



CERTIFICATION TEST REPORT

Report Number. : 4789893923-E9V1

Applicant : SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Model : NP545XLA, NP545XLA-KA1TT, NP545XLA-KA1VZ

FCC ID : A3LNP545XLA

EUT Description : WCDMA/LTE/5G NR Laptop + BT/BLE, DTS/UNII a/b/g/n/ac/ax

Test Standard(s) : FCC 47 CFR PART 15 SUBPART E

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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

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: WCDMA/LTE/5G NR Laptop + BT/BLE, DTS/UNII a/b/g/n/ac/ax
MODEL NUMBER: NP545XLA, NP545XLA-KA1TT, NP545XLA-KA1VZ
SERIAL NUMBER: FLKR01R2S00430 (CONDUCTED);
FLKJ930R400094X (RADIATED);
DATE TESTED: 2021-04-20 ~ 2021-06-14;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Complies

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:



Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Hyunsik Yun
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. KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
5. KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02
6. KDB 662911 D01 v02r01
7. ANSI C63.10-2013.

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	
<input checked="" type="checkbox"/>	Chamber 1
<input checked="" type="checkbox"/>	Chamber 2
<input checked="" type="checkbox"/>	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>.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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	3.01 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.26 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.90 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 Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a WCDMA/LTE/5G NR Laptop + BT/BLE, DTS/UNII a/b/g/n/ac/ax.
 This test report addresses the NII (WLAN) operational mode.

This report covers the Samsung models NP545XLA, NP545XLA-KA1TT and NP545XLA-KA1VZ. These models are identical in hardware except below.

NP545XLA-KA1TT: eSIM IC unmounted on PCB.

NP545XLA-KA1VZ: There is no difference in hardware(Supported RF band is different).

With some pre-scan, model NP545XLA was set for final test

WiFi operating mode

Frequency rage	Mode	ANT1	ANT2
5GHz (5180 MHz ~ 5825 MHz)	802.11a MIMO	TX/RX	TX/RX
	802.11n MIMO	TX/RX	TX/RX
	802.11ac MIMO	TX/RX	TX/RX
	802.11ax MIMO	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	0	0	0	0	0

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}		61 / -
HE40	26T	0
		9
		17
	52T	37
		41
		44
	106T	53
		54
		56
	242T	61
		62
484T / SU ^{Note}		63 / -
HE80	26T	0
		18
		36
	52T	37
		45
		52
	106T	53
		57
		60
	242T	61
		62
		64
	484T	65
66		
996T / SU ^{Note}		67 / -

Note: Full RU(Resource Unit) 242T 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 MIMO.

Band portion of RU allocation about straddle channels

Mode	Channel	Tones	RU offset	Portion
HE20	Straddle 5720 MHz	26T	6	UNII 2C & UNII 3
		242T / SU	61 / -	
HE40	Straddle 5710 MHz	26T	15	UNII 2C & UNII 3
		484T / SU	65 / -	
HE80	Straddle 5690 MHz	26T	34	UNII 2C & UNII 3
		996T / SU	67 / -	

Note: In case of RU straddle channel, test was performed overlapping RU position.

MAXIMUM OUTPUT POWER

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

Band	Frequency Range [MHz]	Mode	Output Power [dBm]	Output Power [mW]
UNII-1	5180 - 5240	802.11a MIMO	16.87	48.64
		802.11n(HT20) MIMO	16.50	44.67
		802.11ax(HE20) MIMO	16.63	46.03
	5190 - 5230	802.11n(HT40) MIMO	16.54	45.08
		802.11ax(HE40) MIMO	13.38	21.78
	5210	802.11ac(VHT80) MIMO	14.60	28.84
802.11ax(HE80) MIMO		13.51	22.44	
UNII-2A	5260 - 5320	802.11a MIMO	16.81	47.97
		802.11n(HT20) MIMO	17.42	55.21
		802.11ax(HE20) MIMO	16.60	45.71
	5190 - 5230	802.11n(HT40) MIMO	16.55	45.19
		802.11ax(HE40) MIMO	13.21	20.94
	5270 - 5310	802.11ac(VHT80) MIMO	14.62	28.97
802.11ax(HE80) MIMO		13.41	21.93	
UNII-2C	5500 - 5720	802.11a MIMO	16.99	50.00
		802.11n(HT20) MIMO	17.53	56.62
		802.11ax(HE20) MIMO	16.06	40.36
	5510 - 5710	802.11n(HT40) MIMO	16.55	45.19
		802.11ax(HE40) MIMO	13.79	23.93
	5530 - 5690	802.11ac(VHT80) MIMO	15.62	36.48
802.11ax(HE80) MIMO		13.67	23.28	
UNII-3	5745 - 5825	802.11a MIMO	16.77	47.53
		802.11n(HT20) MIMO	17.36	54.45
		802.11ax(HE20) MIMO	15.50	35.48
	5755 - 5795	802.11n(HT40) MIMO	16.34	43.05
		802.11ax(HE40) MIMO	13.61	22.96
	5775	802.11ac(VHT80) MIMO	15.62	36.48
802.11ax(HE80) MIMO		13.10	20.42	

5.2. 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]	Correlated Chains Directional Gain [dBi]
UNII 1 5150 - 5250	1.55	4.75	6.31
UNII 2A 5250 - 5350	2.07	5.14	6.75
UNII 2C 5470 - 5725	0.41	5.57	6.38
UNII 3 5725 - 5850	1.50	4.73	6.27

“Ant1” and “Ant2” as indicated in antenna specification are written as ANT1 and ANT2 in this report.

5.3. 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
802.11a	MIMO	802.11a 2TX	
802.11n HT20		802.11n HT20 2TX	
802.11ac VHT20		802.11ac VHT20 2TX	802.11n HT20 2TX
802.11ax HE20(SU)		802.11ax HE20 RU(242T) 2TX	802.11ax HE20 SU 2TX
802.11n HT40		802.11n HT40 2TX	
802.11ac VHT40		802.11ac VHT40 2TX	802.11n HT40 2TX
802.11ax HE40(SU)		802.11ax HE40 RU(484T) 2TX	802.11ax HE40 SU 2TX
802.11ac VHT80		802.11ac VHT80 2TX	
802.11ax HE80(SU)		802.11ax HE80 RU(996T) 2TX	802.11ax HE80 SU 2TX

Worst-case selection criteria for 802.11ax test items :

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

Note : All radiated and power line conducted tests were performed connected with charger for evaluation of worst case mode.

Test case configuration for 802.11a, 802.11n HT20 & 40, 802.11ac VHT20 & 40 & 80, 802.11ax HE20 & 40 & 80 (SU) modes :

Mode	Band	SISO Target[dBm]				MIMO Target[dBm]			
		802.11a	802.11n	802.11ac	802.11ax (SU)	802.11a	802.11n	802.11ac	802.11ax (SU)
5GHz (20 MHz)	UNII-1	14	14	13	13	17	17	16	16
	UNII-2A	14	14	13	13	17	17	16	16
	UNII-2C	14	14	13	13	17	17	16	16
	UNII-3	14	14	13	13	17	17	16	16
5GHz (40 MHz)	UNII-1		13 38ch: 12	13 38ch: 12	10		16 38ch: 15	16 38ch: 15	13
	UNII-2A		13	13	10		16	16	13
	UNII-2C		13	13	10		16	16	13
	UNII-3		13	13	10		16	16	13
5GHz (80 MHz)	UNII-1			13 42ch: 12	10			16 42ch: 15	13
	UNII-2A			13 58ch: 12	10			16 58ch: 15	13
	UNII-2C			13	10			16	13
	UNII-3			13	10			16	13

	Band-Edge & Spurious Emission
	Band-Edge & Spurious Emission Spot-Check
	Band-Edge Spot-Check

Note. Compared to the 802.11a mode, target power is the same or lower and the density is low, so only the spot-check test was performed in the 802.11n & 802.11ac & 802.11ax mode. Spot check test was performed in the worst tested band of 802.11a mode.

Test case configuration for 802.11ax HE20 & 40 & 80 (RU) modes :

Band	Mode	Freq.	Tone	RU offset	Test Case		
					ANT1	ANT2	MIMO
UNII-1	HE20	5180	26 T	0			
				4			
				8			
		5200		0	-	-	-
				4	-	-	O
				8	-	-	-
		5240		0			
				4			
				8			
	HE40	5190	26 T	0	-	-	-
				9	-	-	O
				17	-	-	-
		5230		0			
				9			
				17			
HE80	5210	26 T	0	-	-	-	
			18	-	-	O	
			36	-	-	-	
UNII-2A	HE20	5260	26 T	0			
				4			
				8			
		5300		0	-	-	-
				4	-	-	O
				8	-	-	-
		5320		0			
				4			
				8			
UNII-2C	HE20	5500	26 T	0	-	-	-
				4	-	-	O
				8	-	-	-
		5580		0			
				4			
				8			
		5700		0			
				4			
				8			
UNII-3	HE20	5745	26 T	0	-	-	O
				4	-	-	-
				8	-	-	-
		5785		0			
				4			
				8			
		5825		0			
				4			
				8			

Note1. Radiated spurious test was performed on the lower tone(26T) with worst average power.
 Note2. Since the target of 26 tones are all the same, spurious test was performed once in each UNII band.
 Note3. Spot-check test was performed in HE40, HE80 modes.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37R32A00XADK3	N/A
Data Cable	SAMSUNG	EP-DW767JWE	N/A	N/A

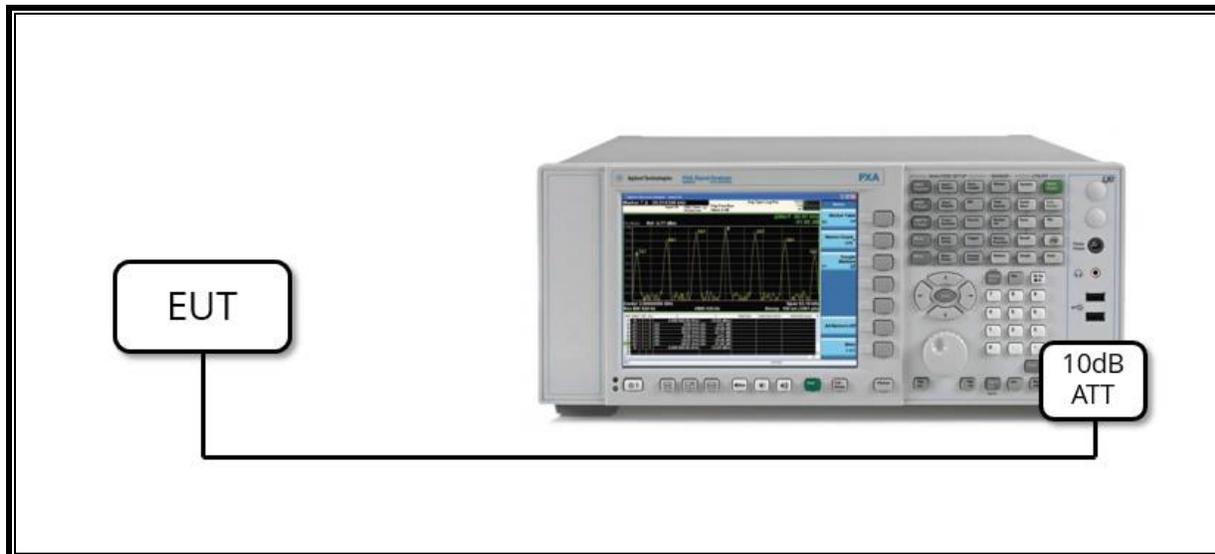
I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

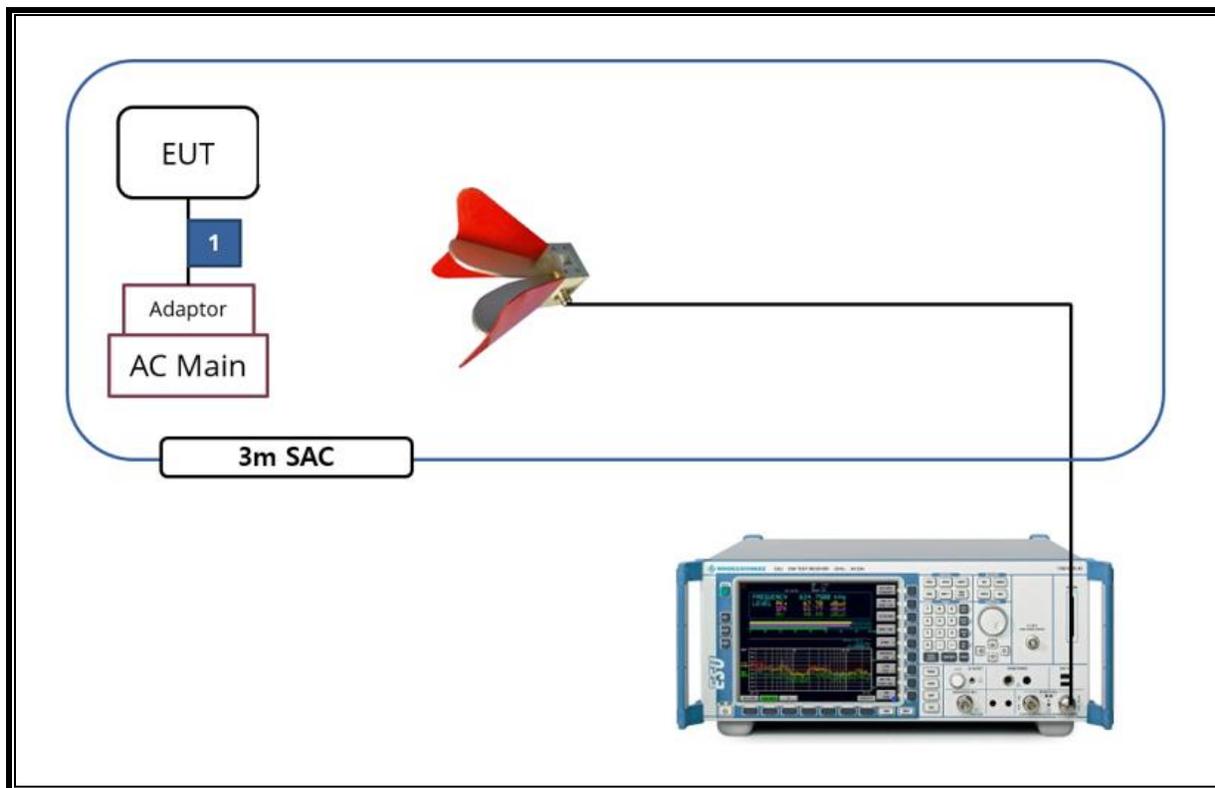
TEST SETUP

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	08-19-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-13-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-13-22
Antenna, Horn, 18 GHz	ETS	3115	00167211	07-27-22
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-15-22
Antenna, Horn, 18 GHz	ETS	3117	00168724	07-27-22
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-15-22
Antenna, Horn, 18 GHz	ETS	3117	00218957	01-15-23
Antenna, Horn, 40 GHz	ETS	3116C	00166155	01-15-23
Antenna, Horn, 40 GHz	ETS	3116C	00168645	10-02-21
Preamplifier	ETS	3116C-PA	00168841	08-06-21
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-06-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-04-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-05-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-05-21
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	08-06-21
EMI Test Receiver, 44 GHz	R&S	ESW44	101590	08-04-21
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-05-21
Attenuator	PASTERNAK	PE7087-10	A001	08-03-21
Attenuator	PASTERNAK	PE7087-10	A008	08-03-21
Attenuator	PASTERNAK	PE7004-10	2	08-04-21
Attenuator	PASTERNAK	PE7087-10	A009	08-05-21
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-03-21
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-03-21
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	08-04-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-03-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-03-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	08-04-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	08-03-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	08-03-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	08-04-21
LISN	R&S	ENV-216	101837	08-06-21
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-02-21
Termination	WEINSCHL	M1406A	T01	08-05-21
Attenuator	WEINSCHL	WA76-30-21	A015	08-05-21
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.407(e)	6dB Band width (5.8GHz)	500kHz	Condcuted	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 500kHz		PASS
15.207 (a)	AC Power Line conducted emissions	Section 13	Radiated	PASS
15.407 (b) & 15.209	Radiated Spurious Emission	< 54dBuV/m		PASS
15.407 (h)(2)	Dynamic Frequency Selection	N/A	Condcuted	PASS ^{Note}

Note. This EUT does not support channel puncturing.

