



CERTIFICATION TEST REPORT

Report Number. : 4790406782-E6V2

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

Model : SM-A236M/DSN, SM-A236M/N

FCC ID : A3LSMA236MN

EUT Description : GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac and
NFC

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

Date Of Issue:
2022-07-12

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ACCREDITED

Testing Laboratory
TL-637

Revision History

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V1	2022-07-01	Initial issue	Sungeun Lee
V2	2022-07-12	Updated to address TCB's question	Sungeun Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC

MODEL NUMBER: SM-A236M/DSN, SM-A236M/N

SERIAL NUMBER: R3CT506PHRL (CONDUCTED, Original);
R3CT506PD1T, R3CT506PDCD (RADIATED, Original);
617c80251d347ece, 617c8028f4347ece (RADIATED, Spot-check);

DATE TESTED: 2022-05-12 ~ 2022-06-29(Original);
2022-06-22 ~ 2022-07-01(Spot-check);

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:



Seokhwan Hong
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Sungeun Lee
Suwon Lab Engineer
UL Korea, Ltd.

1.1. INTRODUCTION OF TEST DATA REUSE

This report referenced from the FCC ID: A3LSMA236BN NII WLAN(FCC CFR 47 Part 15C). And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

1.2. DIFFERENCE

The FCC ID: A3LSMA236MN shares the same enclosure and circuit board as FCC ID: A3LSMA236BN. The WLAN antennas and surrounding circuitry and layout are identical between these two units.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMA236BN remains representative of FCC ID: A3LSMA236MN. The test data of FCC ID: A3LSMA236BN being submitted for this application to cover WLAN features.

1.3. SPOT CHECK VERIFICATION DATA

(Worst case of the radiated band-edge and radiated spurious emissions)

Band	Test Item	Mode	Frequency	Test Limit	Original model	Spot check model	Deviation	Remark
					SM-A236B/DSN Results	SM-A236M/DSN Results		
					FCC ID : A3LSMA236BN	FCC ID : A3LSMA236MN		
NII WLAN (5GHz)	BANDEDGE	802.11ac VHT80	5210 MHz	54.0 dBuV/m	51.33 dBuV/m	51.52 dBuV/m	0.19 dB	
	RSE	802.11a	10400 MHz	68.2 dBuV/m	53.75 dBuV/m	50.89 dBuV/m	-2.86 dB	
	BANDEDGE	802.11ac VHT80	5290 MHz	54.0 dBuV/m	50.09 dBuV/m	51.59 dBuV/m	1.50 dB	
	RSE	802.11a	10520 MHz	68.2 dBuV/m	51.40 dBuV/m	51.56 dBuV/m	0.16 dB	
	BANDEDGE	802.11ac VHT80	5530 MHz	54.0 dBuV/m	49.62 dBuV/m	51.46 dBuV/m	1.84 dB	
	RSE	802.11a	7600 MHz	54.0 dBuV/m	40.40 dBuV/m	41.25 dBuV/m	0.85 dB	
	BANDEDGE	802.11n HT20	5825 MHz	-27.0 dBm	-34.43 dBm	-35.30 dBm	-0.87 dB	
	RSE	802.11a	17355 MHz	68.2 dBuV/m	56.61 dBuV/m	56.45 dBuV/m	-0.16 dB	Noise Floor

Band	Test Item	Test result	Limit	Result
NII WLAN (2A, 2C)	Channel Closing time	3.000 ms	60.000 ms	Complies
	Channel Move time	0.778 s	10.000 s	Complies

Comparison of two models, upper deviation is within 3 dB range and all test results are under FCC Technical Limits.

Note. Slave device follows the operation of the master device. Since channel move & closing time is dependent on the operation of the Master device and has nothing to do with the slave, spot-check was performed only with pass/fail without indicating time deviation.

1.4. REFERENCE DETAIL

Reference application that contains the reused reference data in the individual test reports:

Equipment Class	Reference FCC ID (Parent)	Application Type	Reference Test report number	Exhibit Type	Variant Test Report Number	Data Re-used
DTS	A3LSMA236BN	Original Grant	4790406778-E3 (802.11b/g/n)	Test Report	4790406782-E3 (802.11b/g/n)	All
			4790406778-E4 Bluetooth LE	Test Report	4790406782-E4 Bluetooth LE	All
DSS	A3LSMA236BN	Original Grant	4790406778-E5 (Bluetooth)	Test Report	4790406782-E5 (Bluetooth)	All
NII	A3LSMA236BN	Original Grant	4790406778-E6 (802.11a/n/ac)	Test Report	4790406782-E6 (802.11a/n/ac)	All
DXX	A3LSMA236BN	Original Grant	4790406778-E7 (NFC)	Test Report	4790406782-E7 (NFC)	All

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 291071 DR01-44460(Sept 21, 2021)
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(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 2(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 3(3m semi-anechoic chamber)
<input type="checkbox"/>	Chamber 4(3m Full-anechoic chamber)
<input type="checkbox"/>	Chamber 5(3m Full-anechoic chamber)

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	3.02 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.05 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.78 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.58 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 GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC.
 This test report addresses the NII (WLAN) operational mode.

WiFi operating mode

Frequency range	Mode	Ant.
5GHz (5180 MHz ~ 5825 MHz)	802.11a SISO	TX/RX
	802.11n SISO	TX/RX
	802.11ac SISO	TX/RX

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	15.52	35.65
		802.11n(HT20)	14.38	27.42
	5190 - 5230	802.11n(HT40)	13.37	21.73
	5210	802.11ac(VHT80)	12.62	18.28
UNII-2A	5260 - 5320	802.11a	15.51	35.56
		802.11n(HT20)	14.44	27.80
	5190 - 5230	802.11n(HT40)	13.35	21.63
	5270 - 5310	802.11ac(VHT80)	12.27	16.87
UNII-2C	5500 - 5720	802.11a	15.53	35.73
		802.11n(HT20)	14.88	30.76
	5510 - 5710	802.11n(HT40)	13.64	23.12
	5530 - 5690	802.11ac(VHT80)	12.25	16.79
UNII-3	5745 - 5825	802.11a	15.64	36.64
		802.11n(HT20)	14.72	29.65
	5755 - 5795	802.11n(HT40)	13.74	23.66
	5775	802.11ac(VHT80)	12.55	17.99

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]	ANT Gain [dBi]
UNII 1 5150 - 5250	-3.90
UNII 2A 5250 - 5350	-3.90
UNII 2C 5470 - 5725	-3.90
UNII 3 5725 - 5850	-3.90

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	SISO	802.11a 1TX	
802.11n HT20		802.11n HT20 1TX	
802.11ac VHT20		802.11ac VHT20 1TX	802.11n HT20 1TX
802.11n HT40		802.11n HT40 1TX	
802.11ac VHT40		802.11ac VHT40 1TX	802.11n HT40 1TX
802.11ac VHT80		802.11ac VHT80 1TX	

Note. The target power is the same, and there is no difference in 11ac(VHT20,40) mode and 11n(HT20,40) spot-check data. Test data was reported in 11n(HT20, 40) modes.

Test case configuration for 802.11a, 802.11n HT20 & 40, 802.11ac VHT20 & 40 & 80 modes :

Mode	Band	SISO Target[dBm]		
		802.11a	802.11n	802.11ac
5GHz (20 MHz)	UNII-1	15	14	14
	UNII-2A	15	14	14
	UNII-2C	15	14	14
	UNII-3	15	14	14
5GHz (40 MHz)	UNII-1		13	13
	UNII-2A		13	13
	UNII-2C		13	13
	UNII-3		13	13
5GHz (80 MHz)	UNII-1			12
	UNII-2A			12
	UNII-2C			12
	UNII-3			12

	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 mode. Spot check test was performed in the worst tested band of 802.11a mode.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37MANQ1E72SE3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A BWE	N/A
Earphone	SAMSUNG	GH59-15055A	EHS64AVFWE	N/A

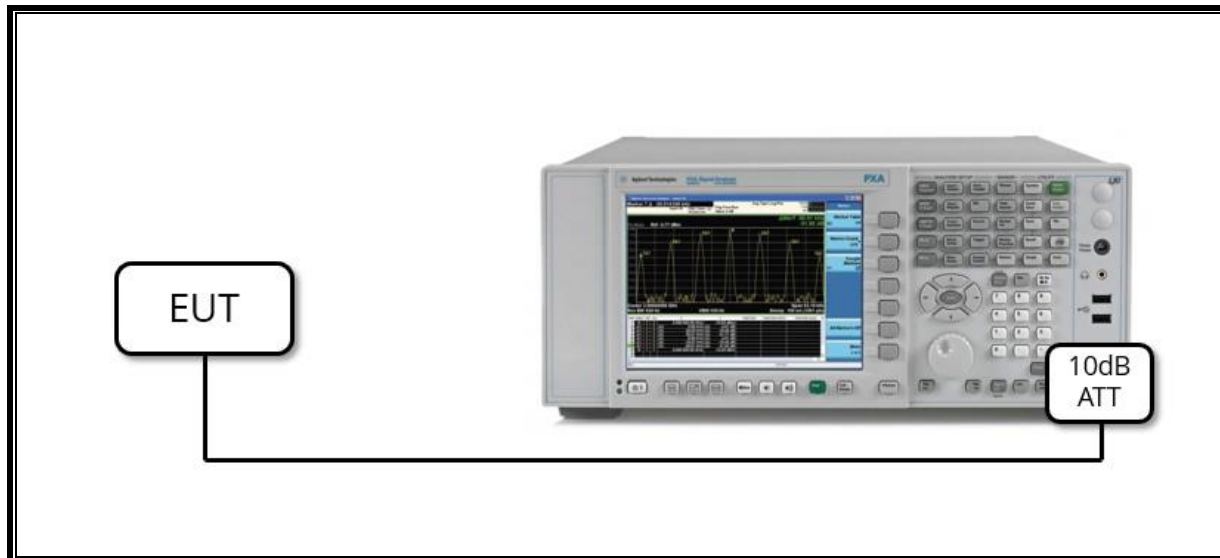
I/O CABLE

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
2	Audio	2	Mini-Jack	Unshielded	0.7 m	N/A

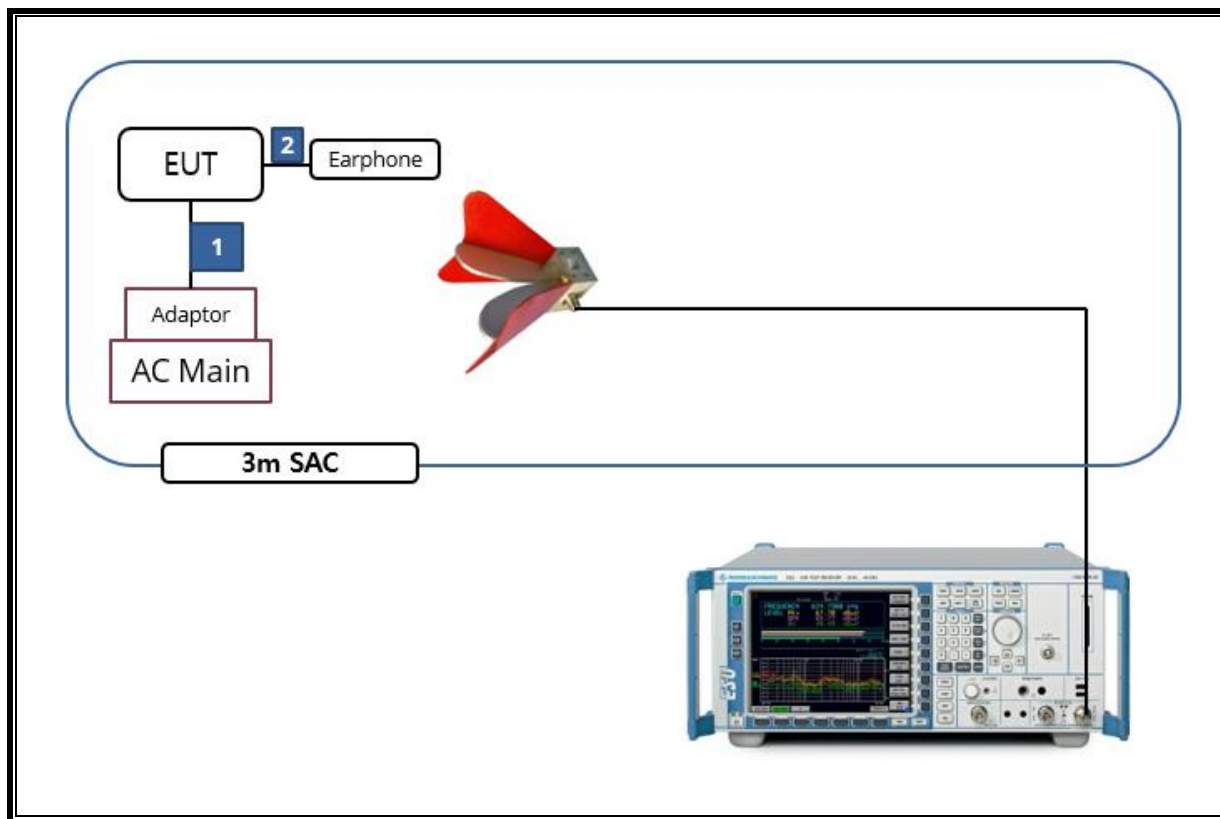
TEST SETUP

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	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	2023-10-13
Preamplifier	ETS	3116C-PA	00168841	2022-08-04
Preamplifier, 1000 MHz	Sonoma	310N	341282	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	370599	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029168	2022-08-02
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2022-08-04
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2022-08-04
Average Power Sensor	Agilent / HP	U2000	MY54270007	2022-08-04
Average Power Sensor	Agilent / HP	U2000	MY54260010	2022-08-04
Attenuator	PASTERNAK	PE7087-10	A001	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2022-08-03
Attenuator	PASTERNAK	PE7004-10	2	2022-08-02
Attenuator	PASTERNAK	PE7087-10	A009	2022-08-03
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2022-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2022-08-02
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2022-08-02
Notch Filter	Micro-Tronics	BRM50702-02	G037	2022-08-03
Notch Filter	Micro-Tronics	BRM50716-2	006	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	019	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	020	2022-08-02
LISN	R&S	ENV-216	101837	2022-08-05
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2023-10-06
Termination	WEINSCHL	M1406A	T09	2022-08-03
Attenuator	WEINSCHL	WA76-30-21	A015	2022-08-03
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	Conducted	Complies
15.407 (a)(1)(iv)	TX Cond. Power (5.150-5.250)	< 24dBm		Complies
15.407 (a)(2)	TX Cond. Power (5.250-5.350 & 5.470-5.725)	< 24dBm or 11+10Log(26dB BW)		Complies
15.407 (a)(3)(i)	TX Cond. Power (5.725-5.850)	< 30dBm		Complies
15.407 (a)(1)(iv) & (a)(2)	PSD (5.150-5.250 & 5.250-5.350 & 5.470-5.725)	< 11dBm/MHz		Complies
15.407 (a)(3)	PSD (5.725-5.850)	< 30dBm/500kHz		Complies
15.207 (a)	AC Power Line conducted emissions	Section 13	Radiated	Complies
15.407 (b) & 15.209	Radiated Spurious Emission	< 74dBuV/m PK < 54dBuV/m AV		Complies
15.407 (h)(2)	Dynamic Frequency Selection	N/A	Condcuted	Complies ^{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	2.795	2.833	0.987	98.659	-
802.11n(HT20)	2.600	2.638	0.986	98.560	-
802.11n(HT40)	2.481	2.519	0.985	98.491	-
802.11ac(VHT80)	2.237	2.276	0.983	98.286	-

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

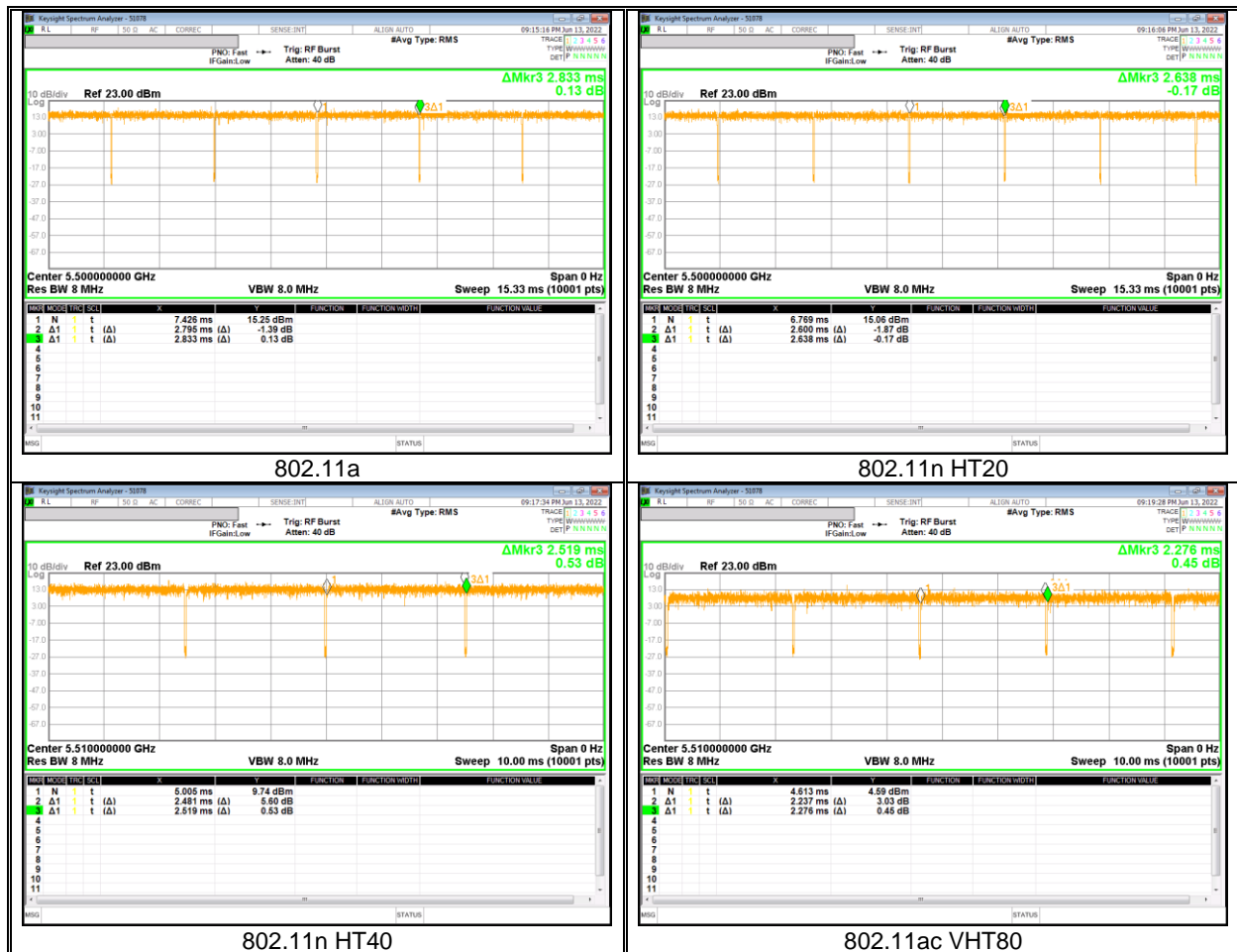
LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

9.2. DUTY CYCLE PLOTS



9.3. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

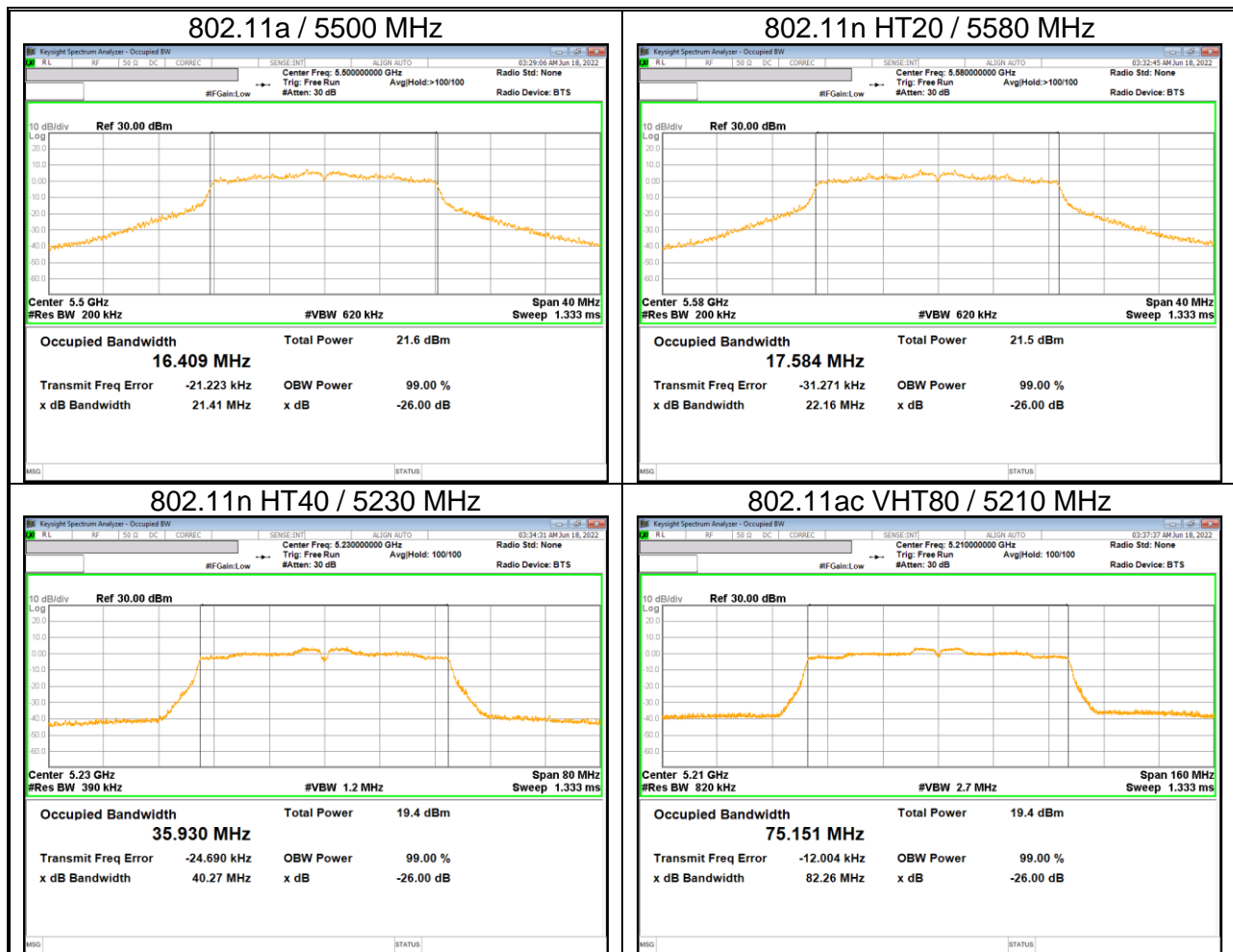
TEST PROCEDURE

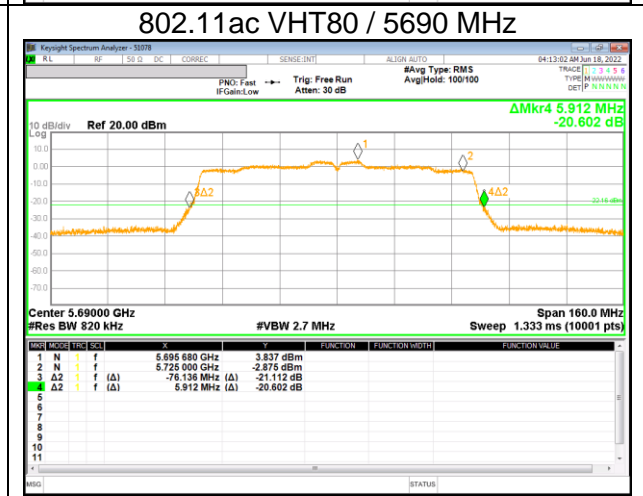
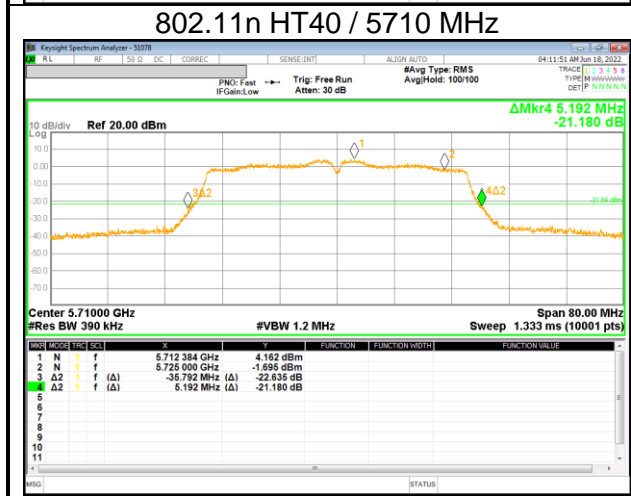
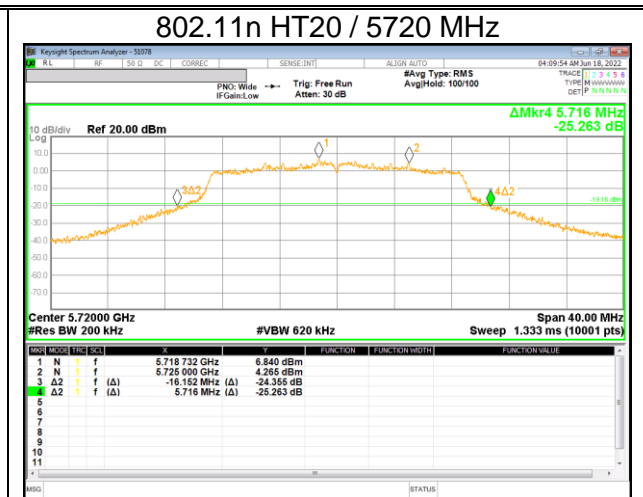
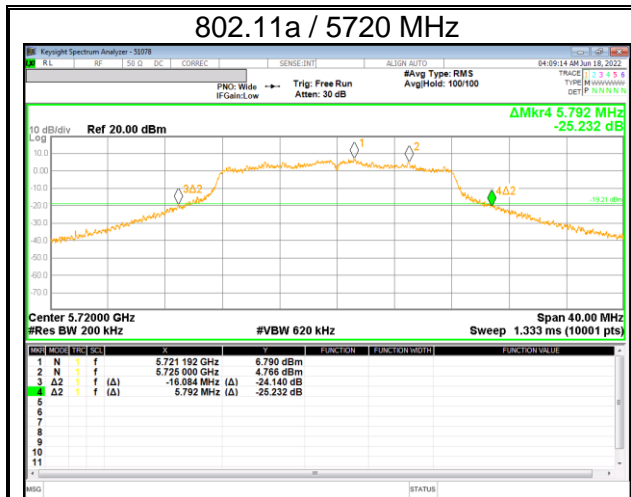
Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to approximately 1% of EBW, the VBW > RBW, peak detector and max hold.

RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS





9.3.1. 802.11a

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]	Worst	99% BW [MHz]
UNII-1 <small>Note</small>	36	5180	20.410	20.870	16.394
	40	5200	20.870		16.404
	48	5240	20.680		16.395
UNII-2A <small>Note</small>	52	5260	20.880	21.140	16.410
	60	5300	21.140		16.399
	64	5320	20.840		16.394
UNII-2C	100	5500	21.410	21.410	
	116	5580	22.260		
	140	5700	21.390		

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

9.3.2. 802.11n HT20

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]	Worst	99% BW [MHz]
UNII-1 <small>Note</small>	36	5180	21.060	21.790	17.577
	40	5200	20.980		17.557
	48	5240	21.790		17.587
UNII-2A <small>Note</small>	52	5260	21.580	21.580	17.588
	60	5300	21.100		17.579
	64	5320	21.500		17.599
UNII-2C	100	5500	22.030	22.160	
	116	5580	22.160		
	140	5700	21.550		

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

9.3.3. 802.11n HT40

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]	Worst	99% BW [MHz]
UNII-1 <small>Note</small>	38	5190	39.990	40.270	35.939
	46	5230	40.270		35.930
UNII-2A <small>Note</small>	54	5270	40.030	40.070	35.976
	62	5310	40.070		35.939
UNII-2C	102	5510	39.990	40.100	
	118	5590	39.670		
	134	5670	40.100		

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

9.3.4. 802.11ac VHT80

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]	Worst	99% BW [MHz]
UNII-1 ^{Note}	42	5210	82.260	82.260	75.151
UNII-2A ^{Note}	58	5290	81.660	81.660	75.127
UNII-2C	106	5530	81.430	82.110	
	122	5610	82.110		

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

9.3.5. STRADDLE CHANNEL

Mode	Channel	Center Freq. [MHz]	26 dB BW [MHz]	
			UNII-2C	UNII-3
802.11a	Straddle	5720	16.084	5.792
802.11n HT20	Straddle	5720	16.152	5.716
802.11n HT40	Straddle	5710	35.792	5.192
802.11ac VHT80	Straddle	5690	76.136	5.912

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.

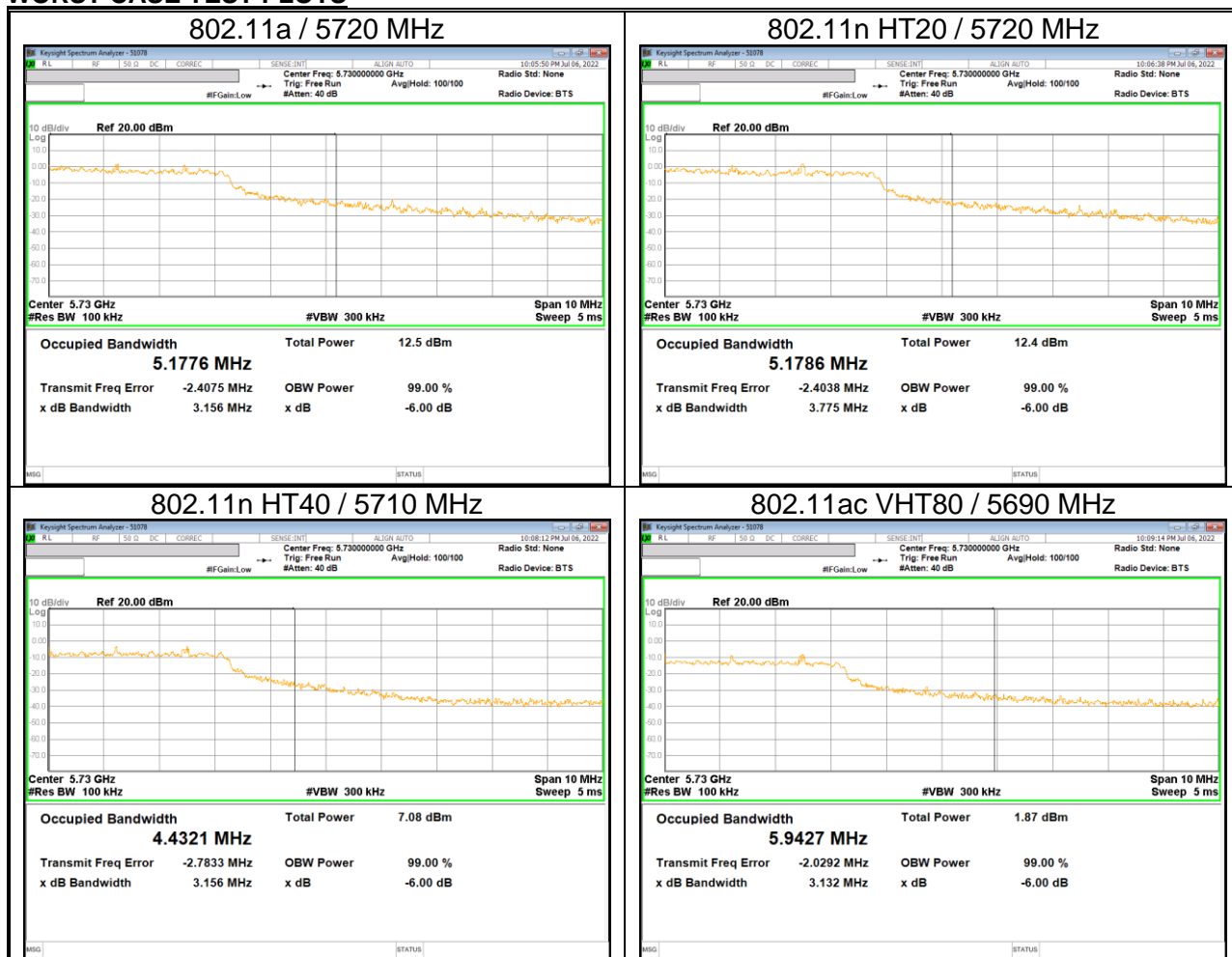
TEST PROCEDURE

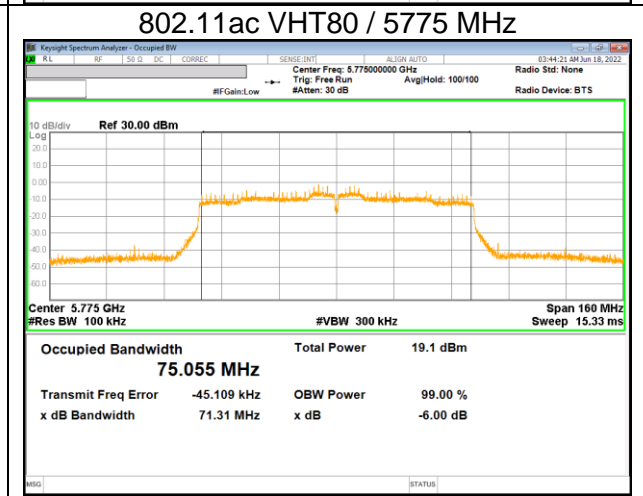
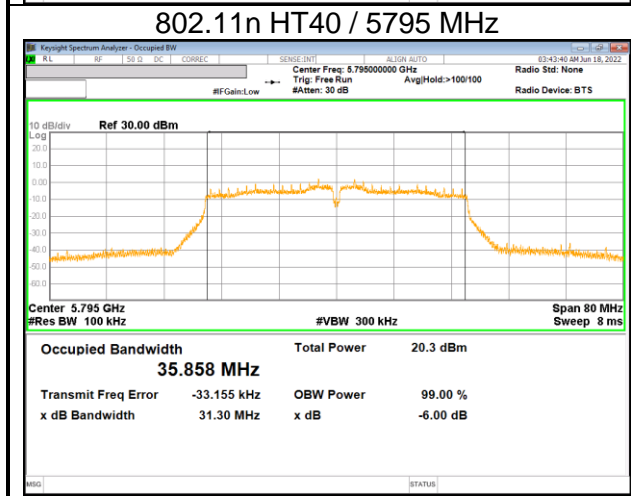
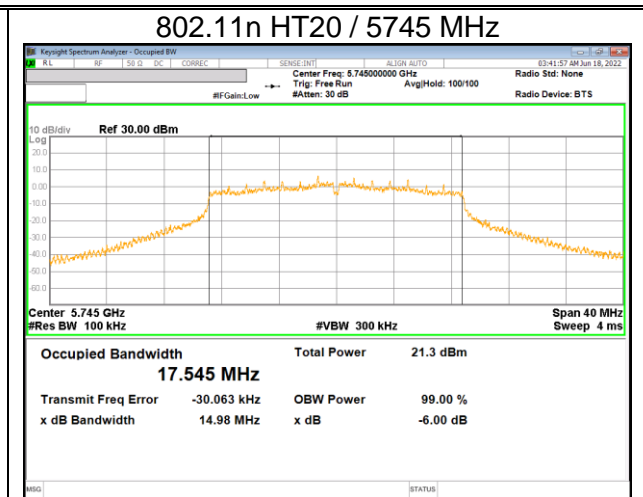
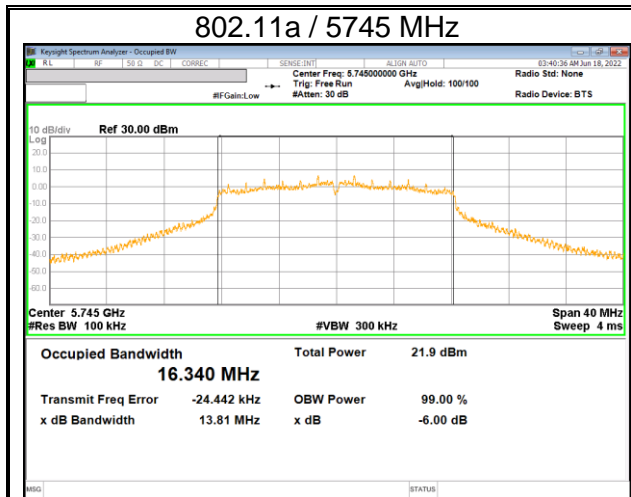
Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100kHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS





10.1.1. STRADDLE CHANNEL

Mode	Channel	Center Freq. [MHz]	6 dB BW [MHz]	Worst	Minimum Limit [MHz]
802.11a	144	5720	3.156	3.156	0.5
802.11n HT20	144	5720	3.775	3.775	
802.11n HT40	142	5710	3.156	3.156	
802.11ac VHT80	138	5690	3.132	3.132	

10.1.2. UNII-3 BAND

Mode	Channel	Center Freq. [MHz]	6 dB BW [MHz]	Worst	Minimum Limit [MHz]
802.11a	149	5745	13.810	13.810	0.5
	157	5785	15.080		
	165	5825	15.060		
802.11n HT20	149	5745	14.980	14.980	
	157	5785	15.000		
	165	5825	15.050		
802.11n HT40	151	5755	35.030	31.300	
	159	5795	31.300		
802.11ac VHT80	155	5775	71.310	71.310	

10.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a)(1)(iv), (a)(2), (a)(3)(i), (a)(3)(iii)

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 $11 \text{ dBm} + 10 \log B$, 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 5.725-5.850 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. 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.

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. For the band 5.850-5.895 GHz, The correlated gain is added to the result to convert e.i.r.p.

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]	ANT Gain [dBi]
UNII 1 5150 - 5250	-3.90
UNII 2A 5250 - 5350	-3.90
UNII 2C 5470 - 5725	-3.90
UNII 3 5725 - 5850	-3.90

10.2.1. 802.11a MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]	Corr'd Power [dBm]	Limit [dBm]
UNII-1	36	5180	15.51	15.51	23.98
	40	5200	15.28	15.28	
	48	5240	15.52	15.52	
UNII-2A	52	5260	15.51	15.51	23.98
	60	5300	15.40	15.40	
	64	5320	15.46	15.46	
UNII-2C	100	5500	15.45	15.45	23.98
	116	5580	15.53	15.53	
	140	5700	15.31	15.31	
UNII-3	149	5745	15.29	15.29	30.00
	157	5785	15.64	15.64	
	165	5825	15.34	15.34	

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

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]	DCCF.	Corr'd PSD [dBm]	Limit [dBm/MHz]
UNII-1	36	5180	6.363	-	6.363	11.00
	40	5200	5.716	-	5.716	
	48	5240	6.463	-	6.463	
UNII-2A	52	5260	6.128	-	6.128	11.00
	60	5300	5.776	-	5.776	
	64	5320	6.041	-	6.041	
UNII-2C	100	5500	6.096	-	6.096	11.00
	116	5580	6.684	-	6.684	
	140	5700	6.308	-	6.308	
UNII-3	149	5745	3.730	-	3.730	30.00/500kHz
	157	5785	4.072	-	4.072	
	165	5825	3.833	-	3.833	

* Calculation of PSD: Corr'd PSD = Meas PSD + Duty CF [dB]

10.2.2. 802.11n HT20 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]	Corr'd Power [dBm]	Limit [dBm]
UNII-1	36	5180	14.18	14.18	23.98
	40	5200	14.11	14.11	
	48	5240	14.38	14.38	
UNII-2A	52	5260	14.44	14.44	23.98
	60	5300	14.37	14.37	
	64	5320	14.27	14.27	
UNII-2C	100	5500	14.11	14.11	23.98
	116	5580	14.88	14.88	
	140	5700	14.72	14.72	
UNII-3	149	5745	14.72	14.72	30.00
	157	5785	14.28	14.28	
	165	5825	14.72	14.72	

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

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]	DCCF.	Corr'd PSD [dBm]	Limit [dBm/MHz]
UNII-1	36	5180	4.753	-	4.753	11.00
	40	5200	4.969	-	4.969	
	48	5240	4.806	-	4.806	
UNII-2A	52	5260	4.732	-	4.732	11.00
	60	5300	4.740	-	4.740	
	64	5320	4.682	-	4.682	
UNII-2C	100	5500	4.394	-	4.394	11.00
	116	5580	5.810	-	5.810	
	140	5700	5.325	-	5.325	
UNII-3	149	5745	2.786	-	2.786	30.00/500kHz
	157	5785	2.684	-	2.684	
	165	5825	2.938	-	2.938	

* Calculation of PSD: Corr'd PSD = Meas PSD + Duty CF [dB]

10.2.3. 802.11n HT40 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]	Corr'd Power [dBm]	Limit [dBm]
UNII-1	38	5190	13.31	13.31	23.98
	46	5230	13.37	13.37	
UNII-2A	54	5270	13.35	13.35	23.98
	62	5310	13.19	13.19	
UNII-2C	102	5510	13.26	13.26	23.98
	118	5590	13.35	13.35	
	134	5670	13.64	13.64	
UNII-3	151	5755	13.63	13.63	30.00
	159	5795	13.74	13.74	

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

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]	DCCF.	Corr'd PSD [dBm]	Limit [dBm/MHz]
UNII-1	38	5190	0.707	-	0.707	11.00
	46	5230	0.696	-	0.696	
UNII-2A	54	5270	0.746	-	0.746	11.00
	62	5310	0.985	-	0.985	
UNII-2C	102	5510	0.982	-	0.982	11.00
	118	5590	1.506	-	1.506	
	134	5670	1.457	-	1.457	
UNII-3	151	5755	-0.970	-	-0.970	30.00/500kHz
	159	5795	-1.177	-	-1.177	

* Calculation of PSD: Corr'd PSD = Meas PSD + Duty CF [dB]

10.2.4. 802.11ac VHT80 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]	Corr'd Power [dBm]	Limit [dBm]
UNII-1	42	5210	12.62	12.62	23.98
UNII-2A	58	5290	12.27	12.27	23.98
UNII-2C	106	5530	12.25	12.25	23.98
	122	5610	12.24	12.24	
UNII-3	155	5775	12.55	12.55	30.00

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

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]	DCCF.	Corr'd PSD [dBm]	Limit [dBm/MHz]
UNII-1	42	5210	-3.208	-	-3.208	11.00
UNII-2A	58	5290	-3.147	-	-3.147	11.00
UNII-2C	106	5530	-3.084	-	-3.084	11.00
	122	5610	-2.693	-	-2.693	
UNII-3	155	5775	-5.299	-	-5.299	30.00/500kHz

* Calculation of PSD: Corr'd PSD = Meas PSD + Duty CF [dB]

10.2.5. STRADDLE CHANNEL

Output Power Results

Mode	Band	Center Freq. [MHz]	Meas Power [dBm]	DCCF.	Corr'd Power [dBm]	Limit [dBm]
802.11a	UNII-2C	5720	14.336	-	14.336	23.06
	UNII-3		6.033	-	6.033	30.00
802.11n HT20	UNII-2C	5720	13.498	-	13.498	23.08
	UNII-3		5.774	-	5.774	30.00
802.11n HT40	UNII-2C	5710	12.753	-	12.753	23.98
	UNII-3		-0.044	-	-0.044	30.00
802.11ac VHT80	UNII-2C	5690	11.478	-	11.478	23.98
	UNII-3		-4.601	-	-4.601	30.00

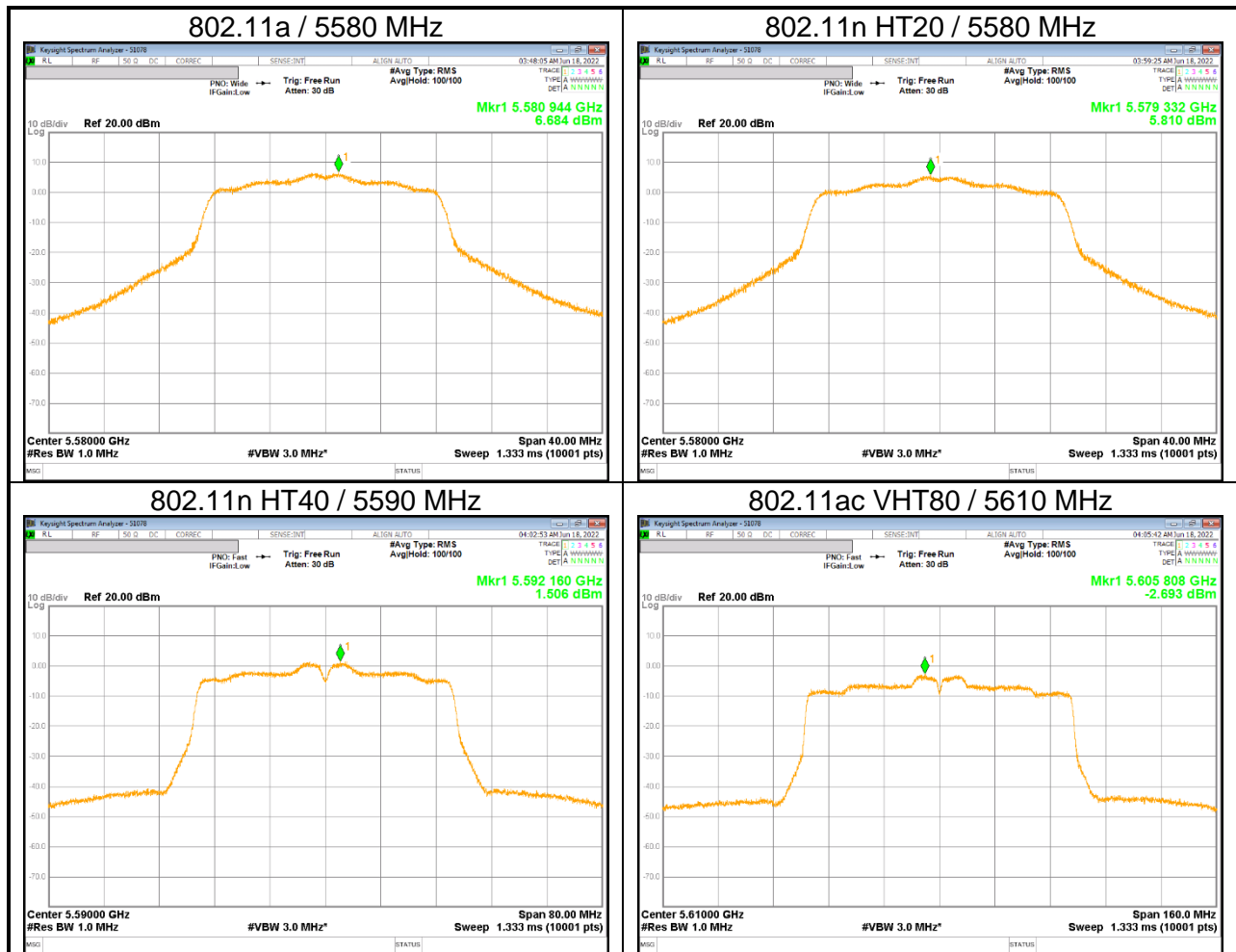
* Calculation of Output Power : Corr'd Power = Meas. Power + Duty CF [dB]

PSD Results

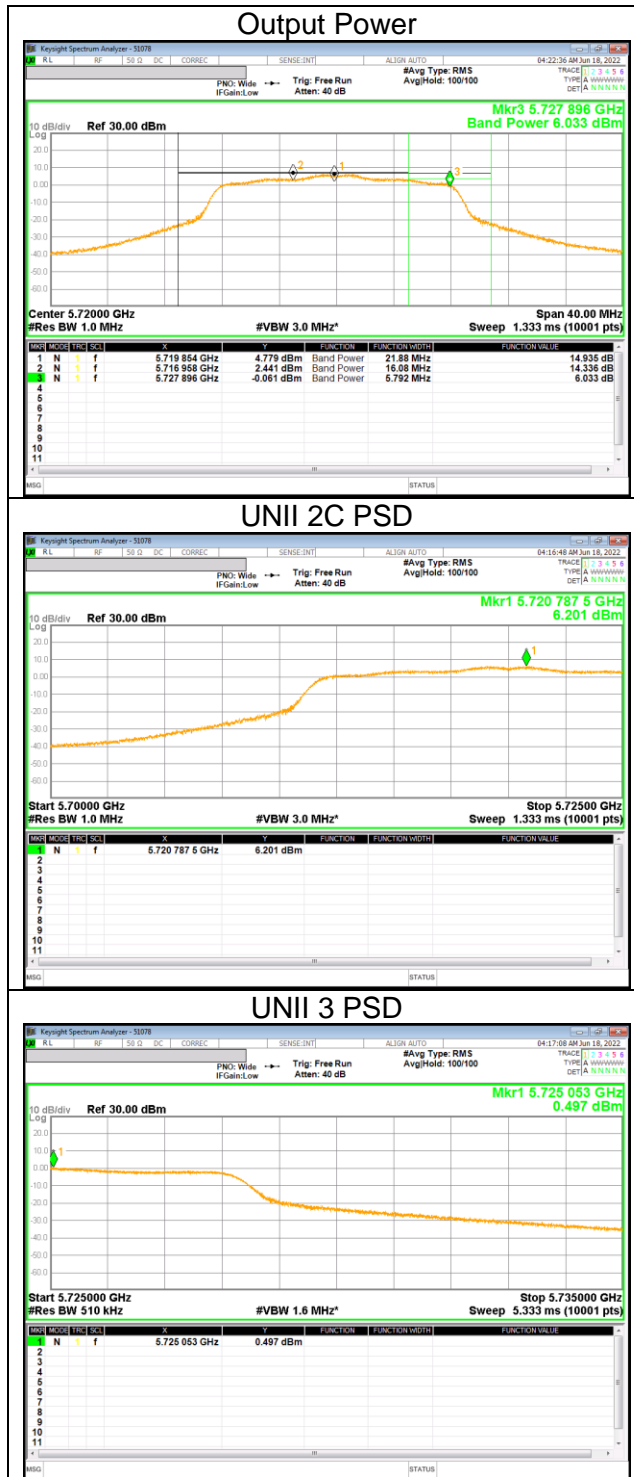
Mode	Band	Center Freq. [MHz]	Meas PSD [dBm/MHz]	DCCF.	Corr'd PSD [dBm]	Limit [dBm/MHz]
802.11a	UNII-2C	5720	6.201	-	6.201	11.00
	UNII-3		0.497	-	0.497	30.00/500kHz
802.11n HT20	UNII-2C	5720	5.405	-	5.405	11.00
	UNII-3		-0.205	-	-0.205	30.00/500kHz
802.11n HT40	UNII-2C	5710	1.569	-	1.569	11.00
	UNII-3		-6.660	-	-6.660	30.00/500kHz
802.11ac VHT80	UNII-2C	5690	-3.005	-	-3.005	11.00
	UNII-3		-11.053	-	-11.053	30.00/500kHz

