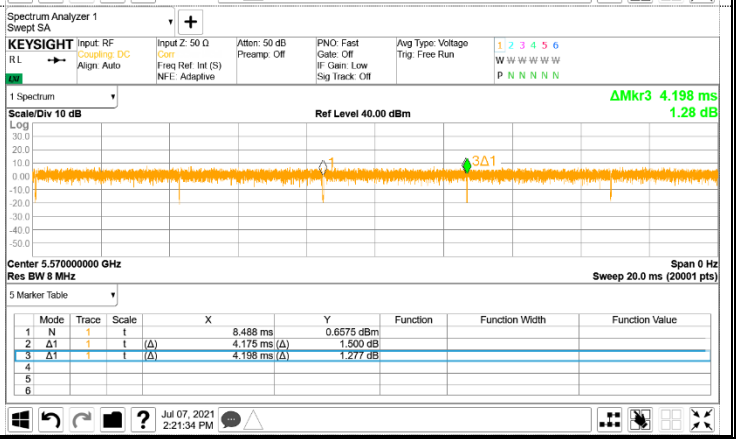
Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE80	ALL	SU	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE160	Single	26T	
		52T	
		106T	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE160	Single	242T	
		484T	
		996T	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE160	Single	996 + 996	
		SU	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE160	ALL	26T	
		52T	
		106T	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE160	ALL	242T	
		484T	
		996T	

Mode	ANT	Mode (Tones)	Test Plot
802.11ax HE160	ALL	996 + 996	
		SU	

9.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Reference to 789033 D02 General UNII Test Procedures New Rules v02r01:
The transmitter output is connected to a spectrum analyzer with the RBW set to approximately 1% of EBW, the VBW > RBW, peak detector and max hold.

NOTE

- Calculation for 26dB Bandwidth of RU allocation and channels inclueded to straddle band in UNII-2C and UNII-3 Straddle Channel

ex) Marker 2: Lower point of 26 dB bandwidth
Marker 3: Upper point of 26 dB bandwidth
  - Turning Frequency : 5725MHz
  - Marker 2: 5710 MHz
  - Marker 3: 5730 MHz
  - 26dB Bandwidth of UNII-2C band Portion
    = (5725 – 5710) = 15 MHz
  - 26dB Bandwidth of UNII-3 band Portion
    = (5730 - 5725) = 5 MHz

RESULTS

See the next page.

9.2.1. 802.11ax 5.2 GHz BAND

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]			
					ANT1	ANT2	ANT3	ANT4
UNII-1	HE20	5180	26T	0	19.78	19.70	18.45	19.60
				4	18.19	17.71	18.38	18.44
				8	19.44	19.81	18.81	19.70
			SU	-	21.20	21.21	21.28	21.13
		5200	26T	0	19.49	19.64	19.56	19.72
				4	18.46	18.98	17.53	18.40
				8	20.13	19.61	19.82	19.09
			SU	-	*21.89*	21.27	21.16	*21.42*
		5240	26T	0	19.53	19.07	18.72	19.62
				4	19.03	17.90	17.73	18.61
				8	19.81	19.85	19.93	19.65
			SU	-	21.18	21.37	*21.39*	21.25
	HE40	5190	26T	0	38.81	39.21	38.95	39.09
				9	37.22	38.13	38.03	38.10
				17	38.72	38.83	38.61	37.66
			SU	-	39.58	39.52	39.59	39.72
		5230	26T	0	39.14	39.12	38.92	38.95
				9	37.66	38.02	37.97	37.95
				17	38.94	38.78	39.14	38.75
			SU	-	*39.66*	*39.64*	*39.66*	*39.85*
	HE80	5210	26T	0	79.53	79.68	78.27	79.57
				18	77.72	76.84	77.73	77.64
				36	78.04	79.41	79.63	79.68
			SU	-	*81.58*	*81.58*	*81.31*	*80.91*
UNII-1 & 2A	HE160	5250	SU	-	*163.00*	*163.30*	*163.10*	*163.00*