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	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor[dB]
802.11a MIMO	2.828	2.926	0.967	96.651	0.15
802.11n(HT20) MIMO	2.512	2.610	0.962	96.245	0.17
802.11n(HT40) MIMO	2.384	2.482	0.961	96.052	0.17
802.11ac(VHT80) MIMO	1.136	1.233	0.921	92.133	0.36

Mode	ANT.	Tone	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor[dB]
802.11ax HE20	MIMO	26T	5.079	5.186	0.979	97.937	0.09
		52T	5.075	5.174	0.981	98.087	-
		106T	4.767	4.866	0.980	97.965	0.09
		SU	4.503	4.602	0.978	97.849	0.09
802.11ax HE40	MIMO	26T	5.063	5.185	0.976	97.647	0.10
		52T	5.036	5.173	0.974	97.352	0.12
		106T	4.740	4.879	0.972	97.151	0.13
		242T	4.494	4.594	0.978	97.823	0.10
		SU	4.459	4.559	0.978	97.807	0.10
802.11ax HE80	MIMO	26T	5.047	5.179	0.975	97.451	0.11
		52T	5.032	5.165	0.974	97.425	0.11
		106T	4.733	4.864	0.973	97.307	0.12
		242T	4.477	4.594	0.975	97.453	0.11
		484T	4.474	4.573	0.978	97.835	0.10
		SU	4.253	4.355	0.977	97.658	0.10

Note. If the duty cycle is over 98%, compensation is not included in average measurement.

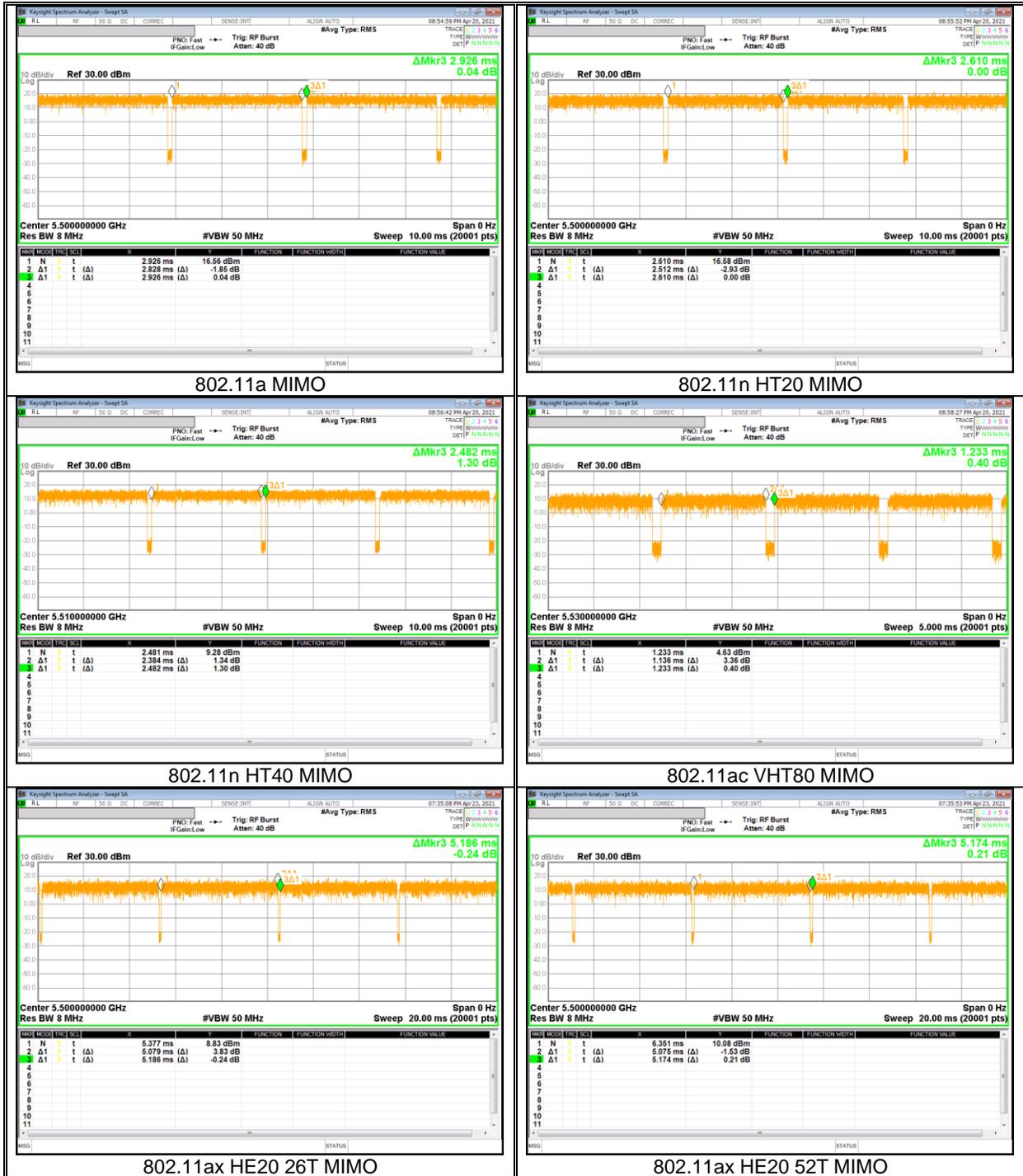
LIMITS

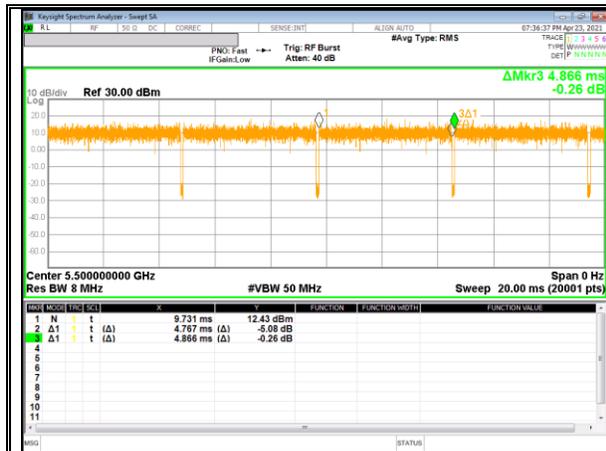
None; for reporting purposes only.

PROCEDURE

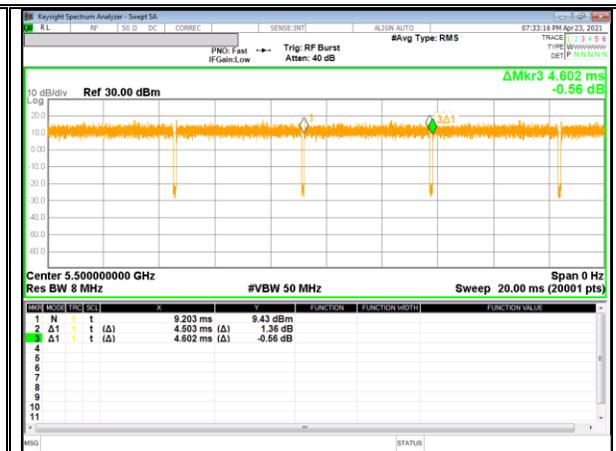
KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

