TEST REPORT

Report Number : 13587903-E14V1

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Models	:	A2636 (Parent Model) A2640, A2638, A2639 (Variant Models)
FCC IDs	:	BCG-E4002A (Parent Model) BCG-E4034A, BCG-E4033A (Variant Models)
IC IDs	:	579C-E4002A (Parent Model) 579C-E4034A, 579C-E4033A (Variant Models)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC CFR 47 PART 15 SUBPART F §15.519 ISED RSS-220 ISSUE 1 AMENDMENT 1

Date Of Issue:
August 09, 2021

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
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CERT. #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	08/09/2021	Initial Issue	Thu Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
ONE APPLE PARK WAY
CUPERTINO, CA 95014, USA

EUT DESCRIPTION: SMARTPHONE

MODELS: A2636 (Parent Model)
A2640, A2638, A2639 (Variant Models)

BRAND: APPLE

FCC IDs: BCG-E4002A (Parent Model)
BCG-E4034A, BCG-E4033A (Variant Models)

IC IDs: 579C-E4002A (Parent Model)
579C-E4034A, 579C-E4033A (Variant Models)

SERIAL NUMBERS: K5FPMHX2M3; FN4G17QY9R

SAMPLE RECEIPT DATES: APRIL 5, 2021; JUNE 4, 2021

DATE TESTED: APRIL 5 – JUNE 25, 2021

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC §15 Subpart F	Complies
ISED RSS-220 Issue 1 Amendment 1	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 A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

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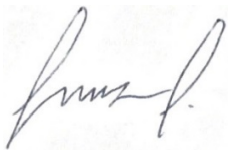
Approved & Released For
UL Verification Services Inc. By:

Thu Chan
Staff Engineer
UL Verification Services Inc.

Tested By:



Livius Darmawan
Laboratory Engineer
UL Verification Services Inc.

UL VERIFICATION SERVICES INC
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2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.4
15.503 & 15.519 (b)	RSS-220 Sect. 2	-10 dB BW	Complies	ANSI C63.10 Section 10.1
15.519 (c) & (e)	RSS-220 Sect. 4 (c) & 5.3.1 (d)	Pk Power & Max Avg Emissions	Complies	ANSI C63.10 Section 10.3
15.519 (a)(1)	RSS-220 Sect. 5.3.1 (b)	Cessation Time	Complies	None
15.519 (c) & 15.209 (a)	RSS-220 Sect. 3.4	Emissions Below 960 MHz	Complies	ANSI C63.10 Section 10.2
15.519 (c) & (d)	RSS-220 Sect. 5.3.1 (d) & (e)	Emissions Above 960 MHz	Complies	ANSI C63.10 Section 10.3
15.207 (a)	RSS-Gen 8.8	AC Power Line Conducted Emissions	Complies	ANSI C63.10 Section 6.2

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with CFR Title 47 Part 15 Subpart F, KDB 393764 D01 UWB FAQ v02, ISED RSS-220 Issue 1 Amendment 1 and ANSI C63.10-2013 and RSS GEN Issue 5.

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	208313
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	208313
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	208313

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5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable 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	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB

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

5.4. SAMPLE CALCULATION

RADIATED EMISSION

Where relevant, the following sample calculation is provided:

EIRP (dBm) = Meter Reading (dBm) + Antenna Factor (dB/m) + Pre-Amp Gain/Cbl Loss (dB)
+ dBm-to-dBm Unit Conversion Factor @ 3m
= -60 dBm + 28 dB/m + (-27) dB + 11.8
= -48.3 dBm

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6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The EUT 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 and NFC. 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.

This test report addresses the UWB operational mode.

The EUT has a UWB transceiver with four integral antennas (ANT 0 = UWB1, ANT 1 = UWB2, ANT 2 = ANT6/UWB0 & ANT3 = UWB3). ANT0 and ANT1 only operates on 8 GHz (Channel 9). ANT2 and ANT3 operates on 6.5 GHz (Channel 5) and 8 GHz (Channel 9). The antennas are not user accessible. Six signal configurations (CONFIG 0,1,2,3,4 & 5) are available for each ANT/CH setting.

ANT	CH	CONFIG
0	9	0
0	9	1
0	9	2
0	9	3
0	9	4
0	9	5
1	9	0
1	9	1
1	9	2
1	9	3
1	9	4
1	9	5
2	5	0
2	5	1
2	5	2
2	5	3
2	5	4
2	5	5
2	9	0
2	9	1
2	9	2
2	9	3
2	9	4
2	9	5
3	5	0
3	5	1
3	5	2
3	5	3
3	5	4
3	5	5
3	9	0
3	9	1
3	9	2
3	9	3
3	9	4
3	9	5

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

The Model, FCC ID and IC ID covered by this report includes:
Parent Model: A2636; FCC ID: BCG-E4002A; IC ID: 579C-E4002A
Variant Models: A2640; FCC ID: BCG-E4034A; IC ID: 579C-E4034A
A2638; FCC ID: BCG-E4033A; IC ID: 579C-E4033A
A2639; FCC ID: BCG-E4034A; IC ID: 579C-E4034A

6.2. MAXIMUM OUTPUT POWER

Highest Average Powers based on ANT/CH.

