



TEST REPORT

Report Number: 13389132-E5V1 & E6V1

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

Model : A2411, A2412, A2413

FCC ID : BCG-E3550A
IC : 579C-E3550A

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:
September 21, 2020

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	9/21/2020	Initial Revision	Chin Pang

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A2411, A2412, A2413

SERIAL NUMBER: (Original): G6TCQ01TQ897, G6TCQ02KQ897
(Spot Check): G6TD401R06R1, G6TD401N06R1

DATE TESTED: AUGUST 14 – 28, 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
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UL Verification Services Inc.

Prepared By:



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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
<input type="checkbox"/> Chamber A (ISED:2324B-1)	<input type="checkbox"/> Chamber D (ISED:22541-1)	<input type="checkbox"/> Chamber I (ISED:2324A-5)
<input type="checkbox"/> Chamber B (ISED:2324B-2)	<input type="checkbox"/> Chamber E (ISED:22541-2)	<input checked="" type="checkbox"/> Chamber J (ISED:2324A-6)
<input type="checkbox"/> Chamber C (ISED:2324B-3)	<input type="checkbox"/> Chamber F (ISED:22541-3)	<input type="checkbox"/> Chamber K (ISED:2324A-1)
	<input type="checkbox"/> Chamber G (ISED:22541-4)	<input type="checkbox"/> Chamber L (ISED:2324A-3)
	<input type="checkbox"/> 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: 2324A.

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

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%.

6. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209 -Restricted bands

FCC §15.407(b)(1-3) -Un-Restricted 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 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.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

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 spectrum from 30 MHz to 1GHz and 18GHz to 40 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 5 GHz bands.

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.

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, TD-SCDMA, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wide band, GPS and NFC. All models support at least one UICC based SIM. The second SIM, if present, is either UICC based pSIM (physical SIM) or e-SIM (electronic SIM). The device has a built-in inductive charging receiver. The rechargeable battery is also 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-E3550A, 579C-E3550A. 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. DIFFERENCE IN MODEL NUMBER

Models A2411, A2412, and A2413 are electrically identical and the model numbers are allocated for marketing and logistic purposes only. Model A2411 was used for the spot check testing described in this report.

7.4. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device model A2411, FCC ID: BCG-E3550A, IC: 579C-E3550A for radiated spurious and radiated band-edge in accordance with the Test Plan that was approved via KDB inquiry.

BCG-E3550A SPOT CHECK RESULTS										
Technology	Mode	Test Item	Channel	Measured	Original model		Spot check model		Delta (dB)	
					A2342		A2411, A2412, A2413			
						BCG-E3548A 579C-E3548A	BCG-E3550A 579C-E3550A			
				Frequency (MHz)	Peak (dBuV)	Ave (dBuV)	Peak	Ave	Peak	Ave
WIFI (5GHz)	ax, HE20 5.2 & 5.3GHz	RBE	Low, 36	5150	61.8	50.53	68.03	52.6	6.23	2.07
			High, 64	5350	61.77	51.08	66.19	52.65	4.42	1.57
	ax, HE20 5.6GHz	RBE	Low, 100	5451	60.54	48.47	60.6	48.21	0.06	0.26
	ax, HE20 5.8GHz	RBE	High,165	5999	-36.57 (EIRP)		-34.27 (EIRP)		2.3 (EIRP)	
	ax, HE20 5.3/5.6/5.8GHz	RSE	Mid, 60	12887.92	52.98	NA	52.04	NA	-0.94	NA
			Mid,116	12.015	53.48	NA	54.61	NA	1.13	NA
			Mid,157	11.302.5	50.79	39.42	48.74	38.92	2.05	0.5

Comparison of the models, upper deviation is within 3dB for the worst case measurements relative to the limit (note some peak values are more than 3dB higher but the corresponding average value, which has less margin relative to the average limit for emissions, is within 3dB of the reference model) and all measurements are under FCC/IC Technical Limits.

Note: The output powers were verified on model A2411 to match with model A2342 before radiated emissions spot check was performed.