9.2.2. 802.11ax 5.3 GHz BAND

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]			
					ANT1	ANT2	ANT3	ANT4
UNII-2A	HE20	5260	26T	0	19.37	19.89	19.59	19.62
				4	18.96	18.31	19.01	18.84
				8	19.70	19.53	19.85	19.78
			SU	-	*21.58*	21.34	21.37	21.24
		5300	26T	0	19.67	18.86	19.56	19.72
				4	18.23	18.58	18.69	18.53
				8	19.58	19.68	19.94	19.78
			SU	-	21.39	21.26	21.35	21.35
		5320	26T	0	19.78	19.78	19.70	19.79
				4	18.14	18.33	18.72	18.68
				8	18.95	19.28	19.61	19.64
			SU	-	21.35	21.21	*21.45*	*21.49*
	HE40	5270	26T	0	38.96	39.05	39.01	38.89
				9	38.14	38.21	37.83	38.00
				17	37.75	39.08	38.99	38.96
			SU	-	39.65	39.71	39.53	39.57
		5310	26T	0	38.76	38.70	39.34	38.97
				9	38.16	38.20	37.34	38.12
				17	37.94	38.98	38.93	39.04
			SU	-	*39.85*	*39.72*	39.65	*39.69*
	HE80	5290	26T	0	79.36	79.50	79.48	78.21
				18	77.33	77.91	77.40	78.03
				36	79.68	79.67	79.53	79.52
			SU	-	*80.90*	*81.01*	*81.40*	*81.16*

9.2.3. 802.11ax 5.5 GHz BAND

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]			
					ANT1	ANT2	ANT3	ANT4
UNII-2C	HE20	5500	26T	0	19.68	18.73	19.53	19.87
				4	16.20	17.85	18.27	18.35
				8	19.70	19.76	19.75	19.80
			SU	-	21.16	21.33	21.36	21.31
		5580	26T	0	19.48	19.52	19.58	19.73
				4	18.59	18.75	18.32	18.01
				8	19.80	20.10	19.88	20.07
			SU	-	21.19	21.87	21.28	21.31
		5700	26T	0	19.84	18.77	19.68	19.54
				4	16.87	18.89	18.40	18.47
				8	19.74	19.74	19.62	19.93
			SU	-	21.29	21.49	21.31	21.44
	HE40	5510	26T	0	38.57	38.98	39.06	38.76
				9	38.13	37.89	37.82	36.32
				17	39.02	38.98	38.14	38.78
			SU	-	39.63	39.69	39.65	39.38
		5590	26T	0	38.90	38.78	38.94	39.03
				9	38.00	37.98	38.10	37.92
				17	38.75	38.26	38.62	38.90
			SU	-	39.67	39.72	39.64	39.47
		5670	26T	0	39.02	39.08	37.94	38.61
				9	38.02	37.42	37.73	37.34
				17	38.82	39.01	38.80	38.76
			SU	-	39.64	39.86	39.64	39.78
	HE80	5530	26T	0	79.69	79.91	79.72	76.63
				18	77.14	77.75	78.02	77.61
				36	79.44	79.65	79.44	79.92
			SU	-	81.24	81.42	81.08	81.16
		5610	26T	0	77.79	78.98	79.68	79.69
				18	77.34	77.05	78.17	77.16
				36	79.86	79.38	79.30	79.54
			SU	-	81.71	81.59	81.21	80.95
	HE160	5570	SU	-	163.80	163.20	162.50	162.90

9.2.4. 802.11ax STRADDLE CHANNEL

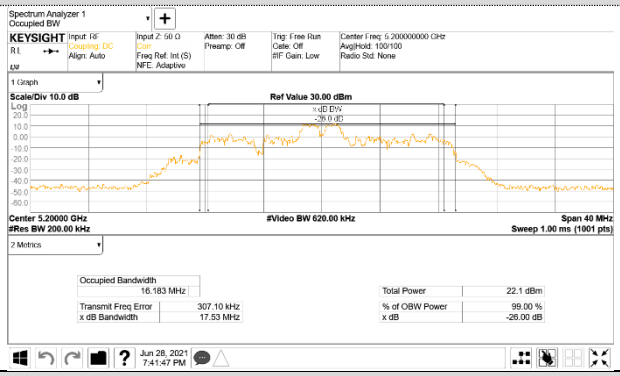
Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]							
				ANT1		ANT2		ANT3		ANT4	
				UNII-2C	UNII-3	UNII-2C	UNII-3	UNII-2C	UNII-3	UNII-2C	UNII-3
HE20	5720	26T	4	14.42	4.25	14.61	4.19	14.44	4.04	14.42	4.22
		SU	-	15.67	5.52	15.69	5.70	15.65	5.70	15.75	5.65
HE40	5710	26T	9	34.04	3.98	34.12	4.00	34.08	4.12	34.07	4.12
		SU	-	34.94	4.85	34.84	4.89	34.84	4.92	34.68	4.80
HE80	5690	26T	18	74.01	3.83	73.86	3.80	73.95	3.76	73.95	3.78
		SU	-	75.48	5.45	75.24	5.48	75.32	5.41	75.28	5.84

