CERTIFICATION TEST REPORT

Report Number: 13131738-E5V2 & E6V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2410
FCC ID	:	BCG-E3549A
IC	:	579C-E3549A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date of Issue:
October 02, 2020

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	09/21/2020	Initial Issue	Vien Tran
V2	10/02/2020	Updated Section 7.3 per TCB's question	Vien Tran

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

TABLE OF CONTENTS

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: SMARTPHONE

MODEL: A2410

SERIAL NUMBER: (Original): G6TCQ01TQ897, G6TCV00BQ88T
(Spot Check): G6TD401A06P9, G6TD401306P3

DATE TESTED: JULY 17 to AUGUST 31, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Complies
ISED RSS-247 ISSUE 2	Complies
ISED RSS-GEN ISSUE 5	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.
The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:

Chin Pang
Senior Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:

Tony Li
Test Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST RESULT SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
15.209, 15.205, 15.407 (b)	RSS-GEN 8.9, 8.10, RSS-247 6.2	Radiated Emissions	Complies	None.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC KDB 662911 D01 v02r01, FCC KDB 789033 D02 v02r01, ANSI C63.10-2013, RSS-GEN Issue 5, and RSS-247 Issue 2

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions are measured only at the 47173 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.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd
☐ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☒ Chamber I (ISED:2324A-5)
☐ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☐ Chamber J (ISED:2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☐ Chamber K (ISED:2324A-1)
	☐ Chamber G (ISED:22541-4)	☒ Chamber L (ISED:2324A-3)
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

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.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U_{Lab}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.39 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.07 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

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

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

6. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209 -Restriced bands

FCC §15.407(b)(1-3) -Un-Restriced bands

RSS 247 Issue 2 Sections
6.2.1.2 (for 5150-5250 MHz band)
6.2.2.2 (for 5250-5350 MHz band)
6.2.3.2 (for 5470-5600 MHz and 5650-5725 MHz bands)
6.2.4.2 (for 5725-5850 MHz band)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement 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 final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

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.

KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

7. INTRODUCTION OF TEST DATA REUSE

7.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, NFC and WPT. All models support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM) or e-SIM (electronic SIM). The device supports a built-in inductive charging transmitter and receiver. The rechargeable battery is not user accessible.

7.2. INTRODUCTION

This application for certification is leveraging the data reuse procedures from KDB 484596 D01 based on reference FCC ID: BCG-E3548A, IC: 579C-E3548A to cover variant model BCG-E3549A, 579C-E3549A. The major difference between the parent/reference model and the variant model is the depopulation in the variant model of the mmWave transmitter. All other circuitry and features are identical. The data reuse test plan was approved via manufacturer KDB inquiry.

7.3. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device model A2410, FCC ID: BCG-E3549A, IC: 579C-E3549A for radiated spurious and radiated band-edge in accordance with the Test Plan that was approved via KDB inquiry.

BCG-E3543A, 579C-E3549A SPOT CHECK RESULTS										
Technology	Mode	Test Item	Channel	Measured	Original model A2342 BCG-E3548A 579C-E3548A		Spot check model A2410 BCG-E3549A 579C-E3549A		Delta (dB)	
				Frequency (GHz)	Peak (dBuV)	Ave (dBuV)	Peak	Ave	Peak	Ave
UNII	ax, HE20 5.2 & 5.3GHz	RBE	Low, 36	5150	61.80	50.53	65.53	50.89	3.73	0.36
			High, 64	5350	61.77	51.08	64.89	51.13	3.12	0.05
	ax, HE20 5.6GHz	RBE	Low, 100	5460	60.54	48.47	61.64	45.27	1.06	-3.2
	ax, HE20 5.8GHz	RBE	High, 165	5825	-39.04 (EIRP)		-36.94 (EIRP)		2.1	
	ax, HE20 5.3/5.6/5.8GHz	RSE	Mid, 60	11.36	51.60	40.04	51.28	39.38	-0.32	-0.66
			Mid, 116	3.808	44.31	33.2	45.32	34.24	1.01	1.2
			Mid, 157	12.5536	53.12	41.82	NF	NF	N/A	N/A

Comparison with parent model data for spurious emissions shows a delta of less than 3dB, and the parent model's data is considered representative of this model. The variant's band edge emissions, although slightly higher than 3dB above the parent model, are more than 10dB below the limit. The data for band edge emissions is taken in the worst operating mode with respect to band-edge emissions, and therefore, no additional testing for band edge is required.

Note: The output powers were verified on model A2410 to match with model A2342 before radiated emissions spot check was performed.