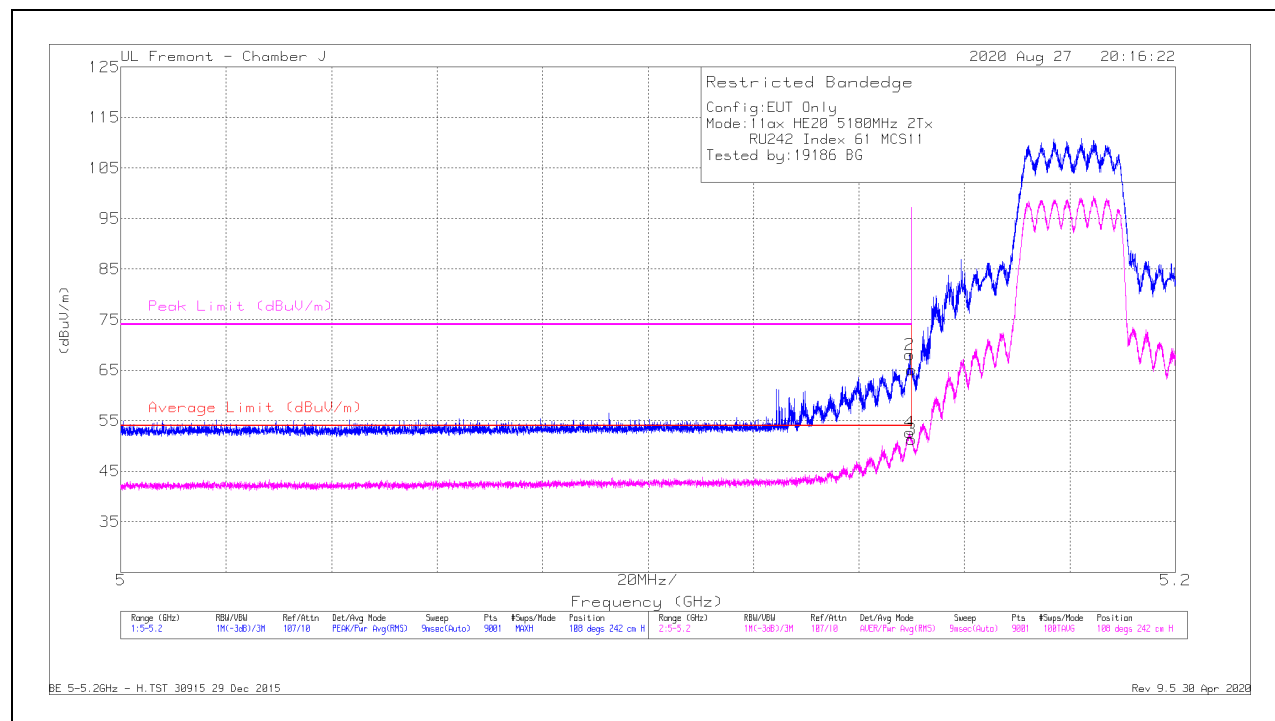
SPOT CHECK

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

2TX Antenna 5 + Antenna 6 OFDMA MODE 242 Tones, RU Index 61

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



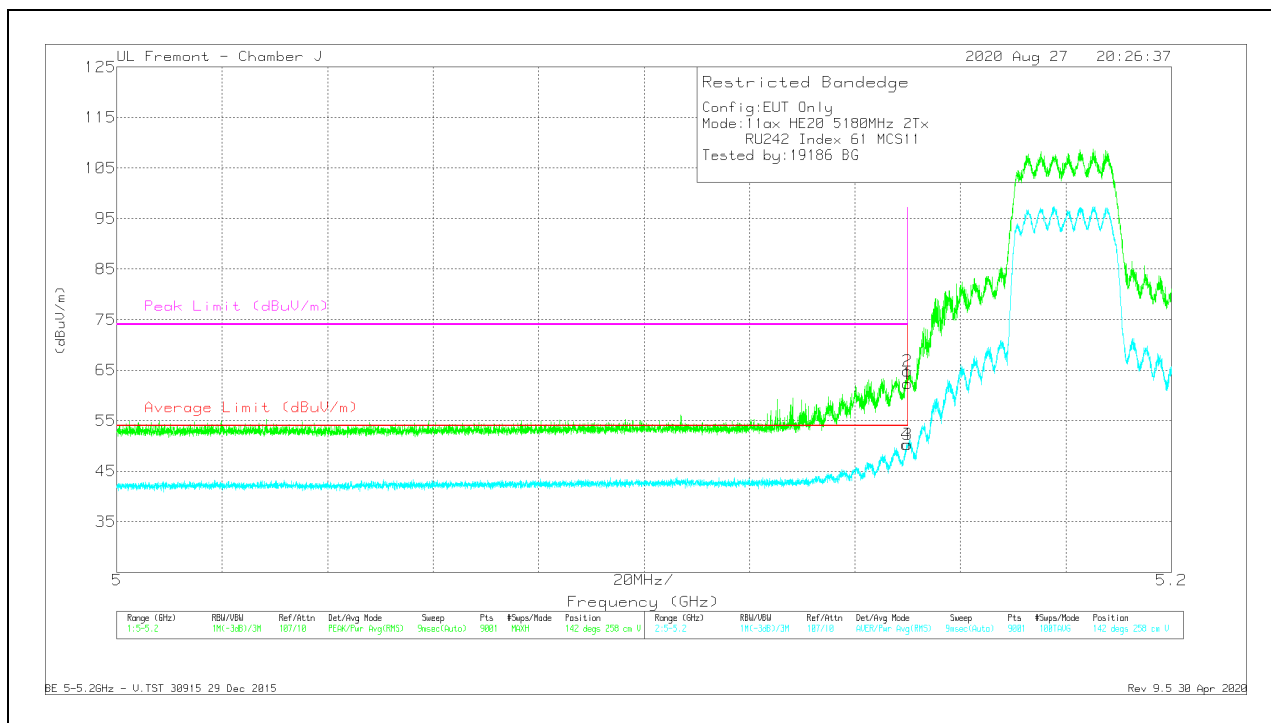
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cbl/Fitr/Pa d (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	51.61	Pk	34.2	-20.8	65.01	-	-	74	-8.99	108	242	H
2	* 5.14964	54.63	Pk	34.2	-20.8	68.03	-	-	74	-5.97	108	242	H
3	* 5.15	37.9	RMS	34.2	-20.8	51.3	54	-2.7	-	-	108	242	H
4	* 5.14958	39.2	RMS	34.2	-20.8	52.6	54	-1.4	-	-	108	242	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Chl/Filt/Pa d (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	48.96	Pk	34.2	-20.8	62.36	-	-	74	-11.64	142	258	V
2	* 5.14998	51.46	Pk	34.2	-20.8	64.86	-	-	74	-9.14	142	258	V
3	* 5.15	36.94	RMS	34.2	-20.8	50.34	54	-3.66	-	-	142	258	V
4	* 5.14975	36.85	RMS	34.2	-20.8	50.25	54	-3.75	-	-	142	258	V

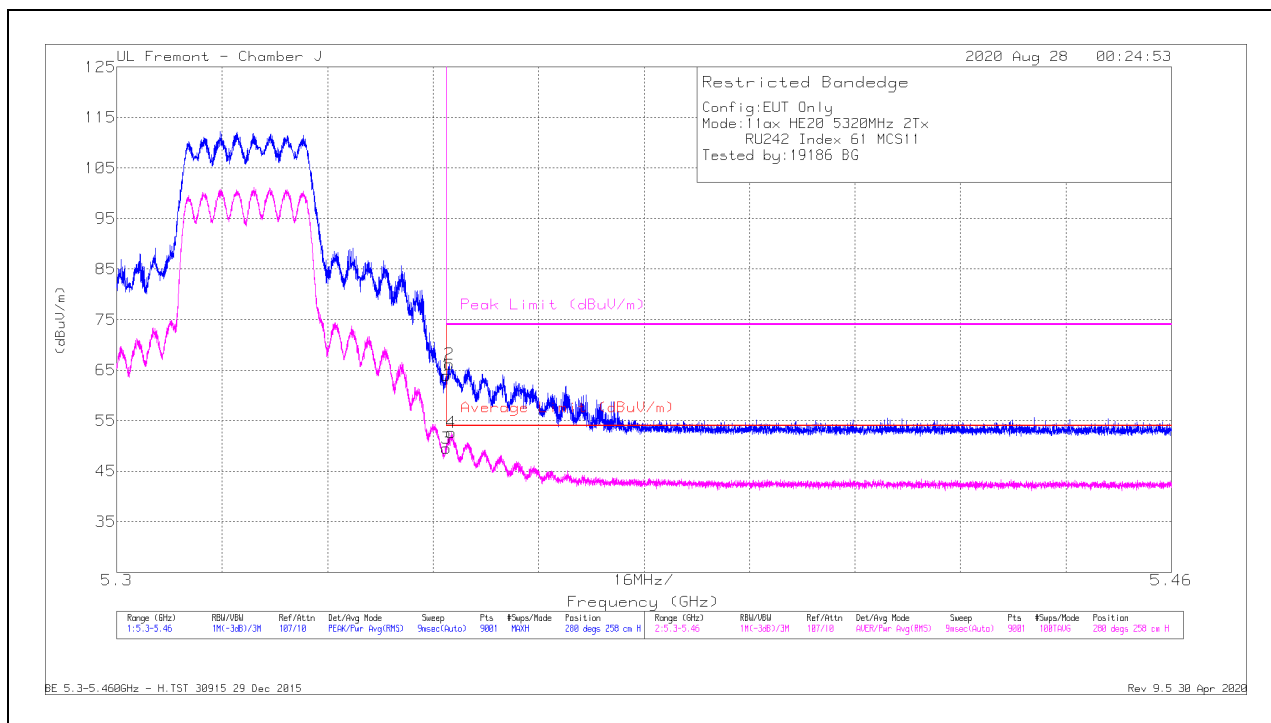
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