ANT	CH	CONFIG	Average Power (dBm EIRP)
0	9	0	-42.31
1	9	1	-42.31
2	5	2	-42.35
2	9	4	-42.37
3	5	4	-42.33
3	9	3	-42.42

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

Four integral antennas are employed and the antenna gains are listed as follow:

CH	Freq. Band (GHz)	Gain (dBi)			
		ANT 0 (UWB1)	ANT 1 (UWB2)	ANT 2 (ANT6/UWB0)	ANT 3 (UWB3)
5	6.5	n/a	n/a	0.4	1.1
9	8.0	0.3	-0.3	-0.9	1.5

6.4. MODULATION

The UWB signal is BPSK pulsed modulated signal.

6.5. SOFTWARE AND FIRMWARE

The Software and Firmware version used at test is 19A272.

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7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

SUPPORT EQUIPMENT LIST			
Description	**Manufacturer**	**Model**	**Serial Number**
Laptop + Adapter	Apple	Mac Book Pro	C02TK02YJ10C
Kanzi – USB Adapter	Apple	--	31EF77
Laptop + Adapter	Apple	Mac Book Pro	C02YVBP0LVDD
Kanzi – USB Adapter	Apple	--	316C5F
Smart Phone	Apple	A2483	FLYCX95795

I/O CABLES

I/O CABLES					
Port	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
AC	1	AC	Un-shielded	2	N/A
USB	1	USB	Un-shielded	1	N/A

TEST SETUP

The EUT was examined at pre-scan test using a fundamental frequency in the portrait (z), landscape (y), and flatbed (x) position and the worst case orientation of individual ANT/CH/CONFIG setting was determined for final spurious emission measurement. Config 3, Payload 125 CH9 on all 4 antennas and Config 3, Payload 125 CH5 on antenna 2 and 3 were selected to test for unwanted emissions as the worst case after pre-scan.

Measurements of spurious average emissions were made with the device operating at a higher power than production power to ensure compliance. Measurements of the in-band signal (peak and average emissions, 10 dBc bandwidth, 99% bandwidth) were all made at the production power settings.

EUT was connected to AC power adapter in all test cases.

For simultaneous transmission on the same antenna of multiple channels in the UWB and WiFi, no noticeable new emission was found.

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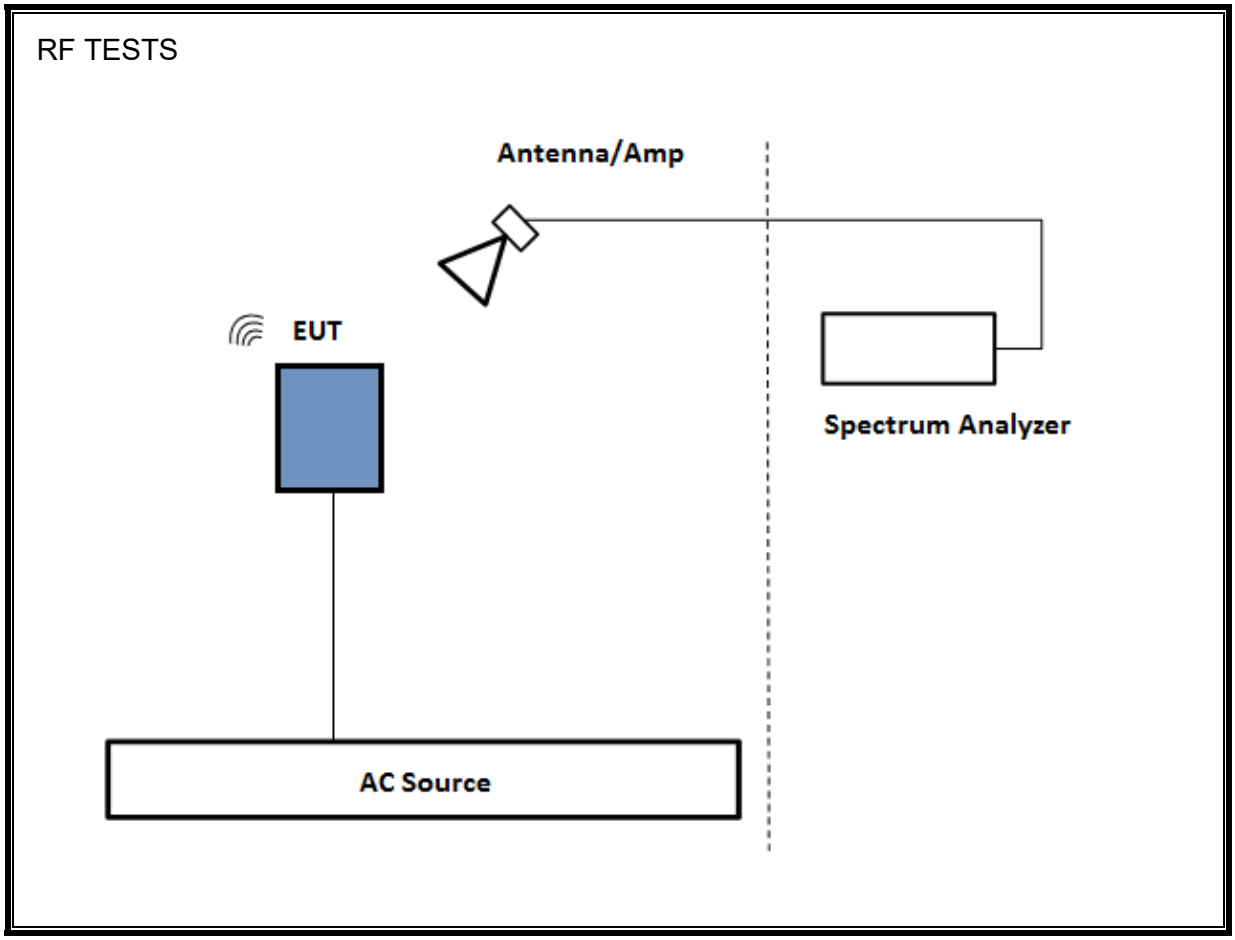
SETUP DIAGRAM FOR TESTS