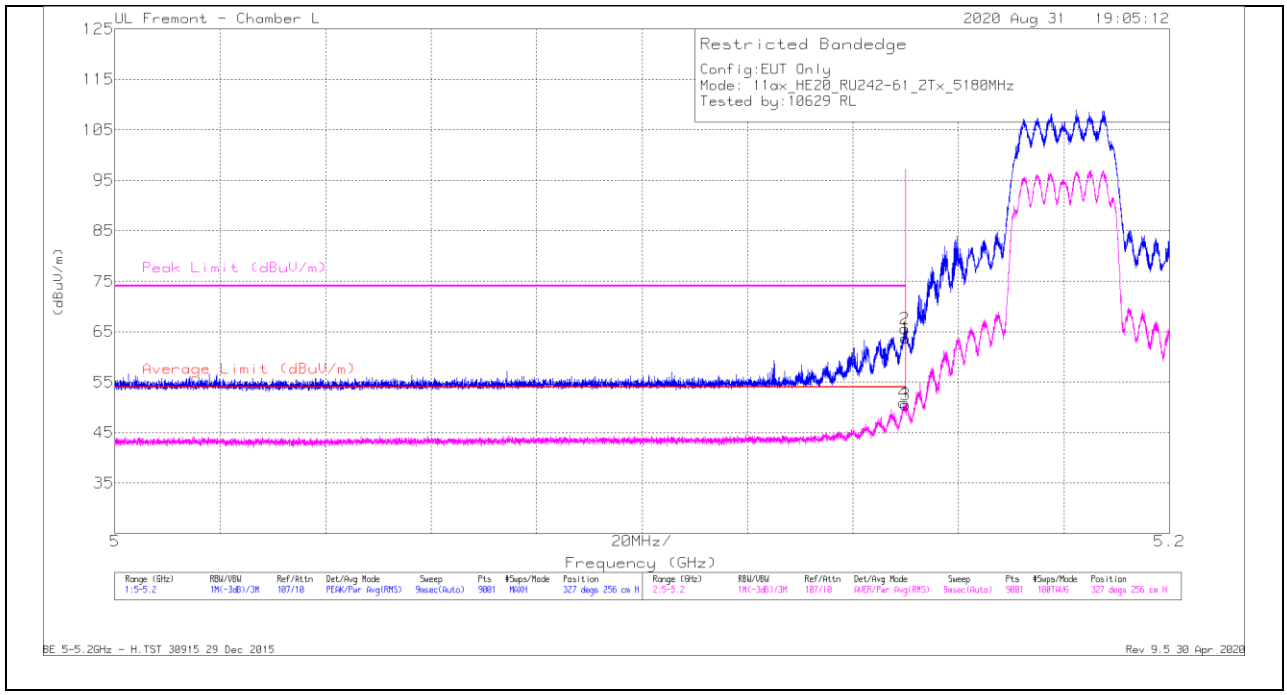
SPOT CHECK DATA

7.3.1. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE 5.2 GHz BAND

5.2GHz Band, Ax, HE 20 RU 61, 242 Tone

BANDEDGE (LOW CHANNEL), 5180MHz

HORIZONTAL RESULT

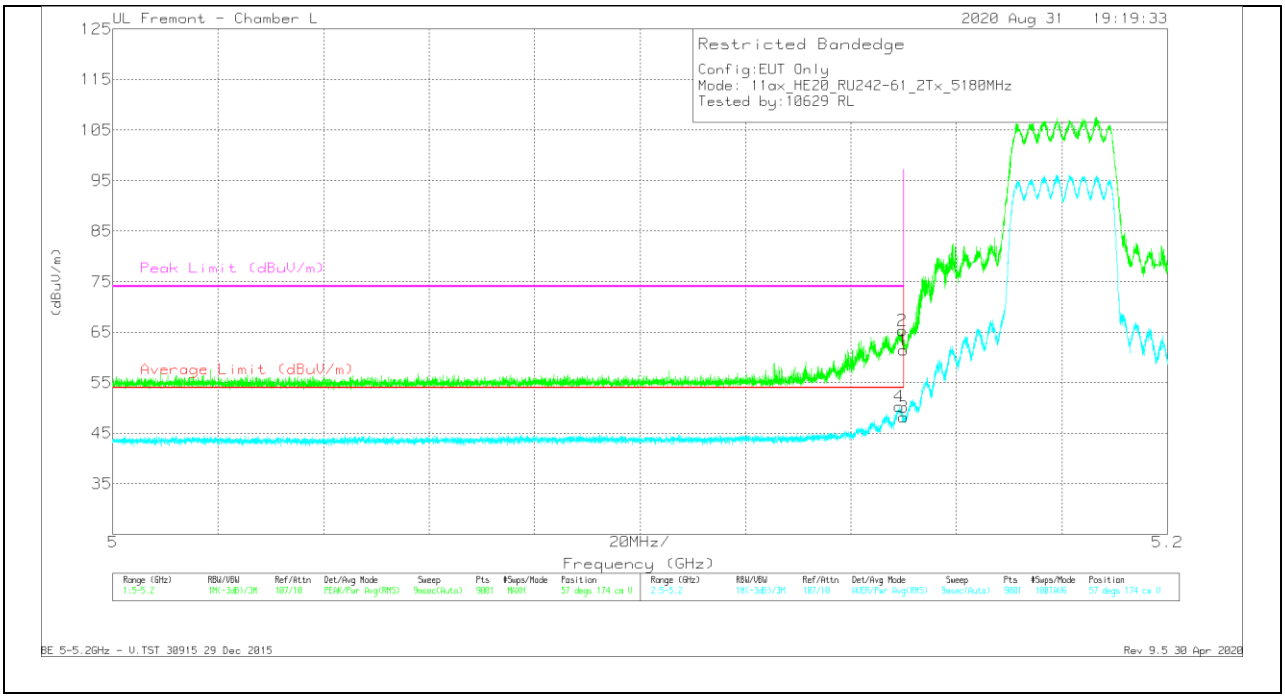


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	46.86	Pk	34.3	-17.5	63.66	-	-	74	-10.34	327	256	H
2	* 5.14989	48.73	Pk	34.3	-17.5	65.53	-	-	74	-8.47	327	256	H
3	* 5.15	33.77	RMS	34.3	-17.5	50.57	54	-3.43	-	-	327	256	H
4	* 5.14967	34.09	RMS	34.3	-17.5	50.89	54	-3.11	-	-	327	256	H

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

BE 5-5.2GHz - H.TST 30915 29 Dec 2015
Rev 9.5 30 Apr 2020

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	44.63	Pk	34.3	-17.5	61.43	-	-	74	-12.57	57	174	V
2	* 5.14971	48.56	Pk	34.3	-17.5	65.36	-	-	74	-8.64	57	174	V
3	* 5.15	31.37	RMS	34.3	-17.5	48.17	54	-5.83	-	-	57	174	V
4	* 5.14915	33.49	RMS	34.3	-17.5	50.29	54	-3.71	-	-	57	174	V

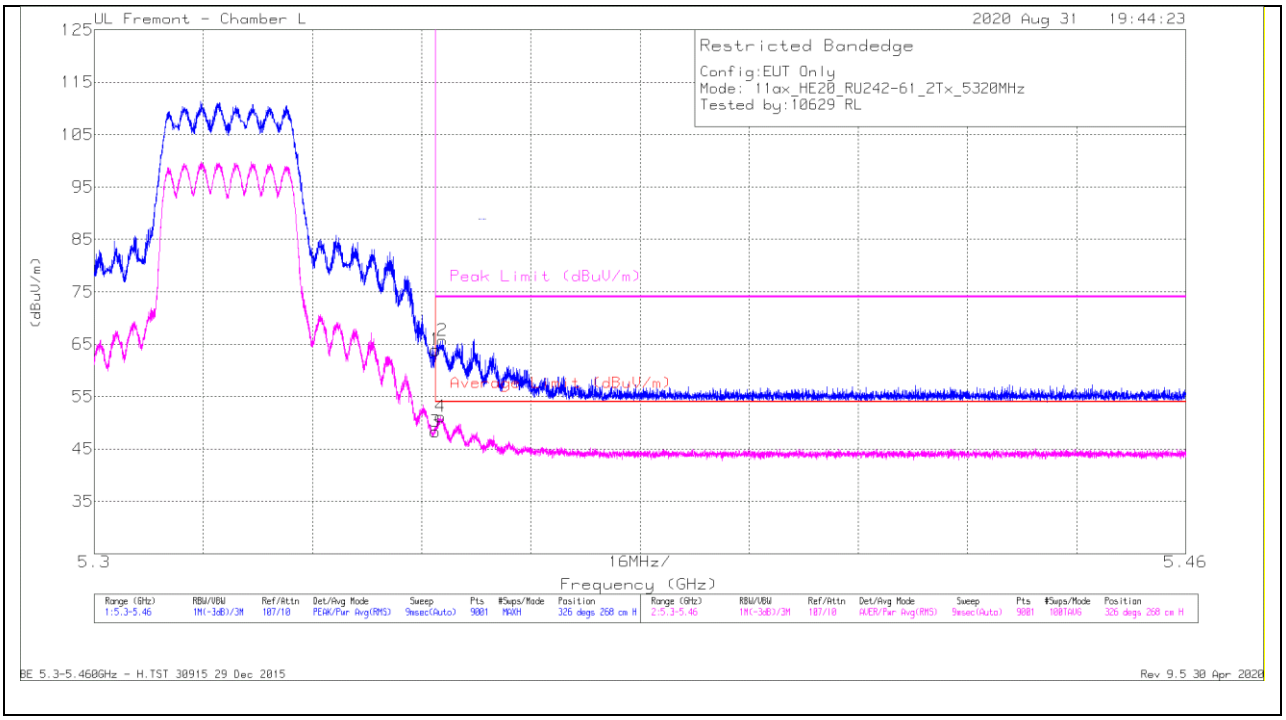
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