9.2. DUTY CYCLE PLOTS

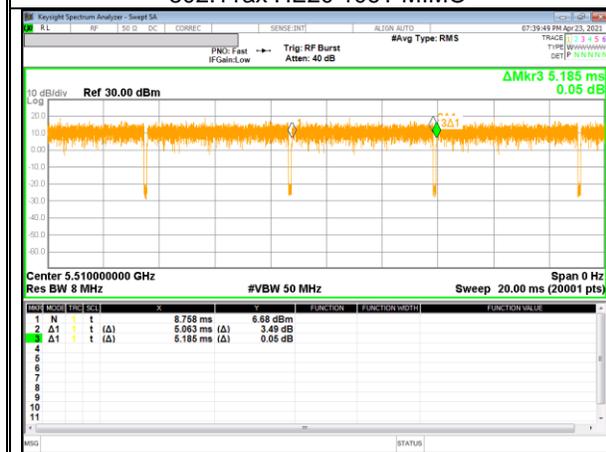




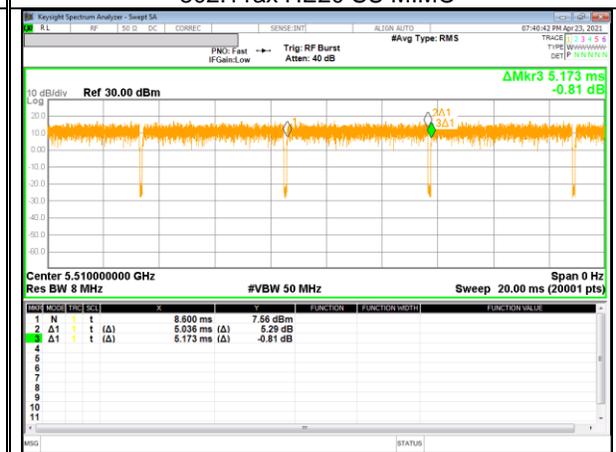
802.11ax HE20 106T MIMO



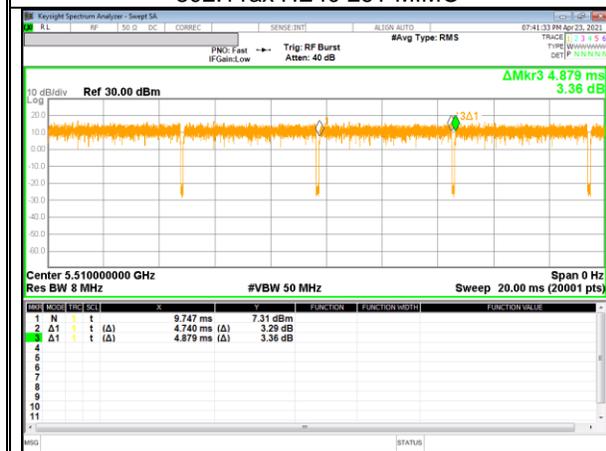
802.11ax HE20 SU MIMO



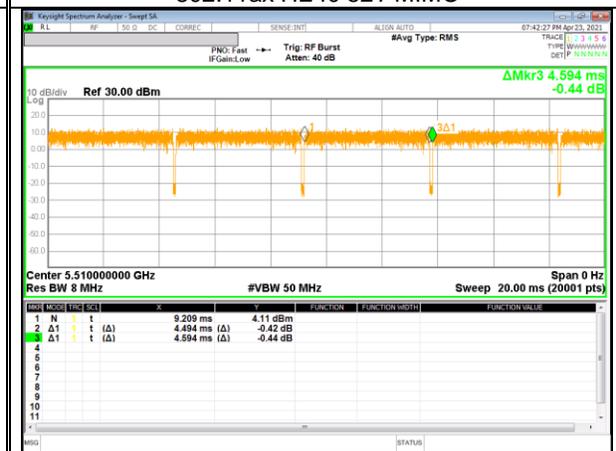
802.11ax HE40 26T MIMO



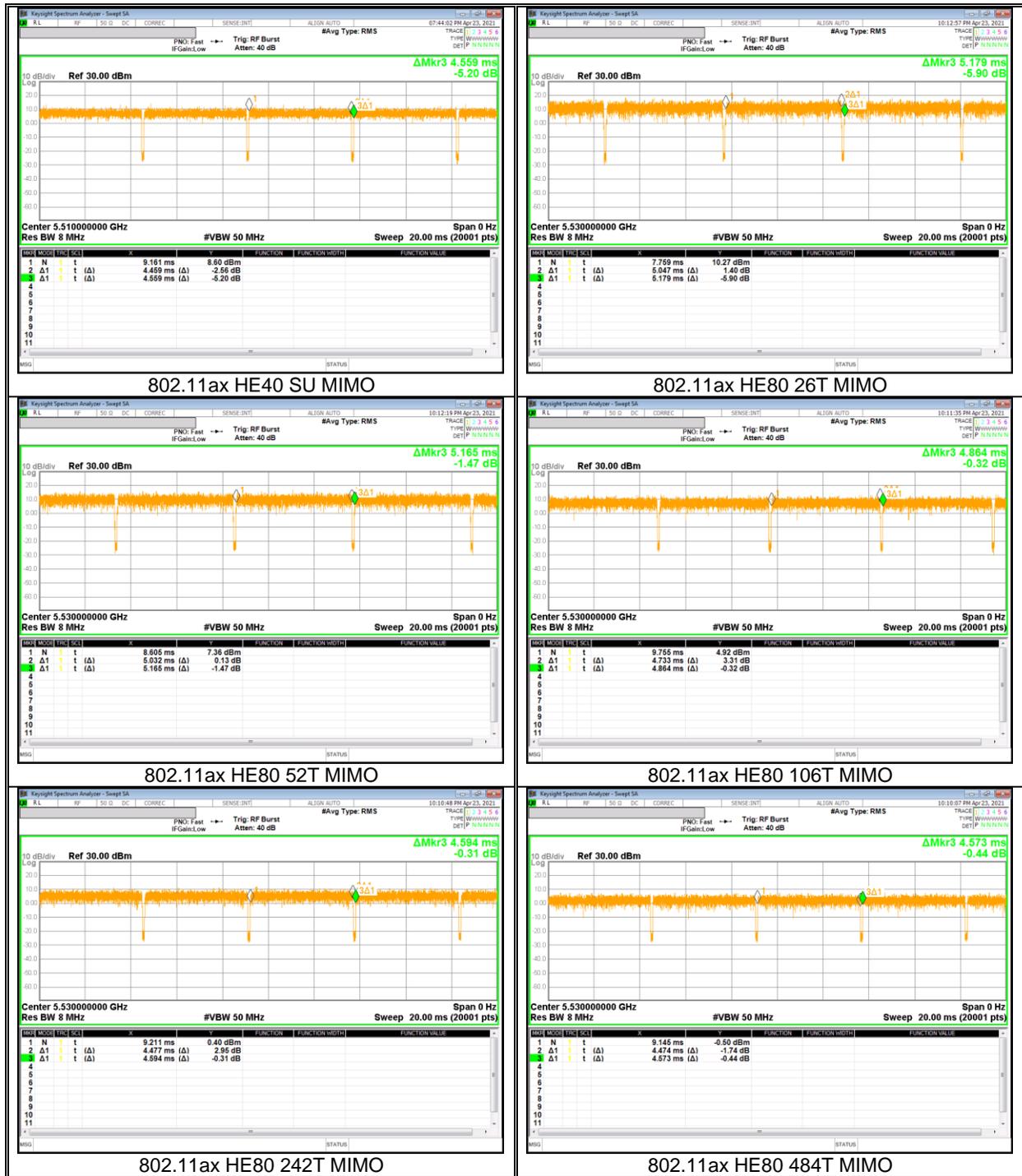
802.11ax HE40 52T MIMO

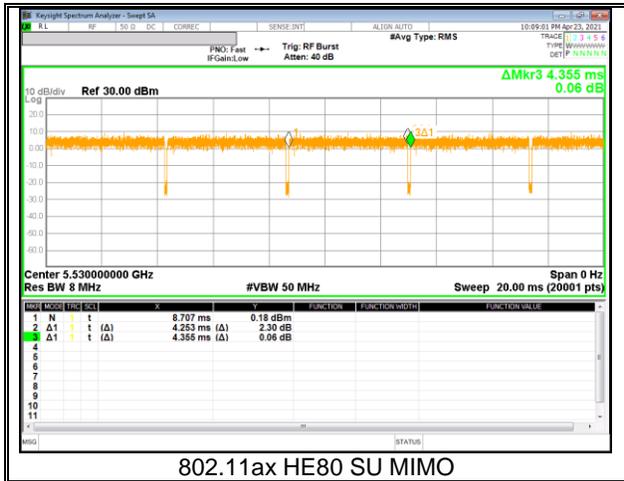


802.11ax HE40 106T MIMO



802.11ax HE40 242T MIMO





9.3. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

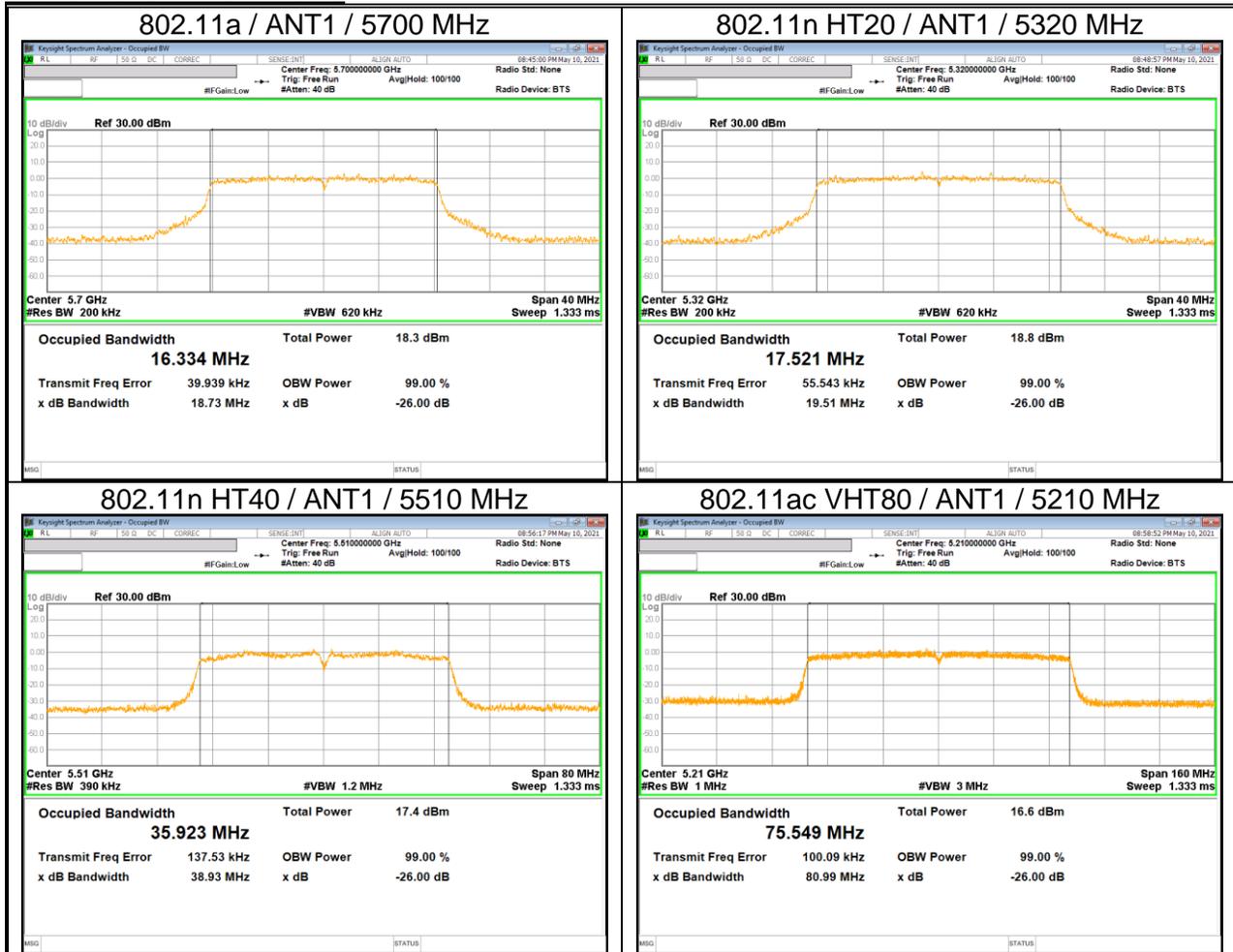
TEST PROCEDURE

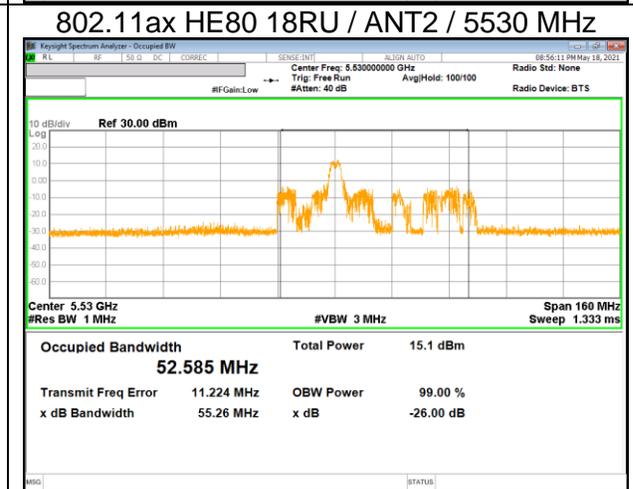
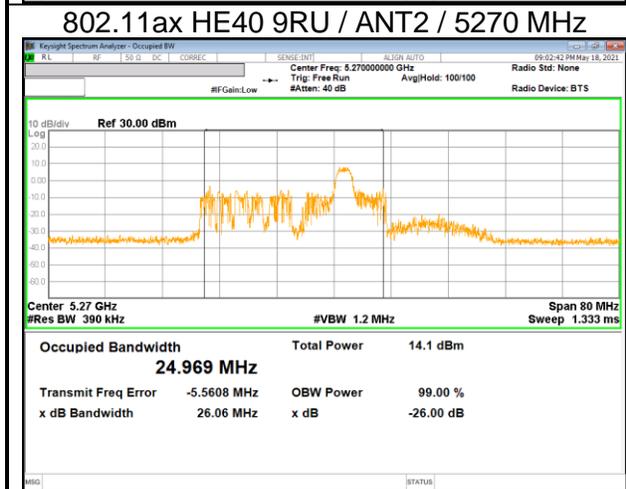
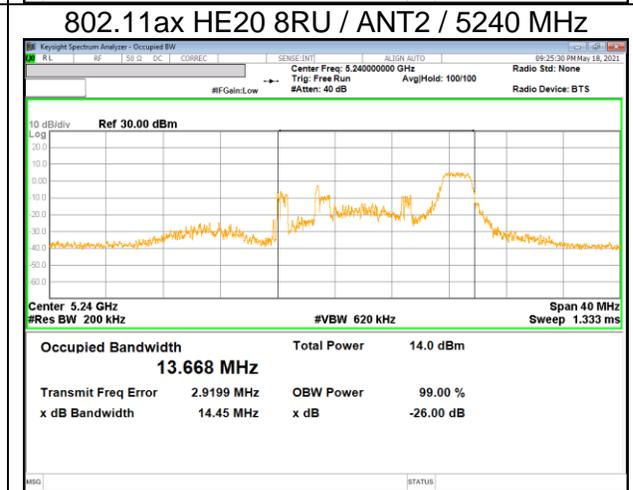
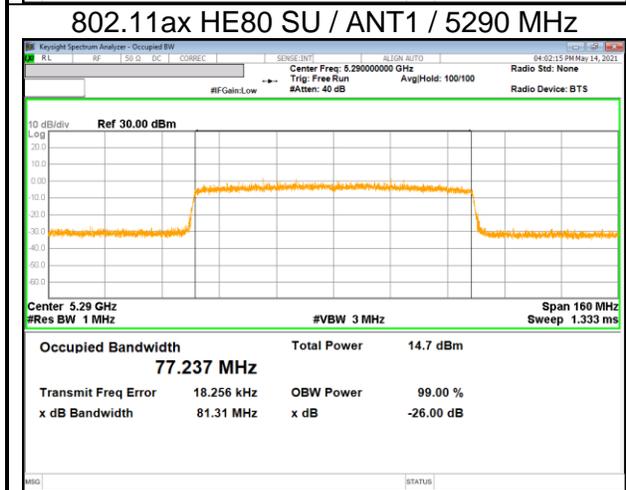
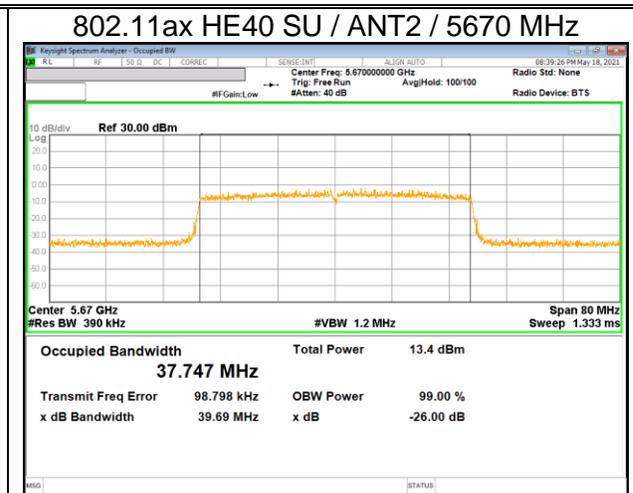
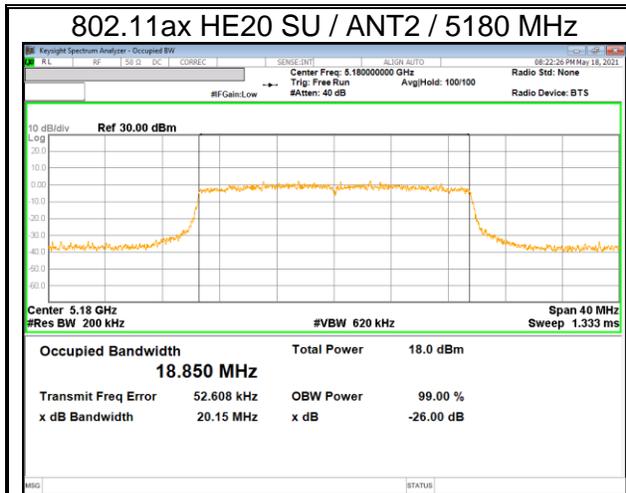
Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to approximately 1% of EBW, the VBW > RBW, peak detector and max hold.

RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS





9.3.1. 5.2 GHz BAND

Band	Mode	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz](Note1)	
				ANT1	ANT2		ANT1	ANT2
UNII-1	802.11a	Low	5180	19.44	18.98	18.83	16.30	16.37
		Mid	5200	18.85	19.39		16.31	16.36
		High	5240	19.89	18.83		16.31	16.37
	802.11n HT20	Low	5180	19.58	19.61	19.57	17.56	17.52
		Mid	5200	20.04	19.57		17.57	17.52
		High	5240	19.61	19.84		17.56	17.51
	802.11n HT40	Low	5190	39.33	39.17	39.03	35.94	35.95
		High	5230	39.03	39.51		35.93	35.93
	802.11ac VHT80	Mid	5210	80.99	81.61	80.99	75.55	75.50
	802.11ax HE20(SU)	Low	5180	20.35	20.15	20.15	18.88	18.85
		Mid	5200	20.26	20.28		18.88	18.85
		High	5240	20.30	20.15		18.88	18.85
	802.11ax HE40(SU)	Low	5190	40.03	40.12	39.91	37.62	37.65
		High	5230	39.91	40.03		37.68	37.67
802.11ax HE80(SU)	Mid	5210	81.61	82.33	81.61	77.24	77.29	

Note1. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

9.3.2. 5.3 GHz BAND

Band	Mode	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz](Note2)	
				ANT1	ANT2		ANT1	ANT2
UNII-2A	802.11a	Low	5260	18.74	19.41	18.74	16.32	16.36
		Mid	5300	20.22	18.77		16.33	16.35
		High	5320	18.89	19.02		16.34	16.35
	802.11n HT20	Low	5260	19.89	19.71	19.51	17.54	17.51
		Mid	5300	19.65	19.87		17.53	17.52
		High	5320	19.51	20.08		17.52	17.54
	802.11n HT40	Low	5270	39.85	39.05	39.05	35.93	35.96
		High	5310	39.05	39.14		35.93	35.94
	802.11ac VHT80	Mid	5290	82.65	81.20	81.20	75.54	75.47
	802.11ax HE20(SU)	Low	5260	20.35	20.65	20.24	18.90	18.88
		Mid	5300	20.38	20.28		18.86	18.83
		High	5320	20.31	20.24		18.88	18.86
	802.11ax HE40(SU)	Low	5270	40.18	39.96	39.91	37.69	37.65
		High	5310	39.91	40.20		37.59	37.66
802.11ax HE80(SU)	Mid	5290	81.31	81.33	81.31	77.24	77.37	

Note2. As a result of 99% bandwidth test, the bandwidth of UNII-2A does not interfere with UNII-1.