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8. 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**	**Local ID**	**Cal Date**	**Cal Due**
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0203383	2/24/2021	2/24/2022
Horn Antenna, 1-18 GHz	ETS Lindgren	3117	T120	4/7/2021	4/7/2022
Preamp, 1-18 GHz	Miteq	AFS42-00101800-25-S-42	PRE0183207	6/11/2020	6/11/2021*
PXA Signal Analyzer	Agilent	N9030A	T906	1/27/2021	1/27/2022
Hybrid Antenna, 30-2000 MHz	SunAR	JB3	T900	2/24/2021	2/24/2022
Preamp, 0.1-1300 MHz	Sonoma Inst.	310	T173	7/22/2020	7/22/2021
Horn Antenna, 1-18 GHz	ETS Lindgren	3117	T712	3/22/2021	3/22/2022
Preamp, 1-18 GHz	Miteq	AFS42-00101800-25-S-42	PRE0183530	8/27/2020	8/27/2021
Antenna, Active Loop 9kHz-30MHz	ETS Lindgren	6502	T757	11/12/2020	11/12/2021
PXA Signal Analyzer	Aglilent	N9030A	T1454	1/27/2021	1/27/2022
Preamplifier, 1-26.5GHz	Agilent	8449B	T404	4/19/2021	4/19/2022
Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	T449	4/22/2021	4/22/2022
Preamplifier, 26-40 GHz	Miteq	NSTTA2640-35-HG	T1864	4/19/2021	4/19/2022
Horn Antenna, 26-40 GHz	ARA	MWH-2640/B	PRE0183142	4/22/2021	4/22/2022
Low Pass Filter	Microtronics	LPM20143	188196	11/3/2020	11/3/2021
High Pass Filter, CH5	Wainwright Inst. GMBH	WHW2-7100-10000-18000-40DC	176232	11/3/2020	11/3/2021
High Pass Filter, CH9	Wainwright Inst. GMBH	WHW2-8165-11500-21000-40CD	176234	10/26/2020	10/26/2021
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	T1436	2/19/2021	2/19/2022
Power Cable, Line Conducted Emissions	Pasternack Enterprises	RG233/U	202327	10/16/2020	10/16/2021
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01	PRE0186446	1/20/2021	1/20/2022
Radiated Software	UL	UL EMC	Ver 9.5.07, July 2020		
AC Line Conducted Software	UL	UL EMC	Ver 9.5.07, July 2020		

*Equipment was used to perform tests prior to the calibration due date.

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9. APPLICABLE LIMITS AND TEST RESULTS

9.1. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

ANSI C63.10 Section 6.9.4

The transmitter output is connected to a spectrum analyzer. The RBW is in the range of 1% to 5% of the OBW bandwidth. The VBW is set to ≥ 3*RBW. The sweep time is coupled.

Tabulated data provides the test results of all available test configurations. The plots of Ant 3, CONFIG 0, Payload 125 bandwidth measurement on CH5 and CH9 are presented and same measurement settings apply to the rest of test configurations.