* Calculation of PSD: Corr'd PSD = Meas PSD + Duty CF [dB]

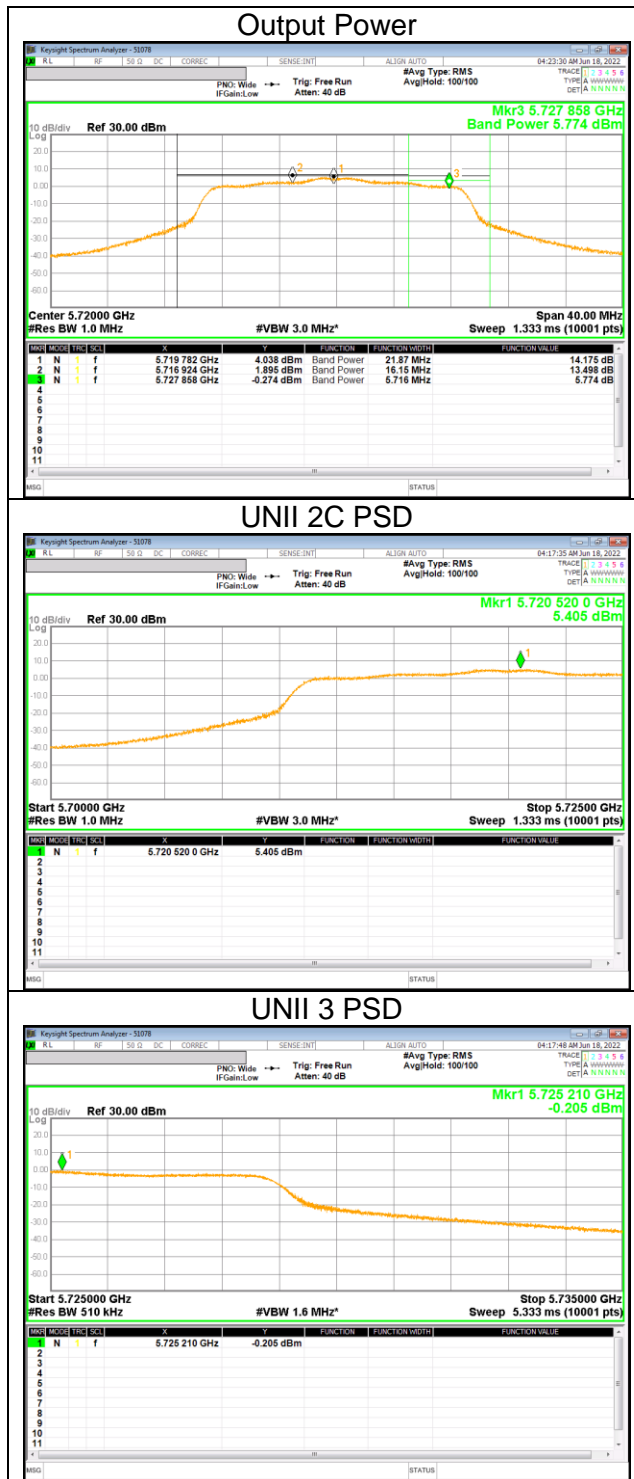
10.2.6. OUTPUT POWER AND PPSD PLOTS (WORST CASE)



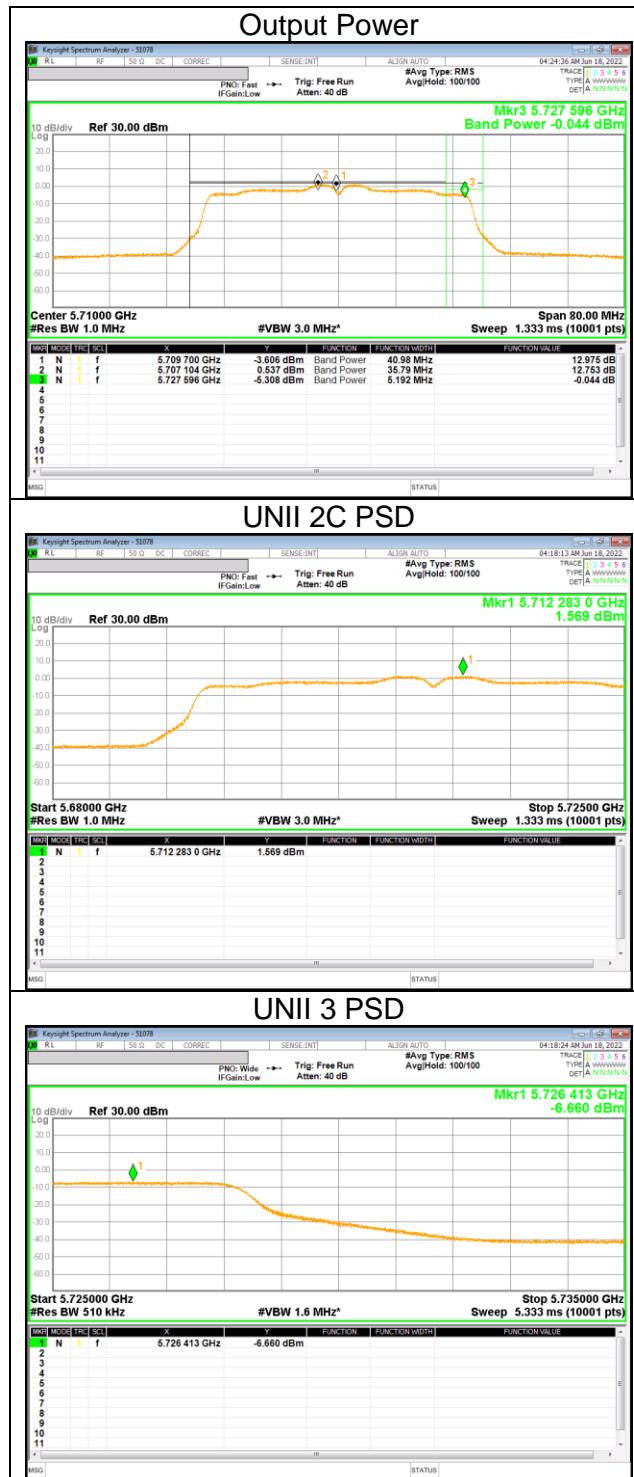
UNII Straddle Ch. IEEE 802.11a mode Output Power and PSD



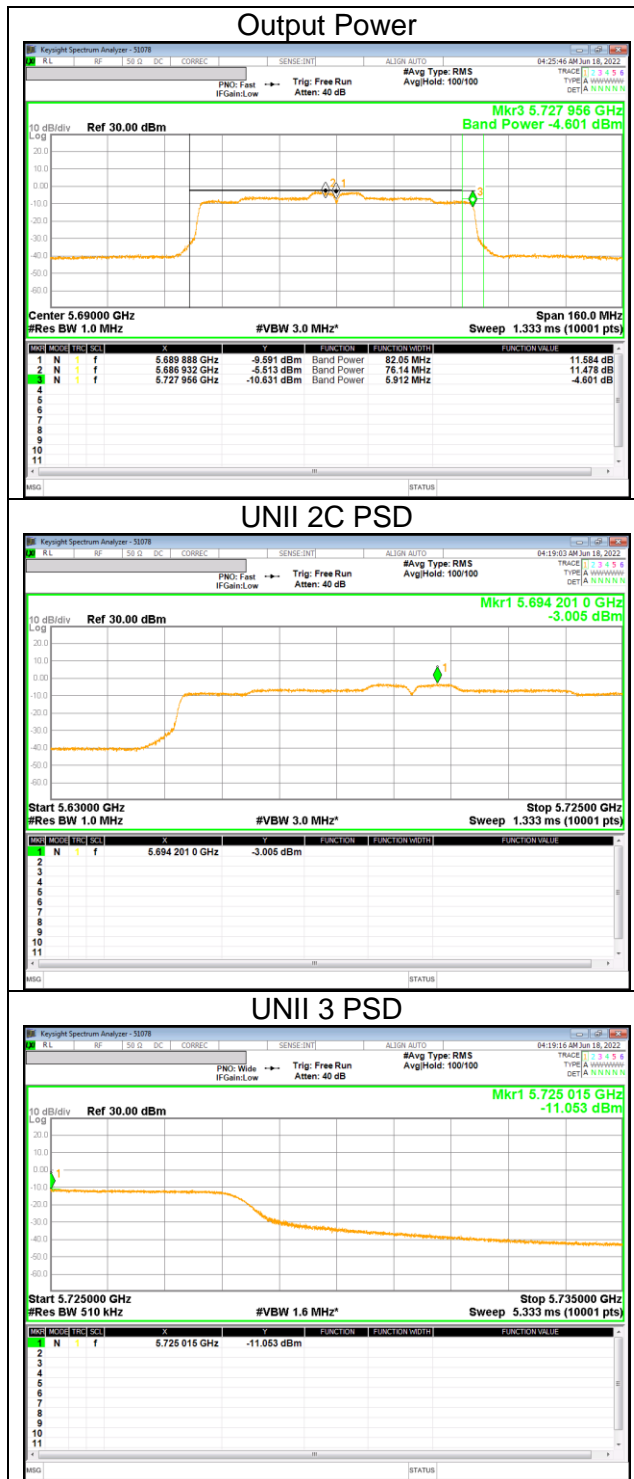
UNII Straddle Ch. IEEE 802.11n HT20 mode Output Power and PSD



UNII Straddle Ch. IEEE 802.11n HT40 mode Output Power and PSD



UNII Straddle Ch. IEEE 802.11ac VHT80 mode Output Power and PSD



11. TRANSMITTER ABOVE 1 GHz

LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

FCC Part 15.205 (a) : Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~ 156.52525	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.7 ~ 156.9	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	162.0125 ~ 167.17	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	167.72 ~ 173.2	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	240 ~ 285	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	322 ~ 335.4	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	960 ~ 1240	3345.8 ~ 3358 3600 ~ 4400		

▪ FCC Part 15.205(b) : The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

FCC §15.407 (b)

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
 - (iii) For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of -27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of 27 dBm/MHz at 5.725 GHz
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary,
provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

Note

- Limit translation to field strength level (FCC §15.407)

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2 = -27\text{dBm} + 95.2 = 68.2\text{dBuV/m}$$

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2 = -17\text{dBm} + 95.2 = 78.2\text{dBuV/m}$$

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 100 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Reference to KDB 789033 D02 v02r01 UNII part G) 6) c) Method AD:

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor to the reading offset for average measurements. In UNII-4, unwanted emissions outside of restricted bands are measured with an RMS detector.

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1GHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

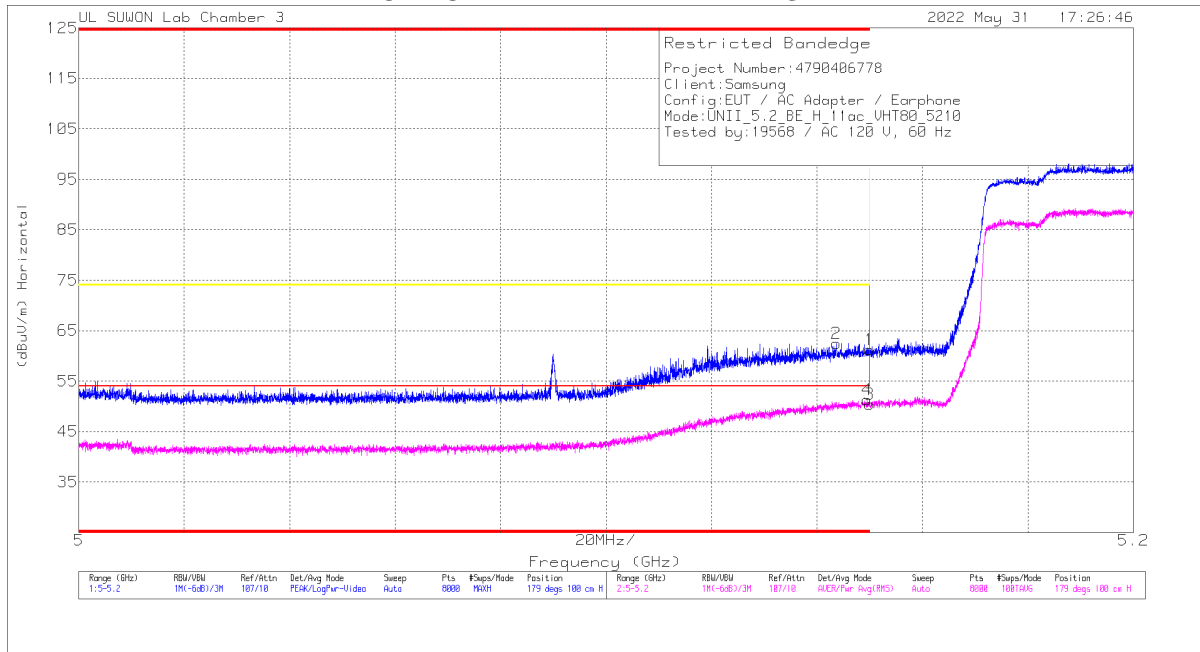
Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open area test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

11.1. TX ABOVE 1GHz 1Tx MODE IN THE 5.2GHz BAND

BANDEDGE (WORST CASE: 802.11ac VHT80 / 5210 MHz)

HORIZONTAL PEAK AND AVERAGE DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.14999	46.97	Pk		-20.6	0	61.17	-	-	74	-12.83	179	100	H
2	* 5.14999	48.29	Pk		-20.6	0	62.49	-	-	74	-11.51	179	100	H
3	* 5.14999	36.16	RMS		-20.6	0	50.36	54	-3.64	-	-	179	100	H
4	* 5.14954	37.13	RMS		-20.6	0	51.33	54	-2.67	-	-	179	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

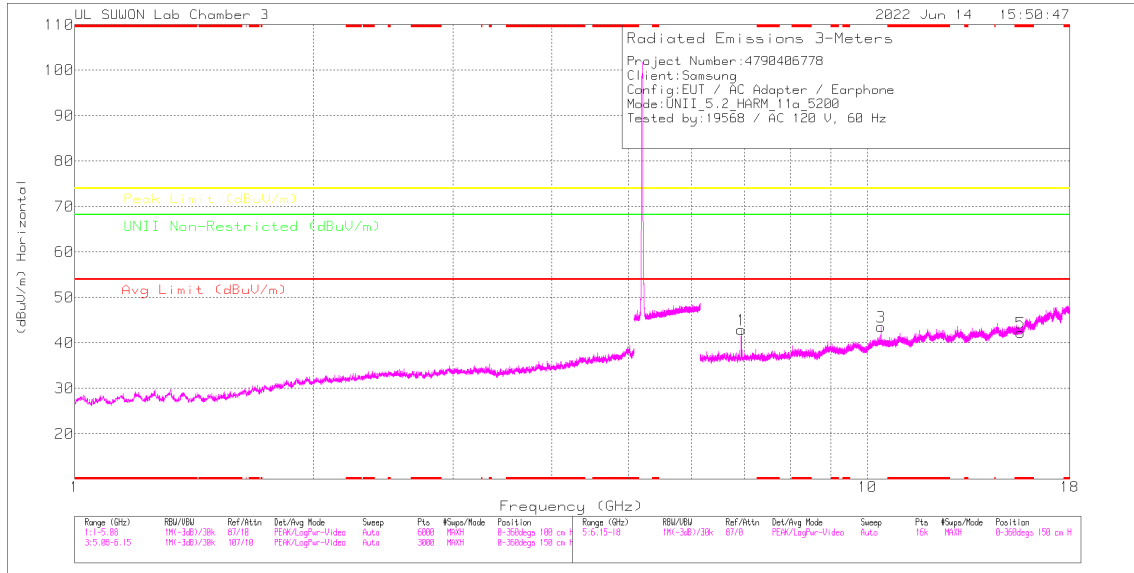
RMS - RMS detection

BANDEDGE TEST DATA

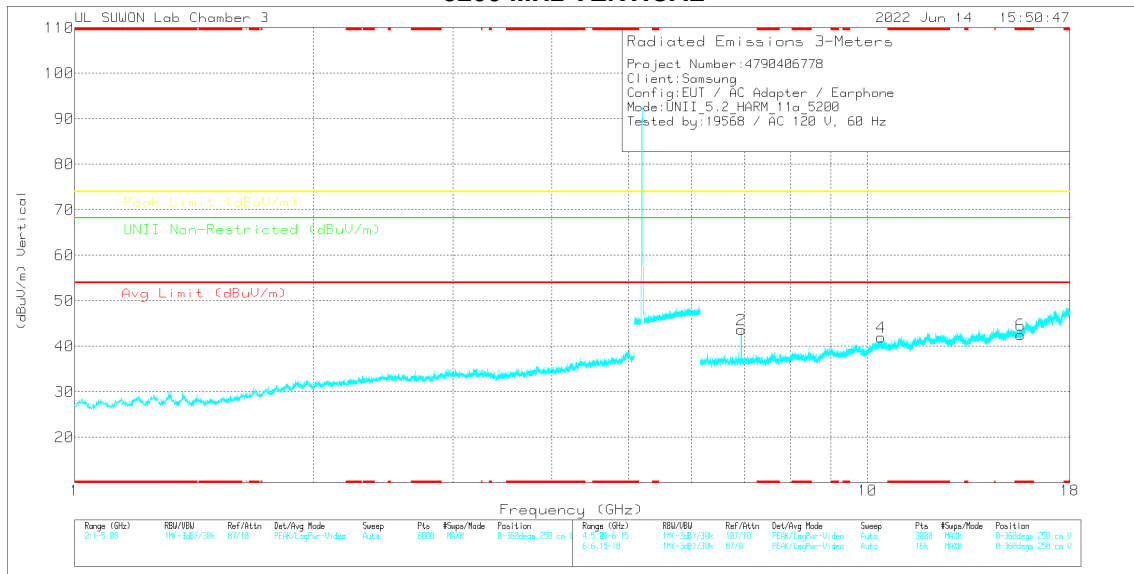
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	5180	ANT1	* 5.14999	40.11	Pk	34.80	-20.60	0.00	54.31	-	-	74.00	-19.69	159	149	H
			* 5.14467	41.34	Pk	34.80	-20.60	0.00	55.54	-	-	74.00	-18.46	159	149	H
			* 5.14999	29.45	RMS	34.80	-20.60	0.00	43.65	54.00	-10.35	-	-	159	149	H
			* 5.14984	30.49	RMS	34.80	-20.60	0.00	44.69	54.00	-9.31	-	-	159	149	H
			* 5.14999	37.79	Pk	34.80	-20.60	0.00	51.99	-	-	74.00	-22.01	267	121	V
			* 5.03495	40.05	Pk	34.70	-20.60	0.00	54.15	-	-	74.00	-19.85	267	121	V
			* 5.14999	28.11	RMS	34.80	-20.60	0.00	42.31	54.00	-11.69	-	-	267	121	V
* 5.00738	29.39	RMS	34.70	-20.70	0.00	43.39	54.00	-10.61	-	-	267	121	V			
802.11n (HT20)	5180	ANT1	* 5.14999	39.83	Pk	34.80	-20.60	0.00	54.03	-	-	74.00	-19.97	174	100	H
			* 5.14874	41.68	Pk	34.80	-20.60	0.00	55.88	-	-	74.00	-18.12	174	100	H
			* 5.14999	29.97	RMS	34.80	-20.60	0.00	44.17	54.00	-9.83	-	-	174	100	H
			* 5.14984	31.01	RMS	34.80	-20.60	0.00	45.21	54.00	-8.79	-	-	174	100	H
			* 5.14999	37.90	Pk	34.80	-20.60	0.00	52.10	-	-	74.00	-21.90	251	106	V
			* 5.0037	40.69	Pk	34.70	-20.60	0.00	54.79	-	-	74.00	-19.21	251	106	V
			* 5.14999	27.33	RMS	34.80	-20.60	0.00	41.53	54.00	-12.47	-	-	251	106	V
* 5.00815	29.37	RMS	34.70	-20.70	0.00	43.37	54.00	-10.63	-	-	251	106	V			
802.11n (HT40)	5190	ANT1	* 5.14999	45.22	Pk	34.80	-20.60	0.00	59.42	-	-	74.00	-14.58	178	100	H
			* 5.14729	46.66	Pk	34.80	-20.60	0.00	60.86	-	-	74.00	-13.14	178	100	H
			* 5.14999	33.71	RMS	34.80	-20.60	0.00	47.91	54.00	-6.09	-	-	178	100	H
			* 5.14977	33.90	RMS	34.80	-20.60	0.00	48.10	54.00	-5.90	-	-	178	100	H
			* 5.14999	38.31	Pk	34.80	-20.60	0.00	52.51	-	-	74.00	-21.49	251	107	V
			* 5.00258	40.92	Pk	34.70	-20.60	0.00	55.02	-	-	74.00	-18.98	251	107	V
			* 5.14999	28.90	RMS	34.80	-20.60	0.00	43.10	54.00	-10.90	-	-	251	107	V
* 5.14944	29.27	RMS	34.80	-20.60	0.00	43.47	54.00	-10.53	-	-	251	107	V			
802.11ac (VHT80)	5210	ANT1	* 5.14999	46.97	Pk	34.80	-20.60	0.00	61.17	-	-	74.00	-12.83	179	100	H
			* 5.14362	48.29	Pk	34.80	-20.60	0.00	62.49	-	-	74.00	-11.51	179	100	H
			* 5.14999	36.16	RMS	34.80	-20.60	0.00	50.36	54.00	-3.64	-	-	179	100	H
			* 5.14954	37.13	RMS	34.80	-20.60	0.00	51.33	54.00	-2.67	-	-	179	100	H
			* 5.14999	39.79	Pk	34.80	-20.60	0.00	53.99	-	-	74.00	-20.01	252	107	V
			* 5.12517	42.31	Pk	34.80	-20.60	0.00	56.51	-	-	74.00	-17.49	252	107	V
			* 5.14999	30.74	RMS	34.80	-20.60	0.00	44.94	54.00	-9.06	-	-	252	107	V
* 5.14929	30.96	RMS	34.80	-20.60	0.00	45.16	54.00	-8.84	-	-	252	107	V			

Note1. Pk - Peak detector, RMS - RMS detector
 Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5200 MHz)
5200 MHz HORIZONTAL



5200 MHz VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Max. Reading (dBuV)	Det	317_0021867	ISRL-HP(50)	DC Corr (dB)	Commod Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Altitude (Degs)	Height (m)	Polarity
6.93329	40.42	PK-U	36.2	-26.7	0	49.92	-	-	-	-	68.2	-18.28	162	241	H
10.40019	37.05	PK-U	38.1	-21.4	0	53.75	-	-	-	-	68.2	-14.45	125	104	H
* 15.59841	33.35	PK-U	40.3	-21.8	0	51.85	-	-	74	-22.15	-	-	0	100	H
* 15.59834	34	PK-U	40.3	-21.8	0	52.5	-	-	74	-21.5	-	-	0	100	V
6.93329	41.15	PK-U	36.2	-26.7	0	50.65	-	-	-	-	68.2	-17.55	169	100	V
10.40011	34.76	PK-U	39.1	-21.4	0	51.46	-	-	-	-	68.2	-16.74	241	119	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
802.11a	5180	ANT1	10.360	35.36	PK-U	38.10	-21.30	0.00	52.16	-	-	-	-	68.20	-16.04	120	119	H	
			6.907	39.98	PK-U	36.20	-26.90	0.00	49.28	-	-	-	-	68.20	-18.92	152	242	H	
			* 15.54721	34.36	PK-U	40.20	-21.90	0.00	52.66	-	-	74.00	-21.34	-	-	0	100	H	
			6.907	40.65	PK-U	36.20	-26.80	0.00	50.05	-	-	-	-	-	68.20	-18.15	159	101	V
			10.360	34.97	PK-U	38.10	-21.30	0.00	51.77	-	-	-	-	-	68.20	-16.43	91	104	V
			* 15.54083	33.85	PK-U	40.20	-22.00	0.00	52.05	-	-	74.00	-21.95	-	-	0	100	V	
	5200	ANT1	6.933	40.42	PK-U	36.20	-26.70	0.00	49.92	-	-	-	-	68.20	-18.28	162	241	H	
			10.400	37.05	PK-U	38.10	-21.40	0.00	53.75	-	-	-	-	68.20	-14.45	125	104	H	
			* 15.59841	33.35	PK-U	40.30	-21.80	0.00	51.85	-	-	74.00	-22.15	-	-	0	100	H	
			* 15.59834	34.00	PK-U	40.30	-21.80	0.00	52.50	-	-	74.00	-21.50	-	-	0	100	V	
			6.933	41.15	PK-U	36.20	-26.70	0.00	50.65	-	-	-	-	-	68.20	-17.55	169	100	V
			10.400	34.76	PK-U	38.10	-21.40	0.00	51.46	-	-	-	-	-	68.20	-16.74	241	119	V
	5240	ANT1	6.987	38.58	PK-U	36.20	-26.00	0.00	48.78	-	-	-	-	68.20	-19.42	155	115	H	
			10.479	33.50	PK-U	38.20	-21.20	0.00	50.50	-	-	-	-	68.20	-17.70	0	100	H	
			* 15.72827	34.00	PK-U	40.50	-20.90	0.00	53.60	-	-	74.00	-20.40	-	-	0	100	H	
			6.987	40.76	PK-U	36.20	-26.00	0.00	50.96	-	-	-	-	-	68.20	-17.24	169	101	V
			10.479	33.47	PK-U	38.20	-21.20	0.00	50.47	-	-	-	-	-	68.20	-17.73	0	100	V
			* 15.71877	34.24	PK-U	40.50	-21.00	0.00	53.74	-	-	74.00	-20.26	-	-	0	100	V	