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

2TX Antenna 5 + Antenna 6 OFDMA MODE 242 Tones, RU Index 61

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



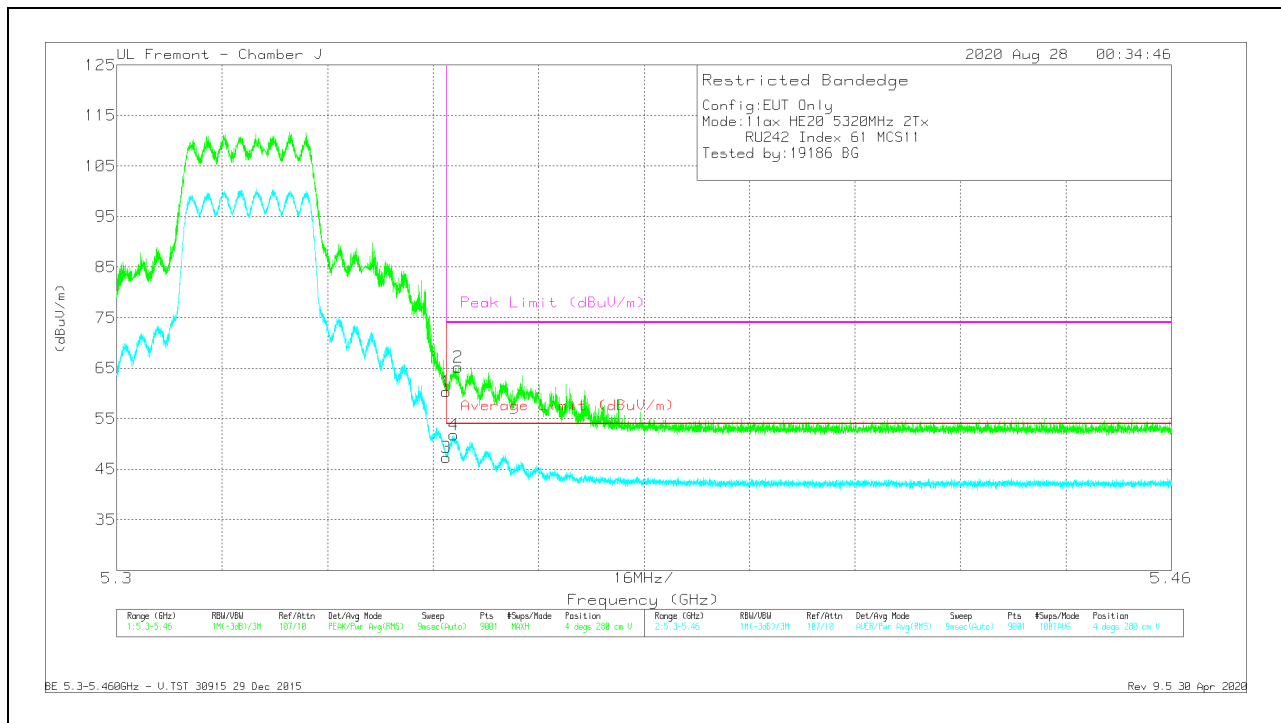
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35001	51.02	Pk	33.3	-20.4	63.92	-	-	74	-10.08	280	258	H
2	* 5.35045	53.29	Pk	33.3	-20.4	66.19	-	-	74	-7.81	280	258	H
3	* 5.35001	36.61	RMS	33.3	-20.4	49.51	54	-4.49	-	-	280	258	H
4	* 5.35079	39.75	RMS	33.3	-20.4	52.65	54	-1.35	-	-	280	258	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cbl/Filt/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	47.47	Pk	33.3	-20.4	60.37	-	-	74	-13.63	4	280	V
2	* 5.35177	52.3	Pk	33.3	-20.4	65.2	-	-	74	-8.8	4	280	V
3	* 5.35001	34.44	RMS	33.3	-20.4	47.34	54	-6.66	-	-	4	280	V
4	* 5.35115	38.85	RMS	33.3	-20.4	51.75	54	-2.25	-	-	4	280	V

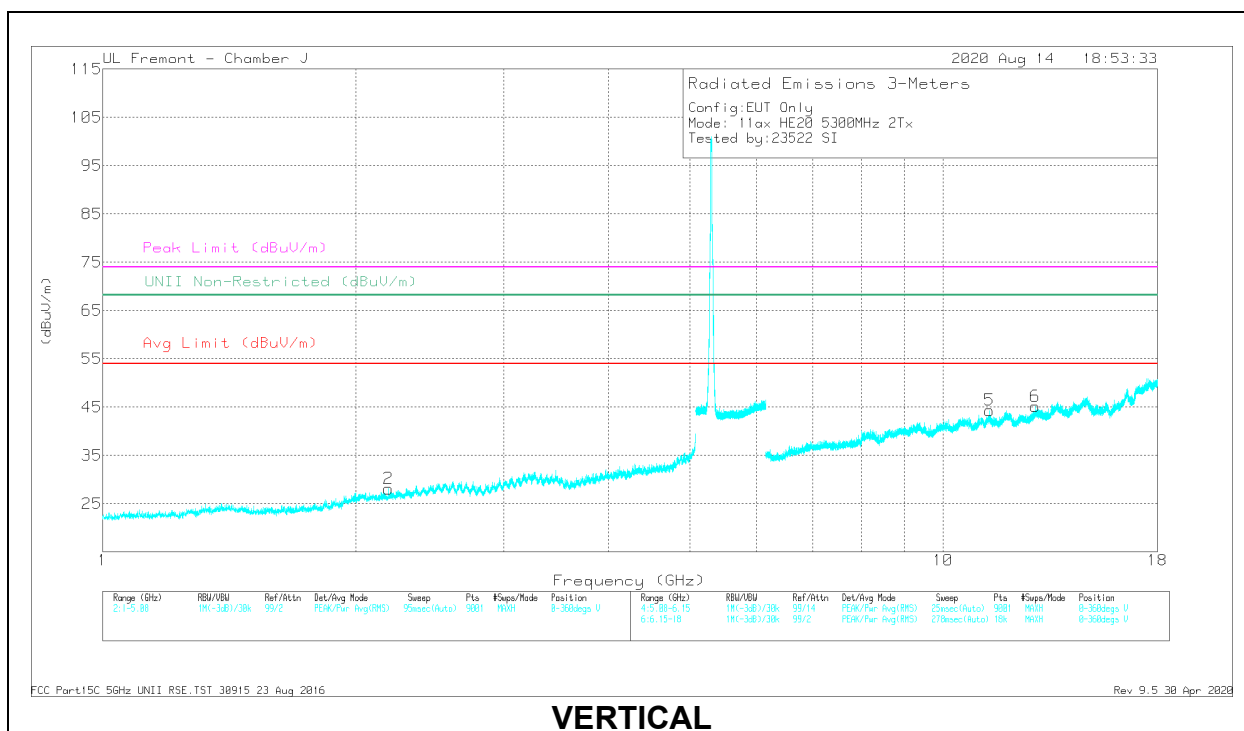
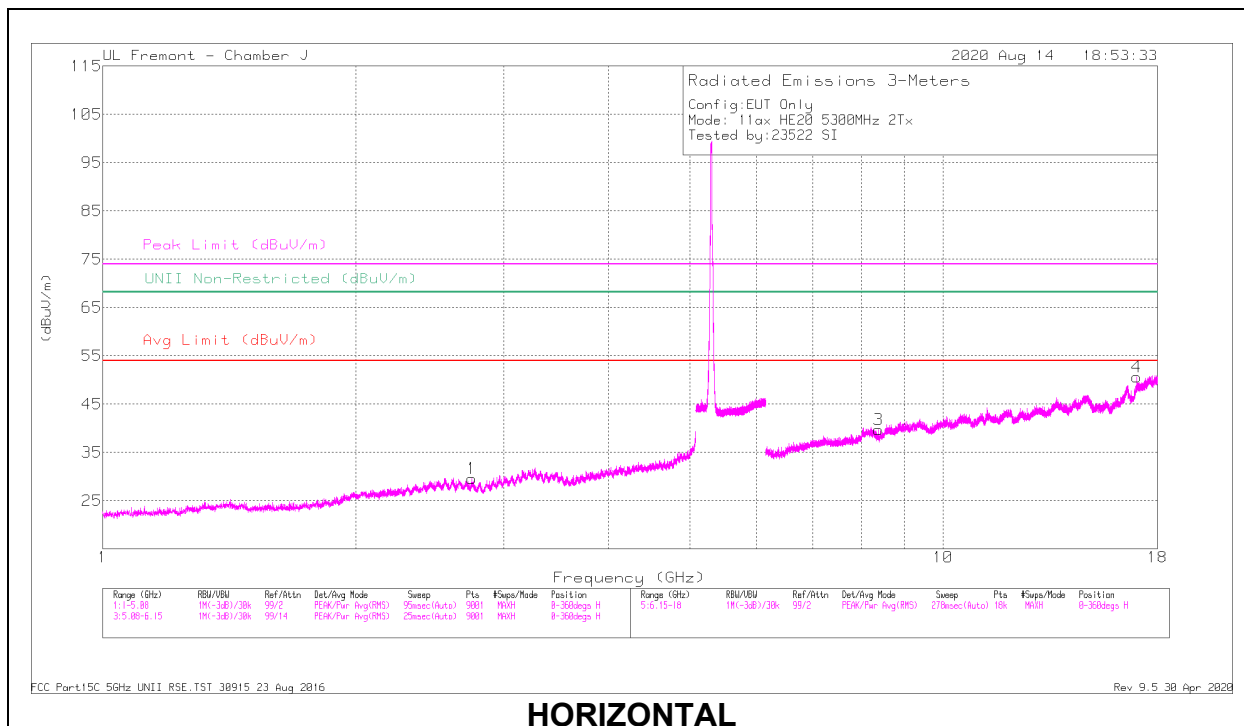
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF 1563 (dBm)	Amp/Cable/Fit/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	* 2.74982	42.85	PK-U	29.4	-34.9	37.35	-	-	74	-36.65	-	-	133	299	H
	* 2.75322	32.18	ADR	29.4	-34.9	26.68	54	-27.32	-	-	-	-	133	299	H
2	2.18515	42.12	PK-U	28	-35.4	34.72	-	-	-	-	68.2	-33.48	387	335	V
3	* 8.38453	35.38	PK-U	37.9	-26.3	46.98	-	-	74	-27.02	-	-	91	378	H
	* 8.38375	24.31	ADR	37.9	-26.3	35.91	54	-18.09	-	-	-	-	91	378	H
4	17.00856	31.76	PK-U	42.3	-18.8	55.26	-	-	-	-	68.2	-12.94	56	320	H
5	* 11.35976	33.7	PK-U	39.7	-22.8	50.6	-	-	74	-23.4	-	-	154	337	V
	* 11.36044	23.59	ADR	39.7	-22.8	40.49	54	-13.51	-	-	-	-	154	337	V
6	12.86999	33.04	PK-U	41	-22	52.04	-	-	-	-	68.2	-16.16	140	230	V