BE 5-5.2GHz - V.TST 30915 29 Dec 2015
Rev 9.5 30 Apr 2020

7.3.2. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE 5.3 GHz BAND

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT

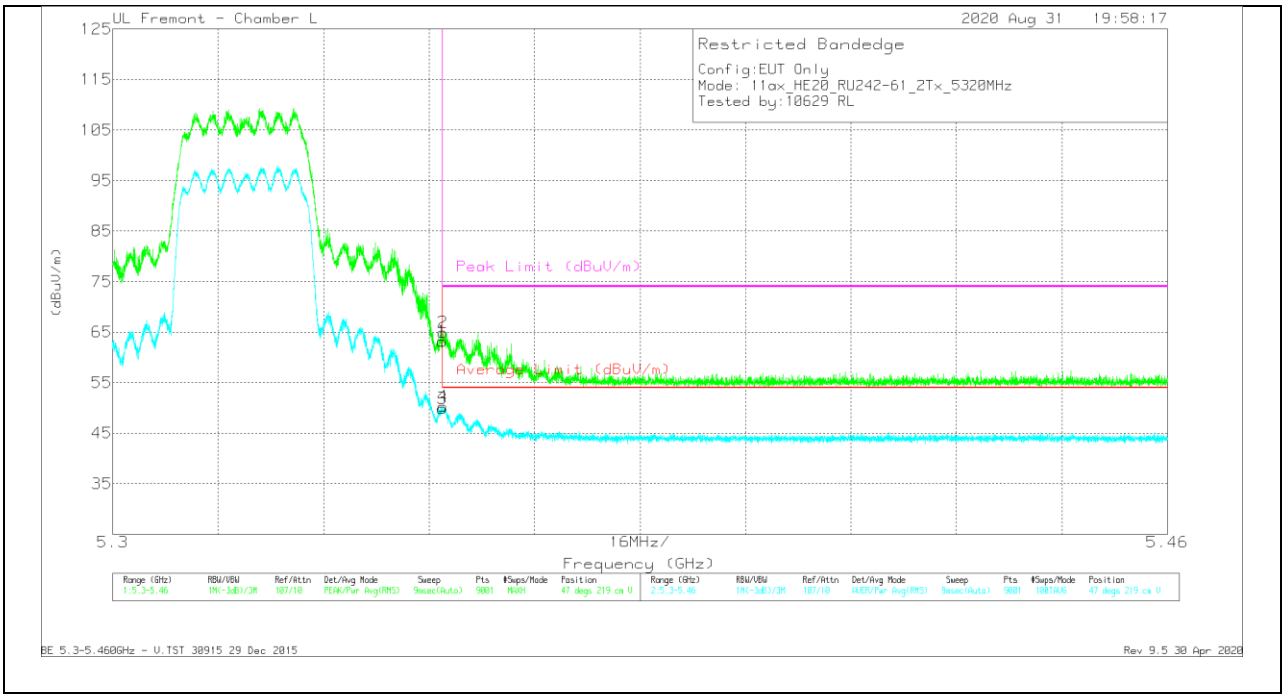


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35001	45.49	Pk	34.5	-17.1	62.89	-	-	74	-11.11	326	268	H
2	* 5.35115	47.49	Pk	34.5	-17.1	64.89	-	-	74	-9.11	326	268	H
3	* 5.35001	30.94	RMS	34.5	-17.1	48.34	54	-5.66	-	-	326	268	H
4	* 5.35072	33.73	RMS	34.5	-17.1	51.13	54	-2.87	-	-	326	268	H

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

BE 5.3-5.460GHz - H.TST 30915 29 Dec 2015
Rev 9.5 30 Apr 2020

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Amp/Cbl /Fltr/Pad (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	45.83	Pk	34.5	-17.1	63.23	-	-	74	-10.77	47	219	V
2	* 5.35012	47.54	Pk	34.5	-17.1	64.94	-	-	74	-9.06	47	219	V
3	* 5.35001	32.49	RMS	34.5	-17.1	49.89	54	-4.11	-	-	47	219	V
4	* 5.35012	32.87	RMS	34.5	-17.1	50.27	54	-3.73	-	-	47	219	V

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

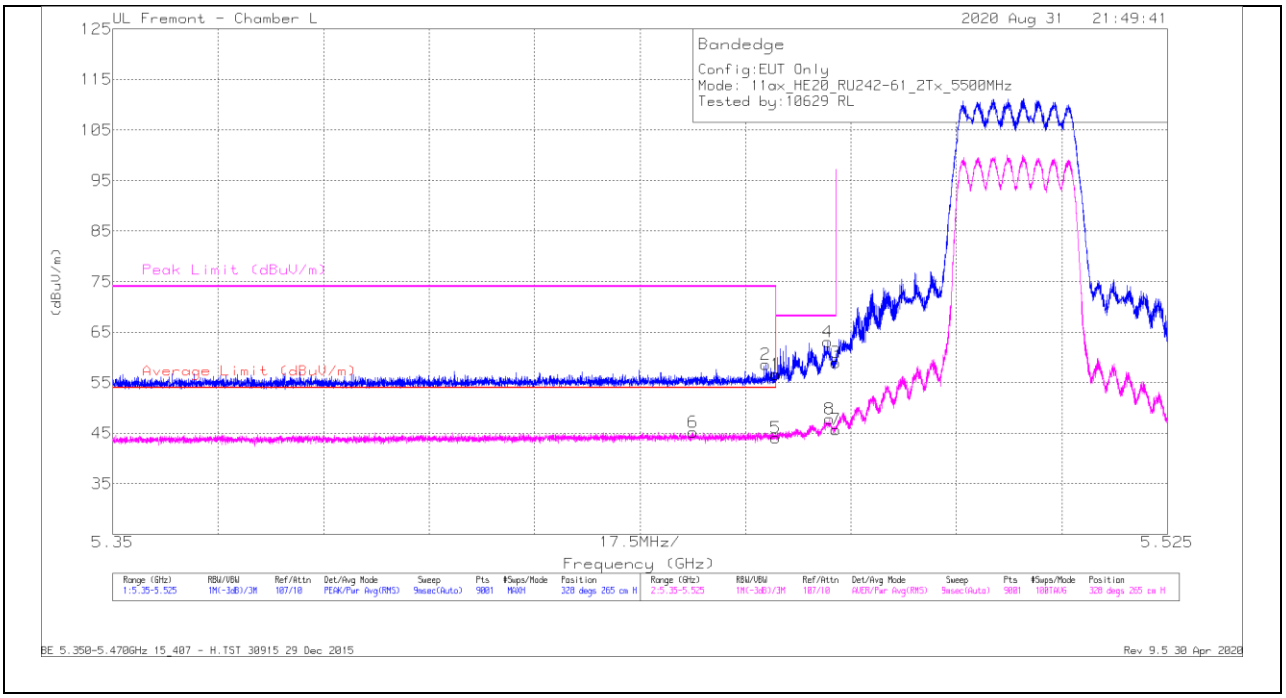
BE 5.3-5.460GHz - V.TST 30915 29 Dec 2015
Rev 9.5 30 Apr 2020