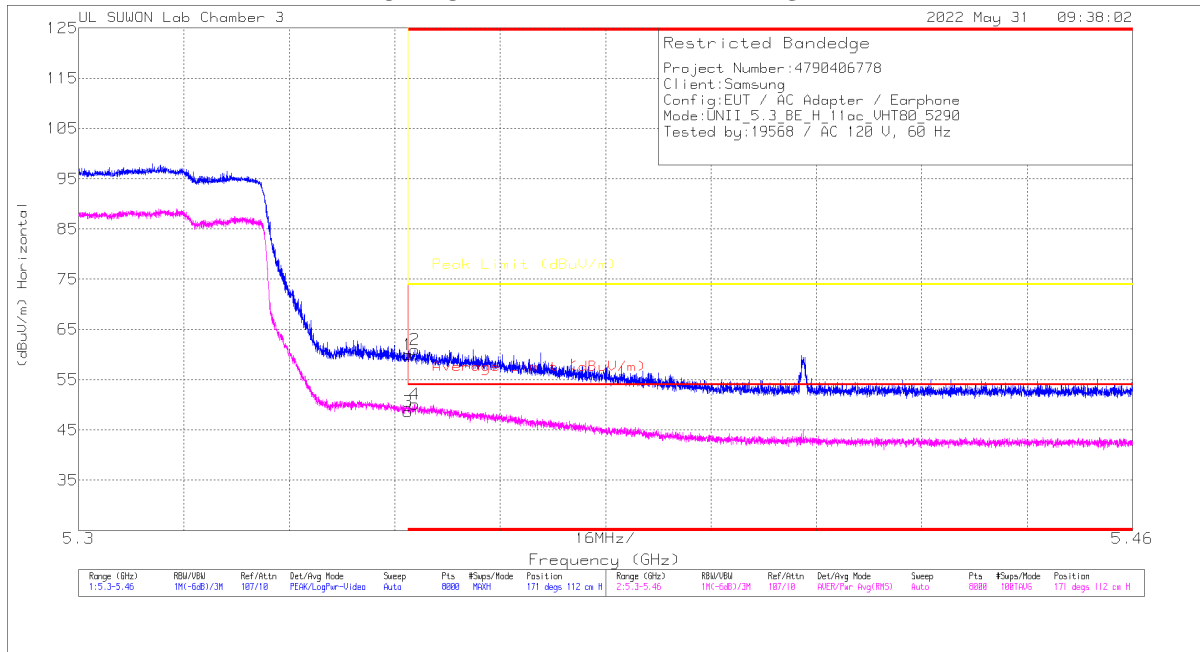
Note1. PK-U - U-NII: Maximum Peak

Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

11.2. TX ABOVE 1GHz 1Tx MODE IN THE 5.3GHz BAND

BANDEDGE (WORST CASE: 802.11ac VHT80 / 5290 MHz)

HORIZONTAL PEAK AND AVERAGE DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35001	45.08	Pk	35.1	-20.2	0	59.98	-	-	74	-14.02	171	112	H
2	* 5.35105	46.12	Pk	35.1	-20.2	0	61.02	-	-	74	-12.98	171	112	H
3	* 5.35001	33.71	RMS	35.1	-20.2	0	48.61	54	-5.39	-	-	171	112	H
4	* 5.35101	35.19	RMS	35.1	-20.2	0	50.09	54	-3.91	-	-	171	112	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector
 RMS - RMS detection

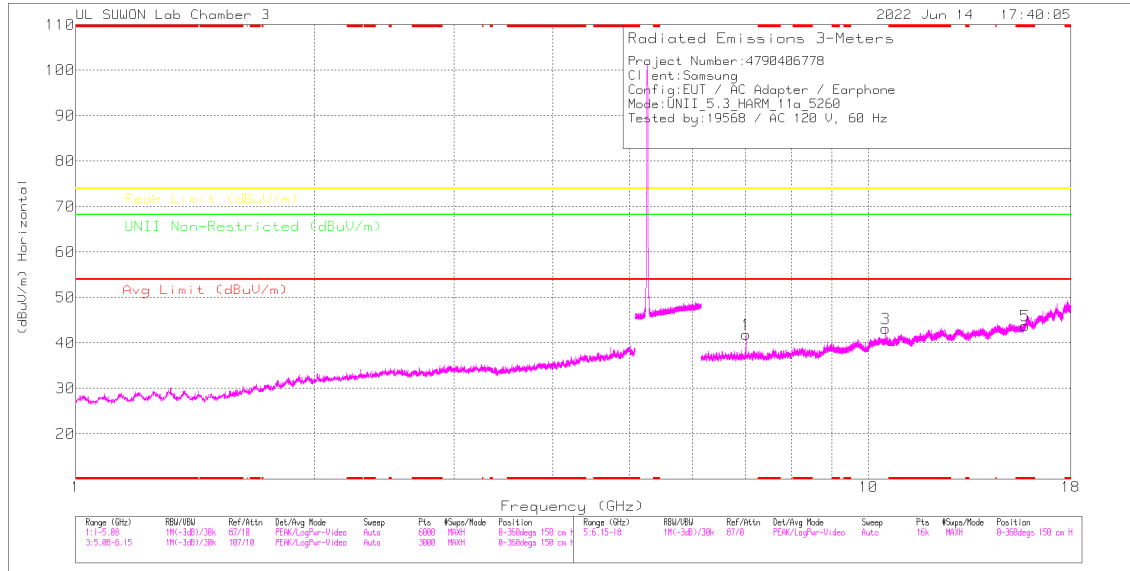
BANDEDGE TEST DATA

Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	5320	ANT1	* 5.35001	40.92	Pk	35.10	-20.20	0.00	55.82	-	-	74.00	-18.18	173	124	H
			* 5.35175	41.87	Pk	35.10	-20.20	0.00	56.77	-	-	74.00	-17.23	173	124	H
			* 5.35001	30.27	RMS	35.10	-20.20	0.00	45.17	54.00	-8.83	-	-	173	124	H
			* 5.35069	30.05	RMS	35.10	-20.20	0.00	44.95	54.00	-9.05	-	-	173	124	H
			* 5.35001	38.98	Pk	35.10	-20.20	0.00	53.88	-	-	74.00	-20.12	86	100	V
			* 5.39089	40.08	Pk	35.20	-20.20	0.00	55.08	-	-	74.00	-18.92	86	100	V
			* 5.35001	27.94	RMS	35.10	-20.20	0.00	42.84	54.00	-11.16	-	-	86	100	V
* 5.35031	28.81	RMS	35.10	-20.20	0.00	43.71	54.00	-10.29	-	-	86	100	V			
802.11n (HT20)	5320	ANT1	* 5.35001	39.63	Pk	35.10	-20.20	0.00	54.53	-	-	74.00	-19.47	163	157	H
			* 5.43512	40.66	Pk	35.30	-20.10	0.00	55.86	-	-	74.00	-18.14	163	157	H
			* 5.35001	29.30	RMS	35.10	-20.20	0.00	44.20	54.00	-9.80	-	-	163	157	H
			* 5.35065	30.17	RMS	35.10	-20.20	0.00	45.07	54.00	-8.93	-	-	163	157	H
			* 5.35001	38.98	Pk	35.10	-20.20	0.00	53.88	-	-	74.00	-20.12	86	100	V
			* 5.39089	40.08	Pk	35.20	-20.20	0.00	55.08	-	-	74.00	-18.92	86	100	V
			* 5.35001	27.94	RMS	35.10	-20.20	0.00	42.84	54.00	-11.16	-	-	86	100	V
* 5.35031	28.81	RMS	35.10	-20.20	0.00	43.71	54.00	-10.29	-	-	86	100	V			
802.11n (HT40)	5310	ANT1	* 5.35001	45.18	Pk	35.10	-20.20	0.00	60.08	-	-	74.00	-13.92	173	122	H
			* 5.35019	46.86	Pk	35.10	-20.20	0.00	61.76	-	-	74.00	-12.24	173	122	H
			* 5.35001	33.96	RMS	35.10	-20.20	0.00	48.86	54.00	-5.14	-	-	173	122	H
			* 5.35051	34.40	RMS	35.10	-20.20	0.00	49.30	54.00	-4.70	-	-	173	122	H
			* 5.35001	39.01	Pk	35.10	-20.20	0.00	53.91	-	-	74.00	-20.09	30	148	V
			* 5.35161	40.36	Pk	35.10	-20.20	0.00	55.26	-	-	74.00	-18.74	30	148	V
			* 5.35001	28.26	RMS	35.10	-20.20	0.00	43.16	54.00	-10.84	-	-	30	148	V
* 5.35245	29.12	RMS	35.10	-20.20	0.00	44.02	54.00	-9.98	-	-	30	148	V			
802.11ac (VHT80)	5290	ANT1	* 5.35001	45.08	Pk	35.10	-20.20	0.00	59.98	-	-	74.00	-14.02	171	112	H
			* 5.35105	46.12	Pk	35.10	-20.20	0.00	61.02	-	-	74.00	-12.98	171	112	H
			* 5.35001	33.71	RMS	35.10	-20.20	0.00	48.61	54.00	-5.39	-	-	171	112	H
			* 5.35101	35.19	RMS	35.10	-20.20	0.00	50.09	54.00	-3.91	-	-	171	112	H
			* 5.35001	41.56	Pk	35.10	-20.20	0.00	56.46	-	-	74.00	-17.54	269	121	V
			* 5.35703	43.09	Pk	35.10	-20.20	0.00	57.99	-	-	74.00	-16.01	269	121	V
			* 5.35001	30.32	RMS	35.10	-20.20	0.00	45.22	54.00	-8.78	-	-	269	121	V
* 5.35197	31.42	RMS	35.10	-20.20	0.00	46.32	54.00	-7.68	-	-	269	121	V			

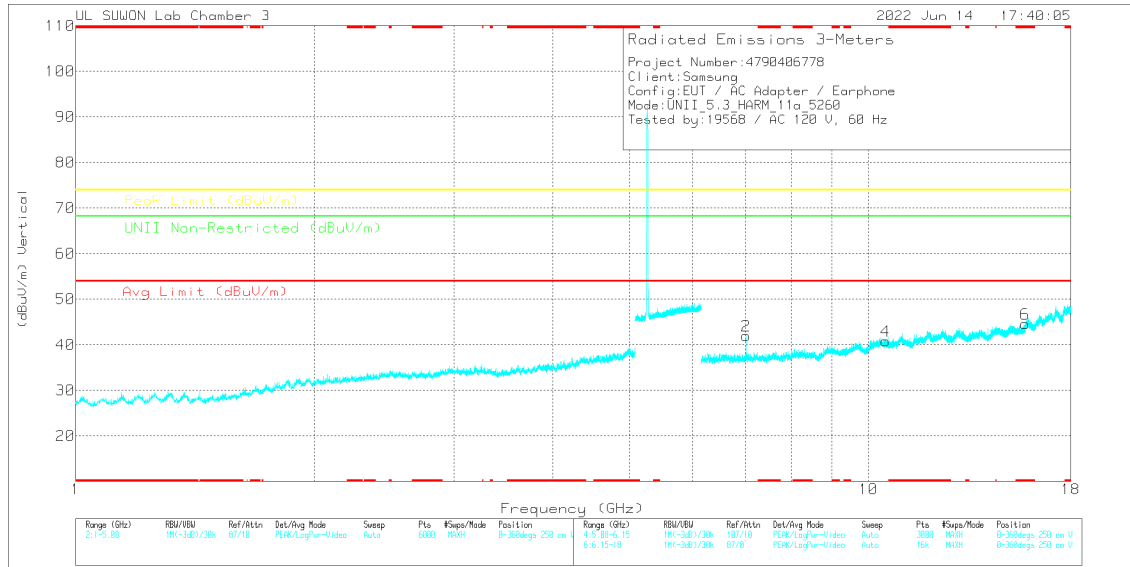
Note1. Pk - Peak detector, RMS - RMS detector

Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5260 MHz)
5260 MHz HORIZONTAL



5260 MHz VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Main Reading (dBuV/m)	Det	317_021897	dBHz_HFdB	CC Corr (dB)	Conducted Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Admitt (Deg)	Height (cm)	Polarity
7.013	39.79	PK-U	38.2	-25.9	0	50.09	-	-	-	-	68.2	-18.11	133	208	H
10.5189	34.3	PK-U	38.2	-21.1	0	51.4	-	-	-	-	68.2	-16.8	189	144	H
* 15.78004	34.19	PK-U	40.6	-20.8	0	53.99	-	-	74	-20.01	-	-	0	100	H
10.52168	33.26	PK-U	38.2	-21.1	0	50.36	-	-	-	-	68.2	-17.84	0	100	V
* 15.77605	33.91	PK-U	40.6	-20.9	0	53.61	-	-	74	-20.39	-	-	0	100	V
7.01324	40.67	PK-U	38.2	-25.9	0	50.97	-	-	-	-	68.2	-17.23	170	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

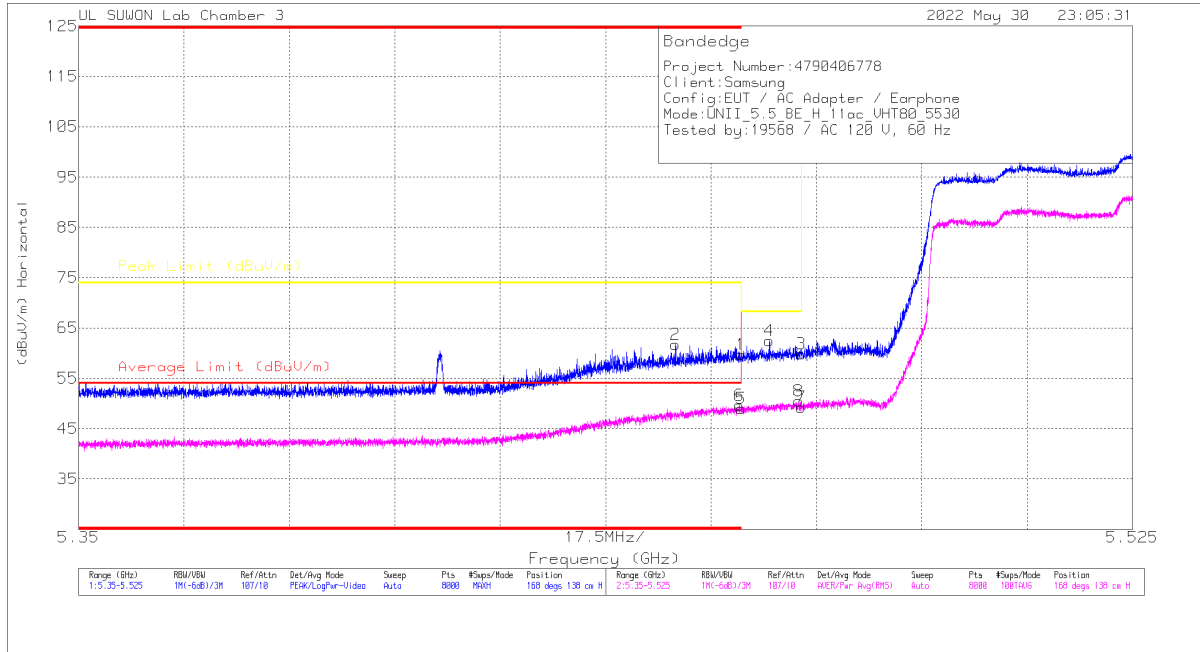
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity		
802.11a	5260	ANT1	7.013	39.79	PK-U	36.20	-25.90	0.00	50.09	-	-	-	-	68.20	-18.11	133	208	H		
			10.520	34.30	PK-U	38.20	-21.10	0.00	51.40	-	-	-	-	-	68.20	-16.80	189	144	H	
			15.78004	34.19	PK-U	40.60	-20.80	0.00	53.99	-	-	-	74.00	-20.01	-	-	0	100	H	
			10.522	33.26	PK-U	38.20	-21.10	0.00	50.36	-	-	-	-	-	-	68.20	-17.84	0	100	V
			15.77606	33.91	PK-U	40.60	-20.90	0.00	53.61	-	-	-	74.00	-20.39	-	-	0	100	V	
			7.013	40.67	PK-U	36.20	-25.90	0.00	50.97	-	-	-	-	-	-	68.20	-17.23	170	100	V
	5300	ANT1	15.90626	33.91	PK-U	40.80	-20.30	0.00	54.41	-	-	74.00	-19.59	-	-	0	100	H		
			11.57777	33.80	PK-U	38.80	-21.60	0.00	51.00	-	-	74.00	-23.00	-	-	190	101	H		
			7.066	39.35	PK-U	36.20	-25.90	0.00	49.65	-	-	-	-	-	68.20	-18.55	201	260	H	
			7.067	40.72	PK-U	36.20	-25.90	0.00	51.02	-	-	-	-	-	68.20	-17.18	171	108	V	
			11.65681	34.08	PK-U	38.90	-21.50	0.00	51.48	-	-	-	74.00	-22.52	-	-	0	100	V	
			15.90575	33.80	PK-U	40.80	-20.30	0.00	54.30	-	-	-	74.00	-19.70	-	-	0	100	V	
	5320	ANT1	7.094	38.67	PK-U	36.20	-26.00	0.00	48.87	-	-	-	-	68.20	-19.33	131	278	H		
			10.64665	33.14	PK-U	38.30	-21.20	0.00	50.24	-	-	74.00	-23.76	-	-	0	100	H		
			15.95415	33.89	PK-U	40.90	-20.40	0.00	54.39	-	-	-	74.00	-19.61	-	-	0	100	H	
			10.63355	32.84	PK-U	38.30	-21.10	0.00	50.04	-	-	74.00	-23.96	-	-	0	100	V		
			15.95766	33.77	PK-U	40.90	-20.40	0.00	54.27	-	-	-	74.00	-19.73	-	-	0	100	V	
			7.093	39.92	PK-U	36.20	-26.00	0.00	50.12	-	-	-	-	-	68.20	-18.08	170	103	V	
	802.11n (HT20) Spot-Check	5300	ANT1	7.067	39.19	PK-U	36.20	-25.90	0.00	49.49	-	-	-	-	68.20	-18.71	155	120	H	
				11.64688	34.14	PK-U	38.80	-21.50	0.00	51.44	-	-	74.00	-22.56	-	-	0	100	H	
				15.89723	33.50	PK-U	40.80	-20.30	0.00	54.00	-	-	-	74.00	-20.00	-	-	0	100	H
11.64831				34.35	PK-U	38.80	-21.40	0.00	51.75	-	-	-	74.00	-22.25	-	-	0	100	V	
15.90951				33.82	PK-U	40.80	-20.30	0.00	54.32	-	-	-	74.00	-19.68	-	-	0	100	V	
7.067				40.68	PK-U	36.20	-25.90	0.00	50.98	-	-	-	-	-	68.20	-17.22	171	101	V	
802.11n (HT40) Spot-Check	5310	ANT1	7.080	38.82	PK-U	36.20	-26.00	0.00	49.02	-	-	-	-	68.20	-19.18	153	117	H		
			10.6287	32.62	PK-U	38.30	-21.10	0.00	49.82	-	-	74.00	-24.18	-	-	0	100	H		
			15.93147	33.85	PK-U	40.90	-20.30	0.00	54.45	-	-	-	74.00	-19.55	-	-	0	100	H	
			10.61317	33.29	PK-U	38.30	-21.10	0.00	50.49	-	-	-	74.00	-23.51	-	-	0	100	V	
			15.93792	33.61	PK-U	40.90	-20.30	0.00	54.21	-	-	-	74.00	-19.79	-	-	0	100	V	
			7.080	40.44	PK-U	36.20	-26.00	0.00	50.64	-	-	-	-	-	68.20	-17.56	171	100	V	
802.11ac (VHT80) Spot-Check	5290	ANT1	7.053	39.26	PK-U	36.20	-25.90	0.00	49.56	-	-	-	-	68.20	-18.64	154	128	H		
			10.576	32.75	PK-U	38.30	-21.10	0.00	49.95	-	-	-	-	68.20	-18.25	0	100	H		
			15.87087	33.83	PK-U	40.70	-20.40	0.00	54.13	-	-	-	74.00	-19.87	-	-	0	100	H	
			10.574	32.73	PK-U	38.30	-21.10	0.00	49.93	-	-	-	-	-	68.20	-18.27	0	100	V	
			15.87649	33.53	PK-U	40.80	-20.40	0.00	53.93	-	-	-	74.00	-20.07	-	-	0	100	V	
			7.054	40.83	PK-U	36.20	-25.90	0.00	51.13	-	-	-	-	-	68.20	-17.07	169	100	V	

Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average
 Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

11.3. TX ABOVE 1GHz 1Tx MODE IN THE 5.5 GHz BAND

BANDEDGE (WORST CASE: 802.11ac VHT80 / 5530 MHz)

HORIZONTAL PEAK AND AVERAGE DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Asimuth (Degs)	Height (cm)	Polarity
1	* 5.45998	44.58	Pk	35.3	-20.1	0	59.78	-	-	74	-14.22	168	138	H
2	* 5.44913	46.53	Pk	35.3	-20.1	0	61.73	-	-	74	-12.27	168	138	H
3	5.46999	44.66	Pk	35.3	-20.1	0	59.86	-	-	68.2	-8.34	168	138	H
4	5.46473	47.26	Pk	35.3	-20.1	0	62.46	-	-	68.2	-5.74	168	138	H
5	* 5.45998	33.86	RMS	35.3	-20.1	0	49.06	54	-4.94	-	-	168	138	H
6	* 5.4597	34.42	RMS	35.3	-20.1	0	49.62	54	-4.38	-	-	168	138	H
7	5.46998	34.1	RMS	35.3	-20.1	0	49.3	-	-	-	-	168	138	H
8	5.46961	35.26	RMS	35.3	-20.1	0	50.46	-	-	-	-	168	138	H

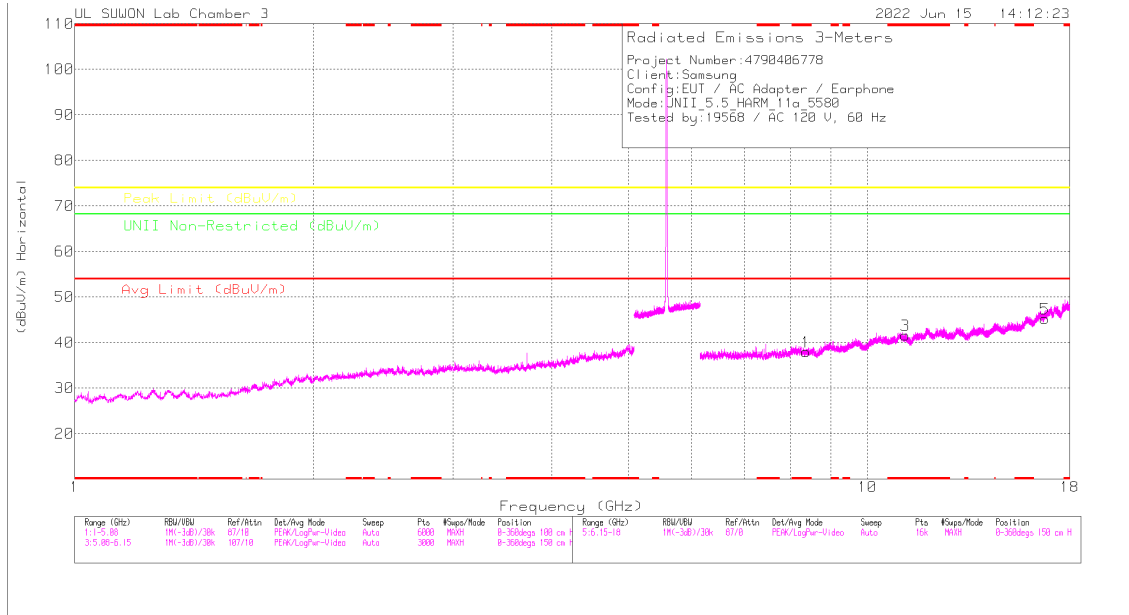
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