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

PK-U - U-NII: Maximum Peak

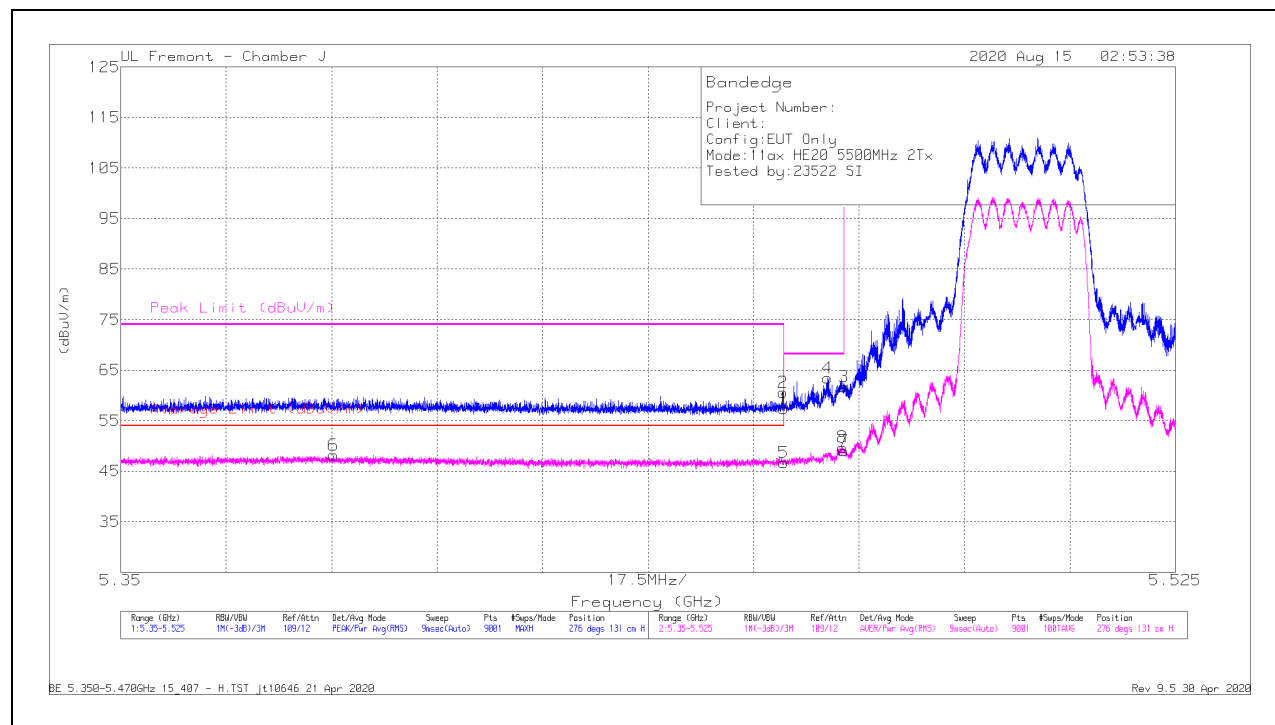
ADR - U-NII AD primary method, RMS average

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

2TX Antenna 5 + Antenna 6 OFDMA MODE 242 Tones, RU Index 61

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cbl/Filtr/Pa d (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	32.69	Pk	33	-8.3	57.39	-	-	74	-16.61	276	131	H
2	* 5.45986	35.9	Pk	33	-8.3	60.6	-	-	74	-13.4	276	131	H
3	5.46999	37.17	Pk	33.1	-8.5	61.77	-	-	68.2	-6.43	276	131	H
4	5.46731	38.83	Pk	33	-8.4	63.43	-	-	68.2	-4.77	276	131	H
5	* 5.45999	22.01	RMS	33	-8.3	46.71	54	-7.29	-	-	276	131	H
6	* 5.38529	23.31	RMS	33.1	-8.2	48.21	54	-5.79	-	-	276	131	H
7	5.46999	24.49	RMS	33.1	-8.5	49.09	-	-	-	-	276	131	H
8	5.46978	25.13	RMS	33.1	-8.5	49.73	-	-	-	-	276	131	H