9.3.3. 5.5 GHz BAND

Band	Mode	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst
				ANT1	ANT2	
UNII-2C	802.11a	Low	5500	19.97	19.76	18.73
		Mid	5580	19.82	19.55	
		High	5700	18.73	19.71	
	802.11n HT20	Low	5500	20.00	19.51	19.51
		Mid	5580	20.13	19.99	
		High	5700	19.88	19.84	
	802.11n HT40	Low	5510	38.93	39.33	38.93
		Mid	5590	39.23	39.06	
		High	5670	39.01	39.12	
	802.11ac VHT80	Low	5530	81.43	81.42	81.42
		High	5610	82.19	82.23	
	802.11ax HE20(SU)	Low	5500	20.35	20.26	20.26
		Mid	5580	20.43	20.40	
		High	5700	20.52	20.27	
	802.11ax HE40(SU)	Low	5510	40.07	40.16	39.69
		Mid	5590	40.06	40.12	
		High	5670	40.26	39.69	
	802.11ax HE80(SU)	Low	5530	81.41	81.73	81.41
High		5610	81.47	81.79		

9.3.4. STRADDLE CHANNEL

Band	Mode	Channel	Center Freq. [MHz]	26 dB BW [MHz]			
				ANT1		ANT2	
				UNII-2C	UNII-3	UNII-2C	UNII-3
Straddle Channel	802.11a	Straddle	5720	15.070	4.544	14.780	4.504
	802.11n HT20	Straddle	5720	15.034	4.992	14.746	4.814
	802.11n HT40	Straddle	5710	34.790	4.612	34.566	4.622
	802.11ac VHT80	Straddle	5690	76.774	5.998	75.510	5.822
	802.11ax HE20(SU)	Straddle	5720	14.988	5.150	15.120	5.348
	802.11ax HE40(SU)	Straddle	5710	35.032	4.978	34.884	4.948
	802.11ax HE80(SU)	Straddle	5690	75.742	6.050	75.972	6.076

9.3.5. 802.11ax 5.2 GHz BAND(RU)

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]		99% BW [MHz] ^(Note1)	
					ANT1	ANT2	ANT1	ANT2
UNII-1	HE20	5180	26T	0	17.92	19.41	16.72	18.28
				4	15.53	16.96	14.73	16.32
				8	14.68	19.70	13.53	14.78
		5200		0	18.93	19.84	17.70	18.43
				4	18.11	17.96	16.97	15.69
				8	19.40	18.68	18.24	17.18
	5240	0		19.05	18.56	17.85	17.60	
		4		16.48	17.90	14.25	17.08	
		8		18.45	14.45	17.42	13.67	
	HE40	5190		0	39.15	37.60	37.34	35.99
				9	34.70	36.96	32.94	35.58
				17	36.85	38.90	35.78	37.25
		5230		0	36.45	38.29	34.40	36.69
				9	37.07	38.11	35.09	36.36
				17	35.86	36.34	34.81	34.66
	HE80	5210		0	82.29	73.97	78.04	69.51
				18	74.25	64.28	70.92	62.31
				36	79.07	75.13	75.96	72.81

Note1. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

9.3.6. 802.11ax 5.3 GHz BAND(RU)

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]		99% BW [MHz] ^(Note2)	
					ANT1	ANT2	ANT1	ANT2
UNII-2A	HE20	5260	26T	0	17.51	19.14	16.30	18.23
				4	16.29	15.22	15.13	14.51
				8	19.55	16.17	18.35	15.01
		5300		0	16.36	19.11	15.09	18.11
				4	17.42	15.99	16.73	13.25
				8	19.76	19.43	15.91	18.21
	5320	0		19.28	19.50	17.86	16.87	
		4		18.16	18.11	16.57	12.48	
		8		18.95	18.46	17.93	17.51	
	HE40	5270		0	39.67	39.35	37.22	37.43
				9	31.50	26.06	30.46	24.97
				17	39.39	38.67	37.44	37.24
		5310		0	32.48	39.42	31.13	38.05
				9	36.49	35.90	35.29	34.06
				17	33.38	39.86	32.12	37.94
	HE80	5290		0	79.55	81.46	74.90	77.58
				18	77.71	78.11	74.47	66.00
				36	80.47	81.76	77.44	78.49

Note2. As a result of 99% bandwidth test, the bandwidth of UNII-2A does not interfere with UNII-1.

9.3.7. 802.11ax 5.5 GHz BAND(RU)

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]	
					ANT1	ANT2
UNII-2C	HE20	5500	26T	0	16.90	18.56
				4	16.43	15.85
				8	19.76	16.03
		5580		0	18.44	18.82
				4	17.80	15.43
				8	18.73	19.71
		5700		0	19.42	16.67
				4	17.39	18.14
				8	18.43	19.48
	HE40	5510		0	39.23	38.81
				9	36.49	33.68
				17	38.79	38.84
		5590		0	39.44	36.10
				9	33.24	35.48
				17	39.98	38.29
		5670		0	38.08	39.29
				9	37.11	31.39
				17	39.73	39.68
	HE80	5530		0	77.72	81.45
				18	56.75	55.26
		36		74.63	67.63	
		5610		0	81.03	78.89
				18	76.20	78.01
		36		80.86	81.36	

9.3.8. 802.11ax STRADDLE CHANNEL(RU)

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]			
					ANT1		ANT2	
					UNII-2C	UNII-3	UNII-2C	UNII-3
Straddle Channel	HE20	5720	26T	6	14.010	1.538	13.924	4.074
	HE40	5710		15	31.470	3.938	32.808	3.968
	HE80	5690		34	73.998	5.082	71.756	2.804

10. ANTENNA PORT TEST RESULTS

10.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407

The minimum 6 dB bandwidth shall be at least 500 kHz.

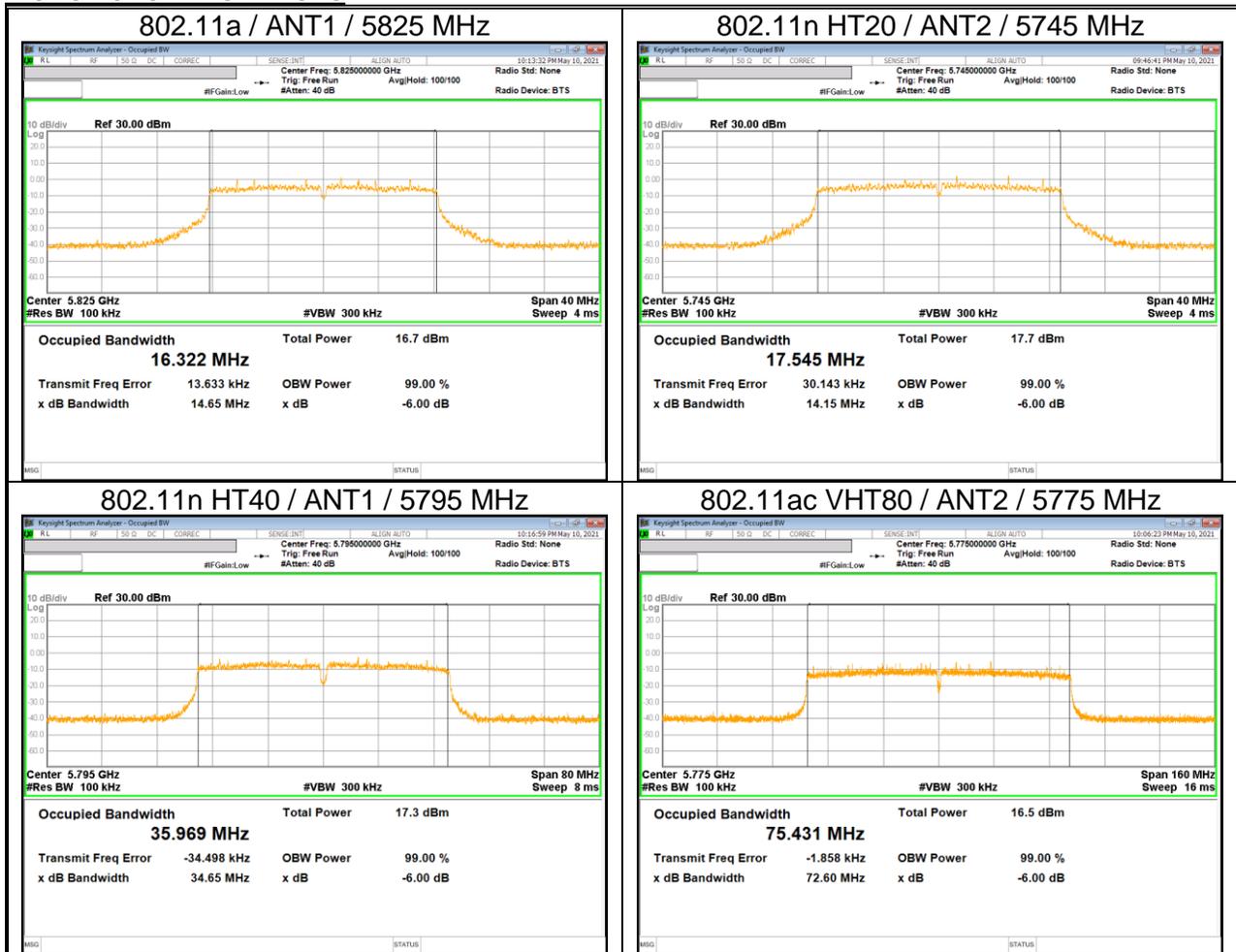
TEST PROCEDURE

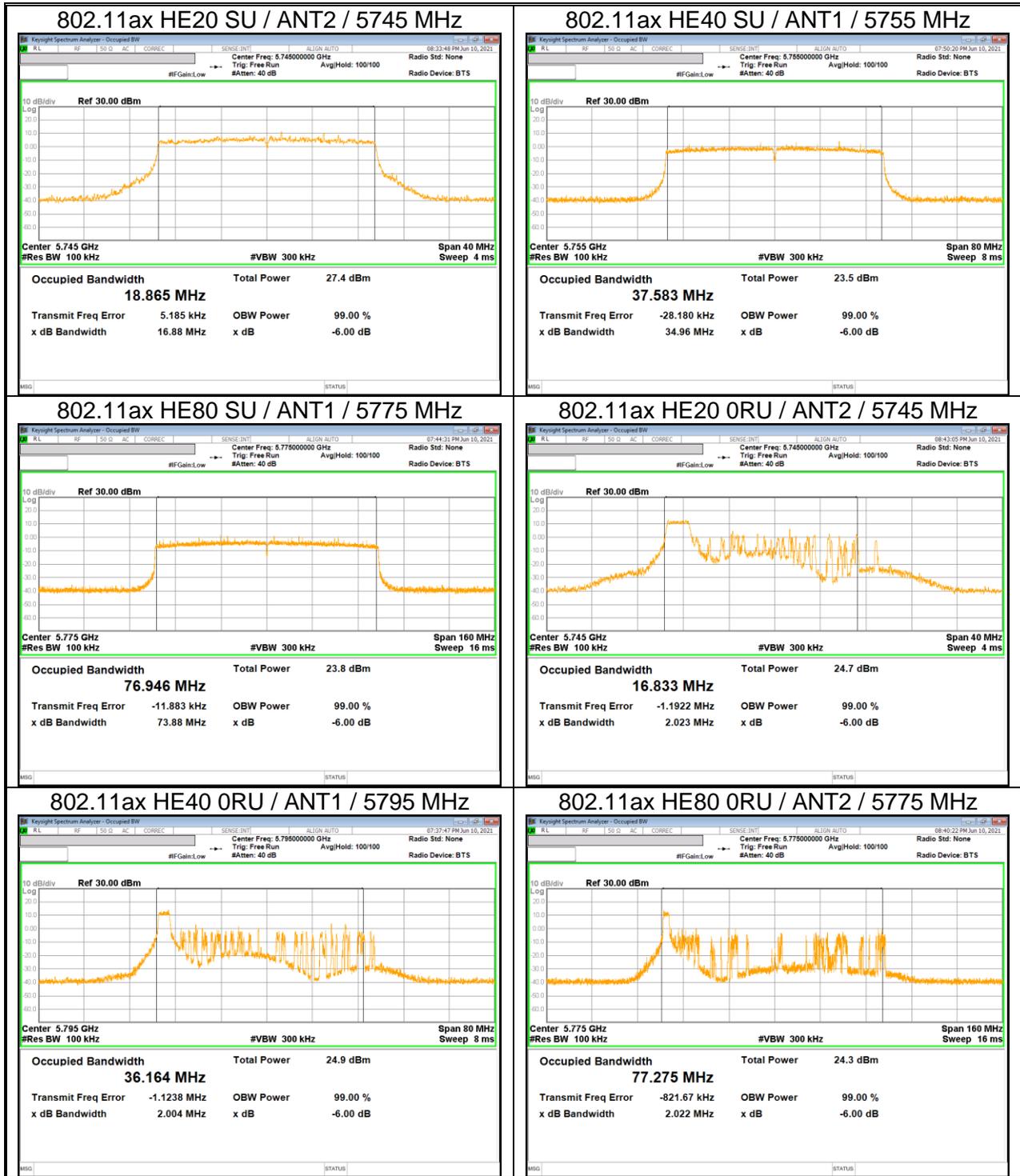
Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100kHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS





10.1.1. 5.8 GHz BAND

Band	Mode	Channel	Center Freq. [MHz]	6 dB BW [MHz]		Worst	Minimum Limit [MHz]
				ANT1	ANT2		
UNII-3	802.11a	Low	5745	15.89	15.89	14.65	0.5
		Mid	5785	15.68	16.28		
		High	5825	14.65	16.29		
	802.11n HT20	Low	5745	16.90	14.15	14.15	
		Mid	5785	15.93	15.65		
		High	5825	15.95	16.53		
	802.11n HT40	Low	5755	35.02	35.29	34.65	
		High	5795	34.65	35.29		
	802.11ac VHT80	Mid	5775	75.09	72.60	72.60	
	802.11ax HE20(SU)	Low	5745	17.96	16.88	16.88	
		Mid	5785	18.21	17.11		
		High	5825	17.91	17.27		
	802.11ax HE40(SU)	Low	5755	34.96	38.00	34.96	
		High	5795	36.33	37.58		
	802.11ax HE80(SU)	Mid	5775	73.88	75.00	73.88	

10.1.2. 802.11ax 5.8 GHz Band(RU)

Band	Mode	Channel	Tones	RU offset	6 dB BW [MHz]		Minimum Limit [MHz]
					ANT1	ANT2	
UNII-3	HE20	Low	26T	0	2.07	2.02	0.5
		Mid			5.77	14.49	
		High			2.04	2.10	
	Minimum 6dB Bandwidth				2.02		
	HE40	Low	26T	0	2.01	2.03	
		High			2.00	2.02	
		Minimum 6dB Bandwidth				2.00	
	HE80	Mid	26T	0	2.05	2.02	
		Minimum 6dB Bandwidth				2.02	

10.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1) (2) (3)

FCC

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

TEST PROCEDURE

KDB 789033 Method PM is used for output power.

KDB 789033 Method SA-2 is used for only power of straddle Ch. and PPSD. RBW set to 1MHz(500kHz for the band 5.725-5.85 GHz, the VBW $\geq 3 \times$ RBW, RMS detector and trace averaging). Band power function used for power and peak marker value of the spectrum is used for PSD.