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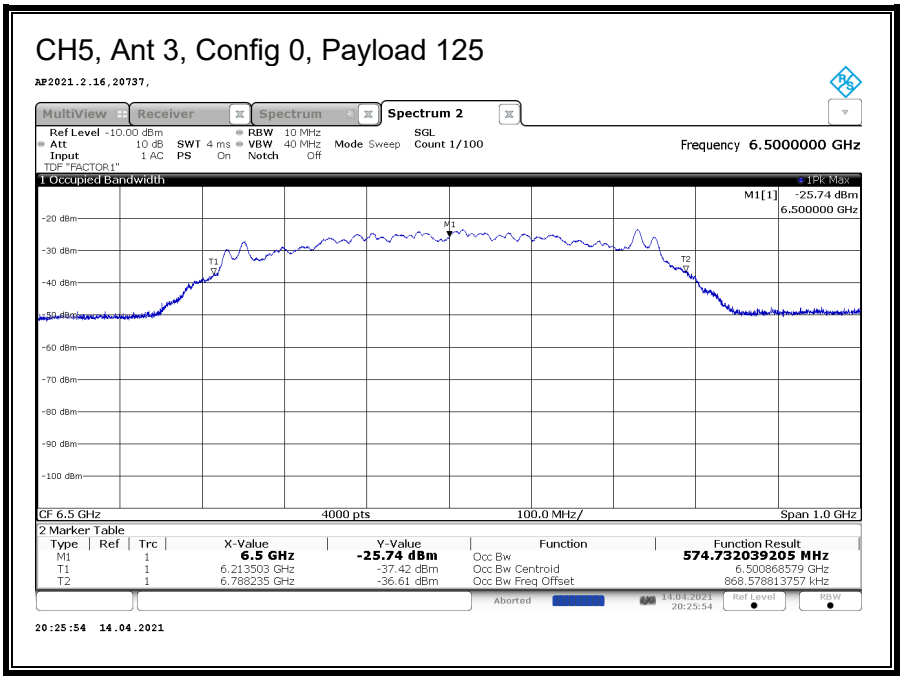
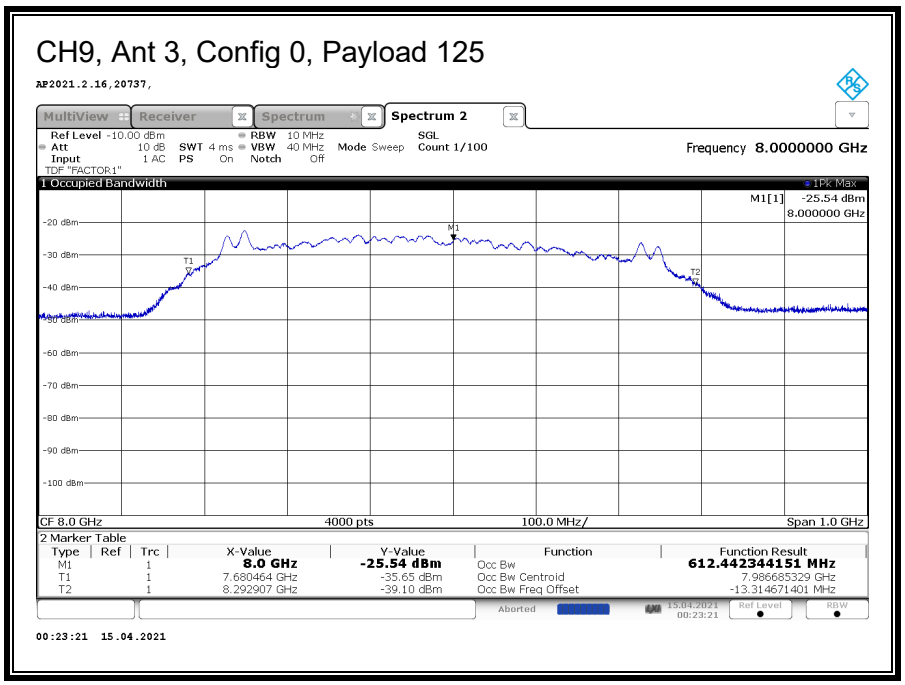
RESULTS

Employee IDs: 19419, 19190, 12471, 20737
Location: Chamber D
Test Date: 04/05/2021 – 04/13/2021

ANT	CH	CONFIG	Payload	EUT Orientation	Meas. Ant Polarity	99% BW (MHz)
0	9	0	125	Portrait	H	609.99
0	9	1	125	Portrait	H	603.41
0	9	2	125	Portrait	H	685.66
0	9	3	125	Portrait	H	676.25
0	9	4	0	Portrait	H	695.64
0	9	5	0	Portrait	H	632.13
1	9	0	125	Landscape	V	603.76
1	9	1	125	Landscape	V	588.66
1	9	2	125	Landscape	V	688.28
1	9	3	125	Landscape	V	674.97
1	9	4	0	Landscape	V	728.70
1	9	5	0	Landscape	V	654.54
2	5	0	125	Landscape	H	553.48
2	5	1	125	Landscape	H	550.53
2	5	2	125	Landscape	H	590.75
2	5	3	125	Landscape	H	592.84
2	5	4	0	Landscape	H	637.73
2	5	5	0	Landscape	H	585.51
2	9	0	125	Landscape	V	624.80
2	9	1	125	Landscape	V	618.86
2	9	2	125	Landscape	V	744.82
2	9	3	125	Landscape	V	743.30
2	9	4	0	Landscape	V	686.16
2	9	5	0	Landscape	V	686.35
3	5	0	125	Landscape	V	574.73
3	5	1	125	Landscape	V	572.67
3	5	2	125	Landscape	V	594.50
3	5	3	125	Landscape	V	607.67
3	5	4	0	Landscape	V	614.35
3	5	5	0	Landscape	V	587.24
3	9	0	125	Landscape	V	612.44
3	9	1	125	Landscape	V	603.40
3	9	2	125	Landscape	V	668.78
3	9	3	125	Landscape	V	656.16
3	9	4	0	Landscape	V	684.13
3	9	5	0	Landscape	V	624.63

99% BW





9.2. OPERATING BANDWIDTH

LIMITS

FCC

§15.503 (a)*UWB bandwidth.* For the purpose of this subpart, the UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The upper boundary is designated fH and the lower boundary is designated fL. The frequency at which the highest radiated emission occurs is designated fM.