9.2.5. WORST CASE TEST PLOT_802.11ax 5.2 GHz BAND

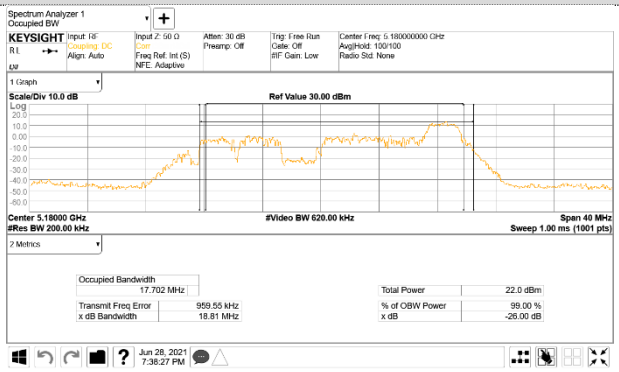
Band	UNII-1
Mode	HE20

ANT3 / 5180 MHz / 26T / 0RU

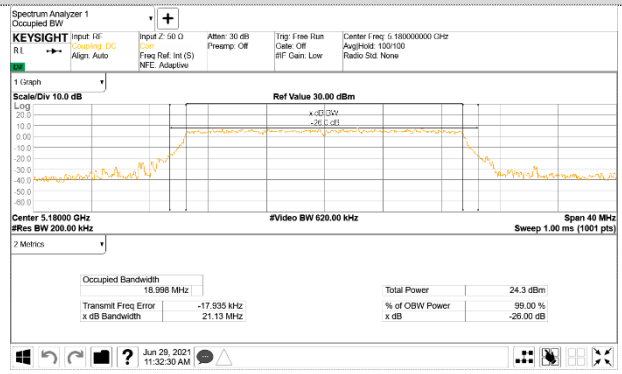
ANT3 / 5200 MHz / 26T / 4RU



ANT3 / 5180 MHz / 26T / 8RU

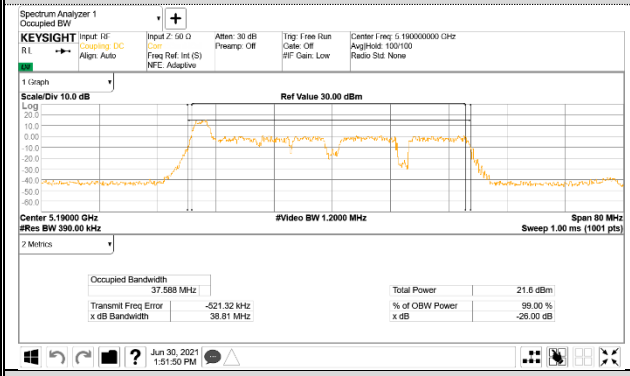


ANT4 / 5180 MHz / SU

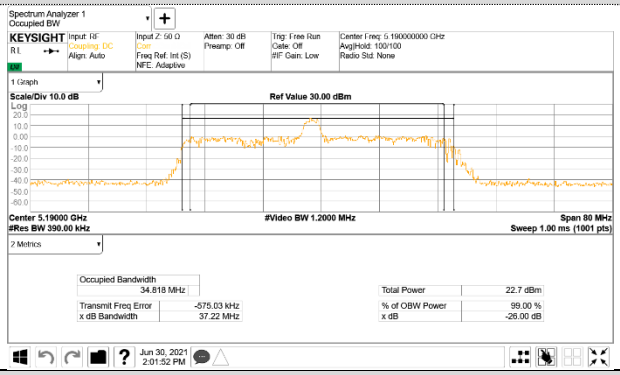


Band	UNII-1
Mode	HE40

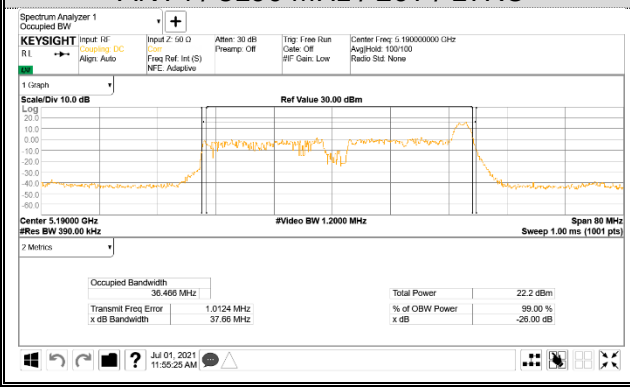
ANT1 / 5190 MHz / 26T / 0RU