DIRECTIONAL ANTENNA GAIN

For OUTPUT POWER and PSD: The TX chains are correlated and the antenna gains are unequal among the chains. The directional gain is:

Frequency Band [MHz]	ANT1 Gain [dBi]	ANT2 Gain [dBi]	Correlated Chains Directional Gain [dBi]
UNII 1 5150 - 5250	1.55	4.75	6.31
UNII 2A 5250 - 5350	2.07	5.14	6.75
UNII 2C 5470 - 5725	0.41	5.57	6.38
UNII 3 5725 - 5850	1.50	4.73	6.27

10.2.1. 2Tx MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain, Limits

Band	Mode	Channel	Center Freq. [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/MHz]
UNII-1	802.11a	Low	5180	18.83	6.31	23.67	10.69
		Mid	5200				
		High	5240				
	802.11n HT20	Low	5180	19.57		23.67	10.69
		Mid	5200				
		High	5240				
	802.11n HT40	Low	5190	39.03		23.67	10.69
		High	5230				
	802.11ac VHT80	Mid	5210	80.99		23.67	10.69
	Included in Calculations of Corr'd Power & PPSD						
Duty Cycle CF [dB]			802.11a			0.15	dB
			802.11n HT20			0.17	dB
			802.11n HT40			0.17	dB
			802.11ac VHT80			0.36	dB

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.31 dB)

Output Power Results

Band	Mode	Channel	Center Freq. [MHz]	Average Power [dBm]		Corr'd Power [dBm]	Power Limit [dBm]
				ANT1	ANT2		
UNII-1	802.11a	Low	5180	13.99	13.72	16.87	23.67
		Mid	5200	14.00	13.65	16.84	
		High	5240	13.85	13.41	16.65	
	802.11n HT20	Low	5180	13.61	13.37	16.50	23.67
		Mid	5200	13.63	13.29	16.47	
		High	5240	13.47	13.06	16.28	
	802.11n HT40	Low	5190	12.82	12.31	15.58	23.67
		High	5230	13.79	13.25	16.54	
	802.11ac VHT80	Mid	5210	11.69	11.49	14.60	23.67

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
 Corr'd Power = Ant1 Average Power + Ant2 Average Power

PPSD Results

Band	Mode	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]		Total Corr'd PSD [dBm/MHz]	PPSD Limit [dBm/MHz]
				ANT1	ANT2		
UNII-1	802.11a	Low	5180	2.697	2.374	5.700	10.69
		Mid	5200	2.445	2.194	5.480	
		High	5240	2.021	1.736	5.040	
	802.11n HT20	Low	5180	1.737	1.720	4.910	
		Mid	5200	1.638	1.376	4.690	
		High	5240	1.509	1.118	4.500	
	802.11n HT40	Low	5190	-2.308	-2.412	0.820	
		High	5230	-1.609	-1.406	1.670	
	802.11ac VHT80	Mid	5210	-7.130	-6.892	-3.640	

* Calculation of PSD result : Corr'd PSD = Ant1 PSD + Ant2 PSD + Duty CF [dB]

10.2.2. 2Tx MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain, Limits

Band	Mode	Channel	Center Freq. [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/MHz]
UNII-2A	802.11a	Low	5260	18.74	6.75	22.98	10.25
		Mid	5300				
		High	5320				
	802.11n HT20	Low	5260	19.51		23.15	10.25
		Mid	5300				
		High	5320				
	802.11n HT40	Low	5270	39.05		23.23	10.25
		High	5310				
	802.11ac VHT80	Mid	5290	81.20		23.23	10.25
	Included in Calculations of Corr'd Power & PPSD						
Duty Cycle CF [dB]			802.11a			0.15	dB
			802.11n HT20			0.17	dB
			802.11n HT40			0.17	dB
			802.11ac VHT80			0.36	dB

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.75 dB)

Output Power Results

Band	Mode	Channel	Center Freq. [MHz]	Average Power [dBm]		Corr'd Power [dBm]	Power Limit [dBm]
				ANT1	ANT2		
UNII-2A	802.11a	Low	5260	13.61	13.34	16.49	22.98
		Mid	5300	14.05	13.54	16.81	
		High	5320	13.78	13.57	16.69	
	802.11n HT20	Low	5260	14.29	13.90	17.11	23.15
		Mid	5300	14.70	14.09	17.42	
		High	5320	14.46	14.11	17.30	
	802.11n HT40	Low	5270	13.79	13.26	16.54	23.23
		High	5310	13.81	13.25	16.55	
	802.11ac VHT80	Mid	5290	11.71	11.50	14.62	23.23

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]

Corr'd Power = Ant1 Average Power + Ant2 Average Power

PPSD Results

Band	Mode	Channel	Center Freq. [MHz]	Meas PPSD [dBm/MHz]		Total Corr'd PPSD [dBm/MHz]	PPSD Limit [dBm/MHz]
				ANT1	ANT2		
UNII-2A	802.11a	Low	5260	1.717	1.724	4.880	10.25
		Mid	5300	2.691	1.804	5.430	
		High	5320	2.322	1.971	5.310	
	802.11n HT20	Low	5260	2.423	2.035	5.410	
		Mid	5300	3.192	2.295	5.950	
		High	5320	3.108	2.253	5.880	
	802.11n HT40	Low	5270	-1.581	-2.157	1.320	
		High	5310	-1.425	-2.260	1.360	
	802.11ac VHT80	Mid	5290	-6.011	-6.257	-2.760	

* Calculation of PPSD result : Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB]

10.2.3. 2Tx MODE IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain, Limits

Band	Mode	Channel	Center Freq. [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/MHz]
UNII-2C	802.11a	Low	5500	18.73	6.38	23.35	10.62
		Mid	5580				
		High	5700				
	802.11n HT20	Low	5500	19.51		23.52	10.62
		Mid	5580				
		High	5700				
	802.11n HT40	Low	5510	38.93		23.60	10.62
		Mid	5590				
		High	5670				
	802.11ac VHT80	Low	5530	81.42		23.60	10.62
		High	5610				
	Included in Calculations of Corr'd Power & PSD						
Duty Cycle CF [dB]			802.11a			0.15	dB
			802.11n HT20			0.17	dB
			802.11n HT40			0.17	dB
			802.11ac VHT80			0.36	dB

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.38 dB)

Output Power Results

Band	Mode	Channel	Center Freq. [MHz]	Average Power [dBm]		Corr'd Power [dBm]	Power Limit [dBm]
				ANT1	ANT2		
UNII-2C	802.11a	Low	5500	13.81	14.14	16.99	23.35
		Mid	5580	13.99	13.57	16.80	
		High	5700	13.75	13.96	16.87	
	802.11n HT20	Low	5500	14.43	14.60	17.53	23.52
		Mid	5580	14.37	14.06	17.23	
		High	5700	14.39	14.46	17.44	
	802.11n HT40	Low	5510	13.81	13.25	16.55	23.60
		Mid	5590	13.85	13.03	16.47	
		High	5670	13.52	13.12	16.33	
	802.11ac VHT80	Low	5530	12.70	12.52	15.62	23.60
		High	5610	12.71	12.51	15.62	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]

Corr'd Power = Ant1 Average Power + Ant2 Average Power

PPSD Results

Band	Mode	Channel	Center Freq. [MHz]	Meas PPSD [dBm/MHz]		Total Corr'd PPSD [dBm/MHz]	PPSD Limit [dBm/MHz]
				ANT1	ANT2		
UNII-2C	802.11a	Low	5500	2.130	2.643	5.550	10.62
		Mid	5580	2.625	1.904	5.440	
		High	5700	2.555	0.854	4.950	
	802.11n HT20	Low	5500	2.640	3.018	6.010	
		Mid	5580	2.959	2.365	5.850	
		High	5700	2.980	1.506	5.490	
	802.11n HT40	Low	5510	-1.959	-1.516	1.450	
		Mid	5590	-1.715	-2.304	1.180	
		High	5670	-1.467	-2.386	1.280	
	802.11ac VHT80	Low	5530	-5.488	-5.286	-2.020	
		High	5610	-6.445	-6.836	-3.270	

* Calculation of PPSD result : Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB]

10.2.4. 2Tx MODE IN THE 5.8 GHz BAND

Bandwidth and Antenna Gain, Limits

Included in Calculations of Corr'd Power & PPSD				
Duty Cycle CF [dB]	802.11a		0.15	dB
	802.11n HT20		0.17	dB
	802.11n HT40		0.17	dB
	802.11ac VHT80		0.36	dB

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.27 dB)

Output Power Results

Band	Mode	Channel	Center Freq. [MHz]	Average Power [dBm]		Corr'd Power [dBm]	Power Limit [dBm]
				ANT1	ANT2		
UNII-3	802.11a	Low	5745	13.74	13.73	16.75	29.73
		Mid	5785	13.76	13.76	16.77	
		High	5825	13.80	13.59	16.71	
	802.11n HT20	Low	5745	14.35	14.31	17.34	
		Mid	5785	14.39	14.30	17.36	
		High	5825	14.42	14.08	17.26	
	802.11n HT40	Low	5755	13.53	13.13	16.34	
		High	5795	13.52	13.13	16.34	
	802.11ac VHT80	Mid	5775	12.70	12.52	15.62	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
 Corr'd Power = Ant1 Average Power + Ant2 Average Power

PPSD Results

Band	Mode	Channel	Center Freq. [MHz]	Meas PPSD [dBm/500kHz]		Total Corr'd PPSD [dBm/500kHz]	PPSD Limit [dBm/500kHz]
				ANT1	ANT2		
UNII-3	802.11a	Low	5745	-0.939	-2.079	1.690	29.73
		Mid	5785	-1.390	-1.913	1.520	
		High	5825	-1.896	-2.111	1.160	
	802.11n HT20	Low	5745	-0.461	-1.909	2.060	
		Mid	5785	-1.094	-1.422	1.930	
		High	5825	-1.177	-1.891	1.660	
	802.11n HT40	Low	5755	-3.674	-5.239	-1.210	
		High	5795	-4.409	-5.594	-1.780	
	802.11ac VHT80	Mid	5775	-8.823	-9.399	-5.730	

* Calculation of PPSD result : Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB]

10.2.5. 2Tx Mode Straddle channel IN THE 5.5 GHz BAND

Bandwidth and Antenna Gain, Limits

Band	Mode	Channel	Center Freq. [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/MHz]
UNII-2C	802.11a	Straddle	5720	14.78	6.38	22.32	10.62
	802.11n HT20	Straddle	5720	14.75		22.31	10.62
	802.11n HT40	Straddle	5710	34.57		23.60	10.62
	802.11ac VHT80	Straddle	5690	75.51		23.60	10.62
Included in Calculations of Corr'd Power & PPSD							
Duty Cycle CF [dB]			802.11a			0.15	dB
			802.11n HT20			0.17	dB
			802.11n HT40			0.17	dB
			802.11ac VHT80			0.36	dB

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.38 dB)

Output Power Results

Band	Mode	Channel	Center Freq. [MHz]	Meas Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
				ANT1	ANT2		
UNII-2C	802.11a	Straddle	5720	12.32	12.34	15.49	22.32
	802.11n HT20	Straddle	5720	12.04	11.89	15.15	22.31
	802.11n HT40	Straddle	5710	13.19	12.00	15.82	23.60
	802.11ac VHT80	Straddle	5690	12.64	11.47	15.46	23.60

* Calculation of Output Power : Total Corr'd Power = Meas Power + Duty CF [dB]

PPSD Results

Band	Mode	Channel	Center Freq. [MHz]	Meas PPSD [dBm/MHz]		Total Corr'd PPSD [dBm/MHz]	PPSD Limit [dBm/MHz]
				ANT1	ANT2		
UNII-2C	802.11a	Straddle	5720	1.791	1.325	4.720	10.62
	802.11n HT20	Straddle	5720	1.175	1.191	4.360	
	802.11n HT40	Straddle	5710	-1.623	-2.814	1.000	
	802.11ac VHT80	Straddle	5690	-5.084	-6.137	-2.210	

* Calculation of PPSD result : Corr'd PPSD = Meas PPSD + Duty CF

10.2.6. 2Tx Mode Straddle channel IN THE 5.8 GHZ BAND

Bandwidth and Antenna Gain, Limits

Band	Mode	Channel	Center Freq. [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/500kHz]
UNII-3	802.11a	Straddle	5720	4.50	6.27	29.73	29.73
	802.11n HT20	Straddle	5720	4.81			
	802.11n HT40	Straddle	5710	4.61			
	802.11ac VHT80	Straddle	5690	5.82			
Included in Calculations of Corr'd Power & PSD							
Duty Cycle CF [dB]			802.11a			0.15	dB
			802.11n HT20			0.17	dB
			802.11n HT40			0.17	dB
			802.11ac VHT80			0.36	dB

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.27 dB)

Output Power Results

Band	Mode	Channel	Center Freq. [MHz]	Meas Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
				ANT1	ANT2		
UNII-3	802.11a	Straddle	5720	5.88	5.78	8.99	29.73
	802.11n HT20	Straddle	5720	5.08	5.79	8.63	
	802.11n HT40	Straddle	5710	1.45	0.83	4.33	
	802.11ac VHT80	Straddle	5690	-2.36	-3.33	0.55	

* Calculation of Output Power : Total Corr'd Power = Meas Power + Duty CF [dB]

PPSD Results

Band	Mode	Channel	Center Freq. [MHz]	Meas PSD [dBm/500kHz]		Total Corr'd PSD [dBm/500kHz]	PPSD Limit [dBm/500kHz]
				ANT1	ANT2		
UNII-3	802.11a	Straddle	5720	-1.776	-2.532	1.020	29.73
	802.11n HT20	Straddle	5720	-2.819	-3.052	0.250	
	802.11n HT40	Straddle	5710	-6.822	-7.343	-3.890	
	802.11ac VHT80	Straddle	5690	-10.929	-11.790	-7.970	

* Calculation of PSD result : Corr'd PSD = Meas PSD + Duty CF

10.2.7. 802.11ax 2Tx (MIMO) MODE 5.2 GHz BAND

Bandwidth and Antenna Gain, Limits

Mode	Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/MHz]		
HE20	Low	5180	14.45	6.31	23.67	10.69		
	Mid	5200						
	High	5240						
HE40	Low	5190	34.70		6.31		23.67	10.69
	High	5230						
HE80	Mid	5210	64.28				6.31	

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.31 dB)

Included in Calculations of Corr'd [Power & PPSD]				
Duty Cycle CF [dB]	HE20	26T	0.09	dB
		52T	-	dB
		106T	0.09	dB
		SU	0.09	dB
	HE40	26T	0.10	dB
		52T	0.12	dB
		106T	0.13	dB
		242T	0.10	dB
		SU	0.10	dB
	HE80	26T	0.11	dB
		52T	0.11	dB
		106T	0.12	dB
		242T	0.11	dB
		484T	0.10	dB
		SU	0.10	dB

Output Power Results

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE20	36	5180	26T	0	9.81	9.28	12.56	23.67
				4	9.95	9.32	12.66	
				8	9.94	9.29	12.64	
			52T	37	9.97	9.38	12.70	
				38	10.13	9.48	12.83	
				40	10.01	9.40	12.73	
			106T	53	10.66	10.05	13.38	
				54	10.77	10.01	13.42	
			SU	-	13.86	13.31	16.60	
	40	5200	26T	0	9.90	9.25	12.60	
				4	9.97	9.26	12.64	
				8	9.91	9.28	12.62	
			52T	37	9.97	9.36	12.69	
				38	10.08	9.48	12.80	
				40	10.01	9.36	12.71	
			106T	53	10.65	10.02	13.36	
				54	10.73	10.02	13.40	
			SU	-	13.93	13.28	16.63	
	48	5240	26T	0	9.99	9.33	12.68	
				4	10.05	9.34	12.72	
				8	9.99	9.18	12.61	
			52T	37	10.09	9.36	12.75	
				38	10.16	9.41	12.81	
				40	10.10	9.31	12.73	
106T			53	10.73	9.98	13.38		
			54	10.74	9.97	13.38		
SU			-	13.87	13.09	16.51		