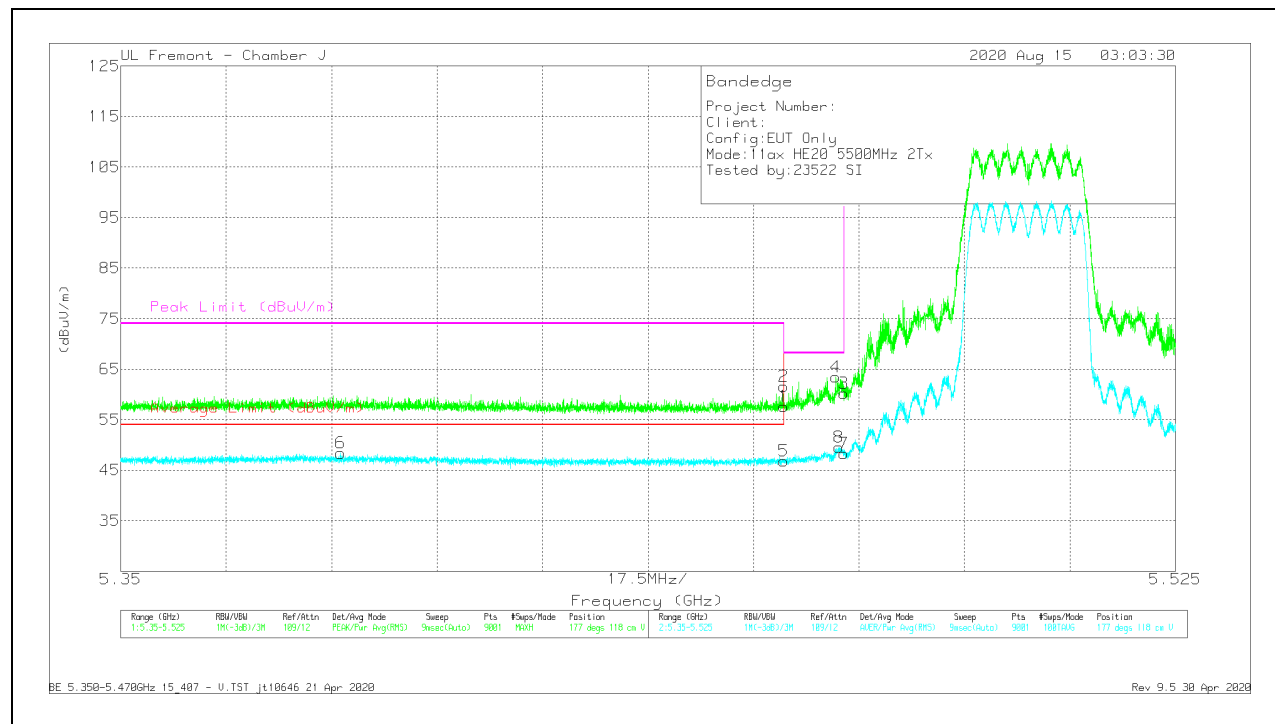
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

BANDEDGE (LOW CHANNEL)

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cbl/Filt/Pa d (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	32.94	Pk	33	-8.3	57.64	-	-	74	-16.36	177	118	V
2	* 5.45996	36.89	Pk	33	-8.3	61.59	-	-	74	-12.41	177	118	V
3	5.46999	35.63	Pk	33.1	-8.5	60.23	-	-	68.2	-7.97	177	118	V
4	5.46865	38.91	Pk	33	-8.5	63.41	-	-	68.2	-4.79	177	118	V
5	* 5.45999	22.13	RMS	33	-8.3	46.83	54	-7.17	-	-	177	118	V
6	* 5.38646	23.47	RMS	33.1	-8.2	48.37	54	-5.63	-	-	177	118	V
7	5.46999	23.72	RMS	33.1	-8.5	48.32	-	-	-	-	177	118	V
8	5.46911	24.91	RMS	33.1	-8.5	49.51	-	-	-	-	177	118	V

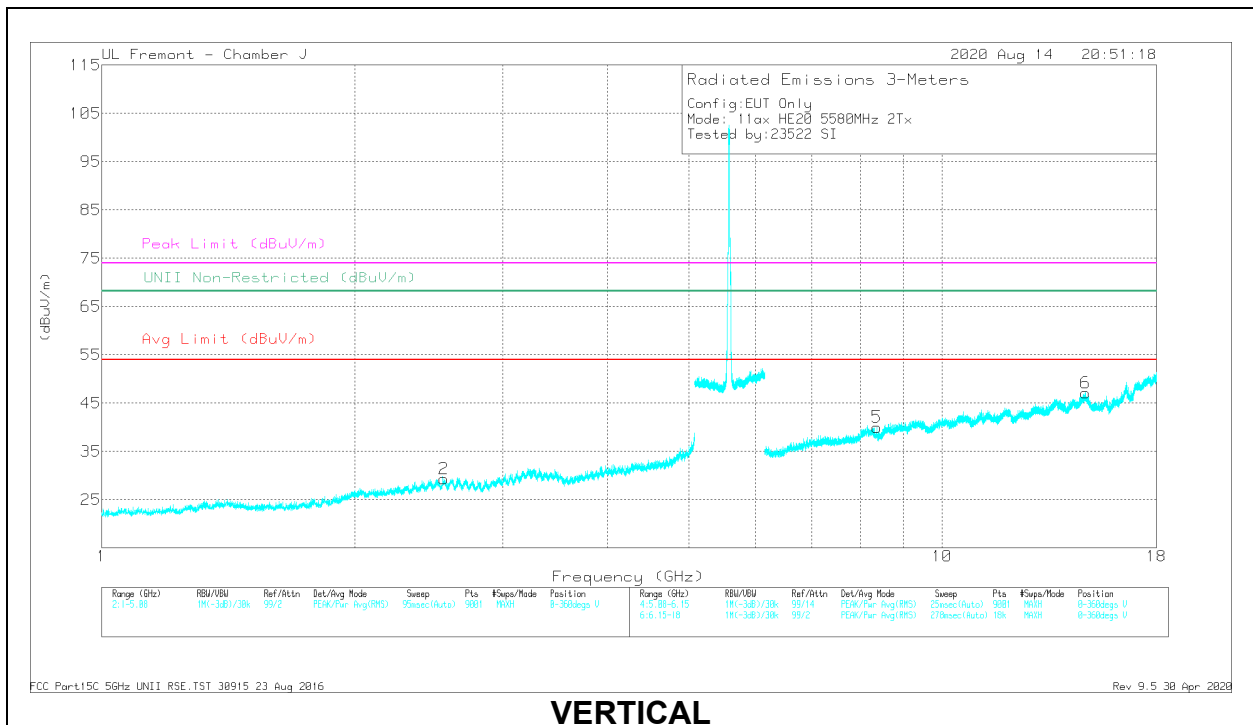
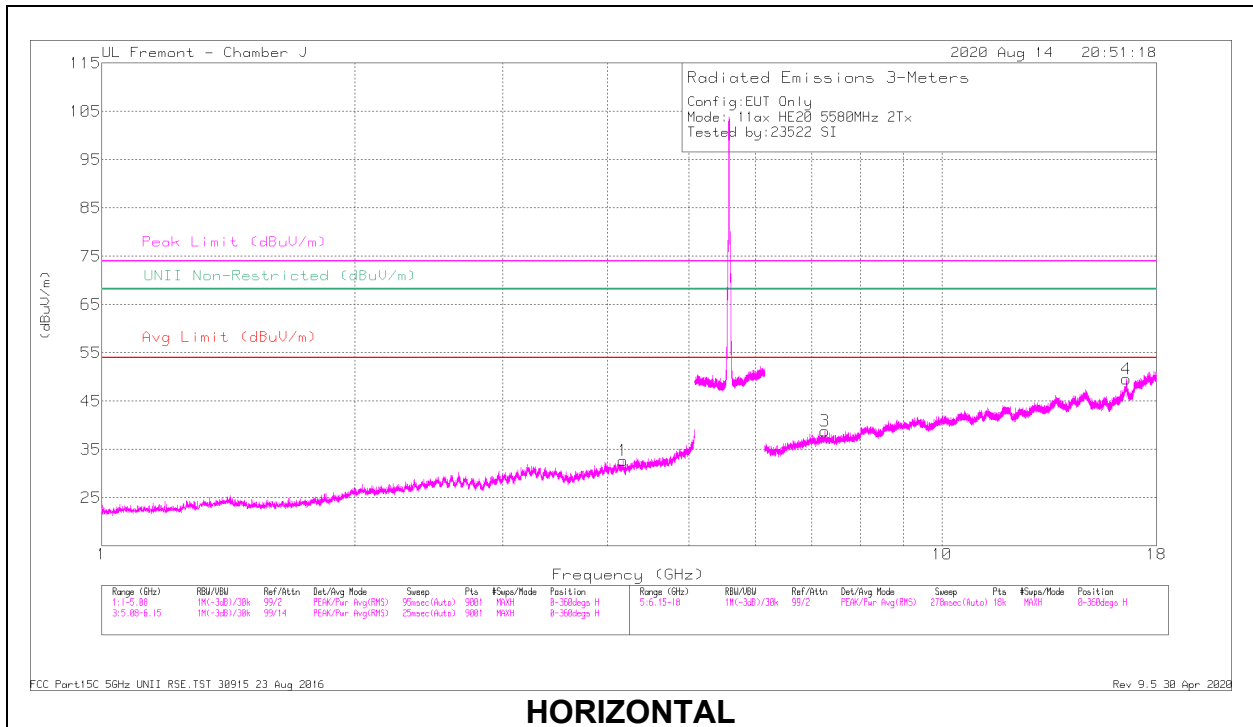
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cb I/Filtr/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	* 4.17076	39.9	PK-U	31.8	-31.2	40.5	-	-	74	-33.5	-	-	154	197	H
	* 4.17043	28.58	ADR	31.8	-31.2	29.18	54	-24.82	-	-	-	-	154	197	H
2	2.55359	43.42	PK-U	29.9	-35	38.32	-	-	-	-	68.2	-29.88	82	382	V
3	* 7.25822	35.72	PK-U	37.1	-27.1	45.72	-	-	74	-28.28	-	-	101	373	H
	* 7.25847	25.56	ADR	37.1	-27.1	35.56	54	-18.44	-	-	-	-	101	373	H
4	16.57507	32.94	PK-U	41.3	-18.9	55.34	-	-	-	-	68.2	-12.86	336	347	H
5	* 8.37136	35.24	PK-U	37.9	-26.3	46.84	-	-	74	-27.16	-	-	230	279	V
	* 8.37072	24.49	ADR	38	-26.3	36.19	54	-17.81	-	-	-	-	230	279	V
6	14.81513	32.41	PK-U	42.3	-20.1	54.61	-	-	-	-	68.2	-13.59	279	245	V