§15.503 (b)*Center frequency.* The center frequency, FC, equals (FH + FL)/2.

§15.503 (c)*Fractional bandwidth.* The fractional bandwidth equals 2(FH−FL)/ (FH+ FL).

§15.503 (d)*Ultra-wideband (UWB) transmitter.* An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

§15.519 (b) The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

RSS-220

Section 2 A *UWB device* is an intentional radiator that has either a *-10 dB bandwidth* of at least 500 MHz or a *-10 dB fractional bandwidth* greater than 0.2.

Section 5.1 (a) The -10 dB bandwidth of the device shall be totally contained in the band 3.1-10.6 GHz.

"-10 dB bandwidth B_{-10}" and "-10 dB fractional bandwidth μ_{-10}" are defined as follows:

$$B_{-10} = f_H - f_L$$
$$\mu_{-10} = B_{-10}/f_C$$

where:

f_M is the frequency of maximum UWB transmission;
f_H is the highest frequency at which the power spectral density of the UWB transmission is -10 dB relative to f_M;
f_L is the lowest frequency at which the power spectral density of the UWB transmission is -10 dB relative to f_M; and
$f_C = (f_H + f_L)/2$ is the centre frequency of the -10 dB bandwidth.

TEST PROCEDURE

ANSI C63.10 Clause 10.1

RSS-220 Section 2 of the Annex

Tabulated data provides the test results of all available test configurations. The plots of Ant 3, CONFIG 0, Payload 125 bandwidth measurement on CH5 and CH9 are presented and same measurement settings apply to the rest of test configurations.

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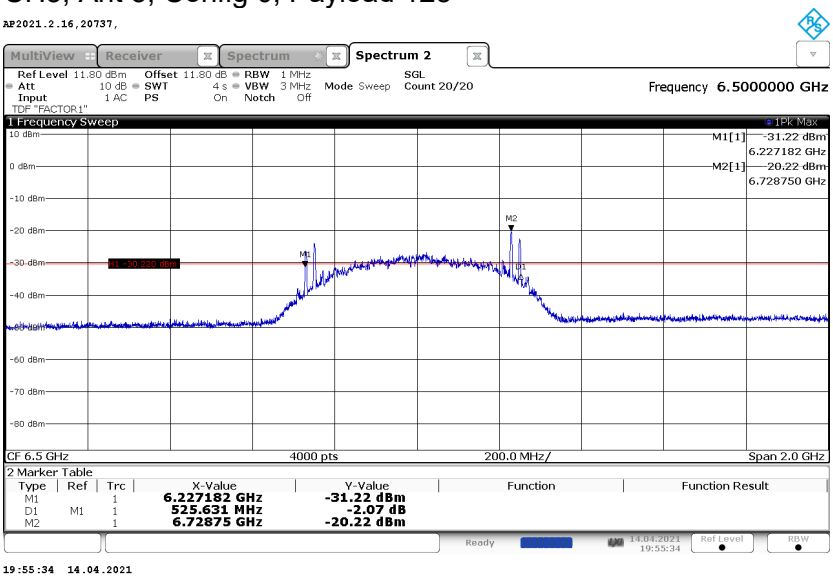
RESULTS

Employee IDs: 19419, 19190, 12471, 20737
Location: Chamber D
Test Date: 04/05/2021 – 04/13/2021