7.3.3. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE 5.6 GHz BAND

5.6GHz Band, Ax, HE 20 242 Tone

BANDEDGE (LOW CHANNEL), 5500MHz

HORIZONTAL RESULT



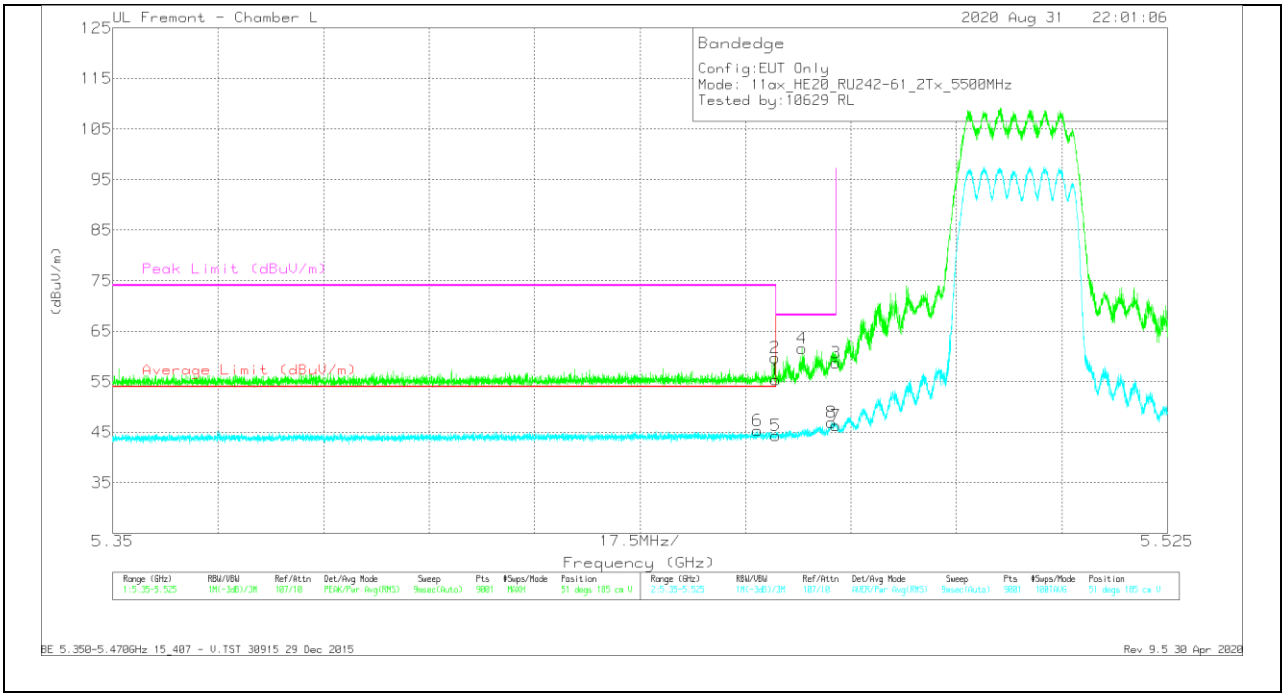
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.45999	38.94	Pk	34.6	-16.9	56.64	-	-	74	-17.36	328	265	H
2	* 5.45836	40.96	Pk	34.6	-16.9	58.66	-	-	74	-15.34	328	265	H
3	5.46999	41.29	Pk	34.6	-16.9	58.99	-	-	68.2	-9.21	328	265	H
4	5.46863	45.39	Pk	34.6	-16.9	63.09	-	-	68.2	-5.11	328	265	H
5	* 5.45999	26.35	RMS	34.6	-16.9	44.05	54	-9.95	-	-	328	265	H
6	* 5.44625	27.53	RMS	34.6	-16.9	45.23	54	-8.77	-	-	328	265	H
7	5.46999	28	RMS	34.6	-16.9	45.7	-	-	-	-	328	265	H
8	5.46896	30.11	RMS	34.6	-16.9	47.81	-	-	-	-	328	265	H

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

BE 5.350-5.470GHz 15_407 - H.TST 30915 29 Dec 2015
Rev 9.5 30 Apr 2020

BANDEDGE (LOW CHANNEL)

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.45999	37.64	Pk	34.6	-16.9	55.34	-	-	74	-18.66	51	185	V
2	* 5.45988	42.04	Pk	34.6	-16.9	59.74	-	-	74	-14.26	51	185	V
3	5.46999	41.07	Pk	34.6	-16.9	58.77	-	-	68.2	-9.43	51	185	V
4	5.46435	44.04	Pk	34.5	-16.9	61.64	-	-	68.2	-6.56	51	185	V
5	* 5.45999	26.6	RMS	34.6	-16.9	44.3	54	-9.7	-	-	51	185	V
6	* 5.457	27.47	RMS	34.7	-16.9	45.27	54	-8.73	-	-	51	185	V
7	5.46999	28.58	RMS	34.6	-16.9	46.28	-	-	-	-	51	185	V
8	5.46923	29.22	RMS	34.6	-16.9	46.92	-	-	-	-	51	185	V

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

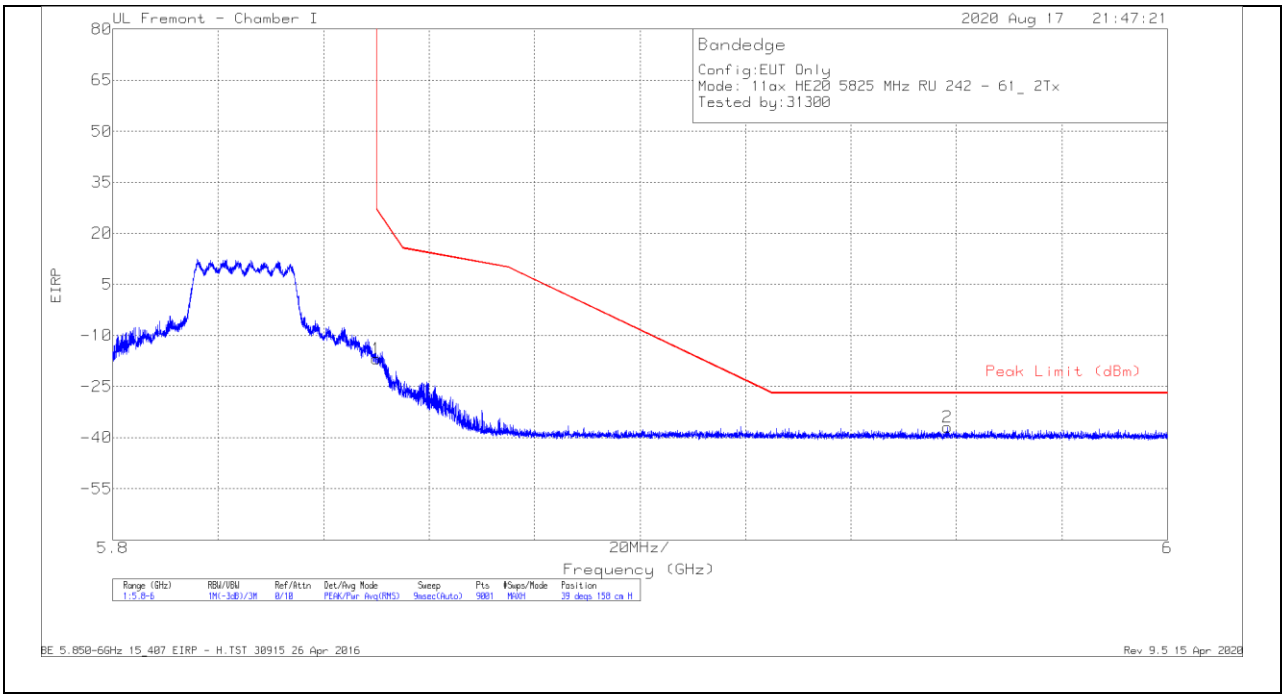
7.3.4. TX ABOVE 1 GHz 802.11ax HE20 MODE IN THE 5.8 GHz BAND