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

PK-U - U-NII: Maximum Peak

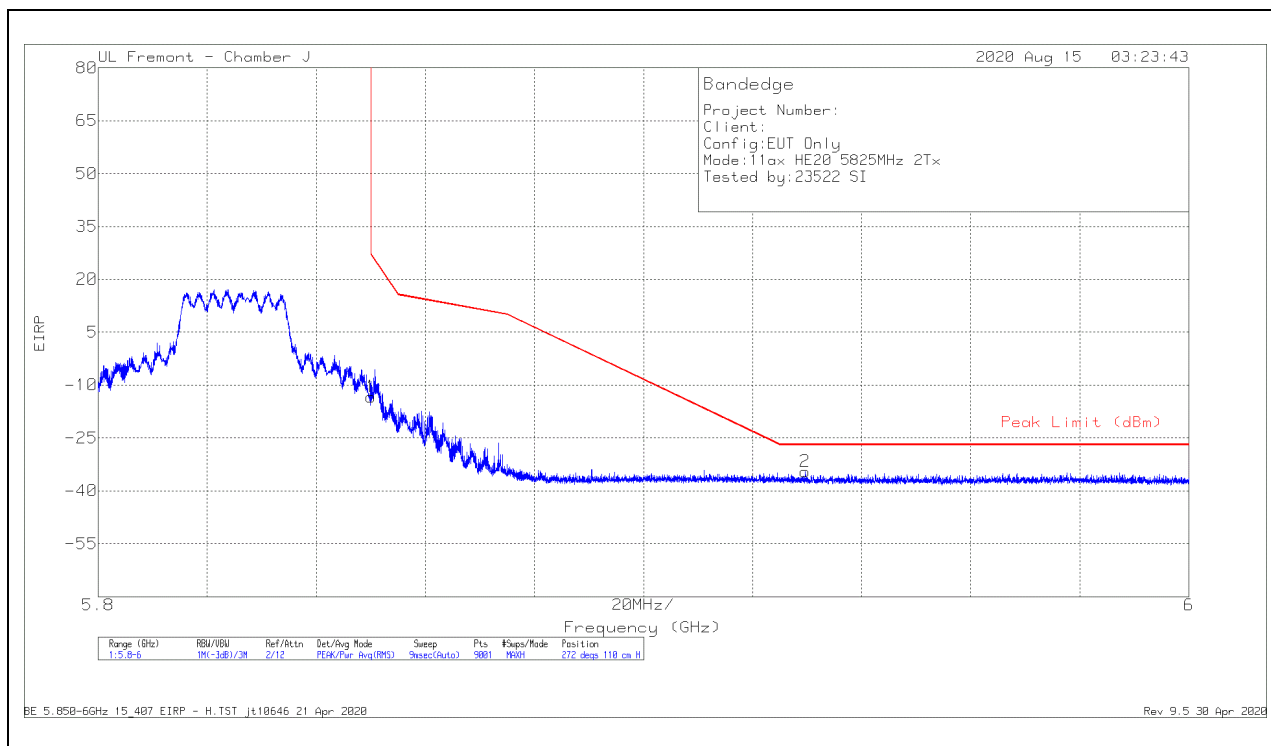
ADR - U-NII AD primary method, RMS average