BANDEDGE TEST DATA

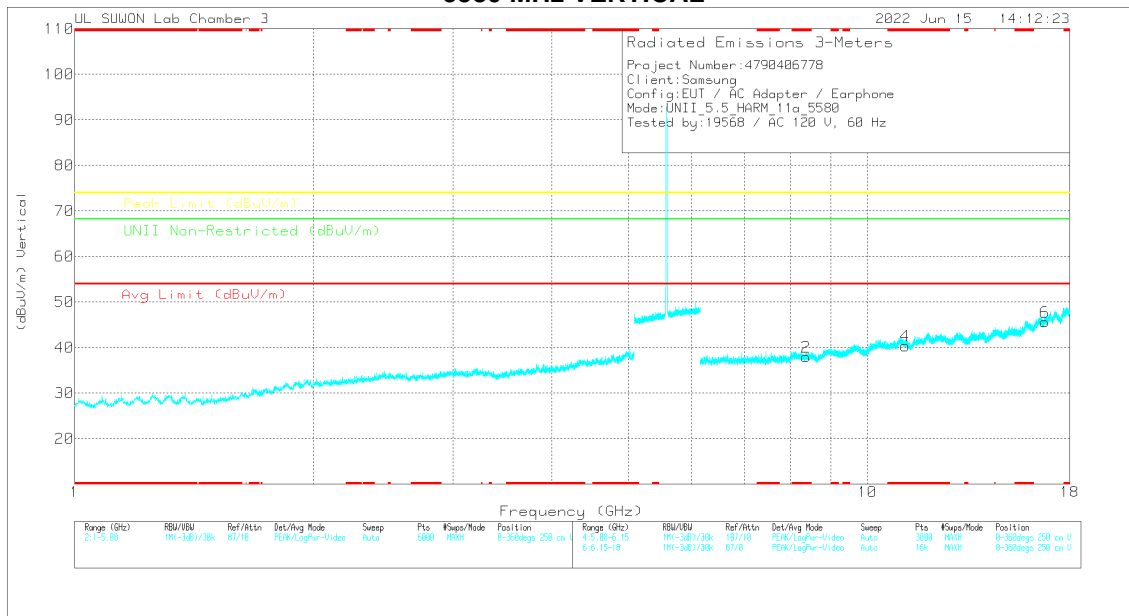
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity			
802.11a	5500	ANT1	* 5.45998	37.99	Pk	35.30	-20.10	0.00	53.19	-	-	74.00	-20.81	162	120	H			
			* 5.45827	39.95	Pk	35.30	-20.10	0.00	55.15	-	-	74.00	-18.85	162	120	H			
			5.46998	40.23	Pk	35.30	-20.10	0.00	55.43	-	-	68.20	-12.77	162	120	H			
			5.46573	41.23	Pk	35.30	-20.10	0.00	56.43	-	-	68.20	-11.77	162	120	H			
			* 5.45998	27.77	RMS	35.30	-20.10	0.00	42.97	54.00	-11.03	-	-	-	-	162	120	H	
			* 5.45972	28.78	RMS	35.30	-20.10	0.00	43.98	54.00	-10.02	-	-	-	-	162	120	H	
			5.46998	28.90	RMS	35.30	-20.10	0.00	44.10	-	-	-	-	-	-	162	120	H	
			5.46856	29.82	RMS	35.30	-20.10	0.00	45.02	-	-	-	-	-	-	162	120	H	
			* 5.45998	36.95	Pk	35.30	-20.10	0.00	52.15	-	-	74.00	-21.85	-	-	82	102	V	
			* 5.42458	40.48	Pk	35.20	-20.10	0.00	55.58	-	-	74.00	-18.42	-	-	82	102	V	
			5.46998	37.58	Pk	35.30	-20.10	0.00	52.78	-	-	68.20	-15.42	-	-	82	102	V	
			5.46698	40.27	Pk	35.30	-20.10	0.00	55.47	-	-	68.20	-12.73	-	-	82	102	V	
			* 5.45998	27.09	RMS	35.30	-20.10	0.00	42.29	54.00	-11.71	-	-	-	-	82	102	V	
			* 5.45243	28.33	RMS	35.30	-20.10	0.00	43.53	54.00	-10.47	-	-	-	-	82	102	V	
	5.46998	28.00	RMS	35.30	-20.10	0.00	43.20	-	-	-	-	-	-	82	102	V			
	5.46622	28.65	RMS	35.30	-20.10	0.00	43.85	-	-	-	-	-	-	82	102	V			
	5700	ANT1	5.72500	39.80	Pk	35.70	-19.50	0.00	56.00	-	-	68.20	-12.20	164	138	H			
			5.72522	40.57	Pk	35.70	-19.50	0.00	56.77	-	-	68.20	-11.43	164	138	H			
			5.72500	37.69	Pk	35.70	-19.50	0.00	53.89	-	-	68.20	-14.31	232	147	V			
			5.72686	39.68	Pk	35.70	-19.50	0.00	55.88	-	-	68.20	-12.32	232	147	V			
			* 5.45998	38.79	Pk	35.30	-20.10	0.00	53.99	-	-	74.00	-20.01	161	119	H			
			* 5.39465	40.20	Pk	35.20	-20.20	0.00	55.20	-	-	74.00	-18.80	161	119	H			
	802.11n (HT20)	5500	ANT1	5.46998	38.32	Pk	35.30	-20.10	0.00	53.52	-	-	68.20	-14.68	161	119	H		
				5.46810	40.20	Pk	35.30	-20.10	0.00	55.40	-	-	68.20	-12.80	161	119	H		
				* 5.45998	27.74	RMS	35.30	-20.10	0.00	42.94	54.00	-11.06	-	-	-	161	119	H	
				* 5.39743	28.75	RMS	35.20	-20.20	0.00	43.75	54.00	-10.25	-	-	-	161	119	H	
				5.46998	28.99	RMS	35.30	-20.10	0.00	44.19	-	-	-	-	-	-	161	119	H
				5.46788	29.16	RMS	35.30	-20.10	0.00	44.36	-	-	-	-	-	-	161	119	H
* 5.45998				36.95	Pk	35.30	-20.10	0.00	52.15	-	-	74.00	-21.85	-	-	82	102	V	
* 5.42458				40.48	Pk	35.20	-20.10	0.00	55.58	-	-	74.00	-18.42	-	-	82	102	V	
5.46998				37.58	Pk	35.30	-20.10	0.00	52.78	-	-	68.20	-15.42	-	-	82	102	V	
5.46698				40.27	Pk	35.30	-20.10	0.00	55.47	-	-	68.20	-12.73	-	-	82	102	V	
* 5.45998				27.09	RMS	35.30	-20.10	0.00	42.29	54.00	-11.71	-	-	-	-	82	102	V	
* 5.45243				28.33	RMS	35.30	-20.10	0.00	43.53	54.00	-10.47	-	-	-	-	82	102	V	
5.46998				28.00	RMS	35.30	-20.10	0.00	43.20	-	-	-	-	-	-	82	102	V	
5.46622				28.65	RMS	35.30	-20.10	0.00	43.85	-	-	-	-	-	-	82	102	V	
5700		ANT1	5.72500	39.80	Pk	35.70	-19.50	0.00	56.00	-	-	68.20	-12.20	164	138	H			
			5.72522	40.57	Pk	35.70	-19.50	0.00	56.77	-	-	68.20	-11.43	164	138	H			
			5.72500	37.26	Pk	35.70	-19.50	0.00	53.46	-	-	68.20	-14.74	233	147	V			
			5.72972	39.90	Pk	35.70	-19.50	0.00	56.10	-	-	68.20	-12.10	233	147	V			
			* 5.45998	40.07	Pk	35.30	-20.10	0.00	55.27	-	-	74.00	-18.73	156	139	H			
			* 5.459	41.10	Pk	35.30	-20.10	0.00	56.30	-	-	74.00	-17.70	156	139	H			
802.11n (HT40)		5510	ANT1	5.46998	43.10	Pk	35.30	-20.10	0.00	58.30	-	-	68.20	-9.90	156	139	H		
				5.46851	44.59	Pk	35.30	-20.10	0.00	59.79	-	-	68.20	-8.41	156	139	H		
				* 5.45998	28.31	RMS	35.30	-20.10	0.00	43.51	54.00	-10.49	-	-	-	156	139	H	
				* 5.45924	29.51	RMS	35.30	-20.10	0.00	44.71	54.00	-9.29	-	-	-	156	139	H	
				5.46998	32.37	RMS	35.30	-20.10	0.00	47.57	-	-	-	-	-	156	139	H	
				5.46950	32.55	RMS	35.30	-20.10	0.00	47.75	-	-	-	-	-	156	139	H	
				* 5.45998	38.08	Pk	35.30	-20.10	0.00	53.28	-	-	74.00	-20.72	230	138	V		
				* 5.39137	40.31	Pk	35.20	-20.20	0.00	55.31	-	-	74.00	-18.69	230	138	V		
	5.46998			39.40	Pk	35.30	-20.10	0.00	54.60	-	-	68.20	-13.60	230	138	V			
	5.46580			40.82	Pk	35.30	-20.10	0.00	56.02	-	-	68.20	-12.18	230	138	V			
	* 5.45998			27.43	RMS	35.30	-20.10	0.00	42.63	54.00	-11.37	-	-	-	230	138	V		
	* 5.45466			28.32	RMS	35.30	-20.10	0.00	43.52	54.00	-10.48	-	-	-	230	138	V		
	5.46998			27.73	RMS	35.30	-20.10	0.00	42.93	-	-	-	-	-	230	138	V		
	5.46856			29.16	RMS	35.30	-20.10	0.00	44.36	-	-	-	-	-	230	138	V		
	5670	ANT1	5.72500	37.66	Pk	35.70	-19.50	0.00	53.86	-	-	68.20	-14.34	9	133	H			
			5.78095	39.50	Pk	35.80	-19.40	0.00	55.90	-	-	68.20	-12.30	9	133	H			
			5.72500	36.81	Pk	35.70	-19.50	0.00	53.01	-	-	68.20	-15.19	197	123	V			
			5.72947	40.06	Pk	35.70	-19.50	0.00	56.26	-	-	68.20	-11.94	197	123	V			
			* 5.45998	44.58	Pk	35.30	-20.10	0.00	59.78	-	-	74.00	-14.22	168	138	H			
			* 5.44913	46.53	Pk	35.30	-20.10	0.00	61.73	-	-	74.00	-12.27	168	138	H			
	802.11ac (VHT80)	5530	ANT1	5.46998	44.66	Pk	35.30	-20.10	0.00	59.86	-	-	68.20	-8.34	168	138	H		
				5.46473	47.26	Pk	35.30	-20.10	0.00	62.46	-	-	68.20	-5.74	168	138	H		
				* 5.45998	33.86	RMS	35.30	-20.10	0.00	49.06	54.00	-4.94	-	-	-	168	138	H	
				* 5.4597	34.42	RMS	35.30	-20.10	0.00	49.62	54.00	-4.38	-	-	-	168	138	H	
				5.46998	34.10	RMS	35.30	-20.10	0.00	49.30	-	-	-	-	-	168	138	H	
				5.46961	35.26	RMS	35.30	-20.10	0.00	50.46	-	-	-	-	-	168	138	H	
				* 5.45998	39.62	Pk	35.30	-20.10	0.00	54.82	-	-	74.00	-19.18	234	116	V		
				* 5.44324	41.58	Pk	35.30	-20.10	0.00	56.78	-	-	74.00	-17.22	234	116	V		
5.46998				39.82	Pk	35.30	-20.10	0.00	55.02	-	-	68.20	-13.18	234	116	V			
5.46808				41.62	Pk	35.30	-20.10	0.00	56.82	-	-	68.20	-11.38	234	116	V			
* 5.45998				28.61	RMS	35.30	-20.10	0.00	43.81	54.00	-10.19	-	-	-	234	116	V		
* 5.45943				29.81	RMS	35.30	-20.10	0.00	45.01	54.00	-8.99	-	-	-	234	116	V		
5.46998				28.33	RMS	35.30	-20.10	0.00	43.53	-	-	-	-	-	234	116	V		
5.46392				30.43	RMS	35.30	-20.10	0.00	45.63	-	-	-	-	-	234	116	V		
5610		ANT1	5.72500	36.78	Pk	35.70	-19.50	0.00	52.98	-	-	68.20	-15.22	164	139	H			
			5.73011	41.30	Pk	35.70	-19.50	0.00	57.50	-	-	68.20	-10.70	164	139	H			
			5.72500	37.46	Pk	35.70	-19.50	0.00	53.66	-	-	68.20	-14.54	152	100	V			
			5.72993	40.11	Pk	35.70	-19.50	0.00	56.31	-	-	68.20	-11.89	152	100	V			

Note1. Pk - Peak detector, RMS - RMS detector
 Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5580 MHz)
5580 MHz HORIZONTAL



5580 MHz VERTICAL



Note. Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Main Reading (dBuV)	Det	317_0021867	6GHz_HPS(S)	DC Corr (dB)	Corrected Reading (dBuV)	Avg Limit (dBuV/m)	Margn (dB)	Peak Limit (dBuV/m)	Margn (dB)	UNII Non-Restricted (dBuV/m)	Margn (dB)	Azimuth (Deg)	Height (cm)	Polarity
* 8.37283	35.49	PK-U	36.2	-23.6	0	48.09	-	-	74	-25.91	-	-	0	100	H
* 11.18356	34.23	PK-U	38.6	-21.5	0	51.33	-	-	74	-22.67	-	-	0	100	H
16.74977	33.21	PK-U	42.3	-18.7	0	56.81	-	-	-	-	68.2	-11.39	0	100	H
* 8.37283	35.65	PK-U	36.2	-23.6	0	49.25	-	-	74	-25.75	-	-	0	100	V
* 11.1871	34.78	PK-U	38.6	-21.5	0	51.88	-	-	74	-22.12	-	-	0	100	V
16.73816	31.9	PK-U	42.3	-18.8	0	55.4	-	-	-	-	68.2	-12.8	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

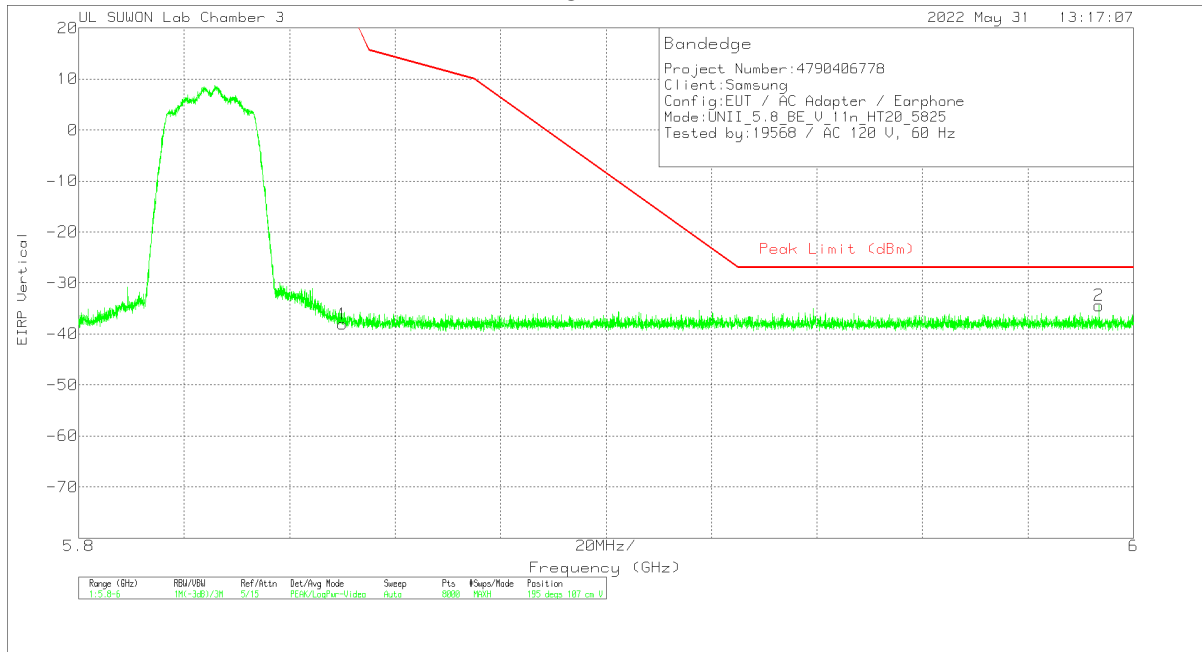
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
802.11a	5500	ANT1	* 7.33319	37.34	PK-U	36.00	-25.20	0.00	48.14	-	-	74.00	-25.86	-	-	165	155	H	
			** 7.33335	27.70	ADR	36.00	-25.20	0.00	38.50	54.00	-15.50	-	-	-	-	-	165	155	H
			* 11.00562	34.31	PK-U	38.50	-21.70	0.00	51.11	-	-	-	74.00	-22.89	-	-	0	100	H
			16.511	32.98	PK-U	42.00	-19.60	0.00	55.38	-	-	-	-	-	68.20	-12.82	0	100	H
			* 10.99625	33.64	PK-U	38.50	-21.60	0.00	50.54	-	-	-	74.00	-23.46	-	-	0	100	V
			16.501	33.12	PK-U	42.00	-19.60	0.00	55.52	-	-	-	-	-	68.20	-12.68	0	100	V
	* 7.33325	38.00	PK-U	36.00	-25.20	0.00	48.80	-	-	-	74.00	-25.20	-	-	165	106	V		
	* 7.33317	28.62	ADR	36.00	-25.20	0.00	39.42	54.00	-14.58	-	-	-	-	-	-	165	106	V	
	* 8.37283	35.49	PK-U	36.20	-23.60	0.00	48.09	-	-	-	74.00	-25.91	-	-	0	100	H		
	* 11.16356	34.23	PK-U	38.60	-21.50	0.00	51.33	-	-	-	74.00	-22.67	-	-	0	100	H		
	16.750	33.21	PK-U	42.30	-18.70	0.00	56.81	-	-	-	-	-	68.20	-11.39	0	100	H		
	* 8.37393	35.65	PK-U	36.20	-23.60	0.00	48.25	-	-	-	74.00	-25.75	-	-	0	100	V		
	* 11.1671	34.78	PK-U	38.60	-21.50	0.00	51.88	-	-	-	74.00	-22.12	-	-	0	100	V		
	16.738	31.90	PK-U	42.30	-18.80	0.00	55.40	-	-	-	-	-	68.20	-12.80	0	100	V		
	* 7.59993	37.24	PK-U	36.20	-24.10	0.00	49.34	-	-	-	74.00	-24.66	-	-	170	100	H		
	* 7.59987	28.26	ADR	36.20	-24.10	0.00	40.36	54.00	-13.64	-	-	-	-	-	170	100	H		
	* 11.39836	32.84	PK-U	38.60	-21.40	0.00	50.04	-	-	-	74.00	-23.96	-	-	0	100	H		
	17.095	31.81	PK-U	42.30	-18.00	0.00	56.11	-	-	-	-	-	68.20	-12.09	0	100	H		
	* 11.40645	32.70	PK-U	38.60	-21.40	0.00	49.90	-	-	-	74.00	-24.10	-	-	0	100	V		
	17.097	31.44	PK-U	42.30	-18.00	0.00	55.74	-	-	-	-	-	68.20	-12.46	0	100	V		
	* 7.59971	36.81	PK-U	36.20	-24.10	0.00	48.91	-	-	-	74.00	-25.09	-	-	205	100	V		
	* 7.59997	28.30	ADR	36.20	-24.10	0.00	40.40	54.00	-13.60	-	-	-	-	-	205	100	V		
	8.572	34.53	PK-U	36.50	-22.90	0.00	48.13	-	-	-	-	-	68.20	-20.07	360	100	H		
	* 11.43436	32.66	PK-U	38.60	-21.30	0.00	49.96	-	-	-	74.00	-24.04	-	-	360	100	H		
	17.164	32.37	PK-U	42.20	-18.00	0.00	56.57	-	-	-	-	-	68.20	-11.63	360	100	H		
	8.572	34.09	PK-U	36.50	-22.90	0.00	47.69	-	-	-	-	-	68.20	-20.51	360	100	V		
	* 11.43571	32.67	PK-U	38.60	-21.30	0.00	49.97	-	-	-	74.00	-24.03	-	-	360	100	V		
	17.165	32.11	PK-U	42.20	-17.90	0.00	56.41	-	-	-	-	-	68.20	-11.79	360	100	V		

Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average
 Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

11.4. TX ABOVE 1GHz 1Tx MODE IN THE 5.8 GHz BAND

BANDEDGE (WORST CASE: 802.11n HT20 / 5825 MHz)

VERTICAL PEAK DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	3117_00218957	10dB_ATT[dB]	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85001	-66.41	Pk	35.9	-19.3	11.8	0	-38.01	26.99	-65	195	107	V
2	5.9935	-63.03	Pk	36	-19.2	11.8	0	-34.43	-27	-7.43	195	107	V

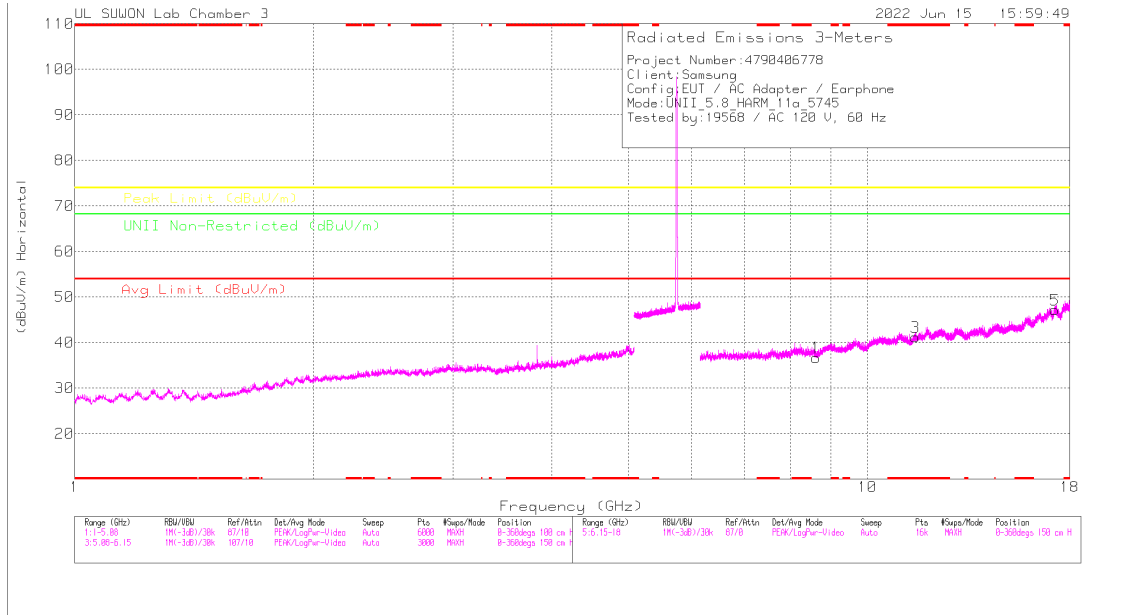
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector

BANDEDGE TEST DATA

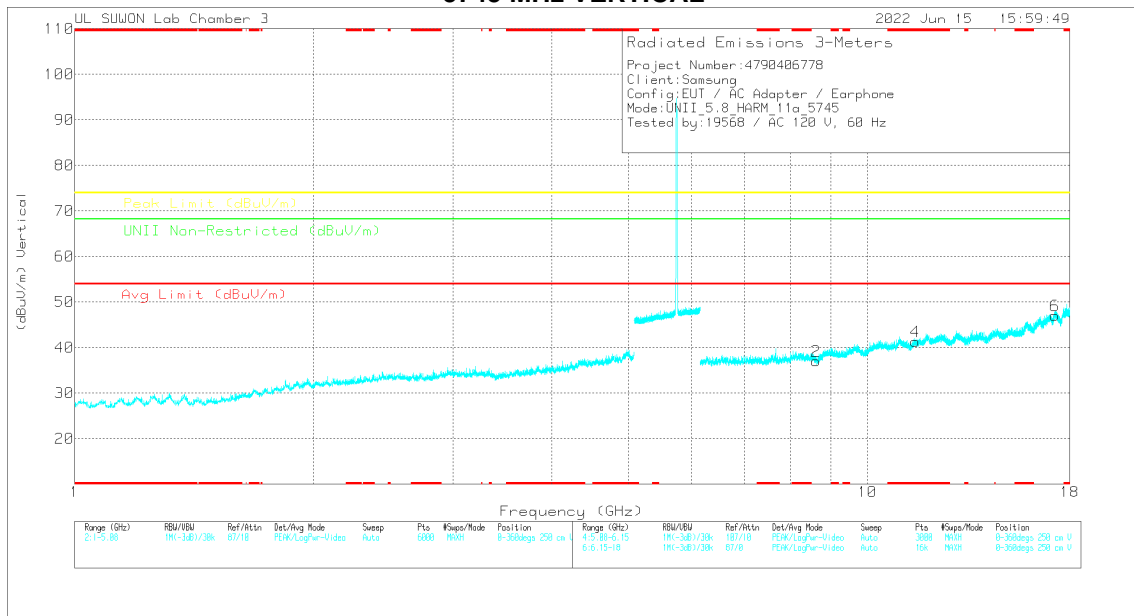
Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBm]	Detector Mode	ANT Factor	Loss [dB]	Conv. F [dB]	DC Corr [dB]	Result [dBm]	PK Limit [dBm]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
802.11a	5745	ANT1	5.72500	-64.23	Pk	35.60	-19.50	11.80	0.00	-36.33	27.00	-63.33	175	107	H
			5.62856	-63.28	Pk	35.50	-19.90	11.80	0.00	-35.88	-27.00	-8.88	175	107	H
			5.72500	-64.01	Pk	35.60	-19.50	11.80	0.00	-36.11	27.00	-63.11	192	103	V
			5.62653	-62.85	Pk	35.50	-19.90	11.80	0.00	-35.45	-27.00	-8.45	192	103	V
	5825	ANT1	5.85001	-65.83	Pk	35.90	-19.30	11.80	0.00	-37.43	26.99	-64.42	3	156	H
			5.99085	-63.79	Pk	36.00	-19.20	11.80	0.00	-35.19	-27.00	-8.19	3	156	H
			5.85001	-65.73	Pk	35.90	-19.30	11.80	0.00	-37.33	26.99	-64.32	204	108	V
			5.97645	-63.93	Pk	36.00	-19.20	11.80	0.00	-35.33	-27.00	-8.33	204	108	V
802.11n (HT20)	5745	ANT1	5.72500	-63.46	Pk	35.60	-19.50	11.80	0.00	-35.56	27.00	-62.56	174	101	H
			5.63288	-63.44	Pk	35.50	-19.90	11.80	0.00	-36.04	-27.00	-9.04	174	101	H
			5.72500	-65.21	Pk	35.60	-19.50	11.80	0.00	-37.31	27.00	-64.31	195	101	V
			5.63695	-63.89	Pk	35.50	-19.80	11.80	0.00	-36.39	-27.00	-9.39	195	101	V
	5825	ANT1	5.85001	-64.28	Pk	35.90	-19.30	11.80	0.00	-35.88	26.99	-62.87	6	157	H
			5.93124	-63.68	Pk	36.00	-19.30	11.80	0.00	-35.18	-27.00	-8.18	6	157	H
			5.85001	-66.41	Pk	35.90	-19.30	11.80	0.00	-38.01	26.99	-65.00	195	107	V
			5.99350	-63.03	Pk	36.00	-19.20	11.80	0.00	-34.43	-27.00	-7.43	195	107	V
802.11n (HT40)	5755	ANT1	5.72500	-62.53	Pk	35.60	-19.50	11.80	0.00	-34.63	27.00	-61.63	180	100	H
			5.62849	-63.74	Pk	35.50	-19.90	11.80	0.00	-36.34	-27.00	-9.34	180	100	H
			5.72500	-63.64	Pk	35.60	-19.50	11.80	0.00	-35.74	27.00	-62.74	192	123	V
			5.62507	-63.92	Pk	35.50	-19.90	11.80	0.00	-36.52	-27.00	-9.52	192	123	V
	5795	ANT1	5.85001	-65.04	Pk	35.90	-19.30	11.80	0.00	-36.64	26.99	-63.63	7	148	H
			5.96272	-63.83	Pk	36.00	-19.20	11.80	0.00	-35.23	-27.00	-8.23	7	148	H
			5.85001	-66.09	Pk	35.90	-19.30	11.80	0.00	-37.69	26.99	-64.68	195	108	V
			5.95309	-63.29	Pk	36.00	-19.30	11.80	0.00	-34.79	-27.00	-7.79	195	108	V
802.11ac (VHT80)	5775 (Lower side)	ANT1	5.72500	-59.68	Pk	35.60	-19.50	11.80	0.00	-31.78	27.00	-58.78	176	109	H
			5.63569	-63.57	Pk	35.50	-19.80	11.80	0.00	-36.07	-27.00	-9.07	176	109	H
			5.72500	-62.47	Pk	35.60	-19.50	11.80	0.00	-34.57	27.00	-61.57	199	103	V
			5.64289	-63.33	Pk	35.50	-19.80	11.80	0.00	-35.83	-27.00	-8.83	199	103	V
	5775 (Upper Side)	ANT1	5.85001	-66.58	Pk	35.90	-19.30	11.80	0.00	-38.18	26.99	-65.17	2	147	H
			5.93907	-63.66	Pk	36.00	-19.30	11.80	0.00	-35.16	-27.00	-8.16	2	147	H
			5.85001	-65.85	Pk	35.90	-19.30	11.80	0.00	-37.45	26.99	-64.44	200	108	V
			5.96885	-63.82	Pk	36.00	-19.30	11.80	0.00	-35.32	-27.00	-8.32	200	108	V

Note. Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5745 MHz)
5745 MHz HORIZONTAL



5745 MHz VERTICAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Main Reading (dBuV)	Det	317_0021867	6GHz_HPS(S)	DC Corr (dB)	Corrected Reading (dBuV)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Deg)	Height (cm)	Polarity
8.62623	34.09	PK-U	36.5	-23.1	0	47.49	-	-	-	-	68.2	-20.71	360	100	H
* 11.49594	33.11	PK-U	38.7	-21.4	0	50.41	-	74	-	-23.59	-	-	360	100	H
17.23347	32.53	PK-U	42.1	-17.1	0	57.53	-	-	-	-	68.2	-10.67	360	100	H
8.62042	33.89	PK-U	36.5	-23.1	0	47.29	-	-	-	-	68.2	-20.91	360	100	V
* 11.49901	32.81	PK-U	38.7	-21.4	0	50.11	-	74	-	-23.89	-	-	360	100	V
17.23079	32.18	PK-U	42.1	-17.1	0	57.18	-	-	-	-	68.2	-11.02	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak

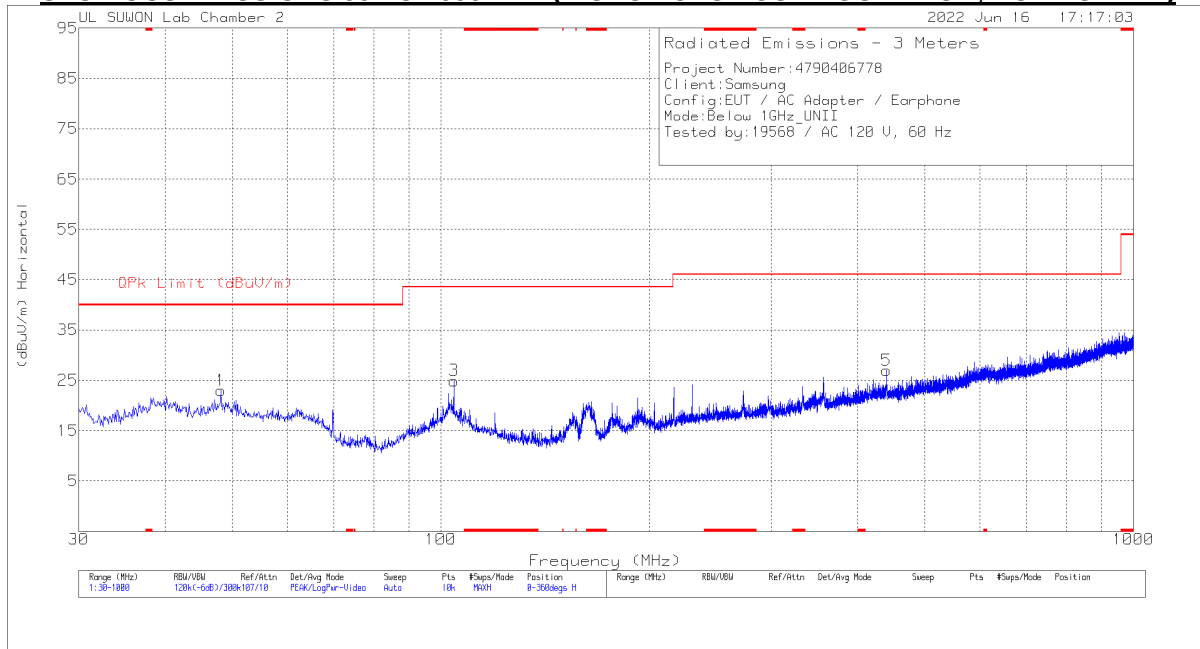
HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Mode	Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Non-Restricted [dBuV/m]	Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
802.11a	5745	ANT1	8.626	34.09	PK-U	36.50	-23.10	0.00	47.49	-	-	-	-	68.20	-20.71	360	100	H	
			* 11.49594	33.11	PK-U	38.70	-21.40	0.00	50.41	-	-	74.00	-23.59	-	-	-	360	100	H
			17.233	32.53	PK-U	42.10	-17.10	0.00	57.53	-	-	-	-	-	68.20	-10.67	360	100	H
			8.620	33.89	PK-U	36.50	-23.10	0.00	47.29	-	-	-	-	-	68.20	-20.91	360	100	V
			* 11.49901	32.81	PK-U	38.70	-21.40	0.00	50.11	-	-	74.00	-23.89	-	-	-	360	100	V
			17.231	32.18	PK-U	42.10	-17.10	0.00	57.18	-	-	-	-	-	68.20	-11.02	360	100	V
	5785	ANT1	8.671	34.09	PK-U	36.50	-23.00	0.00	47.59	-	-	-	-	68.20	-20.61	360	100	H	
			* 11.57763	33.78	PK-U	38.80	-21.60	0.00	50.98	-	-	74.00	-23.02	-	-	-	360	100	H
			17.362	31.91	PK-U	42.00	-17.30	0.00	56.61	-	-	-	-	-	68.20	-11.59	360	100	H
			8.681	34.41	PK-U	36.50	-23.00	0.00	47.91	-	-	-	-	-	68.20	-20.29	360	100	V
			* 11.57317	34.07	PK-U	38.80	-21.60	0.00	51.27	-	-	74.00	-22.73	-	-	-	360	100	V
			17.354	31.43	PK-U	42.00	-17.20	0.00	56.23	-	-	-	-	-	68.20	-11.97	360	100	V
	5825	ANT1	8.743	34.59	PK-U	36.50	-22.80	0.00	48.29	-	-	-	-	68.20	-19.91	360	100	H	
			* 11.64855	34.49	PK-U	38.80	-21.40	0.00	51.89	-	-	74.00	-22.11	-	-	-	360	100	H
			17.470	32.18	PK-U	42.00	-16.80	0.00	57.38	-	-	-	-	-	68.20	-10.82	360	100	H
			8.735	34.08	PK-U	36.50	-22.80	0.00	47.78	-	-	-	-	-	68.20	-20.42	360	100	V
			* 11.65837	34.97	PK-U	38.90	-21.50	0.00	52.37	-	-	74.00	-21.63	-	-	-	360	100	V
			17.471	31.12	PK-U	42.00	-16.80	0.00	56.32	-	-	-	-	-	68.20	-11.88	360	100	V

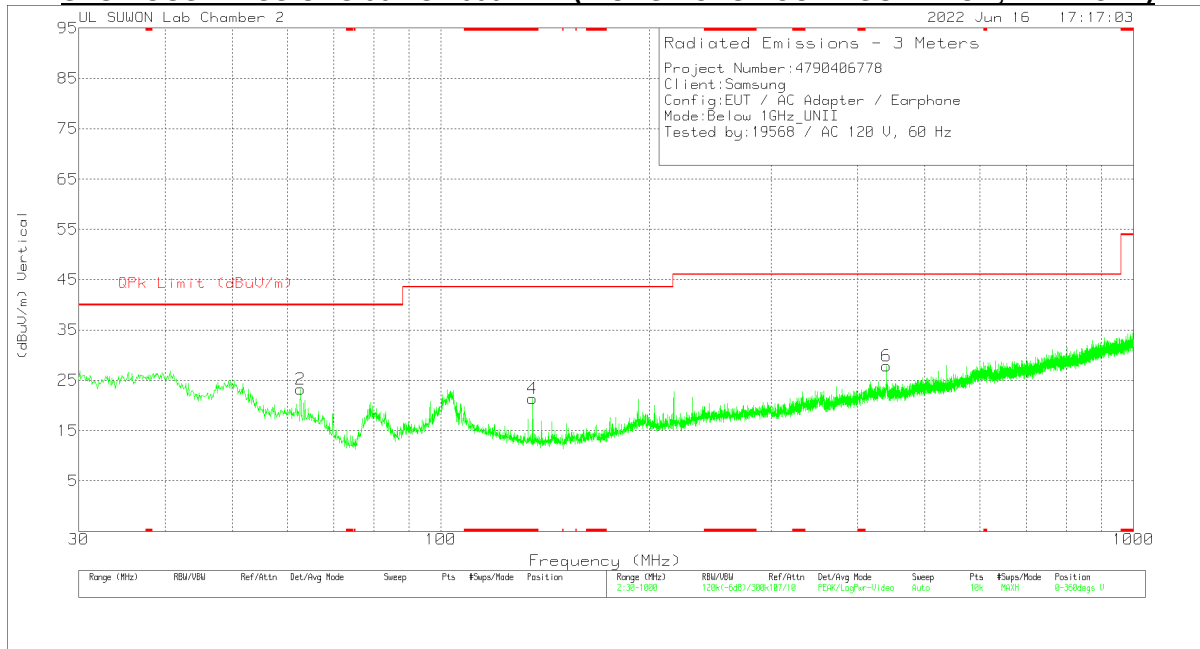
Note1. PK-U - U-NII: Maximum Peak / ADR - U-NII AD primary method, RMS average

Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

12. WORST-CASE BELOW 1 GHz SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	OPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	48.139	34.33	Pk	19.9	-31.2	0	23.03	40	-16.97	0-360	300	H
3	104.399	37.93	PK	17.6	-30.6	0	24.93	43.52	-18.59	0-360	100	H
5	439.825	33.25	PK	22	-28.3	0	26.95	46.02	-19.07	0-360	100	H
2	62.689	36.59	PK	17.8	-31.1	0	23.29	40	-16.71	0-360	100	V
4	* 135.633	37.92	PK	13.8	-30.3	0	21.42	43.52	-22.1	0-360	100	V
6	439.922	34.14	PK	22	-28.3	0	27.84	46.02	-18.18	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector

13. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
IC RSS-GEN Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 [*]	56 to 46 [*]
0.5-5	56	46
5-30	60	50

^{*}Decreases with the logarithm of the frequency.

TEST PROCEDURE

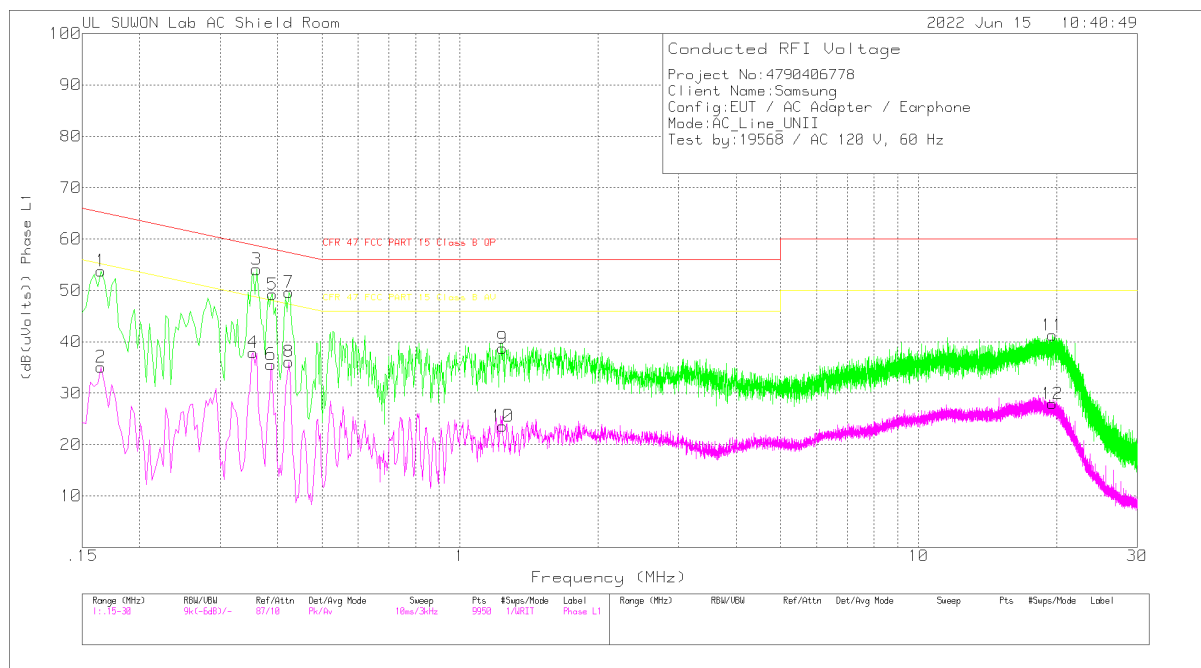
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

LINE 1 DATA



Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_L1[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.165	43.81	Pk	9.9	.1	53.81	65.21	-11.4	-	-
2	.165	25.08	Av	9.9	.1	35.08	-	-	55.21	-20.13
3	.36	44.09	Pk	9.8	.2	54.09	58.73	-4.64	-	-
4	.354	27.92	Av	9.8	.2	37.92	-	-	48.87	-10.95
5	.39	39.24	Pk	9.8	.2	49.24	58.06	-8.82	-	-
6	.387	25.58	Av	9.8	.2	35.58	-	-	48.13	-12.55
7	.423	39.65	Pk	9.8	.2	49.65	57.39	-7.74	-	-
8	.423	26.11	Av	9.8	.2	36.11	-	-	47.39	-11.28
9	1.239	28.74	Pk	9.7	.3	38.74	56	-17.26	-	-
10	1.239	13.58	Av	9.7	.3	23.58	-	-	46	-22.42
11	19.587	30.79	Pk	10.1	.4	41.29	60	-18.71	-	-
12	19.587	17.45	Av	10.1	.4	27.95	-	-	50	-22.05

Pk - Peak detector

Av - Average detection

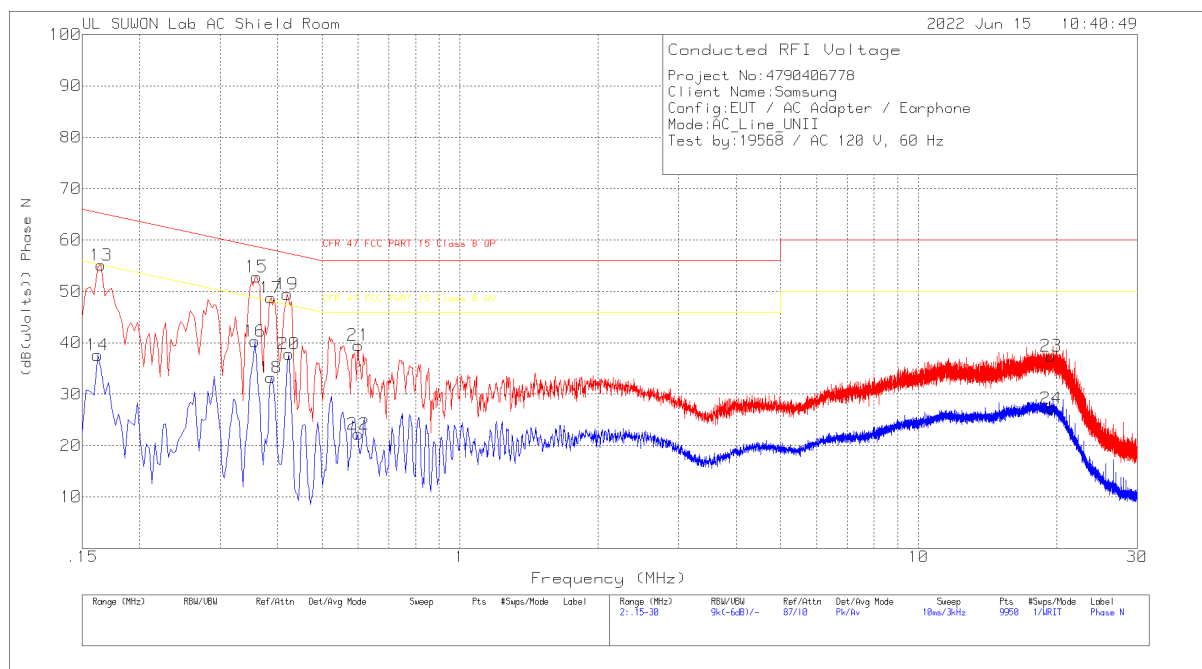
Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_L1[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
.16425	43.35	Qp	9.9	.1	53.35	65.25	-11.9	-	-
.35925	42.03	Qp	9.8	.2	52.03	58.75	-6.72	-	-
.39015	37.71	Qp	9.8	.2	47.71	58.06	-10.35	-	-
.42315	37.49	Qp	9.8	.2	47.49	57.39	-9.9	-	-

Qp - Quasi-Peak detector

LINE 2 DATA



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_N[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
13	.165	45.09	Pk	9.9	.1	55.09	65.21	-10.12	-	-
14	.162	27.59	Av	9.9	.1	37.59	-	-	55.36	-17.77
15	.36	42.83	Pk	9.8	.2	52.83	58.73	-5.9	-	-
16	.357	30.29	Av	9.8	.2	40.29	-	-	48.8	-8.51
17	.387	38.74	Pk	9.8	.2	48.74	58.13	-9.39	-	-
18	.387	23.22	Av	9.8	.2	33.22	-	-	48.13	-14.91
19	.42	39.44	Pk	9.8	.2	49.44	57.45	-8.01	-	-
20	.423	27.83	Av	9.8	.2	37.83	-	-	47.39	-9.56
21	.6	29.4	Pk	9.9	.2	39.5	56	-16.5	-	-
22	.6	12.11	Av	9.9	.2	22.21	-	-	46	-23.79
23	19.467	26.81	Pk	10.2	.4	37.41	60	-22.59	-	-
24	19.464	16.61	Av	10.2	.4	27.21	-	-	50	-22.79

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_N[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
.16425	42.91	Qp	9.9	.1	52.91	65.25	-12.34	-	-
.35925	41.6	Qp	9.8	.2	51.6	58.75	-7.15	-	-
.38775	36.89	Qp	9.8	.2	46.89	58.11	-11.22	-	-
.42075	36.43	Qp	9.8	.2	46.43	57.43	-11	-	-

Qp - Quasi-Peak detector

14. DYNAMIC FREQUENCY SELECTION

14.1. OVERVIEW

14.1.1. LIMITS

FCC

§15.407 (h), FCC KDB 905462 D02 “COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION” and KDB 905462 D03 “U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY”.

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar DFS	Client (without DFS)
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in all 20 MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see notes)
E.I.R.P. \geq 200 mill watt	-64 dBm
E.I.R.P. < 200 mill watt and power spectral density < 10 dBm/MHz	-62 dBm
E.I.R.P. < 200 mill watt that do not meet power spectral density requirement	-64 dBm
<p>Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.</p>	

Table 4: DFS Response requirement values

Parameter	Value
<i>Non-occupancy period</i>	30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds (See Note 1)
<i>Channel Closing Transmission Time</i>	200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U- NII 99% transmission power bandwidth. (See Note 3)
<p>Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.</p>	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (usec)	PRI (usec)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a	Roundup: $\{(1/360) \times (19 \times 10^6 \text{ PRI}_{\text{usec}})\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the <i>Detection Bandwidth</i> test, <i>Channel Move Time</i> , and <i>Channel Closing Time</i> tests.					