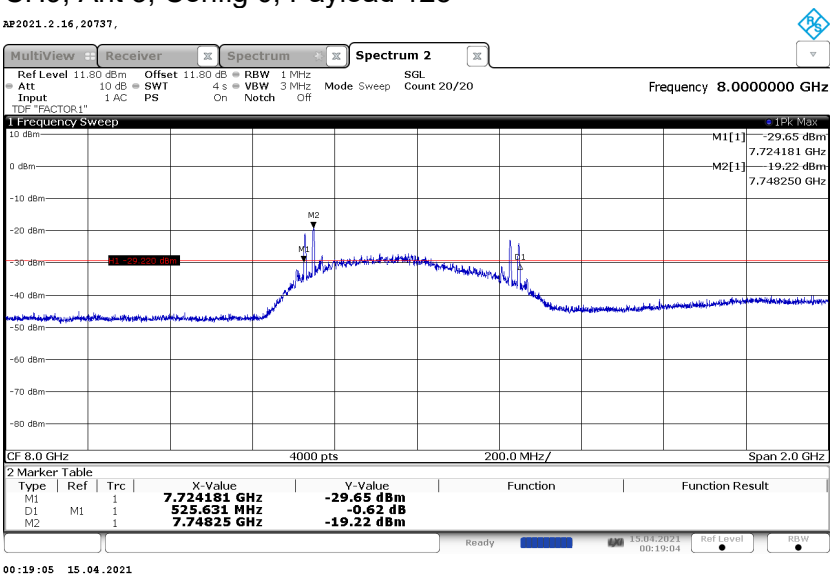
ANT	CH	CONFIG	Payload	EUT Orientation	Meas. Ant Polarity	FM (GHz)	FL (GHz)	FH (GHz)	FC (GHz)	OBW (MHz)	Min. OBW (MHz)	OBW Margin (MHz)	OBW Pass/Fail
0	9	0	125	Portrait	H	7.748	7.724	8.250	7.987	526.13	500	26.13	P
0	9	1	125	Portrait	H	7.748	7.724	8.250	7.987	526.13	500	26.13	P
0	9	2	125	Portrait	H	7.748	7.725	8.249	7.987	523.63	500	23.63	P
0	9	3	125	Portrait	H	7.748	7.726	8.248	7.987	522.63	500	22.63	P
0	9	4	0	Portrait	H	7.748	7.724	8.250	7.987	526.13	500	26.13	P
0	9	5	0	Portrait	H	7.748	7.723	8.251	7.987	527.63	500	27.63	P
1	9	0	125	Landscape	V	7.748	7.724	8.250	7.987	525.63	500	25.63	P
1	9	1	125	Landscape	V	7.748	7.724	8.250	7.987	526.13	500	26.13	P
1	9	2	125	Landscape	V	7.748	7.725	8.249	7.987	523.63	500	23.63	P
1	9	3	125	Landscape	V	7.748	7.726	8.248	7.987	522.13	500	22.13	P
1	9	4	0	Landscape	V	7.748	7.724	8.250	7.987	525.63	500	25.63	P
1	9	5	0	Landscape	V	7.748	7.723	8.251	7.987	528.13	500	28.13	P
2	5	0	125	Landscape	H	6.729	6.227	6.753	6.490	526.13	500	26.13	P
2	5	1	125	Landscape	H	6.729	6.227	6.753	6.490	526.13	500	26.13	P
2	5	2	125	Landscape	H	6.729	6.228	6.751	6.489	523.63	500	23.63	P
2	5	3	125	Landscape	H	6.729	6.228	6.751	6.489	522.63	500	22.63	P
2	5	4	0	Landscape	H	6.729	6.227	6.753	6.490	526.13	500	26.13	P
2	5	5	0	Landscape	H	6.729	6.226	6.754	6.490	528.13	500	28.13	P
2	9	0	125	Landscape	V	8.226	7.725	8.250	7.988	525.13	500	26.13	P
2	9	1	125	Landscape	V	8.226	7.725	8.250	7.988	525.13	500	25.13	P
2	9	2	125	Landscape	V	8.226	7.726	8.249	7.987	523.63	500	23.63	P
2	9	3	125	Landscape	V	8.226	7.726	8.249	7.988	523.13	500	23.13	P
2	9	4	0	Landscape	V	8.226	7.725	8.250	7.988	525.13	500	25.63	P
2	9	5	0	Landscape	V	8.226	7.725	8.252	7.988	527.13	500	27.13	P
3	5	0	125	Landscape	V	6.729	6.227	6.753	6.490	525.63	500	25.63	P
3	5	1	125	Landscape	V	6.729	6.227	6.753	6.490	525.63	500	25.63	P
3	5	2	125	Landscape	V	6.729	6.228	6.751	6.490	523.13	500	23.13	P
3	5	3	125	Landscape	V	6.729	6.229	6.751	6.490	522.13	500	22.13	P
3	5	4	0	Landscape	V	6.729	6.227	6.753	6.490	525.63	500	25.63	P
3	5	5	0	Landscape	V	6.729	6.226	6.754	6.490	527.63	500	27.63	P
3	9	0	125	Landscape	V	7.748	7.724	8.250	7.987	525.63	500	25.63	P
3	9	1	125	Landscape	V	7.748	7.724	8.250	7.987	525.63	500	25.63	P
3	9	2	125	Landscape	V	7.748	7.725	8.249	7.987	523.63	500	23.63	P
3	9	3	125	Landscape	V	7.748	7.726	8.248	7.987	522.13	500	22.13	P
3	9	4	0	Landscape	V	7.748	7.724	8.250	7.987	525.63	500	25.63	P
3	9	5	0	Landscape	V	7.749	7.723	8.251	7.987	527.63	500	27.63	P

RESULTS

CH5, Ant 3, Config 0, Payload 125



CH9, Ant 3, Config 0, Payload 125



9.3. PEAK POWER AND MAXIMUM AVERAGE EMISSIONS

LIMITS

FCC

15.519 (e) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, f_M. That limit is 0 dBm EIRP.

15.519 (c) The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
3100 - 10600	-41.3

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Annex, Section 4 (c) Peak measurements shall be made in addition to average measurements. Transmissions shall not exceed 0 dBm e.i.r.p. in any 50 MHz bandwidth when the average limit is -41.3 dBm/MHz.

Section 5.3.1 (d) Radiated emissions above 960 MHz from a device shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz.