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE40	38	5190	26T	0	9.26	8.94	12.11	23.67
				9	9.78	9.38	12.59	
				17	9.33	8.87	12.12	
			52T	37	9.35	9.05	12.21	
				41	9.84	9.40	12.64	
				44	9.43	8.97	12.22	
			106T	53	10.16	9.84	13.01	
				54	10.48	10.06	13.29	
				56	10.34	9.75	13.07	
			242T	61	10.31	9.90	13.12	
				62	10.43	9.86	13.16	
			SU	-	10.39	9.97	13.20	
	46	5230	26T	0	9.28	9.10	12.20	
				9	9.76	9.49	12.64	
				17	9.26	8.99	12.14	
			52T	37	9.40	9.19	12.31	
				41	9.79	9.52	12.67	
				44	9.37	9.10	12.25	
			106T	53	10.20	9.97	13.10	
				54	10.52	10.21	13.38	
				56	10.27	9.90	13.10	
			242T	61	10.26	10.06	13.17	
				62	10.30	10.01	13.17	
			SU	-	10.28	10.10	13.20	
HE80	42	5210	26T	0	9.35	9.40	12.39	
				18	9.96	9.60	12.79	
				36	9.41	9.17	12.30	
			52T	37	9.34	9.41	12.39	
				45	10.00	9.58	12.81	
				52	9.45	9.21	12.34	
			106T	53	10.11	10.08	13.11	
				57	10.77	10.21	13.51	
				60	10.54	9.93	13.26	
			242T	61	10.16	10.21	13.20	
				62	10.45	10.28	13.38	
				64	10.72	10.04	13.40	
			484T	65	10.36	10.26	13.32	
				66	10.82	10.14	13.50	
			SU	-	10.51	10.11	13.32	

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

PPSD Results

Actual RBW	Ref. Bandwidth	Corr'd factor
100 kHz	1000 kHz	10.00 dB

Mode	Channel	Frequency [MHz]	Tones	RU offset	Meas PPSD [dBm/100kHz]		Corr'd PPSD [dBm/MHz]	PPSD Limit [dBm/MHz]
					ANT1	ANT2		
HE20	36	5180	26T	0	-2.516	-2.749	10.470	10.69
				4	-2.444	-3.090	10.350	
				8	-2.995	-3.044	10.080	
			SU	-	-8.101	-8.508	4.800	
	40	5200	26T	0	-2.908	-3.082	10.110	
				4	-2.569	-3.052	10.300	
				8	-2.823	-3.239	10.070	
			SU	-	-8.160	-8.835	4.620	
	48	5240	26T	0	-2.888	-3.489	9.920	
				4	-3.130	-3.441	9.820	
				8	-3.170	-3.706	9.670	
			SU	-	-8.241	-9.166	4.420	
HE40	38	5190	26T	0	-2.963	-3.678	9.800	
				9	-2.732	-3.470	10.020	
				17	-2.971	-3.724	9.780	
			SU	-	-13.824	-15.007	-1.270	
	46	5230	26T	0	-3.278	-3.783	9.590	
				9	-2.905	-3.478	9.930	
HE80	42	5210	26T	17	-3.233	-3.999	9.510	
				36	-3.622	-4.047	9.290	
				SU	-	-14.332	-14.930	-1.510
			0	-3.365	-3.547	9.670		
				18	-2.737	-3.410	10.060	
				36	-3.622	-4.047	9.290	
			SU	-	-17.012	-16.952	-3.870	

* Calculation of PPSD result : Total Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB] + Corr'd factor [dB]

10.2.8. 802.11ax 2Tx (MIMO) MODE 5.3 GHz BAND

Bandwidth and Antenna Gain, Limits

Mode	Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/MHz]		
HE20	Low	5260	15.22	6.75	22.07	10.25		
	Mid	5300						
	High	5320						
HE40	Low	5270	26.06		6.75		23.23	10.25
	High	5310						
HE80	Mid	5290	77.71				6.75	

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.75 dB)

Included in Calculations of Corr'd [Power & PPSD]				
Duty Cycle CF [dB]	HE20	26T	0.09	dB
		52T	-	dB
		106T	0.09	dB
		SU	0.09	dB
	HE40	26T	0.10	dB
		52T	0.12	dB
		106T	0.13	dB
		242T	0.10	dB
		SU	0.10	dB
	HE80	26T	0.11	dB
		52T	0.11	dB
		106T	0.12	dB
		242T	0.11	dB
		484T	0.10	dB
		SU	0.10	dB

Output Power Results

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE20	52	5260	26T	0	9.55	9.05	12.32	22.07
				4	9.61	9.25	12.44	
				8	9.58	9.16	12.39	
			52T	37	9.63	9.25	12.45	
				38	9.75	9.33	12.56	
				40	9.65	9.16	12.42	
			106T	53	10.26	9.87	13.08	
				54	10.31	9.83	13.09	
			SU	-	13.50	13.49	16.51	
	60	5300	26T	0	10.22	9.24	12.77	
				4	10.29	9.22	12.80	
				8	10.22	9.08	12.70	
			52T	37	10.29	9.26	12.82	
				38	10.39	9.34	12.91	
				40	10.33	9.18	12.80	
			106T	53	10.94	9.91	13.47	
				54	10.93	9.82	13.42	
			SU	-	13.96	13.19	16.60	
	64	5320	26T	0	10.11	9.31	12.74	
				4	10.12	9.29	12.74	
				8	10.06	9.20	12.66	
			52T	37	10.12	9.43	12.80	
				38	10.23	9.50	12.89	
				40	10.14	9.32	12.76	
106T			53	10.72	10.05	13.41		
			54	10.73	9.97	13.38		
SU			-	13.85	13.30	16.59		

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE40	54	5270	26T	0	9.17	8.73	11.97	23.23
				9	9.65	9.13	12.41	
				17	9.21	8.57	11.91	
			52T	37	9.31	8.83	12.09	
				41	9.74	9.14	12.46	
				44	9.30	8.68	12.01	
			106T	53	10.01	9.59	12.82	
				54	10.35	9.81	13.10	
				56	10.07	9.46	12.79	
			242T	61	10.07	9.68	12.89	
				62	10.19	9.59	12.91	
			SU	-	10.27	9.71	13.01	
	62	5310	26T	0	9.35	8.90	12.14	
				9	9.86	9.24	12.57	
				17	9.36	8.64	12.03	
			52T	37	9.38	9.00	12.20	
				41	9.80	9.26	12.55	
				44	9.43	8.76	12.12	
			106T	53	10.12	9.78	12.96	
				54	10.43	9.96	13.21	
				56	10.17	9.57	12.89	
			242T	61	10.15	9.75	12.96	
				62	10.19	9.60	12.92	
			SU	-	10.24	9.84	13.05	
HE80	58	5290	26T	0	10.33	9.76	13.06	
				18	10.93	9.78	13.40	
				36	10.19	9.13	12.70	
			52T	37	10.29	9.79	13.06	
				45	10.97	9.75	13.41	
				52	10.27	9.19	12.77	
			106T	53	10.08	9.30	12.72	
				57	10.67	9.23	13.02	
				60	10.20	8.81	12.57	
			242T	61	10.20	9.41	12.83	
				62	10.46	9.41	12.98	
				64	10.39	8.97	12.75	
			484T	65	10.38	9.44	12.95	
				66	10.60	9.11	12.93	
			SU	-	10.40	9.16	12.83	

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

PPSD Results

Actual RBW	Ref. Bandwidth	Corr'd factor
100 kHz	1000 kHz	10.00 dB

Mode	Channel	Frequency [MHz]	Tones	RU offset	Meas PPSD [dBm/100kHz]		Corr'd PPSD [dBm/MHz]	PPSD Limit [dBm/MHz]
					ANT1	ANT2		
HE20	52	5260	26T	0	-2.801	-3.267	10.070	10.25
				4	-2.792	-3.374	10.030	
				8	-2.582	-3.738	9.980	
			SU	-	-8.741	-9.109	4.180	
	60	5300	26T	0	-3.640	-3.384	9.590	
				4	-2.618	-3.569	10.030	
				8	-2.691	-3.084	10.220	
			SU	-	-8.573	-8.874	4.380	
	64	5320	26T	0	-3.568	-3.116	9.760	
				4	-2.924	-3.180	10.050	
				8	-3.035	-3.459	9.860	
			SU	-	-8.872	-9.036	4.150	
HE40	54	5270	26T	0	-3.022	-3.986	9.630	
				9	-3.429	-3.871	9.470	
				17	-3.824	-4.510	8.960	
			SU	-	-14.799	-15.089	-1.830	
	62	5310	26T	0	-3.381	-4.114	9.380	
				9	-3.259	-3.524	9.720	
HE80	58	5290	26T	17	-4.342	-4.394	8.740	
				36	-3.183	-4.305	9.410	
				SU	-	-14.850	-15.087	-1.860
			0	-2.697	-3.189	10.180		
				18	-2.840	-3.390	10.010	
				36	-3.183	-4.305	9.410	
			SU	-	-17.095	-18.718	-4.720	

* Calculation of PPSD result : Total Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB] + Corr'd factor [dB]

10.2.9. 802.11ax 2Tx (MIMO) MODE 5.5 GHz BAND

Bandwidth and Antenna Gain, Limits

Mode	Channel	Frequency [MHz]	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/MHz]
HE20	Low	5500	15.43	6.38	22.50	10.62
	Mid	5580				
	High	5700				
HE40	Low	5510	31.39			
	Mid	5590				
	High	5670				
HE80	Low	5530	55.26			
	High	5610				

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.38 dB)

Included in Calculations of Corr'd [Power & PPSD]				
Duty Cycle CF [dB]	HE20	26T	0.09	dB
		52T	-	dB
		106T	0.09	dB
		SU	0.09	dB
	HE40	26T	0.10	dB
		52T	0.12	dB
		106T	0.13	dB
		242T	0.10	dB
		SU	0.10	dB
	HE80	26T	0.11	dB
		52T	0.11	dB
		106T	0.12	dB
		242T	0.11	dB
		484T	0.10	dB
		SU	0.10	dB

Output Power Results

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE20	100	5500	26T	0	10.63	10.17	13.42	22.50
				4	10.68	10.20	13.46	
				8	10.61	10.08	13.36	
			52T	37	10.71	10.24	13.49	
				38	10.80	10.32	13.58	
				40	10.69	10.16	13.44	
			106T	53	10.30	9.89	13.11	
				54	10.31	9.85	13.10	
			SU	-	13.17	12.93	16.06	
	116	5580	26T	0	10.58	9.34	13.01	
				4	10.57	9.41	13.04	
				8	10.44	9.38	12.95	
			52T	37	10.64	9.43	13.09	
				38	10.72	9.54	13.18	
				40	10.55	9.48	13.06	
			106T	53	10.35	9.10	12.78	
				54	10.24	9.09	12.71	
			SU	-	13.21	12.12	15.71	
	140	5700	26T	0	10.36	9.96	13.17	
				4	10.32	10.02	13.18	
				8	10.17	9.97	13.08	
			52T	37	10.44	10.03	13.25	
				38	10.50	10.13	13.33	
				40	10.26	10.05	13.17	
106T			53	10.28	9.69	13.01		
			54	10.18	9.66	12.94		
SU			-	12.97	12.64	15.82		

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE40	102	5510	26T	0	10.00	9.07	12.57	23.60
				9	10.46	9.49	13.01	
				17	9.90	8.97	12.47	
			52T	37	10.05	9.15	12.63	
				41	10.50	9.51	13.04	
				44	10.03	9.08	12.59	
			106T	53	10.79	9.98	13.41	
				54	10.98	10.21	13.62	
				56	10.81	9.90	13.39	
	242T	61	10.90	10.06	13.51			
		62	10.94	10.00	13.51			
	SU	-	10.98	10.10	13.57			
	118	5590	26T	0	10.43	9.35	12.93	
				9	10.61	9.88	13.27	
				17	9.98	9.44	12.73	
			52T	37	10.33	9.48	12.94	
				41	10.64	9.90	13.30	
				44	10.11	9.55	12.85	
			106T	53	10.13	9.29	12.74	
				54	10.34	9.53	12.96	
				56	9.96	9.28	12.64	
	242T	61	10.22	9.37	12.83			
		62	10.09	9.37	12.76			
	SU	-	10.26	9.46	12.89			
	134	5670	26T	0	9.78	9.47	12.64	
				9	10.09	10.04	13.08	
				17	9.45	9.63	12.55	
52T			37	9.85	9.56	12.72		
			41	10.12	10.08	13.11		
			44	9.55	9.72	12.65		
106T			53	10.77	10.37	13.58		
			54	10.92	10.63	13.79		
			56	10.44	10.43	13.45		
242T	61	10.80	10.47	13.65				
	62	10.65	10.52	13.60				
SU	-	10.81	10.55	13.69				

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE80	106	5530	26T	0	9.79	10.29	13.06	23.60
				18	10.76	10.56	13.67	
				36	9.57	10.09	12.85	
			52T	37	9.81	10.30	13.07	
				45	10.73	10.57	13.66	
				52	9.64	10.17	12.92	
			106T	53	9.61	9.96	12.80	
				57	10.43	10.12	13.29	
				60	9.54	9.74	12.65	
			242T	61	9.87	10.07	12.98	
				62	10.34	10.17	13.27	
				64	9.80	9.87	12.85	
			484T	65	10.18	10.15	13.18	
				66	10.12	10.03	13.09	
	SU	-	10.04	9.99	13.03			
	122	5610	26T	0	9.55	8.95	12.27	
				18	10.13	9.44	12.81	
				36	8.82	9.11	11.98	
			52T	37	9.57	8.97	12.29	
				45	10.08	9.44	12.78	
				52	8.93	9.16	12.06	
			106T	53	10.37	9.72	13.07	
				57	10.74	10.03	13.41	
				60	9.80	9.76	12.79	
			242T	61	10.60	9.85	13.25	
				62	10.89	10.04	13.50	
				64	10.04	9.90	12.98	
			484T	65	10.68	9.90	13.32	
66				10.47	10.01	13.26		
SU	-	10.50	9.94	13.24				

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

PPSD Results

Actual RBW	Ref. Bandwidth	Corr'd factor
100 kHz	1000 kHz	10.00 dB

Mode	Channel	Frequency [MHz]	Tones	RU offset	Meas PPSD [dBm/100kHz]		Corr'd PPSD [dBm/MHz]	PPSD Limit [dBm/MHz]
					ANT1	ANT2		
HE20	100	5500	26T	0	-2.349	-2.937	10.470	10.62
				4	-2.526	-2.864	10.410	
				8	-2.599	-2.900	10.350	
			SU	-	-9.559	-8.839	3.920	
	116	5580	26T	0	-2.546	-3.020	10.320	
				4	-2.732	-3.082	10.200	
				8	-2.808	-3.138	10.130	
			SU	-	-9.310	-9.343	3.770	
	140	5700	26T	0	-3.413	-3.056	9.870	
				4	-3.213	-2.877	10.060	
				8	-3.073	-2.904	10.110	
			SU	-	-9.293	-8.977	3.970	
HE40	102	5510	26T	0	-2.694	-3.319	10.120	
				9	-2.409	-3.164	10.340	
				17	-3.103	-3.128	9.990	
			SU	-	-14.327	-14.283	-1.190	
	118	5590	26T	0	-2.381	-3.566	10.180	
				9	-2.553	-2.805	10.430	
				17	-2.625	-3.424	10.100	
			SU	-	-13.868	-14.516	-1.070	
	134	5670	26T	0	-2.802	-3.176	10.130	
				9	-3.167	-2.377	10.360	
				17	-3.589	-2.424	10.140	
			SU	-	-14.155	-14.048	-0.990	
HE80	106	5530	26T	0	-3.264	-2.757	10.120	
				18	-3.406	-2.472	10.210	
				36	-3.367	-3.068	9.910	
			SU	-	-17.578	-16.997	-4.170	
	122	5610	26T	0	-3.440	-3.919	9.450	
				18	-2.680	-3.305	10.140	
				36	-4.284	-3.536	9.230	
			SU	-	-17.344	-16.883	-4.000	

* Calculation of PPSD result : Total Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB] + Corr'd factor [dB]