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

2TX Antenna 5 + Antenna 6 OFDMA MODE 242 Tones, RU Index 61

BANDEDGE (HIGH CHANNEL), 5825MHz

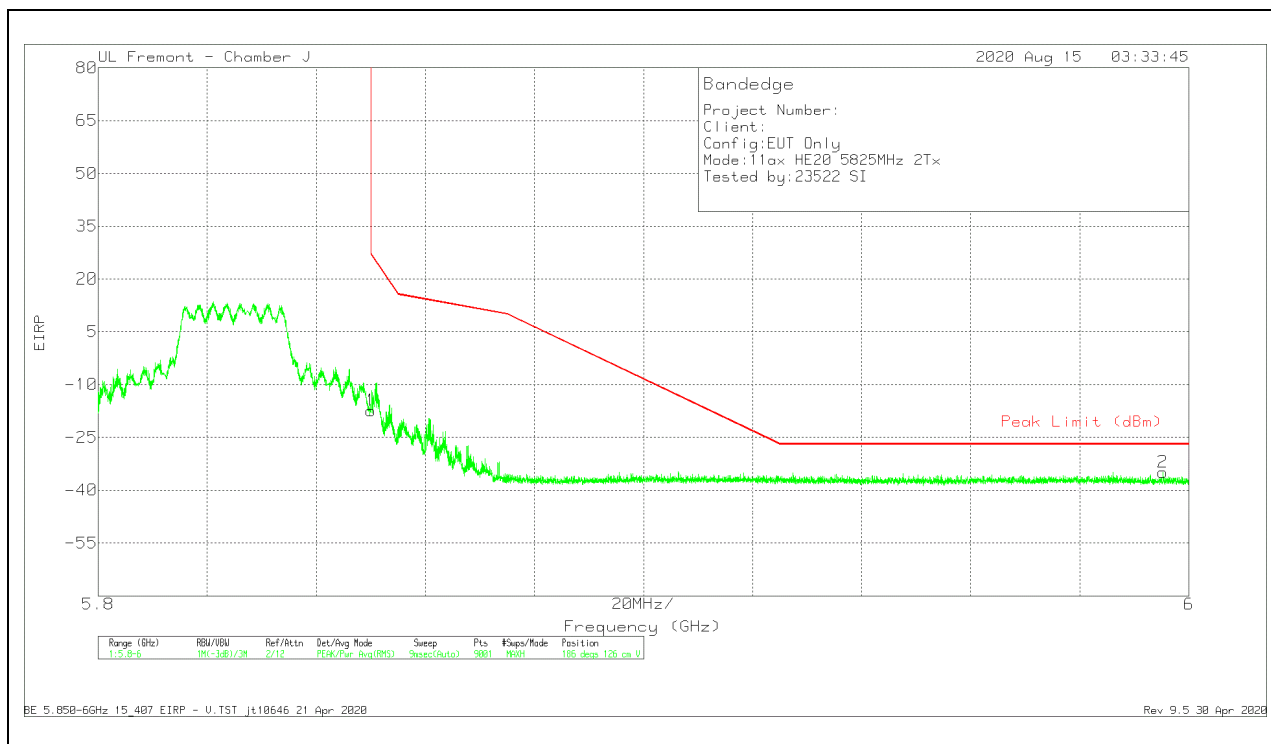
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T963 (dB/m)	Amp/Cbl/Fitr/Pa d (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85002	-51.33	Pk	33.8	-7.6	11.8	-13.33	26.95	-40.28	272	110	H
2	5.92909	-72.77	Pk	34.3	-7.6	11.8	-34.27	-27	-7.27	272	110	H

Pk - Peak detector

VERTICAL RESULT



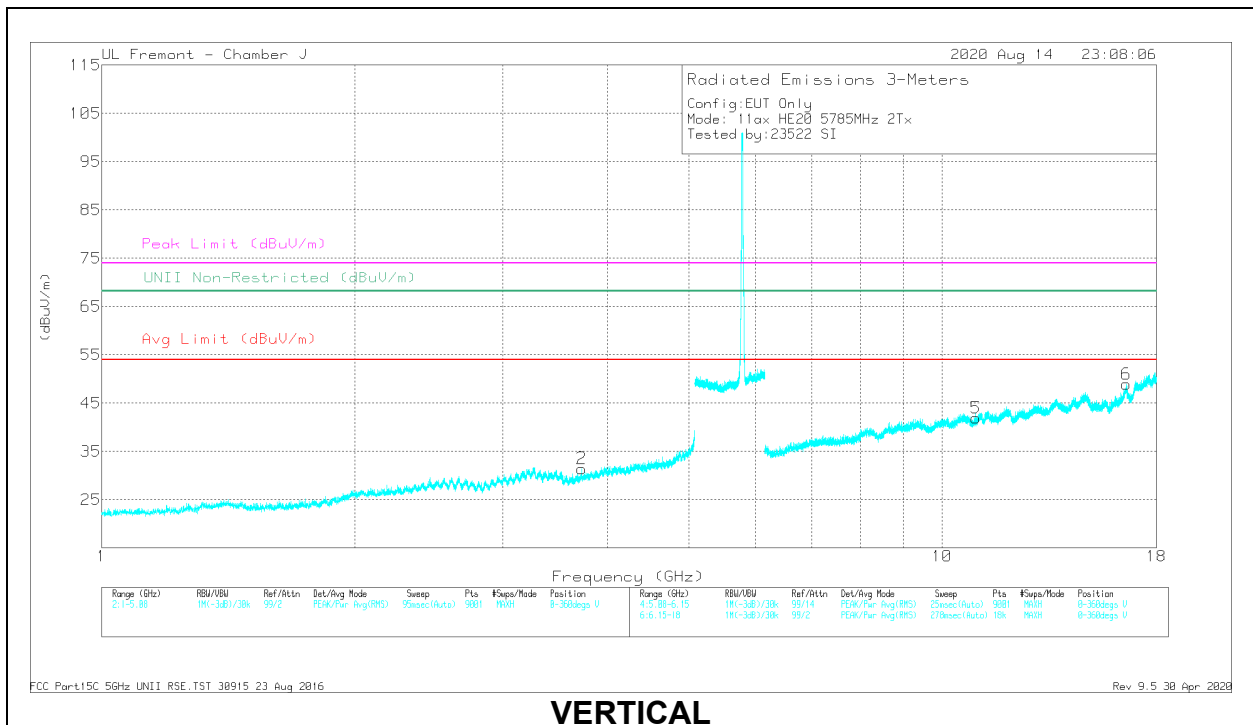
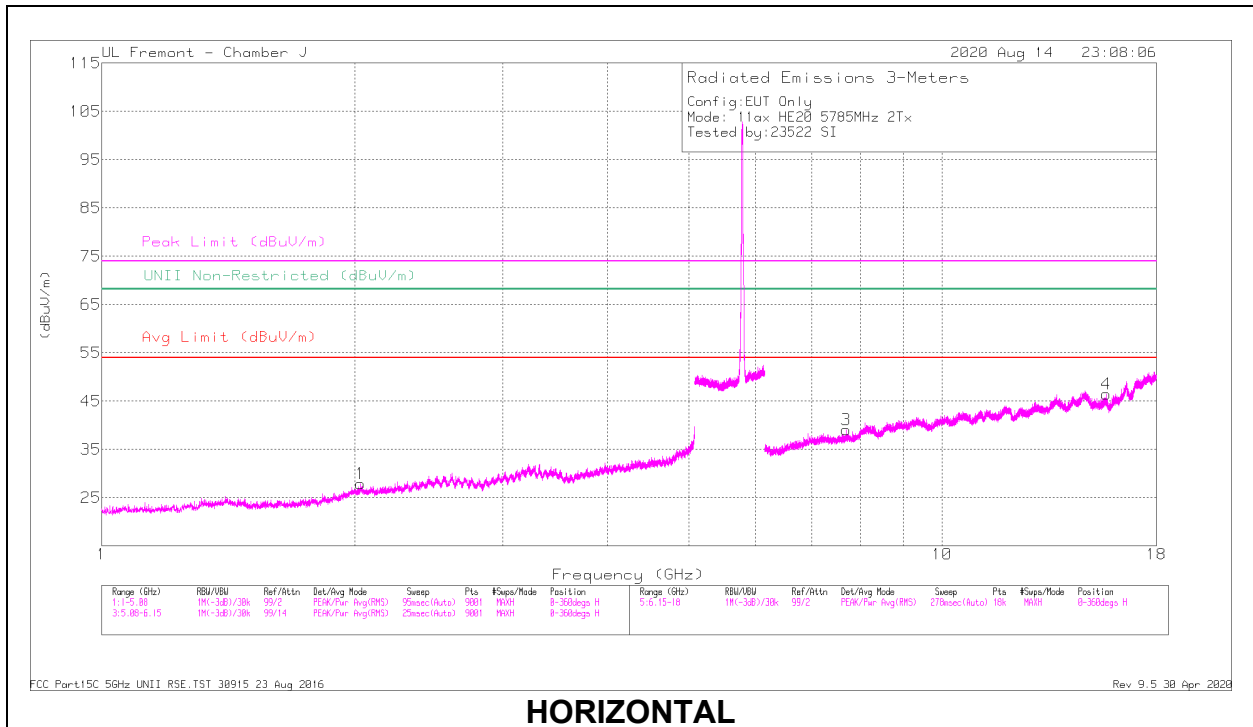
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T963 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85002	-55.43	Pk	33.8	-7.6	11.8	-17.43	26.95	-44.38	186	126	V
2	5.99529	-72.89	Pk	34.6	-7.8	11.8	-34.29	-27	-7.29	186	126	V