Frequency	E.I.R.P. in a Resolution Bandwidth of 1 MHz
4.75 – 10.6 GHz	−41.3 dBm

TEST PROCEDURE

ANSI C63.10 Clause 10.3

RSS-220 Annex

Peak EIPR power is measured using RBW of 50 MHz.

The radiated emissions of 6 - 9 GHz frequency band are performed at 3-meter test distance.

Tabulated data provides the test results of all available test configurations. The plots of Ant 3, CONFIG 0, Payload 125 power measurement on CH5 and CH9 are presented and same measurement settings apply to the rest of test configurations.

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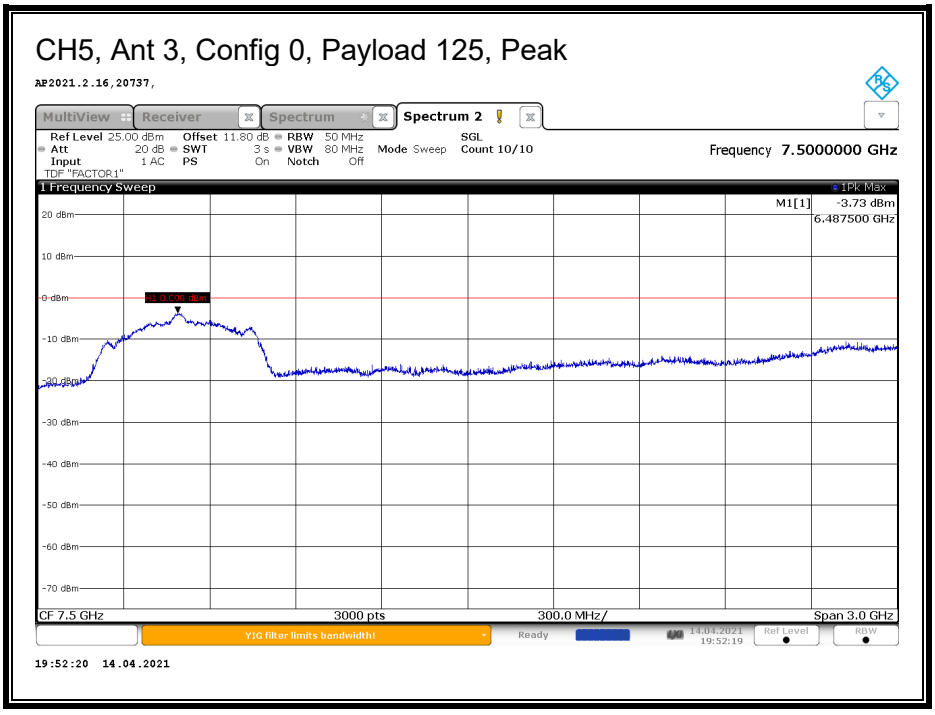
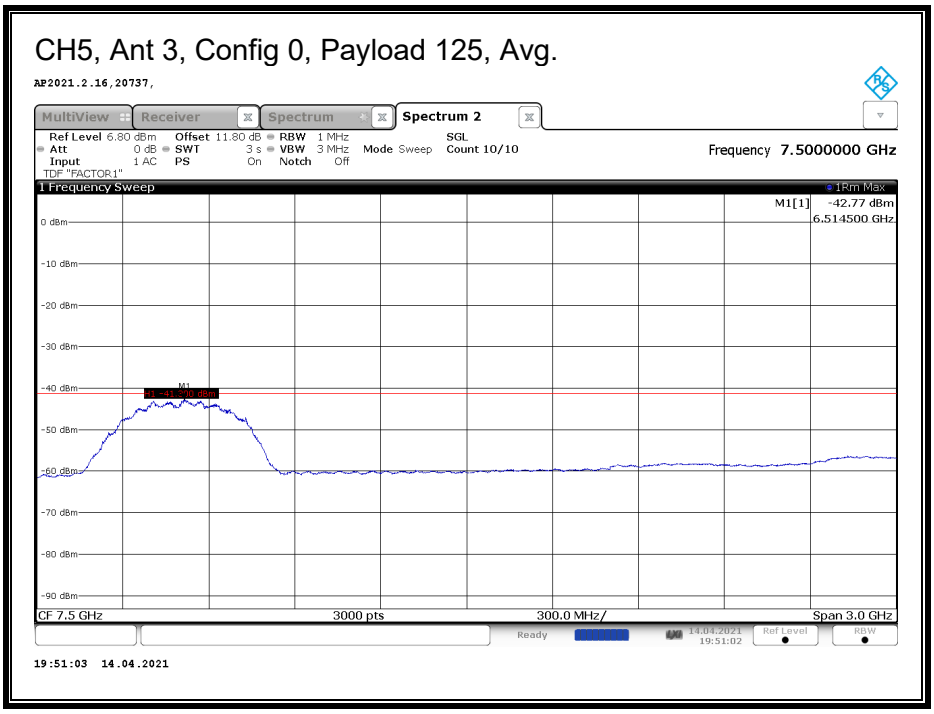
RESULTS

Employee IDs: 19419, 19190, 12471, 20737
Location: Chamber D
Test Date: 04/05/2021 – 04/13/2021