10.2.10. 802.11ax 2Tx (MIMO) MODE STRADDLE CHANNEL

Bandwidth and Antenna Gain, Limits

Frequency [MHz]	Portion	Min 26 dB BW [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit	
5720(HE20)	UNII-2C	13.92	6.38	22.06	10.62 [dBm/MHz]	
	UNII-3	1.54	6.27	29.73	29.73 [dBm/500kHz]	
5710(HE40)	UNII-2C	31.47	6.38	23.60	10.62 [dBm/MHz]	
	UNII-3	3.94	6.27	29.73	29.73 [dBm/500kHz]	
5690(HE80)	UNII-2C	71.76	6.38	23.60	10.62 [dBm/MHz]	
	UNII-3	2.80	6.27	29.73	29.73 [dBm/500kHz]	
Included in Calculations of Corr'd Power & PPSD						
Duty Cycle CF [dB]			HE20	26T	0.09	dB
				SU	0.09	dB
			HE40	26T	0.10	dB
				SU	0.10	dB
			HE80	26T	0.11	dB
				SU	0.10	dB

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced (UNII- 2C: 0.38 dB, UNII-3: 0.27 dB)

Output Power Results

Frequency [MHz]	Portion	Tones	RU offset	Meas Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
				ANT1	ANT2		
5720	UNII-2C	26T	6	9.130	9.814	12.590	22.06
		SU	-	12.021	11.290	14.770	
	UNII-3	26T	6	3.448	4.190	6.940	29.73
		SU	-	5.766	5.467	8.720	
5710	UNII-2C	26T	15	9.697	9.853	12.890	23.60
		SU	-	10.174	10.027	13.210	
	UNII-3	26T	15	-2.518	-2.074	0.820	29.73
		SU	-	-0.704	-0.355	2.580	
5690	UNII-2C	26T	34	9.269	9.938	12.740	23.60
		SU	-	9.720	9.260	12.610	
	UNII-3	26T	34	-1.854	-0.984	1.720	29.73
		SU	-	-4.531	-4.592	-1.450	

* Calculation of Output Power : Total Corr'd Power = Ant1 Power + Ant2 Power + Duty CF [dB]

PPSD Results

Frequency [MHz]	Portion	Tones	RU offset	Meas PPSD [dBm/MHz]		Total Corr'd PPSD [dBm/MHz]	PPSD Limit [dBm/MHz]
				ANT1	ANT2		
5720	UNII-2C	26T	6	6.422	7.897	10.320	10.62
		SU	-	2.356	1.770	5.170	
	*UNII-3	26T	6	3.660	4.960	7.460	29.73
		SU	-	-1.624	-2.542	1.040	
5710	UNII-2C	26T	15	5.770	6.970	9.520	10.62
		SU	-	-3.047	-4.093	-0.430	
	*UNII-3	26T	15	-4.779	-2.869	-0.610	29.73
		SU	-	-7.877	-8.560	-5.090	
5690	UNII-2C	26T	34	5.052	6.138	8.750	10.62
		SU	-	-6.314	-6.918	-3.500	
	*UNII-3	26T	34	-4.591	-4.235	-1.290	29.73
		SU	-	-11.784	-12.599	-9.060	

Note: * For UNII-3, the unit of PPSD is [dBm/500kHz].

Calculation of PPSD result : Total Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB] + Corr'd factor [dB]

10.2.11. 802.11ax 2Tx (MIMO) MODE 5.8 GHz BAND

Bandwidth and Antenna Gain, Limits

Mode	Channel	Frequency [MHz]	Directional Gain [dBi]	Power Limit [dBm]	PPSD Limit [dBm/500kHz]
HE20	Low	5745	6.27	29.73	29.73
	Mid	5785			
	High	5825			
HE40	Low	5755			
	High	5795			
HE80	Mid	5775			

Note. Since the directional gain exceeds 6dBi, the power and PSD limits are reduced(0.27 dB)

Included in Calculations of Corr'd [Power & PPSD]				
Duty Cycle CF [dB]	HE20	26T	0.09	dB
		52T	-	dB
		106T	0.09	dB
		SU	0.09	dB
	HE40	26T	0.10	dB
		52T	0.12	dB
		106T	0.13	dB
		242T	0.10	dB
		SU	0.10	dB
	HE80	26T	0.11	dB
		52T	0.11	dB
		106T	0.12	dB
		242T	0.11	dB
		484T	0.10	dB
		SU	0.10	dB

Output Power Results

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE20	149	5745	26T	0	9.67	9.88	12.79	29.73
				4	9.55	9.98	12.78	
				8	9.28	9.94	12.63	
			52T	37	9.72	9.98	12.86	
				38	9.74	10.06	12.91	
				40	9.42	10.01	12.74	
			106T	53	10.53	10.58	13.57	
				54	10.31	10.59	13.46	
			SU	-	12.28	12.62	15.46	
	157	5785	26T	0	9.48	10.00	12.76	
				4	9.35	10.05	12.72	
				8	9.09	10.00	12.58	
			52T	37	9.55	10.07	12.83	
				38	9.55	10.18	12.89	
				40	9.20	10.08	12.67	
			106T	53	10.41	10.68	13.56	
				54	10.15	10.66	13.42	
			SU	-	12.28	12.69	15.50	
	165	5825	26T	0	9.26	9.93	12.62	
				4	9.16	9.99	12.61	
				8	8.89	9.91	12.44	
			52T	37	9.34	10.01	12.70	
				38	9.35	10.11	12.76	
				40	9.02	10.01	12.55	
			106T	53	10.22	10.63	13.44	
				54	10.02	10.61	13.34	
			SU	-	12.10	12.52	15.33	

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

Mode	Channel	Frequency [MHz]	Tones	RU offset	Average Power [dBm]		Total Corr'd Power [dBm]	Power Limit [dBm]
					ANT1	ANT2		
HE40	151	5755	26T	0	10.66	9.80	13.26	29.73
				9	10.82	10.31	13.58	
				17	10.05	9.88	12.98	
			52T	37	10.72	9.90	13.34	
				41	10.83	10.35	13.61	
				44	10.18	9.98	13.09	
			106T	53	10.53	9.70	13.15	
				54	10.67	9.98	13.35	
				56	10.08	9.71	12.91	
			242T	61	10.57	9.79	13.21	
				62	10.27	9.77	13.04	
			SU	-	10.52	9.89	13.23	
	159	5795	26T	0	10.53	9.30	12.97	
				9	10.71	9.76	13.27	
				17	9.94	9.27	12.63	
			52T	37	10.62	9.37	13.05	
				41	10.68	9.79	13.27	
				44	10.07	9.38	12.75	
			106T	53	10.45	9.30	12.92	
				54	10.55	9.54	13.08	
				56	10.05	9.23	12.67	
			242T	61	10.47	9.36	12.96	
				62	10.21	9.32	12.80	
			SU	-	10.40	9.43	12.95	
HE80	155	5775	26T	0	10.31	9.52	12.94	
				18	10.11	10.07	13.10	
				36	8.91	9.56	12.26	
			52T	37	10.33	9.57	12.98	
				45	10.02	10.09	13.07	
				52	8.97	9.59	12.30	
			106T	53	10.17	9.17	12.71	
				57	9.93	9.57	12.76	
				60	9.06	9.10	12.09	
			242T	61	10.31	9.35	12.87	
				62	10.29	9.62	12.98	
				64	9.26	9.26	12.27	
			484T	65	10.32	9.46	12.92	
				66	9.59	9.47	12.54	
			SU	-	9.87	9.36	12.63	

* Calculation of Output Power :

Average Power = Measured Power + Duty CF [dB]

Total Corr'd Power = Ant1's Average Power + Ant2's Average Power

PPSD Results

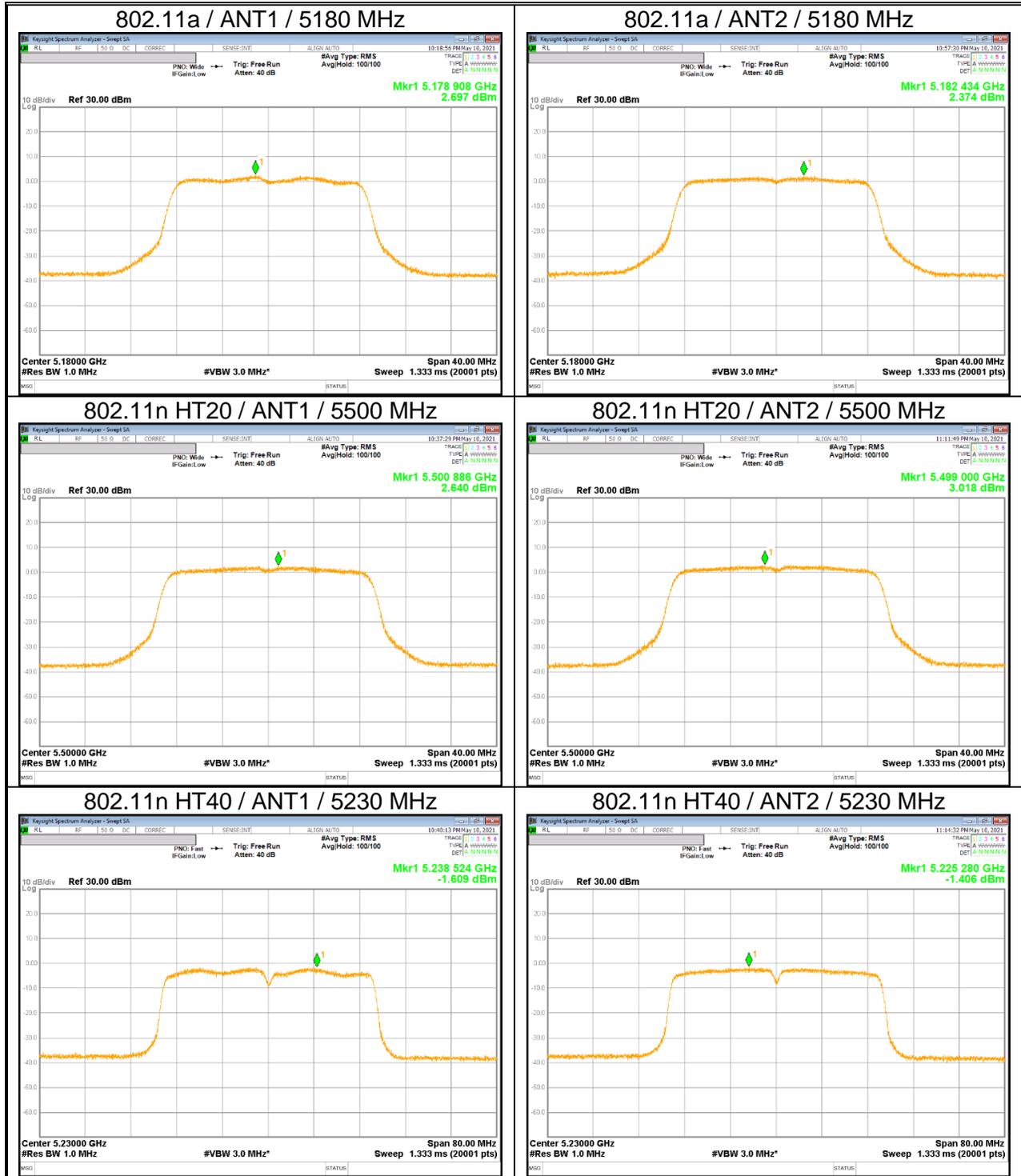
Actual RBW	Ref. Bandwidth	Corr'd factor
100 kHz	500 kHz	6.99 dB

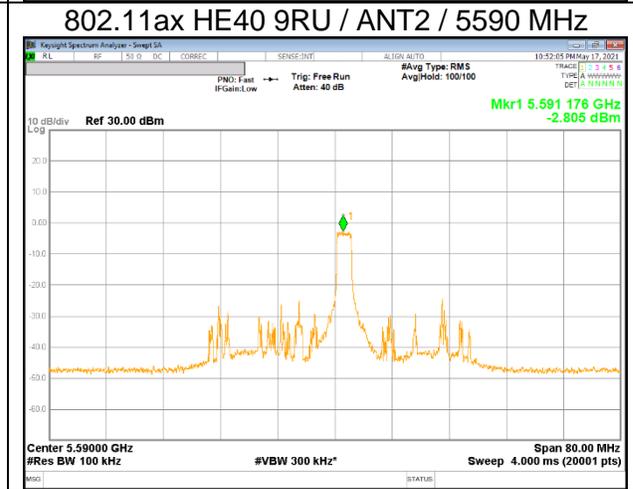
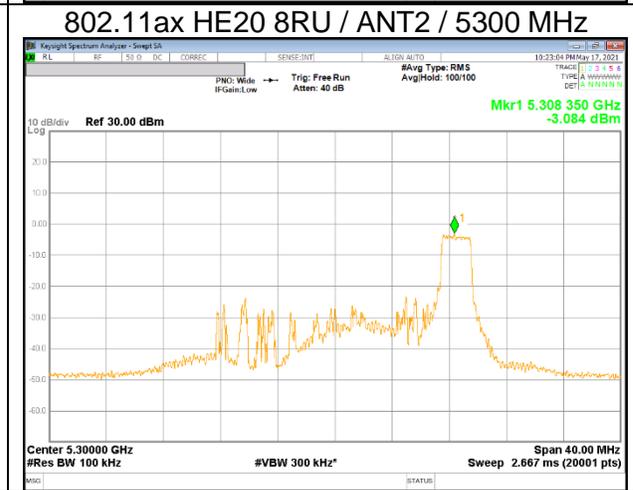
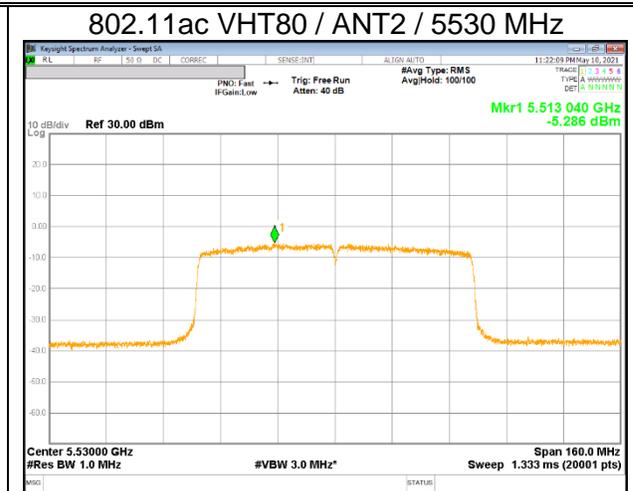
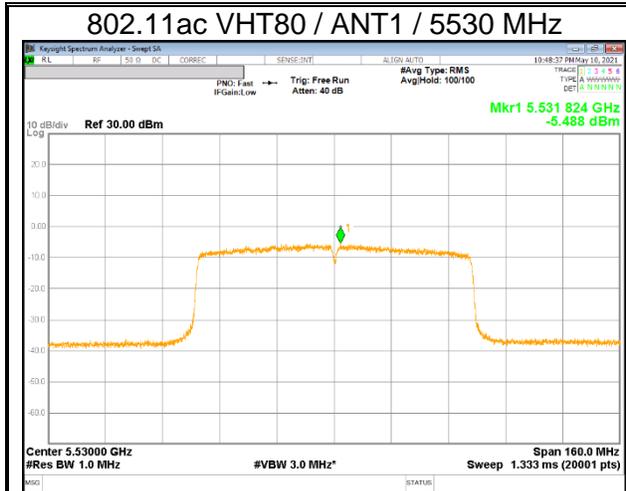
Mode	Channel	Frequency [MHz]	Tones	RU offset	Meas PPSD [dBm/100kHz]		Corr'd PPSD [dBm/500kHz]	PPSD Limit [dBm/500kHz]
					ANT1	ANT2		
HE20	149	5745	26T	0	-3.035	-2.402	7.383	29.73
				4	-2.901	-2.488	7.401	
				8	-3.390	-2.567	7.131	
			SU	-	-8.591	-8.431	1.580	
	157	5785	26T	0	-3.162	-2.822	7.102	
				4	-3.490	-2.728	6.998	
				8	-3.546	-2.710	6.982	
			SU	-	-8.952	-8.546	1.346	
	165	5825	26T	0	-3.022	-2.998	7.080	
				4	-2.961	-2.955	7.132	
				8	-3.249	-2.947	6.995	
			SU	-	-8.825	-8.881	1.237	
HE40	151	5755	26T	0	-2.854	-2.774	7.286	
				9	-2.816	-2.413	7.490	
				17	-3.706	-3.047	6.736	
			SU	-	-14.641	-15.389	-4.899	
	159	5795	26T	0	-3.293	-3.217	6.845	
				9	-2.777	-2.962	7.232	
				17	-3.655	-3.784	6.381	
			SU	-	-15.461	-15.801	-5.527	
HE80	155	5775	26T	0	-2.930	-2.882	7.204	
				18	-3.593	-2.713	6.980	
				36	-4.224	-3.504	6.261	
			SU	-	-18.482	-17.980	-8.123	