5.8GHz Band, Ax, HE 20 242 Tone

5825MHz

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



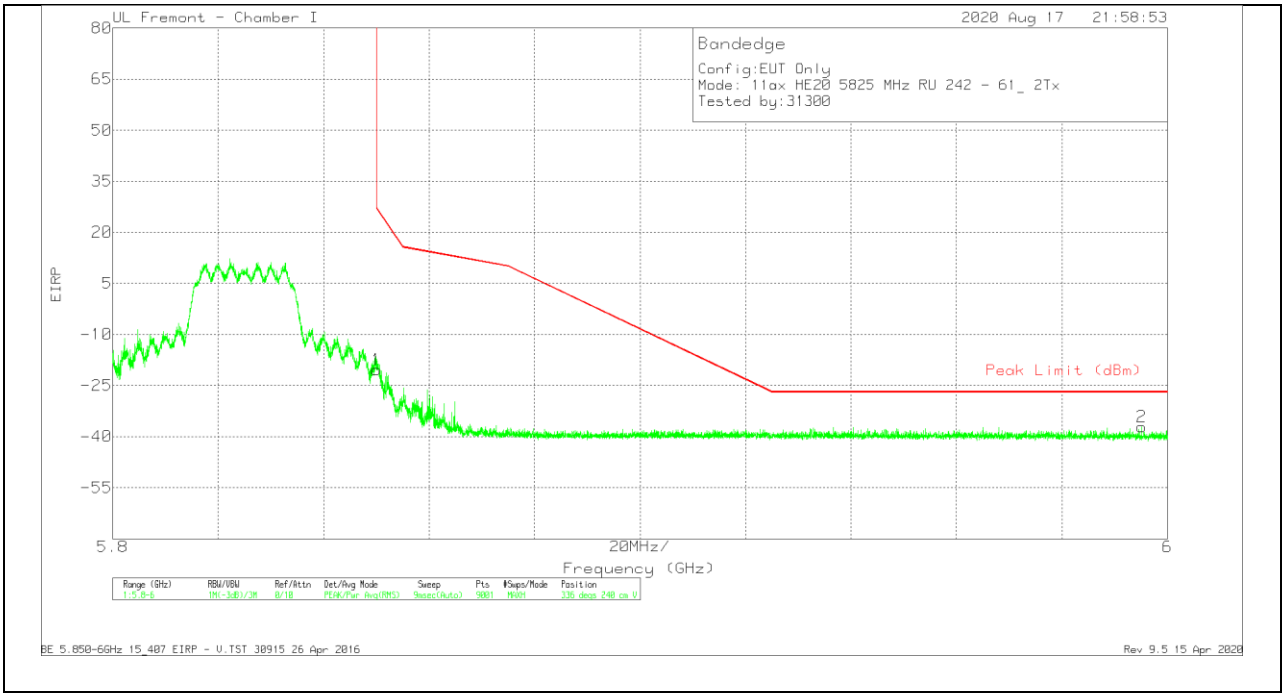
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85002	-49.97	Pk	35	-13.6	11.8	-16.77	26.95	-43.72	39	158	H
2	5.95833	-70.44	Pk	35.2	-13.5	11.8	-36.94	-27	-9.94	39	158	H

Pk - Peak detector

BE 5.850-6GHz 15_407 EIRP - H.TST 30915 26 Apr 2016
Rev 9.5 15 Apr 2020

BANDEDGE (HIGH CHANNEL)

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85002	-53.57	Pk	35	-13.6	11.8	-20.37	26.95	-47.32	336	240	V
2	5.99509	-70.57	Pk	35.3	-13.6	11.8	-37.07	-27	-10.07	336	240	V

Pk - Peak detector

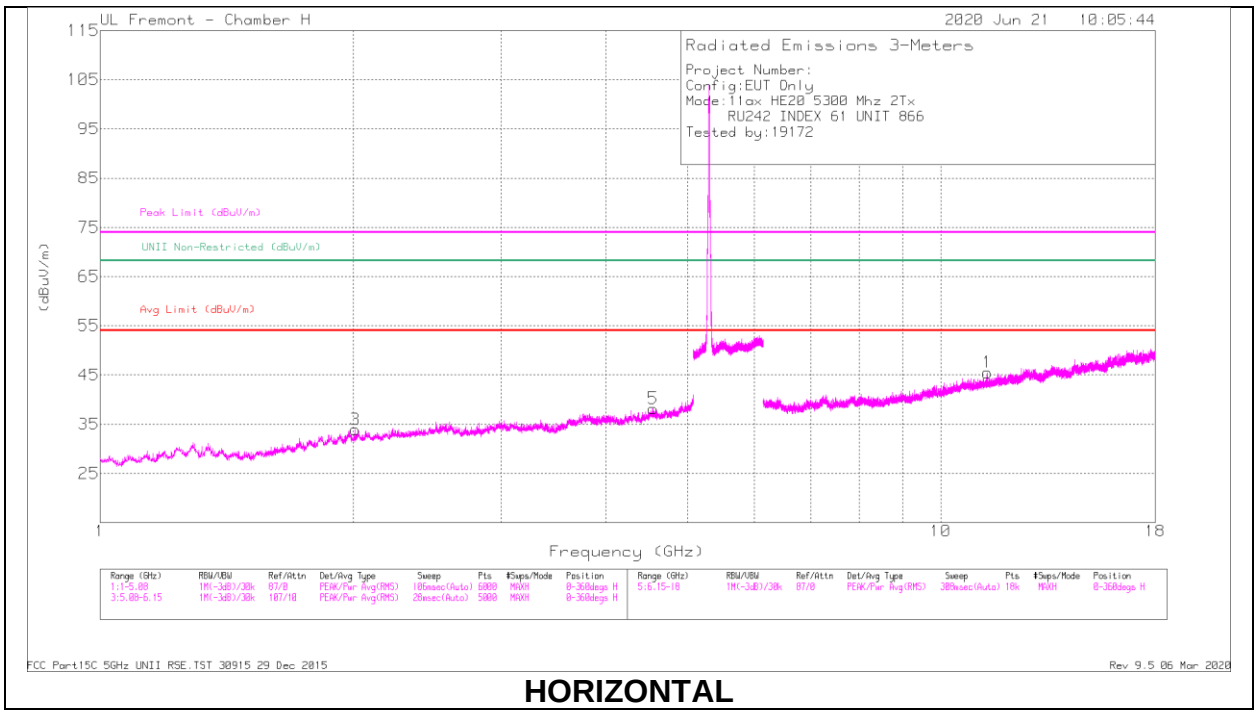
BE 5.850-6GHz 15_407 EIRP - V.TST 30915 26 Apr 2016
Rev 9.5 15 Apr 2020