Table 6 – Long Pulse Radar Test Signal

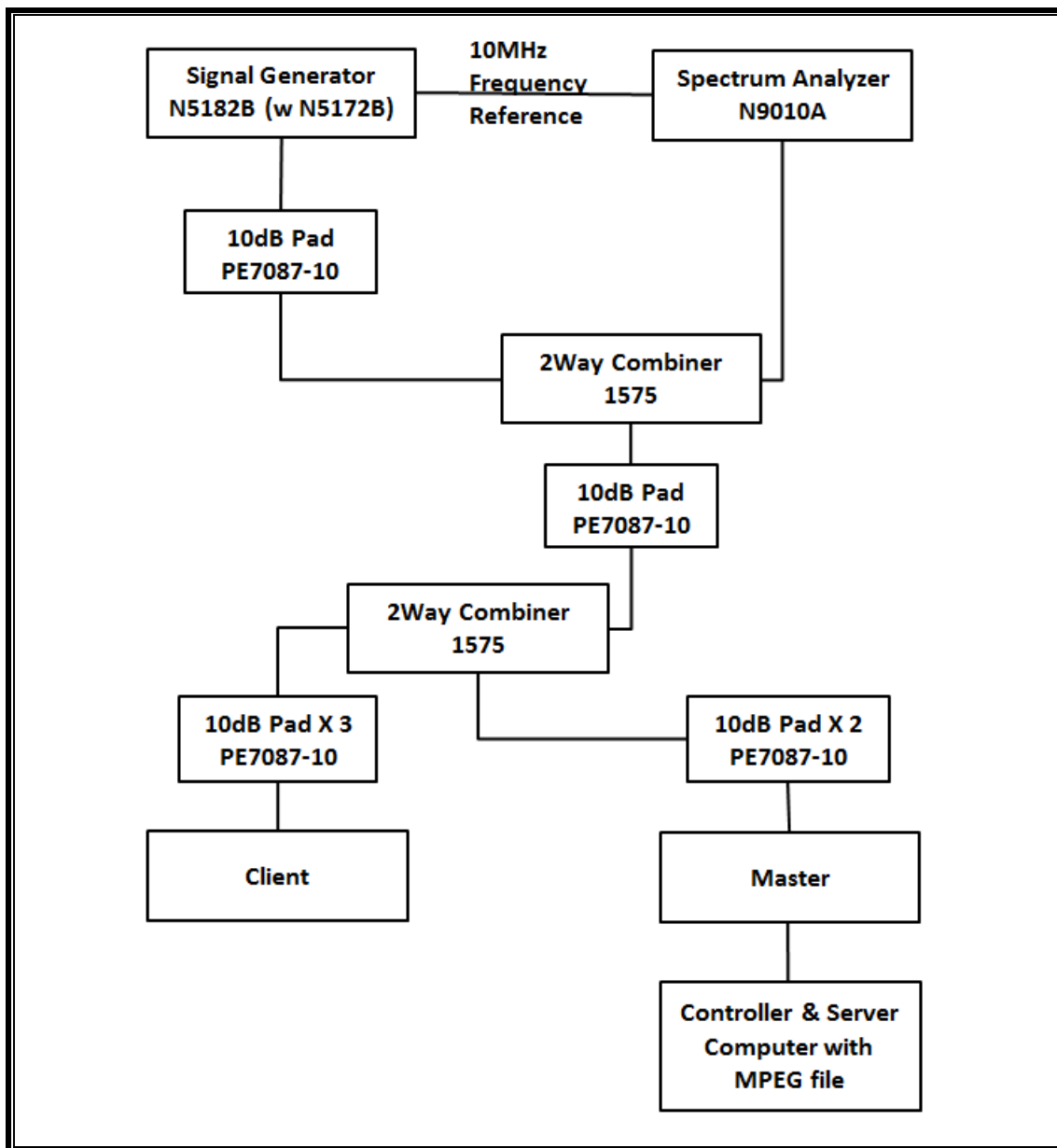
Radar Waveform Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

14.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the Keysite Signal Studio for Pulse Building as N5172B. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 1, 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

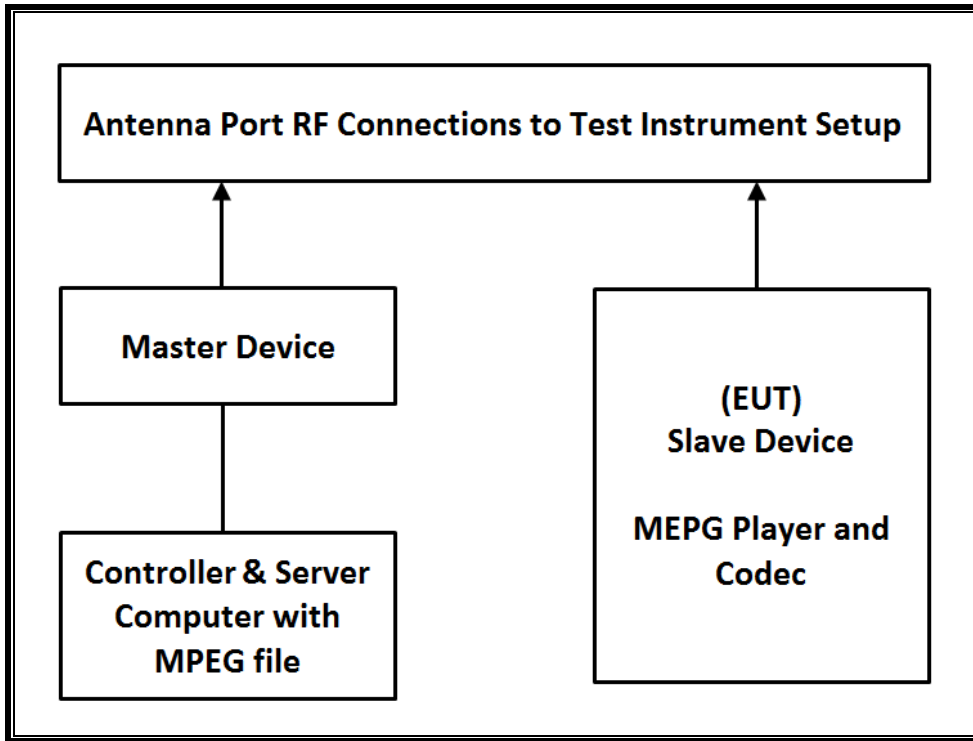
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	S/N	Next Cal Due
Spectrum Analyzer, 7 GHz	Agilent / HP	N9010A	MY54200580	08-02-22
Vector Signal Generator, 6GHz	Agilent / HP	N5182B	MY53051241	08-02-22
Combiner	WEINSCHTEL	WA1534	UL003	01-11-23
Combiner	WEINSCHTEL	WA1535	UL004	01-11-23

14.1.3. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Wireless Access Point	Cisco	AIR-CAP3702E-A-K9	FTX182276QX	LDK102087
Notebook PC (Controller/Server)	HP	HP EliteDesk 800 G1 TWR	CZC4125J25	DoC

14.1.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without Radar Detection.

The highest power level of the widest bandwidth (802.11ac VHT80) within these bands is 12.27 dBm in the 5250-5350 MHz band and 12.25 dBm in the 5470-5725 MHz band.

The antenna assembly utilized two antenna.

Gain of ANT: -3.90 dBi for UNII 2A and -3.90 dBi for UNII 2C.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required conducted threshold at the antenna port is $-64 + 1 = -63$ dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses one transmitter/receiver chain connected to an antenna to perform radiated tests. WLAN traffic that meets or exceeds the minimum required loading was generated by transferring a data stream from the controller/server PC to the EUT using iPerf version 2.0.5 software package.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11 architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The software installed in the access point is 12.4(25d)JA1.

UNIFORM CHANNEL SPREADING

This requirement is not applicable to Slave radio devices.

OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is $-64 + 1 = -63$ dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

14.2. RESULTS FOR 80 MHz BANDWIDTH (UNII-2A BAND)

14.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5290 MHz.

14.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



14.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

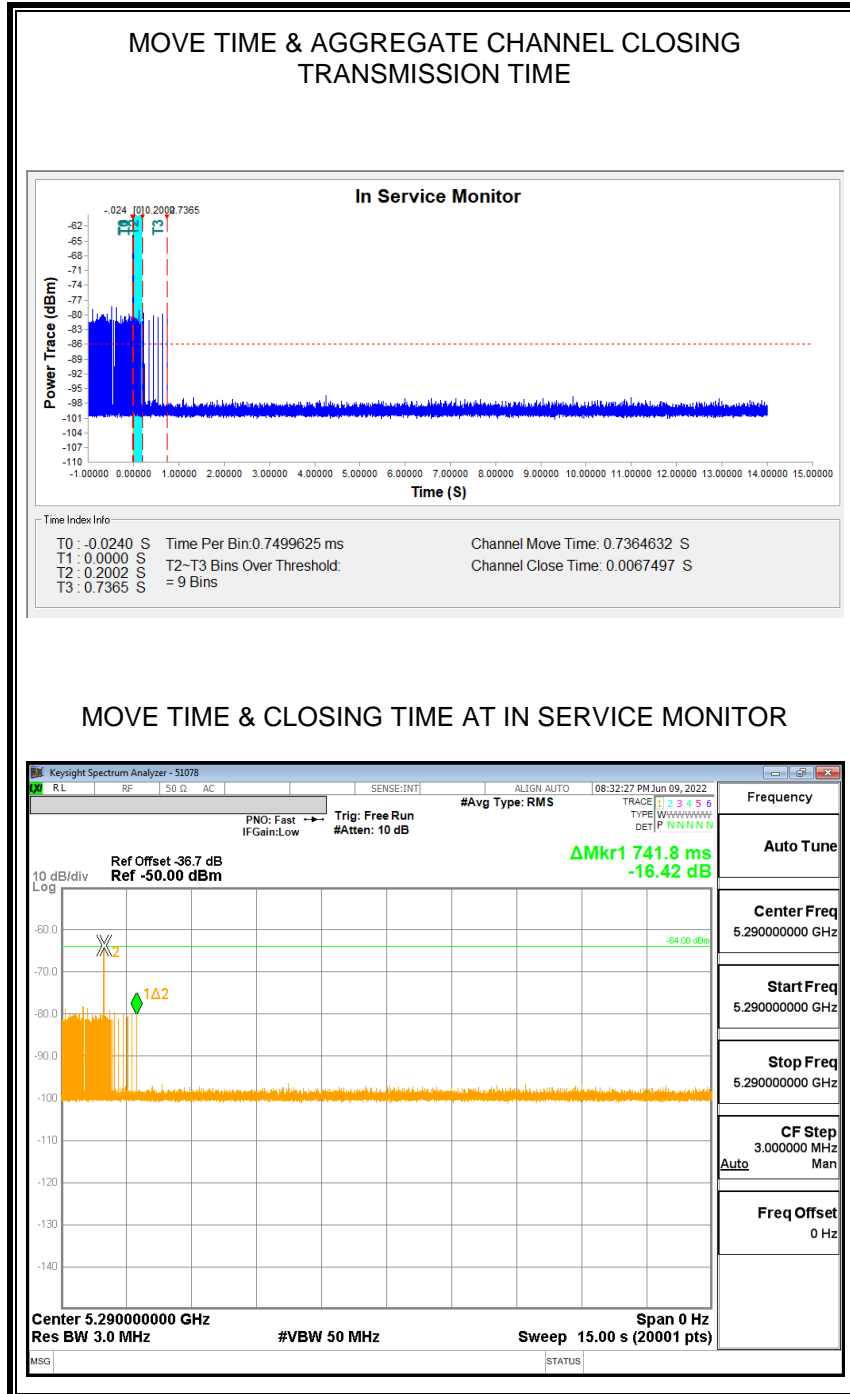
Channel Move Time (sec)	Limit (sec)
0.736	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
6.750	60

MOVE TIME & CHANNEL CLOSING TIME

AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

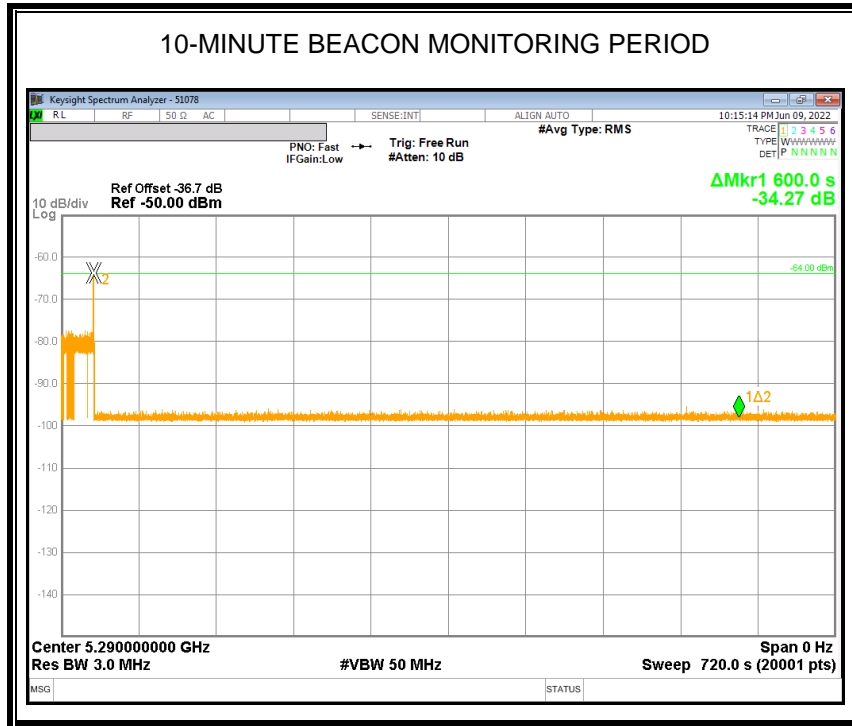
No transmissions are observed during the aggregate monitoring period.



NON-OCCUPANCY PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 10-minute observation time.



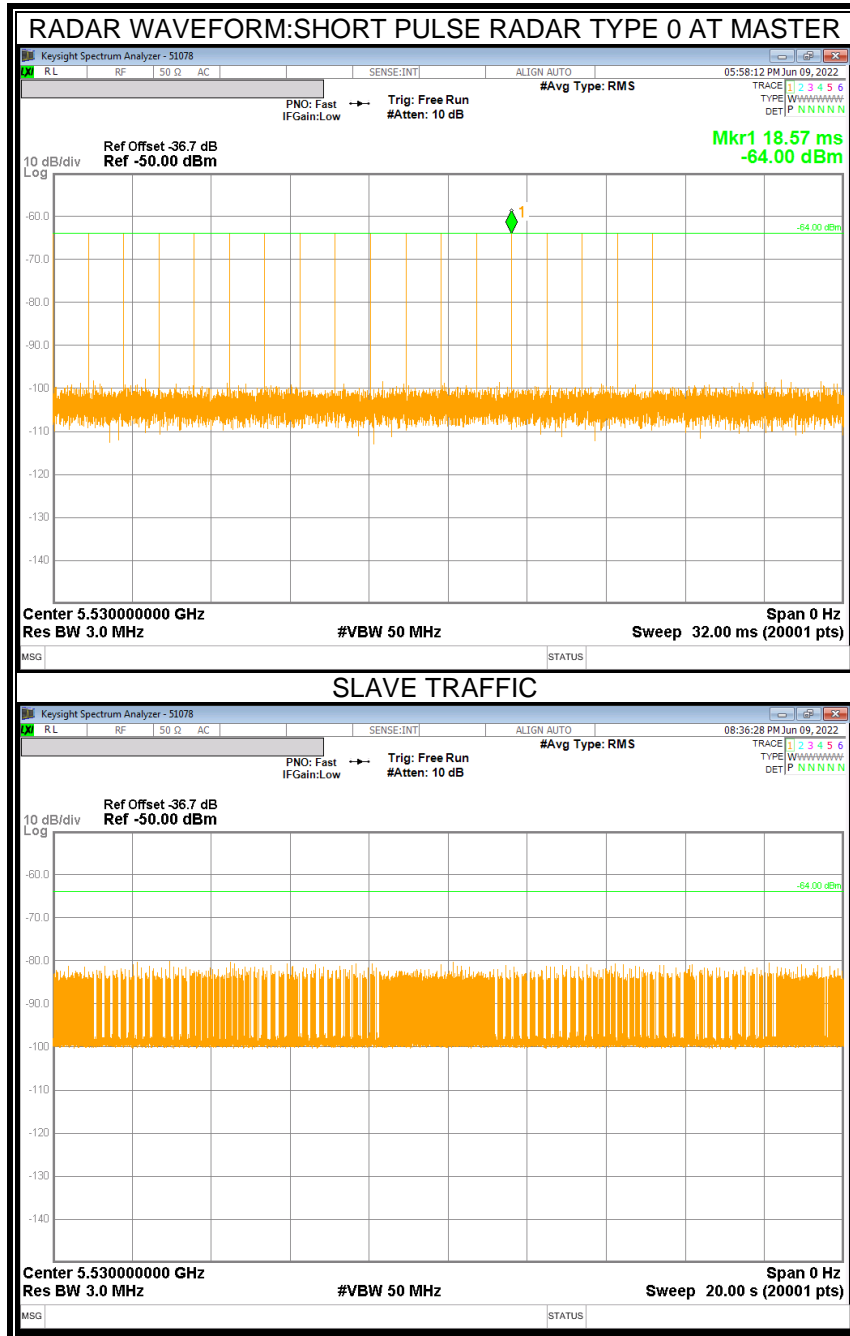
14.3. RESULTS FOR 80 MHz BANDWIDTH (UNII-2C BAND)

14.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

14.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



14.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

14.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

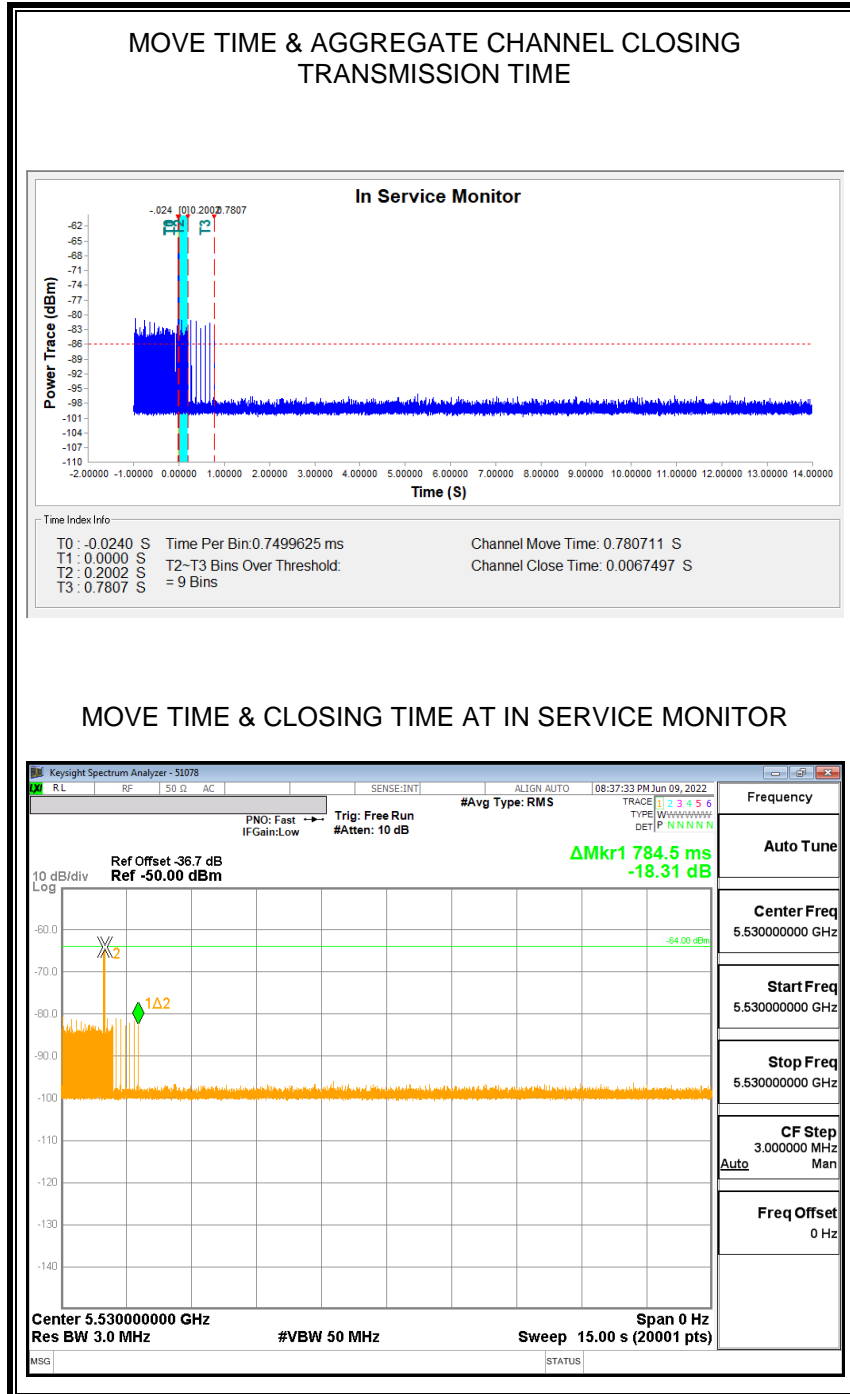
Channel Move Time (sec)	Limit (sec)
0.781	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
6.750	60

MOVE TIME & CHANNEL CLOSING TIME

AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

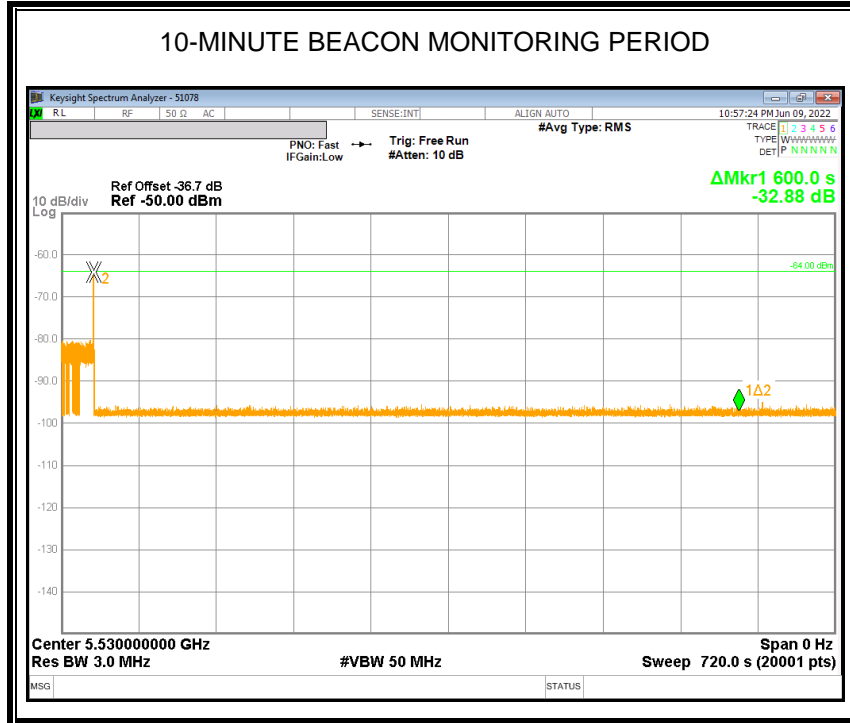
No transmissions are observed during the aggregate monitoring period.



NON-OCCUPANCY PERIOD

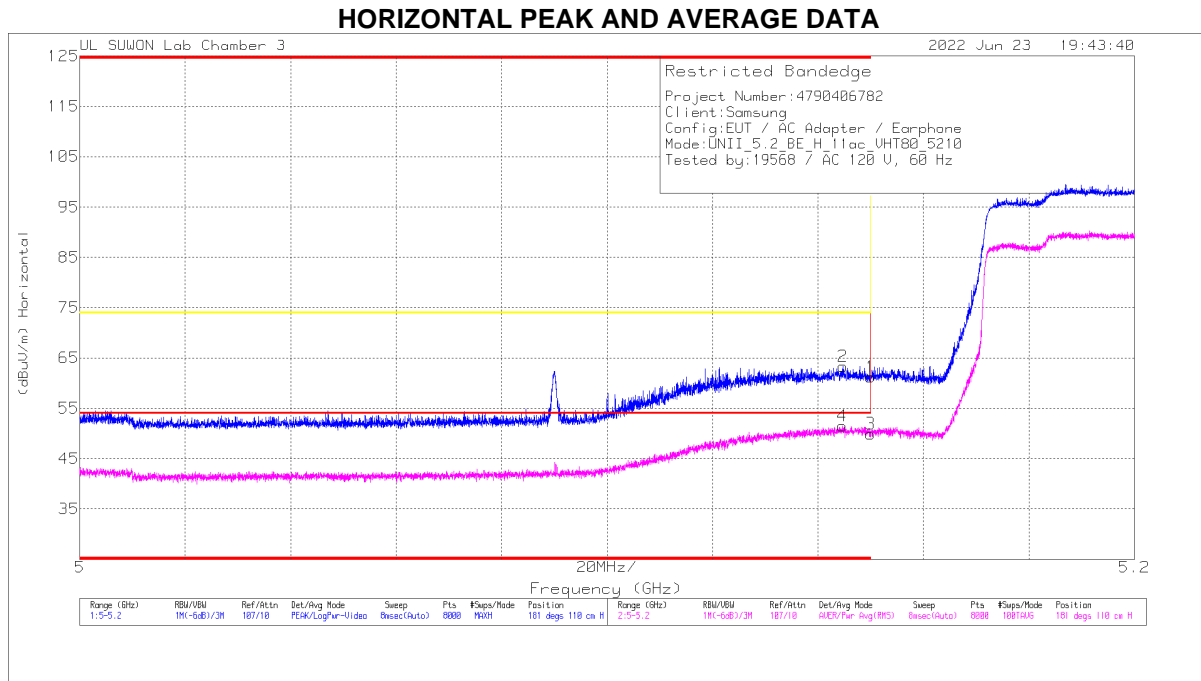
RESULTS

No EUT transmissions were observed on the test channel during the 10-minute observation time.