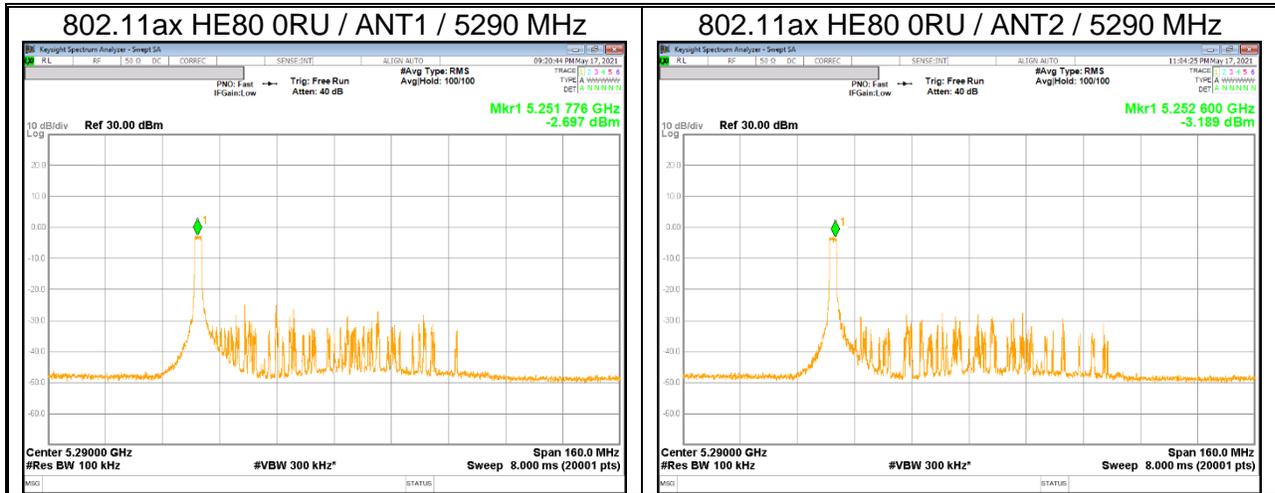
* Calculation of PPSD result : Total Corr'd PPSD = Ant1 PPSD + Ant2 PPSD + Duty CF [dB] + Corr'd factor [dB]

10.2.12. OUTPUT POWER AND PPSD PLOTS(WORST CASE)

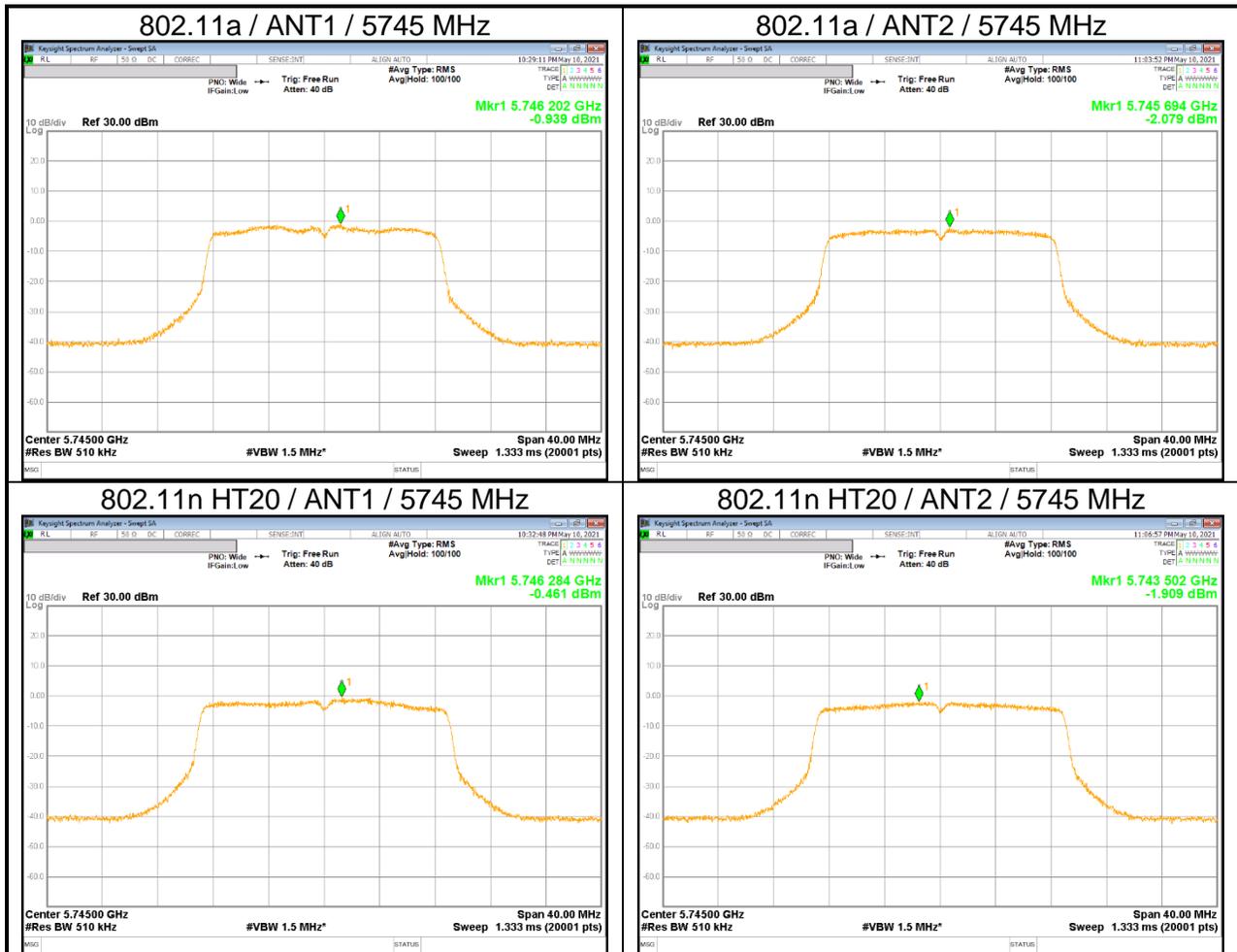
UNII-1 & 2A & 2C

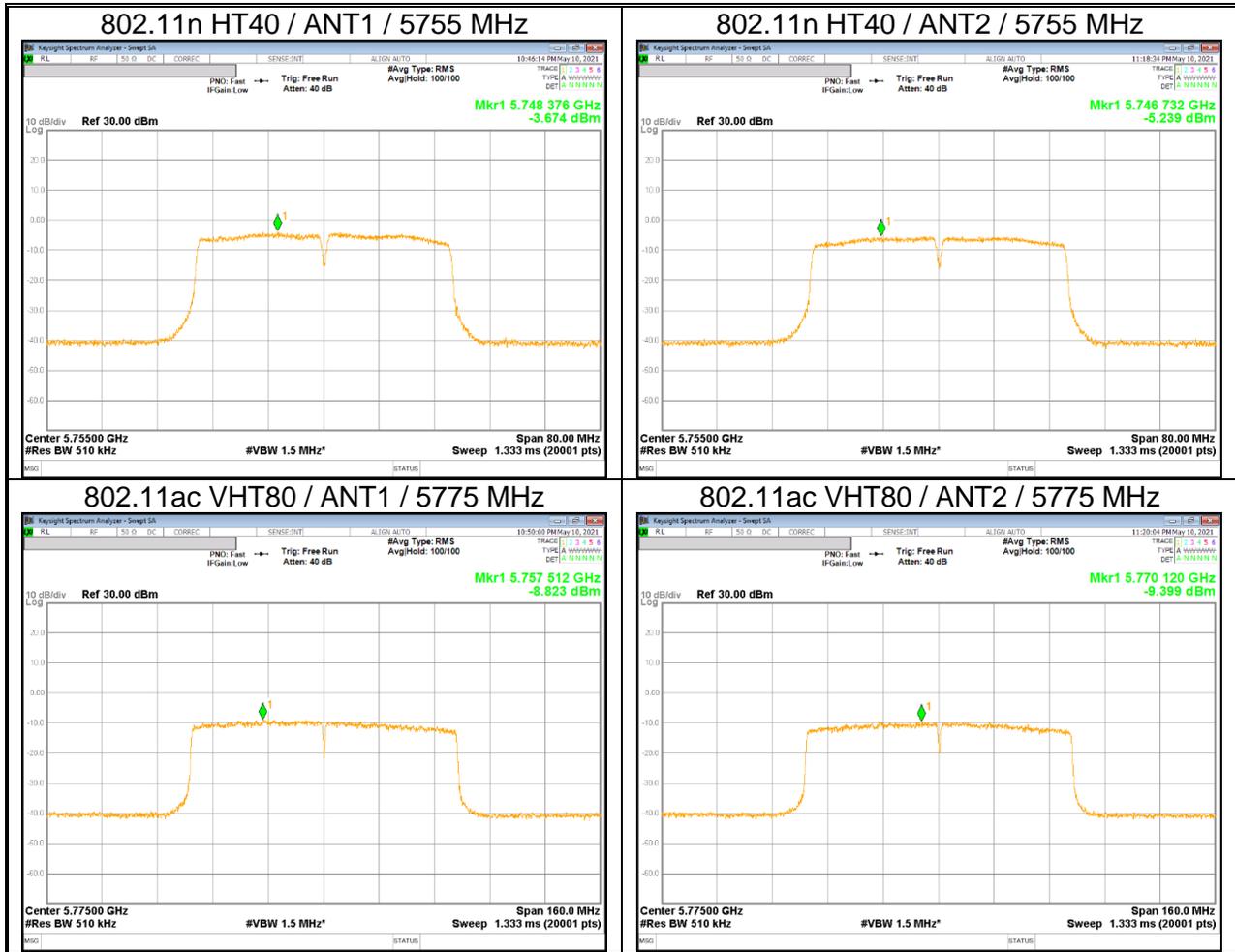




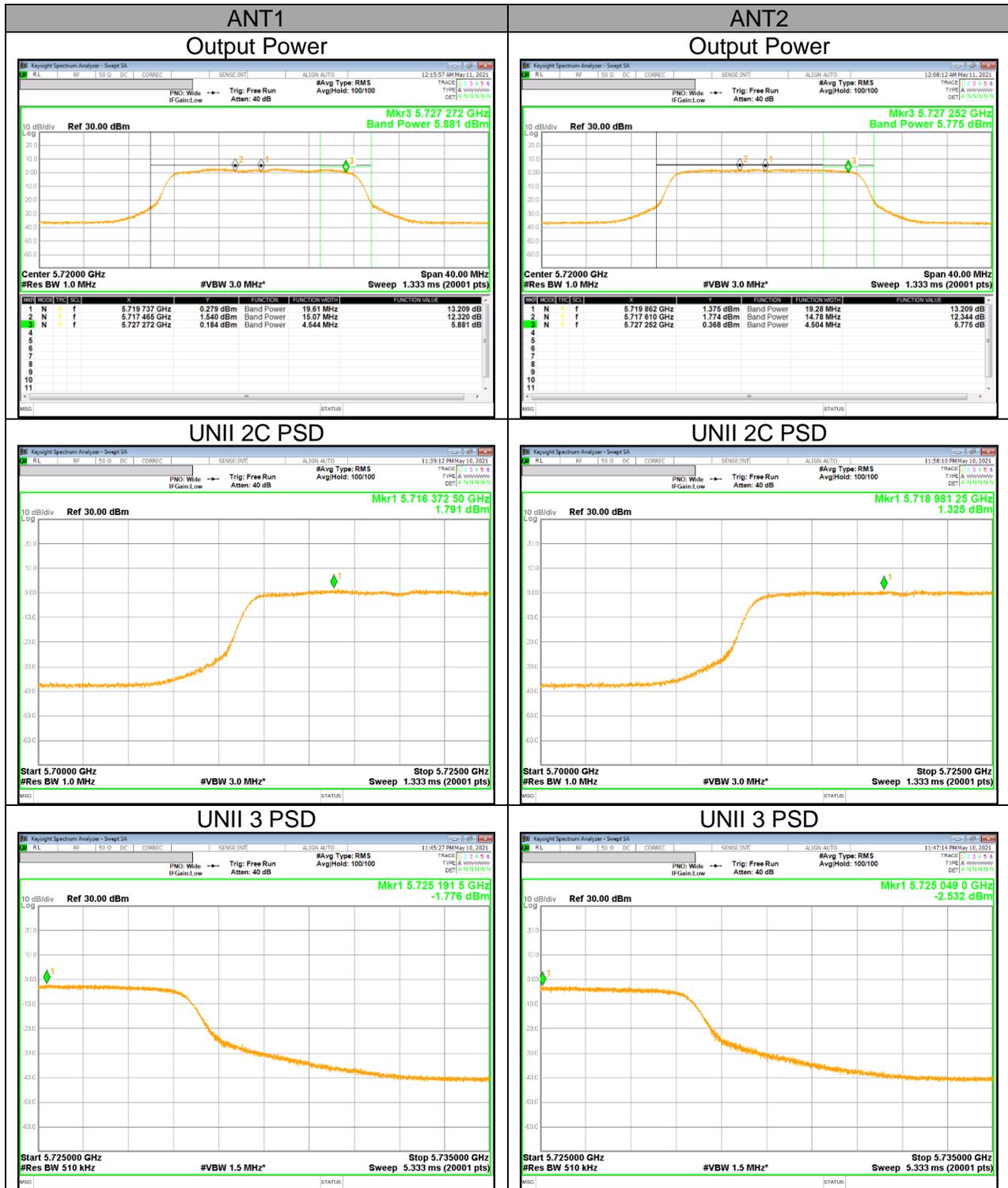


UNII-3





UNII Straddle Ch. IEEE 802.11a mode Output Power and PSD



UNII Straddle Ch. IEEE 802.11n HT20 mode Output Power and PSD