HARMONICS AND SPURIOUS EMISSIONS

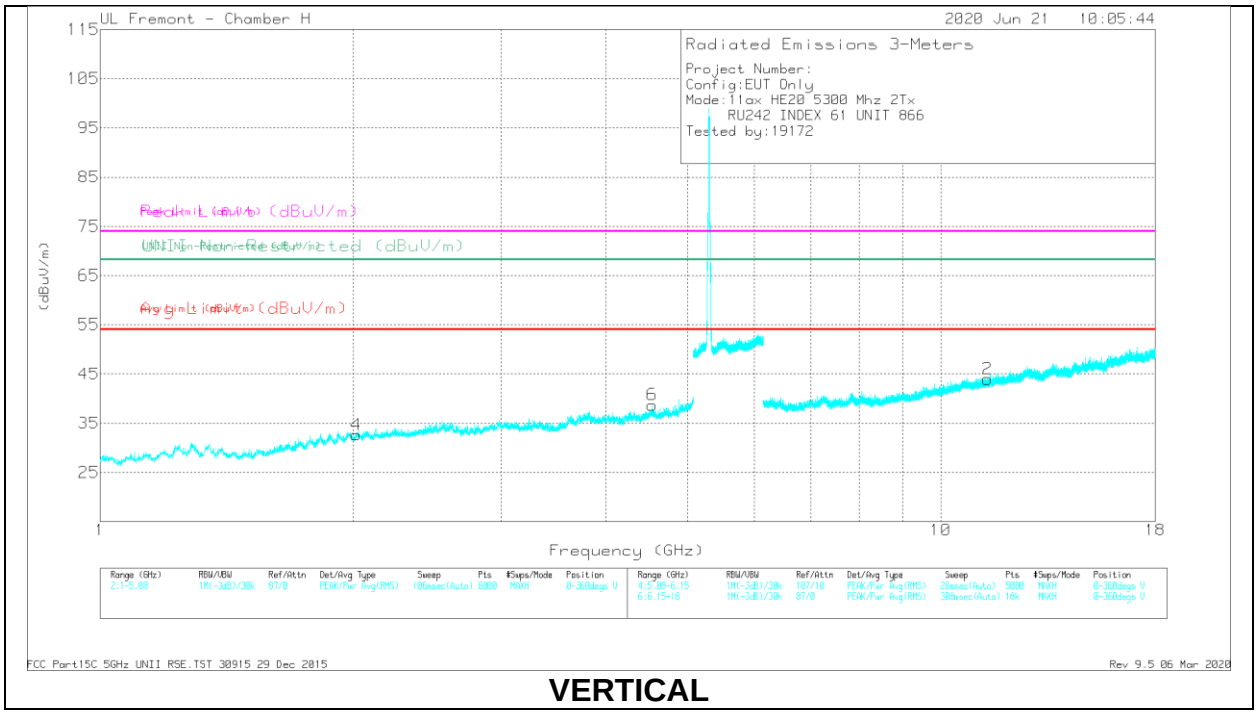
2TX Antenna 5 + Antenna 6 OFDMA MODE

5.3GHz Band, 5300MHz

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr /Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.54664	41.28	PK-U	34.1	-30.4	44.98	-	-	74	-29.02	-	-	9	205	H
	* 4.54668	29.72	ADR	34.1	-30.4	33.42	54	-20.58	-	-	-	-	9	205	H
4	* 4.53554	41.94	PK-U	34.1	-30.3	45.74	-	-	74	-28.26	-	-	343	343	V
	* 4.53469	29.59	ADR	34.1	-30.3	33.39	54	-20.61	-	-	-	-	343	343	V
5	* 11.36142	37.18	PK-U	38.1	-24	51.28	-	-	74	-22.72	-	-	138	278	H
	* 11.36037	25.28	ADR	38.1	-24	39.38	54	-14.62	-	-	-	-	138	278	H
6	* 11.36609	37.21	PK-U	38	-24.1	51.11	-	-	74	-22.89	-	-	249	340	V
	* 11.3664	25.3	ADR	38	-24.1	39.2	54	-14.8	-	-	-	-	249	340	V
1	2.01253	42.98	PK-U	31.6	-34.3	40.28	-	-	-	-	68.2	-27.92	212	299	H
	2.01262	31.06	ADR	31.6	-34.3	28.36	-	-	-	-	-	-	212	299	H
2	2.01609	31.22	ADR	31.6	-34.3	28.52	-	-	-	-	-	-	171	261	V
	2.01684	42.97	PK-U	31.6	-34.3	40.27	-	-	-	-	68.2	-27.93	171	261	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

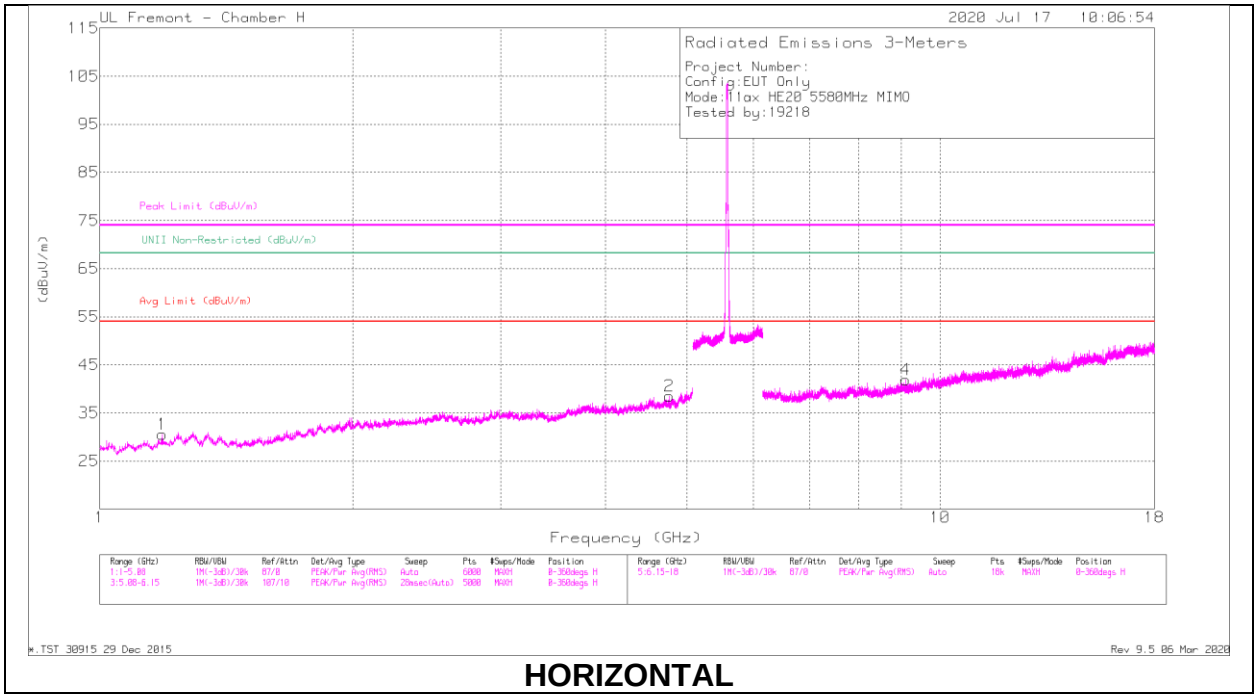
FCC Part15C 5GHz UNII RSE.TST 30915 29 Dec 2015
Rev 9.5 06 Mar 2020