Pk - Peak detector

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HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T9E3 (dBm)	Amp/Cbl/Filr/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	2.0329	41.83	PK-U	27.8	-35.2	34.43	-	-	-	-	68.2	-33.77	306	358	H
2	* 3.72761	40.82	PK-U	30.6	-33	38.42	-	-	74	-35.58	-	-	10	215	V
	* 3.72819	30.19	ADR	30.6	-33	27.79	54	-26.21	-	-	-	-	10	215	V
3	* 7.6897	35.71	PK-U	37.2	-26.8	46.11	-	-	74	-27.89	-	-	338	183	H
	* 7.6894	25.32	ADR	37.2	-26.8	35.72	54	-18.28	-	-	-	-	338	183	H
4	* 15.68078	32.13	PK-U	40.4	-19.6	52.93	-	-	74	-21.07	-	-	150	123	H
	* 15.68209	21.71	ADR	40.4	-19.6	42.51	54	-11.49	-	-	-	-	150	123	H
5	* 10.97404	33.44	PK-U	39.5	-24.2	48.74	-	-	74	-25.26	-	-	168	214	V
	* 10.9751	23.72	ADR	39.4	-24.2	38.92	54	-15.08	-	-	-	-	168	214	V
6	16.58595	32.5	PK-U	41.3	-18.9	54.9	-	-	-	-	68.2	-13.3	66	228	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

7.5. REFERENCE DETAIL

Reference application that contains the reused reference data which is attached to this report in the Appendixes.

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.

7.6. DESCRIPTION OF TEST SETUP

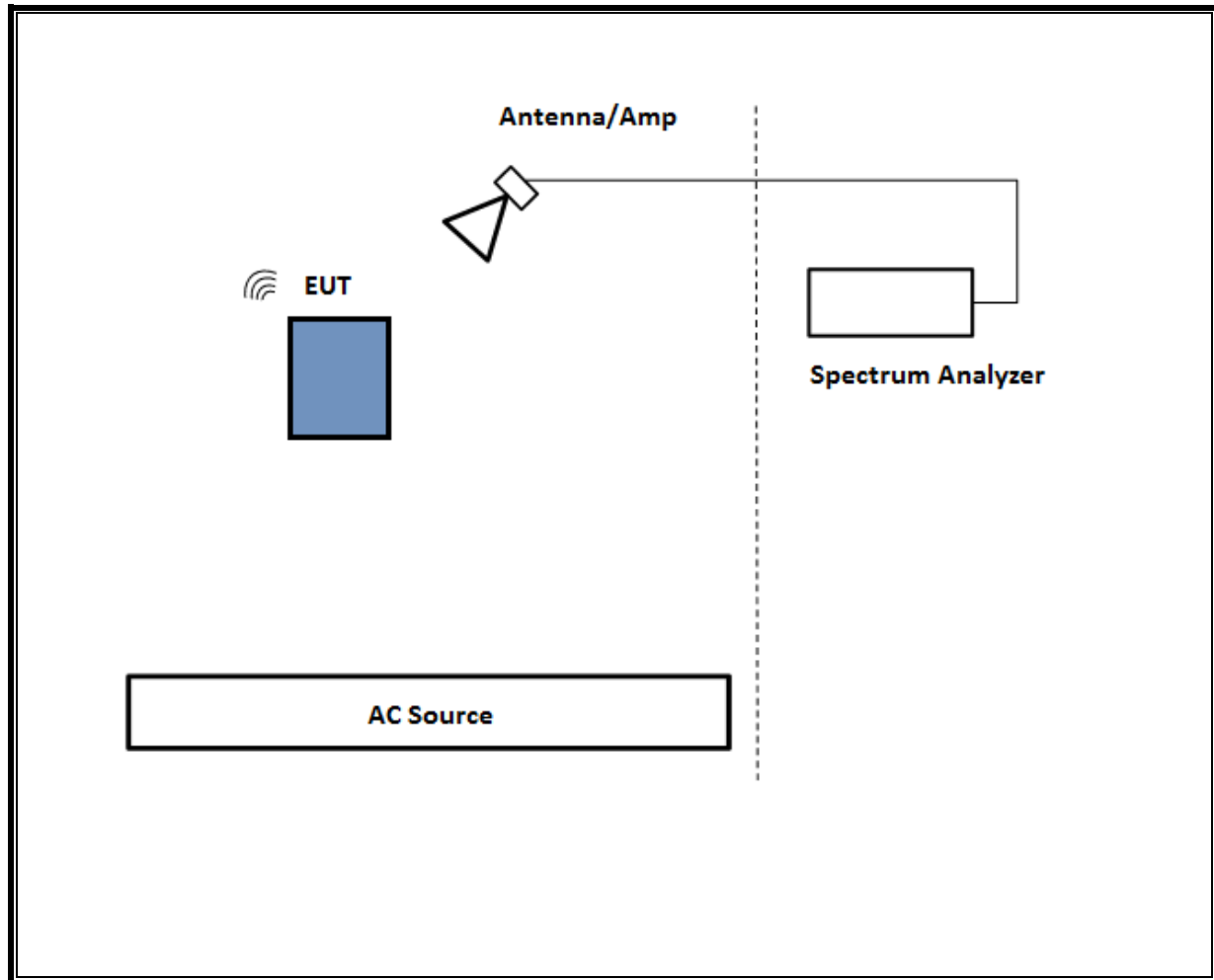
SUPPORT EQUIPMENT

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						

SETUP DIAGRAM FOR RADIATED TESTS Above 1GHz



7.7. 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.

Investigated worst-case data rates as listed below were:

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 Cal
Antenna, Double Ridge Guide Horn Antenna 700MHz to 18GHz	A.H. Systems, Inc.	SAS-571	T963	1/25/2021	1/25/2020
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	T1571	8/20/2021	8/20/2020
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179372	2/22/2021	2/25/2020
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-EP1 for setup photos

END OF TEST REPORT

Appendix A - Conducted Data for FCC Part 15 E

Attached is the test report (13335182-E5) containing the reference data form the parent model as detailed in section 7.5. This data will only be included in the report submitted for FCC filing

Appendix B - Conducted Data for ISED RSS 247

This data will only be included in the report (13335182-E6) submitted for ISED filing.

Appendix C - Radiated Data (13335182-E5 & E6)