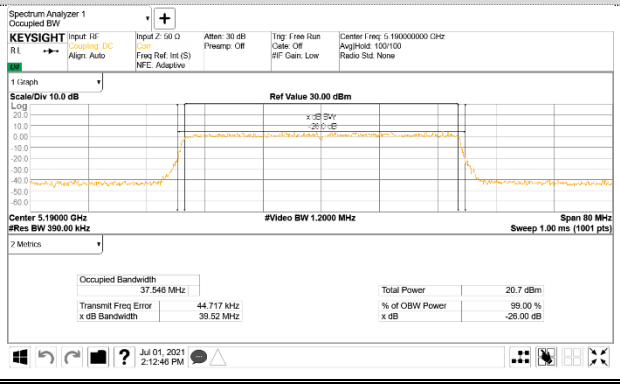
ANT1 / 5190 MHz / 26T / 9RU



ANT4 / 5190 MHz / 26T / 17RU

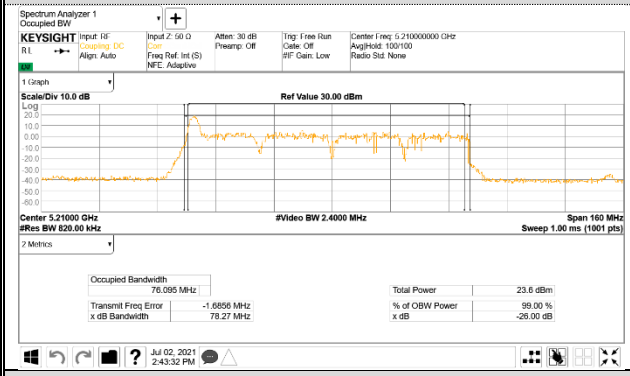


ANT2 / 5190 MHz / SU



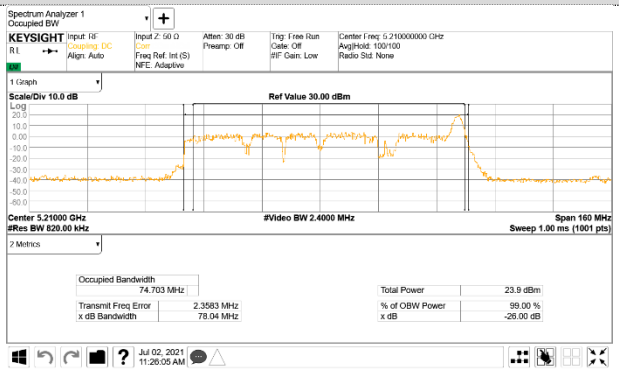
Band	UNII-1
Mode	HE80

ANT3 / 5210 MHz / 26T / 0RU

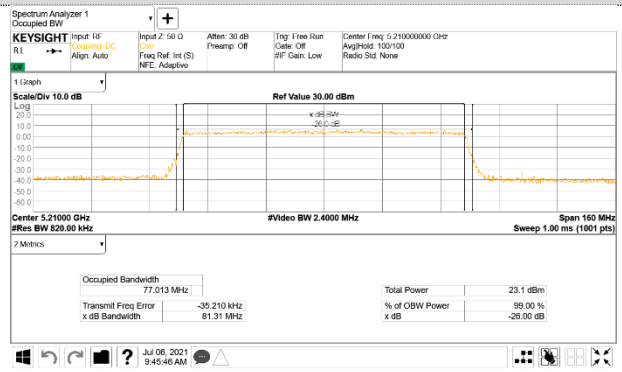


ANT2 / 5210 MHz / 26T / 18RU

ANT1 / 5210 MHz / 26T / 36RU



ANT3 / 5210 MHz / SU



Band	UNII-1 & 2A
Mode	HE160

ANT1 / 5250 MHz / SU