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

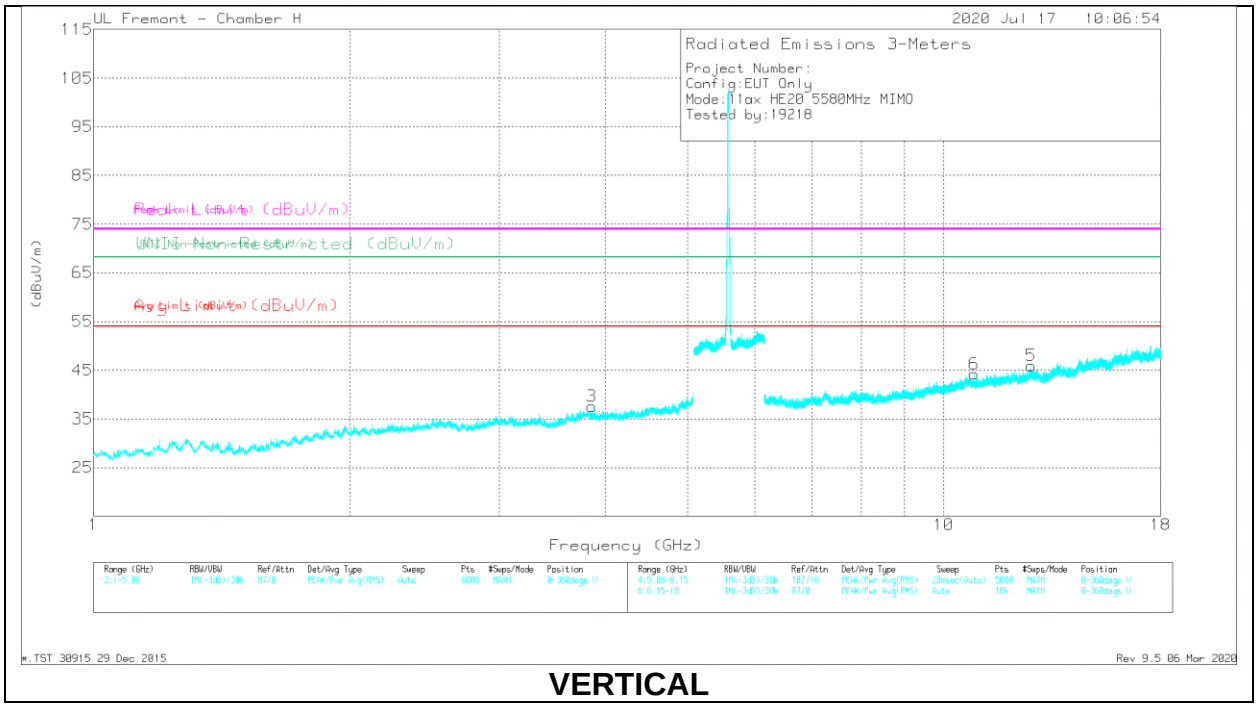
2TX Antenna 5 + Antenna 6 OFDMA MODE

5.6GHz Band, 5580MHz

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.18621	44.87	PK-U	28.2	-35.6	37.47	-	-	74	-36.53	17	161	H
	* 1.18596	32.88	ADR	28.2	-35.6	25.48	54	-28.52	-	-	17	161	H
2	* 4.76253	41.11	PK-U	34.2	-30.8	44.51	-	-	74	-29.49	68	210	H
	* 4.76345	30.29	ADR	34.2	-30.8	33.69	54	-20.31	-	-	68	210	H
3	* 3.81501	41.62	PK-U	34.1	-30.4	45.32	-	-	74	-28.68	104	243	V
	* 3.81512	30.64	ADR	34.1	-30.5	34.24	54	-19.76	-	-	104	243	V
4	* 9.09823	37.48	PK-U	36.3	-26	47.78	-	-	74	-26.22	0	217	H
	* 9.09684	26.43	ADR	36.3	-26	36.73	54	-17.27	-	-	0	217	H
5	* 12.68544	36.01	PK-U	39.8	-23.7	52.11	-	-	74	-21.89	221	313	V
	* 12.68603	25.52	ADR	39.8	-23.7	41.62	54	-12.38	-	-	221	313	V
6	* 10.86353	36.52	PK-U	37.6	-24	50.12	-	-	74	-23.88	318	308	V
	* 10.86219	25.52	ADR	37.6	-24	39.12	54	-14.88	-	-	318	308	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

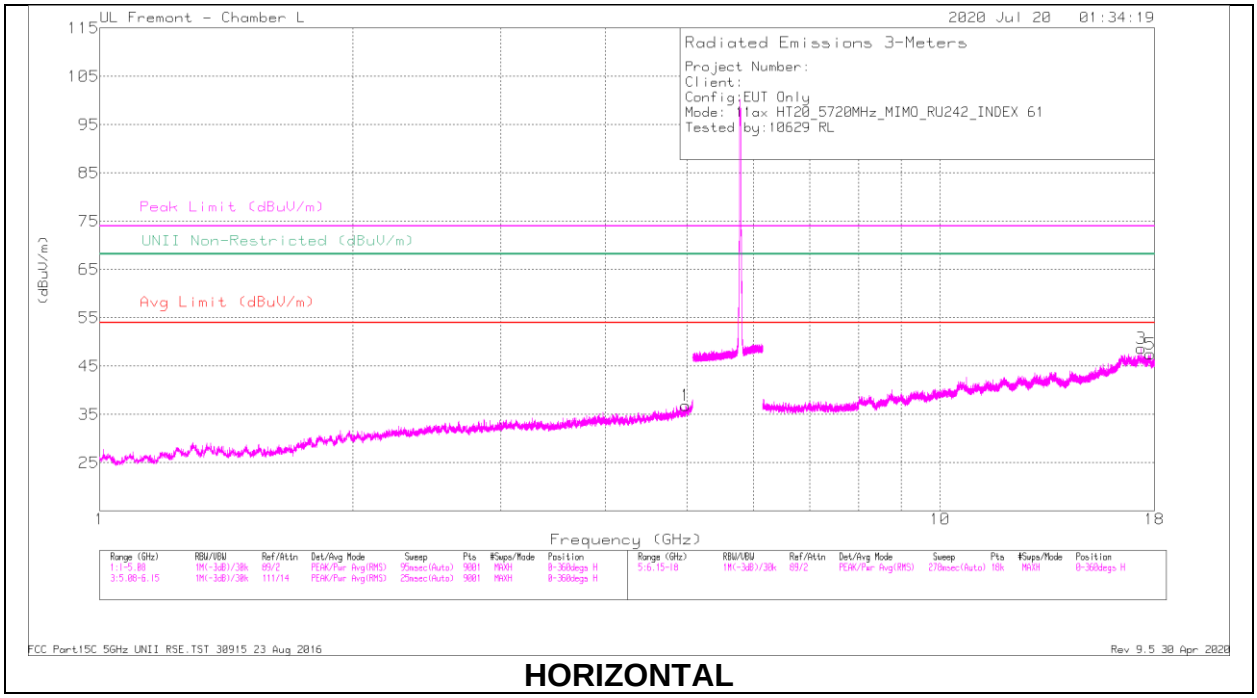
*.TST 30915 29 Dec 2015
Rev 9.5 06 Mar 2020