15. SPOT-CHECK TEST RESULT

BANDEDGE (WORST CASE: 802.11ac VHT80 / 5210 MHz)

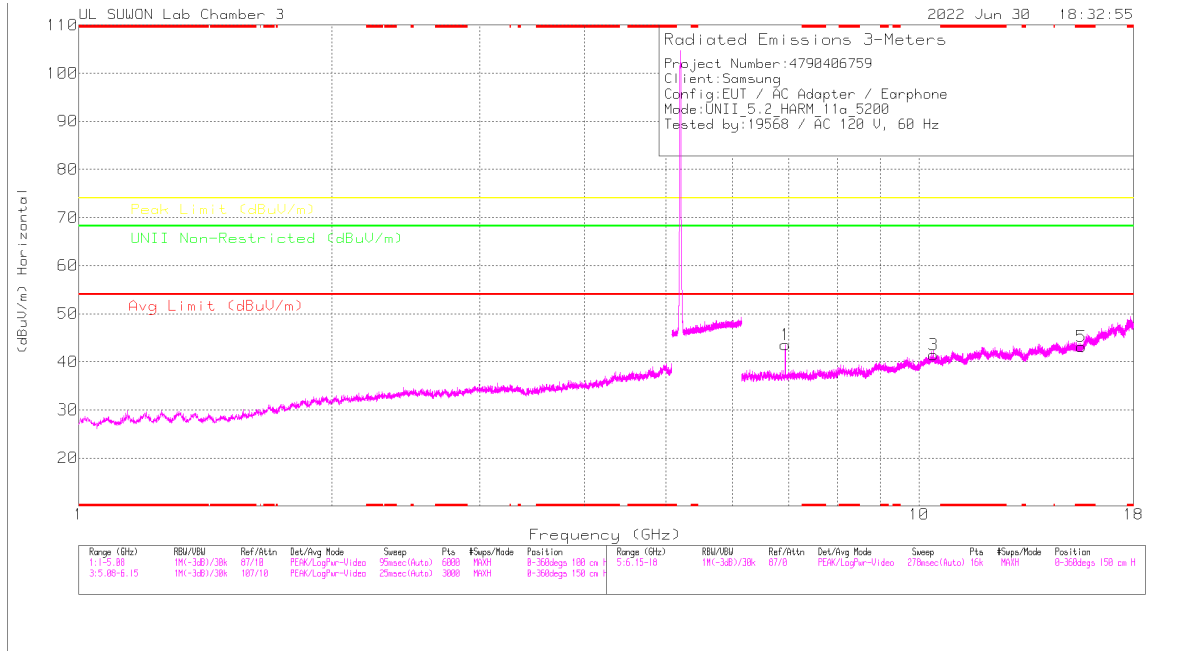


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.14999	47.08	Pk	34.8	-20.6	0	61.28	-	-	74	-12.72	181	110	H
2	* 5.14477	49.15	Pk	34.8	-20.6	0	63.35	-	-	74	-10.65	181	110	H
3	* 5.14999	35.74	RMS	34.8	-20.6	0	49.94	54	-4.06	-	-	181	110	H
4	* 5.14459	37.32	RMS	34.8	-20.6	0	51.52	54	-2.48	-	-	181	110	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5200 MHz)
5200 MHz HORIZONTAL



Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

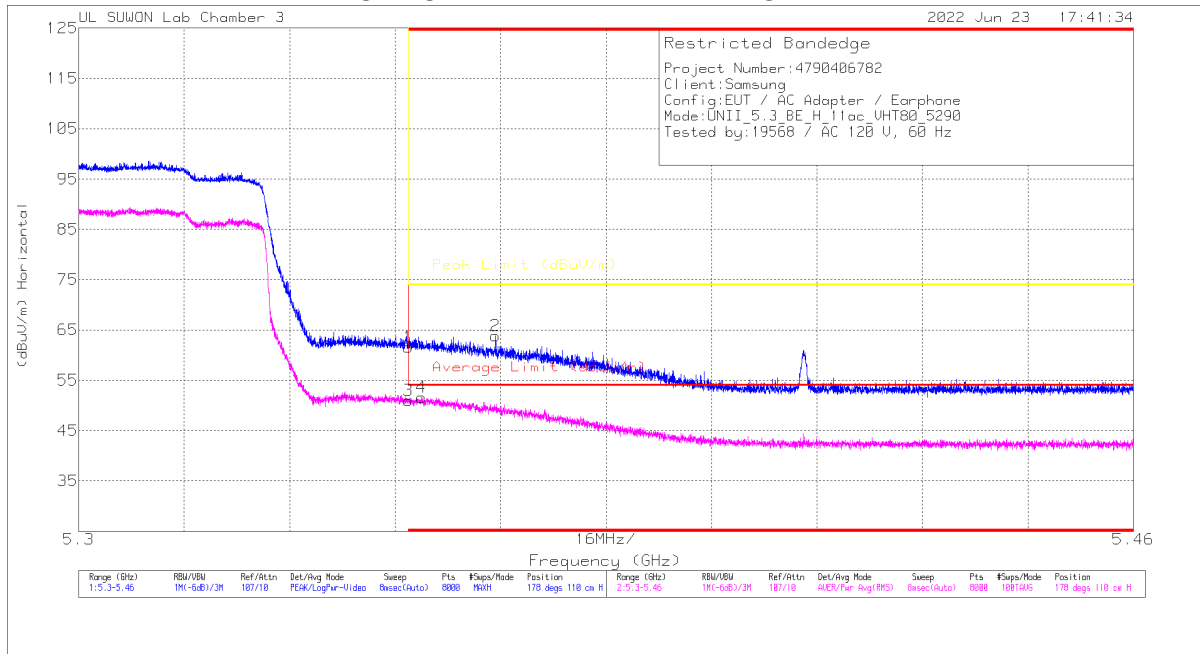
Radiated Emissions

Frequency (GHz)	Meas Reading (dBuV)	Det	317_0021867	60Hz_HF(5B)	DC Corr (dB)	Corrected Reading (dBuV)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Asimuth (Deg)	Height (cm)	Polarity
6.93335	40.14	PK-U	36.2	-26.4	0	49.94	-	-	-	-	68.2	-18.26	159	246	H
10.39948	33.79	PK-U	38.1	-21	0	50.89	-	-	-	-	68.2	-17.31	0	100	H
* 15.59154	33.49	PK-U	40.3	-21.2	0	52.59	-	-	74	-21.41	-	-	0	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak

BANDEDGE (WORST CASE: 802.11ac VHT80 / 5290 MHz)

HORIZONTAL PEAK AND AVERAGE DATA

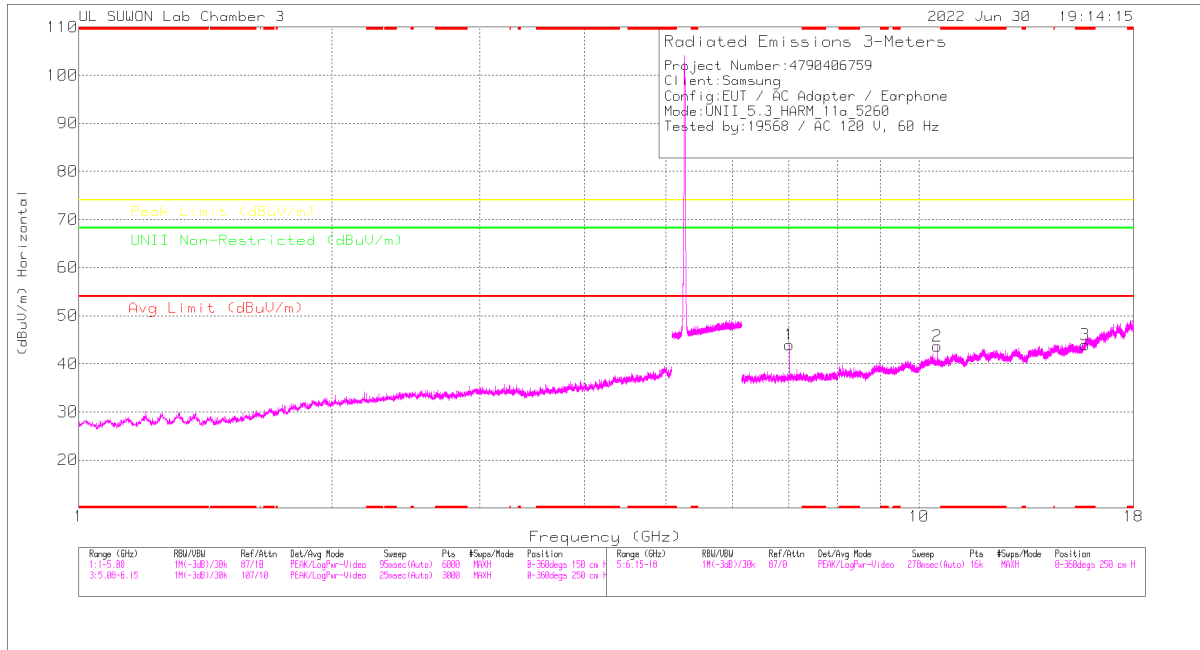


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35001	46.68	PK	35.1	-20.2	0	61.58	-	-	74	-12.42	178	110	H
2	* 5.36325	48.94	PK	35.1	-20.2	0	63.94	-	-	74	-10.16	178	110	H
3	* 5.35001	36.16	RMS	35.1	-20.2	0	51.06	54	-2.94	-	-	178	110	H
4	* 5.35201	36.69	RMS	35.1	-20.2	0	51.59	54	-2.41	-	-	178	110	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5260 MHz)
5260 MHz HORIZONTAL



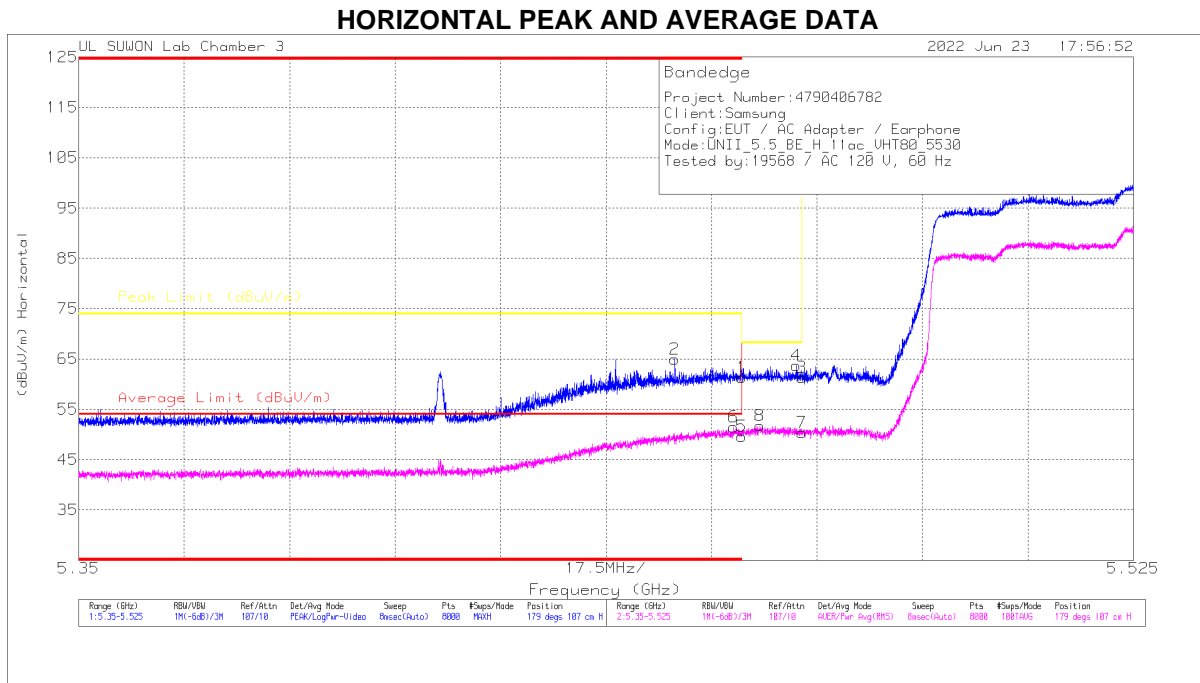
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meas Reading (dBuV)	Det	317_0021857	6GHz_HPS[B]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Altitude (m)	Height (cm)	Polarity
7.0132	40.23	PK-U	36.2	-25.9	0	50.53	-	-	-	-	68.2	-17.67	160	254	H
10.51998	34.46	PK-U	38.2	-21.1	0	51.56	-	-	-	-	68.2	-16.64	164	240	H
*15.77832	34.49	PK-U	40.6	-20.8	0	54.29	-	-	74	-19.71	-	-	0	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak

BANDEDGE (WORST CASE: 802.11ac VHT80 / 5530 MHz)

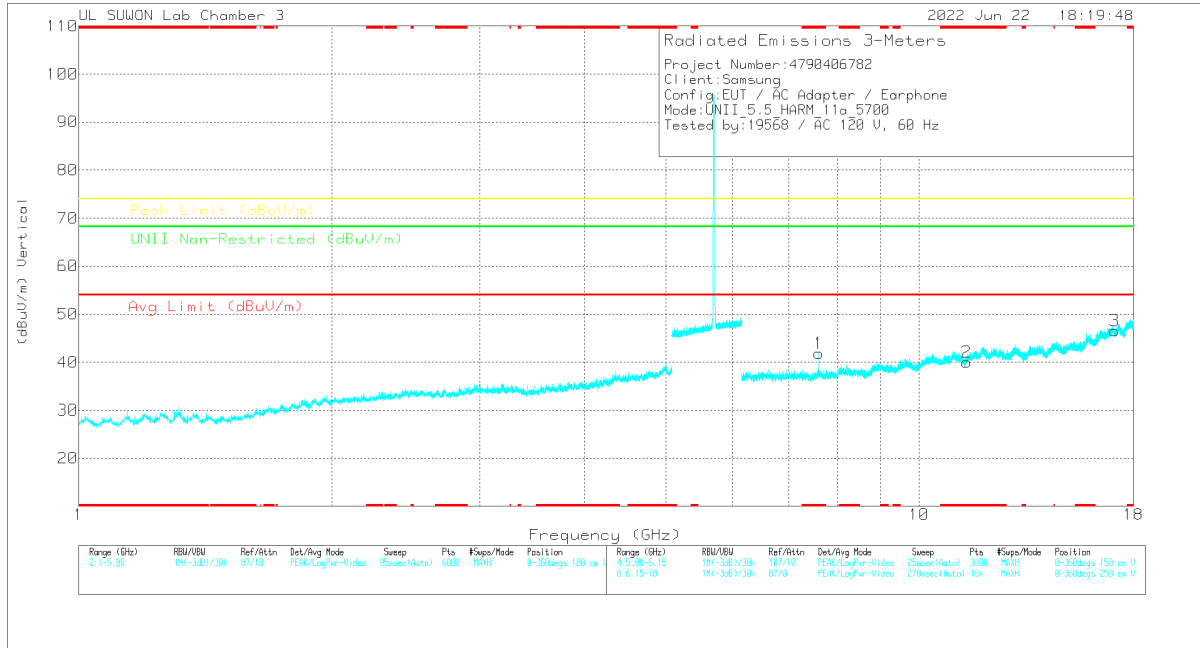


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.45998	46.11	PK	35.3	-20.1	0	61.31	-	-	74	-12.69	179	107	H
2	* 5.44891	49.77	PK	35.3	-20.1	0	64.97	-	-	74	-9.03	179	107	H
3	* 5.46998	46.1	PK	35.3	-20.1	0	61.3	-	-	68.2	-6.9	179	107	H
4	* 5.46908	48.52	PK	35.3	-20.1	0	63.72	-	-	68.2	-4.48	179	107	H
5	* 5.45998	34.41	RMS	35.3	-20.1	0	49.61	54	-4.39	-	-	179	107	H
6	* 5.45862	36.26	RMS	35.3	-20.1	0	51.46	54	-2.54	-	-	179	107	H
7	* 5.46998	35.19	RMS	35.3	-20.1	0	50.39	-	-	-	-	179	107	H
8	* 5.463	36.55	RMS	35.3	-20.1	0	51.75	-	-	-	-	179	107	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5700 MHz)
5700 MHz VERTICAL



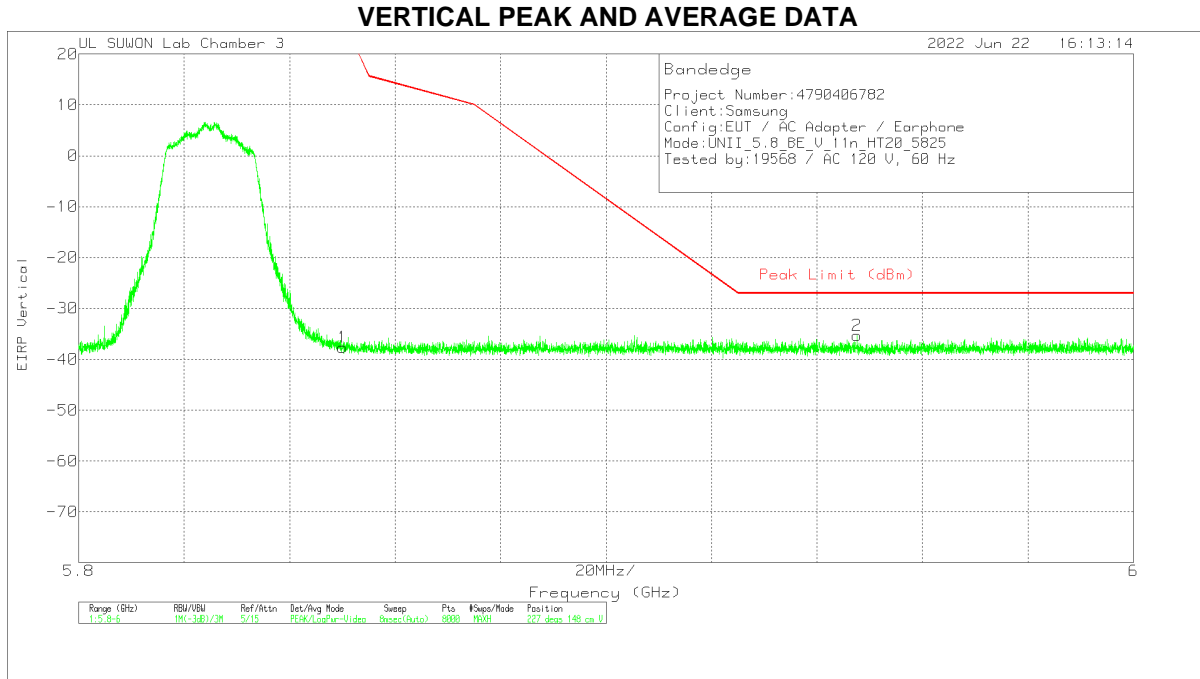
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Mean Reading (dBuV/m)	Det	317_0021857	6GHz_HPI5B	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 7.59993	37.42	PK-U	36.2	-24.1	0	49.52	-	-	74	-24.48	-	-	214	101	V
* 7.59987	29.15	ADR	36.2	-24.1	0	41.25	54	-12.75	-	-	-	-	214	101	V
* 11.40713	32.7	PK-U	38.6	-21.4	0	49.9	-	-	74	-24.1	-	-	360	100	V
17.09309	31.16	PK-U	42.3	-18	0	55.46	-	-	-	-	66.2	-12.72	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak
 ADR - U-NII AD primary method, RMS average

BANDEDGE (WORST CASE: 802.11n HT20 / 5825 MHz)

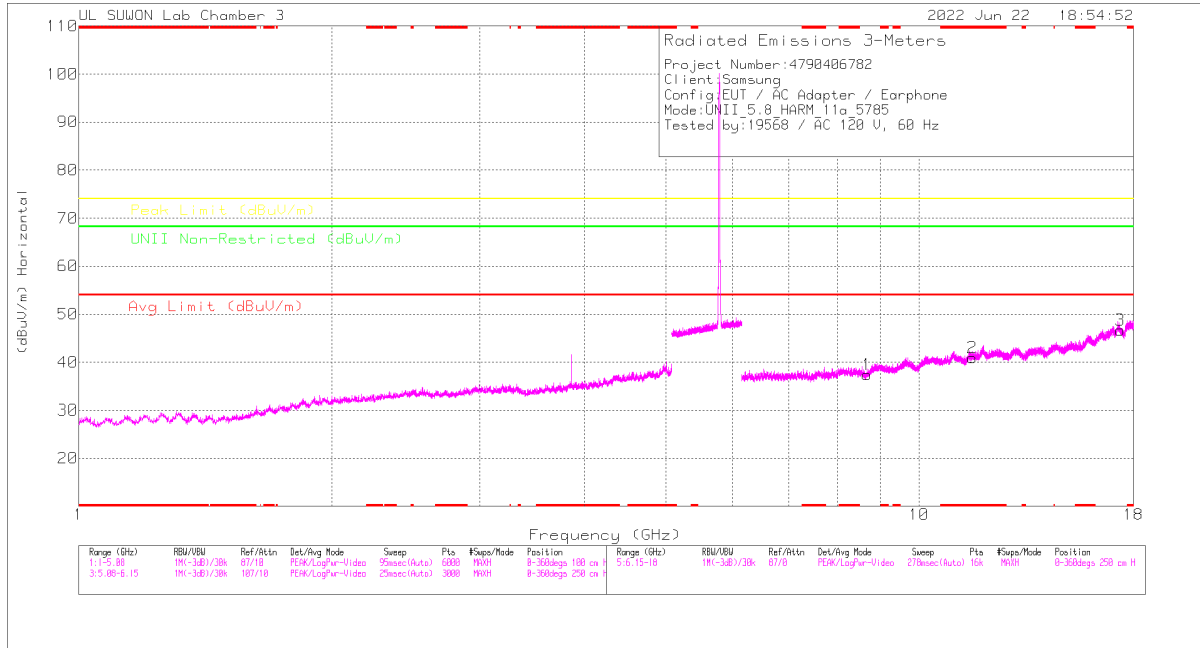


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	3117_00218957	10dB_ATT[dB]	Conversion Factor (dB)	DC Corr (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85001	-66.09	Pk	35.9	-19.3	11.8	0	-37.69	26.99	-64.68	227	148	V
2	5.94759	-63.8	Pk	36	-19.3	11.8	0	-35.3	-27	-8.3	227	148	V

Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 802.11a / 5785 MHz)
5785 MHz HORIZONTAL



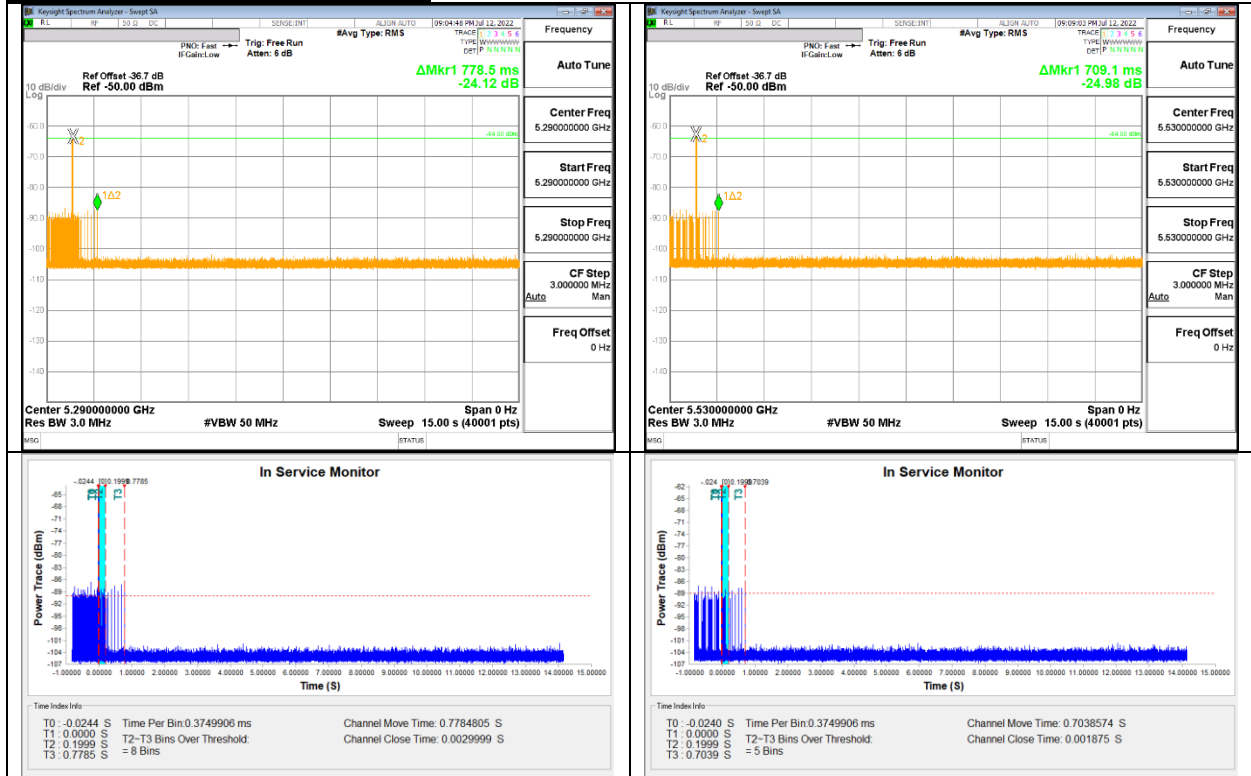
Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Mean Reading (dBuV)	Det	317_00218957	6GHz_HF(5B)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	UNII Non-Restricted (dBuV/m)	Margin (dB)	Azimuth (Deg)	Height (cm)	Polarity
8.67248	34.44	PK-U	36.5	-23	0	47.94	-	-	-	-	68.2	-20.26	360	100	H
* 11.57613	34.46	PK-U	38.9	-21.6	0	51.68	-	-	74	-22.32	-	-	360	100	H
17.36235	31.75	PK-U	42	-17.3	0	56.45	-	-	-	-	68.2	-11.75	360	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK-U - U-NII: Maximum Peak

DFS Channel move & Closing time



END OF TEST REPORT