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

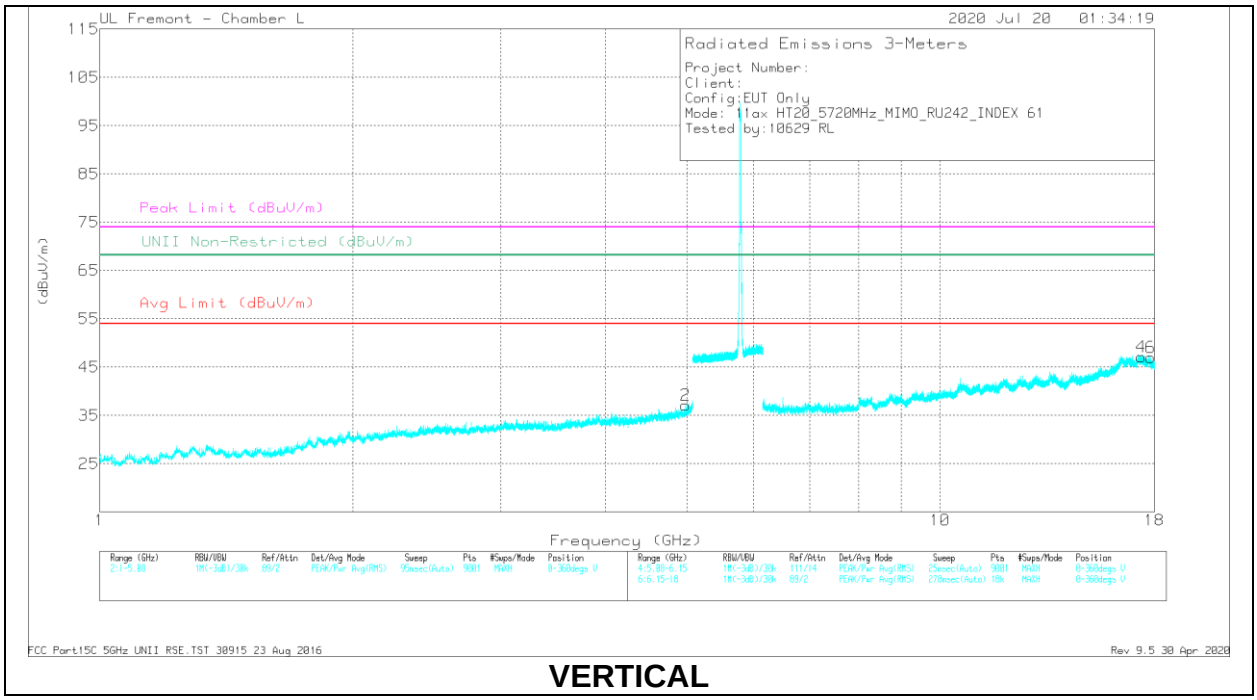
2TX Antenna 5 + Antenna 6 OFDMA MODE

5.8GHz Band, 5785MHz

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.98417	35.79	PK-U	34.1	-25.6	44.29	-	-	74	-29.71	-	-	107	158	H
	* 4.98498	25.9	ADR	34.1	-25.6	34.4	54	-19.6	-	-	-	-	107	158	H
2	* 4.98417	35.77	PK-U	34.1	-25.6	44.27	-	-	74	-29.73	-	-	130	286	V
	* 4.98592	26.07	ADR	34.1	-25.5	34.67	54	-19.33	-	-	-	-	130	286	V
3	17.35219	35.39	PK-U	41.6	-17.6	59.39	-	-	-	-	68.2	-8.81	152	103	H
5	* 17.79843	31.72	PK-U	41.5	-16.5	56.72	-	-	74	-17.28	-	-	222	115	H
	* 17.80418	19.84	ADR	41.5	-16.5	44.84	54	-9.16	-	-	-	-	222	115	H
4	17.35134	33.53	PK-U	41.6	-17.6	57.53	-	-	-	-	68.2	-10.67	183	164	V
6	* 17.80337	30.12	PK-U	41.5	-16.5	55.12	-	-	74	-18.88	-	-	0	175	V
	* 17.80266	19.56	ADR	41.5	-16.5	44.56	54	-9.44	-	-	-	-	0	175	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

FCC Part15C 5GHz UNII RSE.TST 30915 23 Aug 2016
Rev 9.5 30 Apr 2020

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

7.4. REFERENCE DETAIL

Reference application that contains the reference data which is attached to this report in Appendix A.

Equipment Class	Reference FCC ID & IC	Reference Report	Report Title/Section
NII	BCG-E3548A 579C-E3548A	13335182-E5 (FCC) 13335182-E6 (IC) 13335182-E5 & E6	FCC IC_UNII Report / All sections

*-E5 report is conducted measurements for FCC, -E6 is conducted for Canada, -E5 & E6 contains radiated emissions data.

7.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

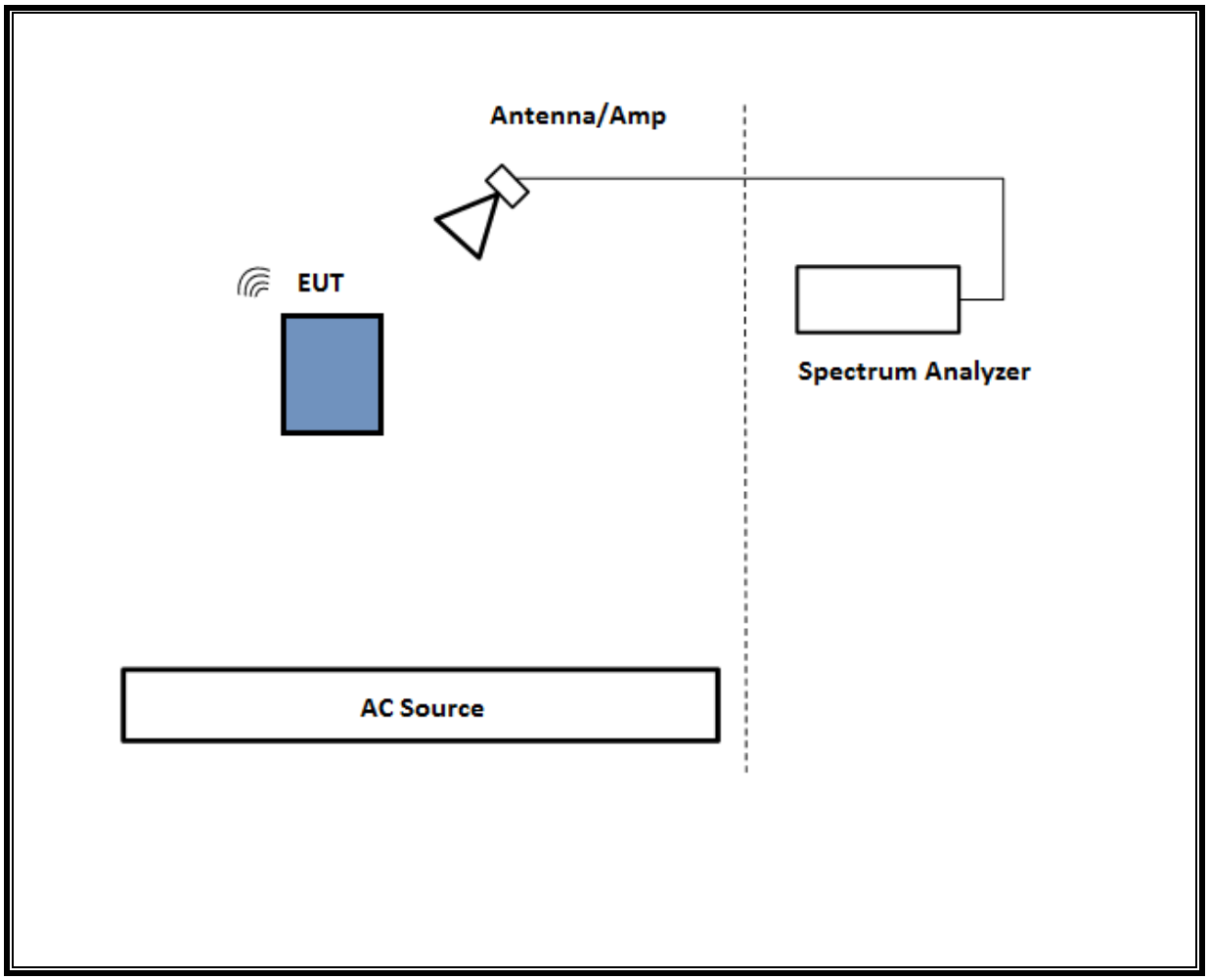
Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Apple	A1989	C02YL3ZMJHC8	BCGA1989
Laptop 61W USBC-C AC/DC adapter	Liteon Technology	A1718	C4N711404U3GN8RAW	NA
EUT AC Adapter	Apple	A2305	D292365CDYADHLHC3	NA

I/O CABLES (RADIATED ABOVE 1 GHZ)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
NA						

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

SETUP DIAGRAM FOR RADIATED TESTS Above 1GHz



7.6. WORST-CASE CONFIGURATION AND MODE

For radiated harmonics spurious 1-18GHz L/M/H channels were performed with the EUT set at the 2TX CDD mode based on model A2342 with power setting equal or higher than SISO modes as worst-case scenario.

8. MEASUREMENT METHOD

Test Item	Test Method
Unwanted emissions in restricted bands:	KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.
Unwanted emissions in non-restricted bands	KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.
Band-edge	ANSI C63.10-2013, Section 6.10.

9. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Due**
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T344	05/26/2021	05/26/2020
Amplifier, 1 to 18GHz, 35dB	Amplical	AFS42-00101800-25-S-42	T1568	04/14/2021	04/14/2020
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0180917	02/26/2021	02/26/2020
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	11/01/2020	11/01/2019
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	T1569	01/30/2021	01/30/2020
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A-544	T1210	01/21/2021	01/21/2020
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	11/01/2020	11/01/2019
EMI Test Receiver	Rohde & Schwarz	ESW44	Pre0179372	02/25/2021	02/25/2020
Amplifier, 1 to 18GHz, 35dB	Amplical	AFS42-00101800-25-S-42	T1567	01/24/2021	01/24/2020
Power Meter, P-series single channel	Keysight	N1911A	PRE0177682	01/21/2021	01/21/2020
Power Sensor	Keysight	N1921A	T1226	02/13/2021	02/13/2020

UL AUTOMATION SOFTWARE			
Radiated Software	UL	UL EMC	Rev 9.5, 30 Apr, 2020

10. SETUP PHOTOS

Please refer to 13335182-EP1V1 for setup photos

END OF TEST REPORT

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888