						Peak EIRP Power				Average EIRP Power			
ANT	CH	CONFIG	Payload	EUT Orientation	Meas. Ant. Polarity	FM (GHz)	Peak Power (dBm/50MHz)	Peak Limit (0 dBm/50 MHz)	Margin (dB)	FM (GHz)	Avg Power (dBm/MHz)	Avg Limit (dBm/MHz)	Margin (dB)
0	9	0	125	Portrait	H	7.9875	-4.03	0	-4.03	7.8685	-42.31	-41.3	-1.01
0	9	1	125	Portrait	H	7.9745	-3.08	0	-3.08	7.8685	-42.36	-41.3	-1.06
0	9	2	125	Portrait	H	7.9865	-7.67	0	-7.67	7.8645	-42.63	-41.3	-1.33
0	9	3	125	Portrait	H	7.9845	-7.09	0	-7.09	7.8635	-42.44	-41.3	-1.14
0	9	4	0	Portrait	H	8.2225	-5.73	0	-5.73	7.8675	-42.55	-41.3	-1.25
0	9	5	0	Portrait	H	8.2245	-3.50	0	-3.50	7.8665	-42.67	-41.3	-1.37
1	9	0	125	Landscape	V	7.9875	-3.44	0	-3.44	7.9785	-42.73	-41.3	-1.43
1	9	1	125	Landscape	V	7.9765	-1.66	0	-1.66	7.9715	-42.31	-41.3	-1.01
1	9	2	125	Landscape	V	7.9925	-5.99	0	-5.99	7.9855	-42.71	-41.3	-1.41
1	9	3	125	Landscape	V	7.9875	-5.44	0	-5.44	7.9695	-42.51	-41.3	-1.21
1	9	4	0	Landscape	V	8.2225	-6.86	0	-6.86	7.9805	-42.49	-41.3	-1.19
1	9	5	0	Landscape	V	8.2245	-5.29	0	-5.29	7.9825	-42.35	-41.3	-1.05
2	5	0	125	Landscape	H	6.4805	-3.31	0	-3.31	6.4065	-42.46	-41.3	-1.16
2	5	1	125	Landscape	H	6.4895	-2.27	0	-2.27	6.5145	-42.44	-41.3	-1.14
2	5	2	125	Landscape	H	6.4905	-6.44	0	-6.44	6.5115	-42.35	-41.3	-1.05
2	5	3	125	Landscape	H	6.4845	-6.02	0	-6.02	6.5105	-42.56	-41.3	-1.26
2	5	4	0	Landscape	H	6.4865	-8.07	0	-8.07	6.5095	-42.39	-41.3	-1.09
2	5	5	0	Landscape	H	6.4905	-6.52	0	-6.52	6.5115	-42.55	-41.3	-1.25
2	9	0	125	Landscape	V	8.2245	-2.50	0	-2.50	8.1535	-42.54	-41.3	-1.24
2	9	1	125	Landscape	V	8.2245	-1.62	0	-1.62	8.1535	-42.60	-41.3	-1.30
2	9	2	125	Landscape	V	8.2235	-6.25	0	-6.25	8.1515	-42.53	-41.3	-1.23
2	9	3	125	Landscape	V	8.1385	-7.21	0	-7.21	8.1395	-43.14	-41.3	-1.84
2	9	4	0	Landscape	V	8.2245	-1.67	0	-1.67	8.1545	-42.37	-41.3	-1.07
2	9	5	0	Landscape	V	8.2225	-1.52	0	-1.52	8.1405	-44.33	-41.3	-3.03
3	5	0	125	Landscape	V	6.4875	-3.73	0	-3.73	6.5145	-42.77	-41.3	-1.47
3	5	1	125	Landscape	V	6.4805	-2.63	0	-2.63	6.5145	-42.73	-41.3	-1.43
3	5	2	125	Landscape	V	6.4935	-5.89	0	-5.89	6.5135	-42.40	-41.3	-1.10
3	5	3	125	Landscape	V	6.4905	-6.77	0	-6.77	6.5145	-42.37	-41.3	-1.07
3	5	4	0	Landscape	V	6.7395	-6.32	0	-6.32	6.5105	-42.33	-41.3	-1.03
3	5	5	0	Landscape	V	6.7355	-5.21	0	-5.21	6.5185	-42.53	-41.3	-1.23
3	9	0	125	Landscape	V	7.9755	-3.30	0	-3.30	7.9155	-42.90	-41.3	-1.60
3	9	1	125	Landscape	V	7.9905	-2.79	0	-2.79	7.9145	-42.70	-41.3	-1.40
3	9	2	125	Landscape	V	7.9785	-6.04	0	-6.04	7.9265	-42.69	-41.3	-1.39
3	9	3	125	Landscape	V	7.9875	-6.14	0	-6.14	7.9195	-42.42	-41.3	-1.12
3	9	4	0	Landscape	V	7.7395	-4.60	0	-4.60	7.9165	-42.44	-41.3	-1.14
3	9	5	0	Landscape	V	7.7345	-3.04	0	-3.04	7.9175	-42.47	-41.3	-1.17

RESULTS





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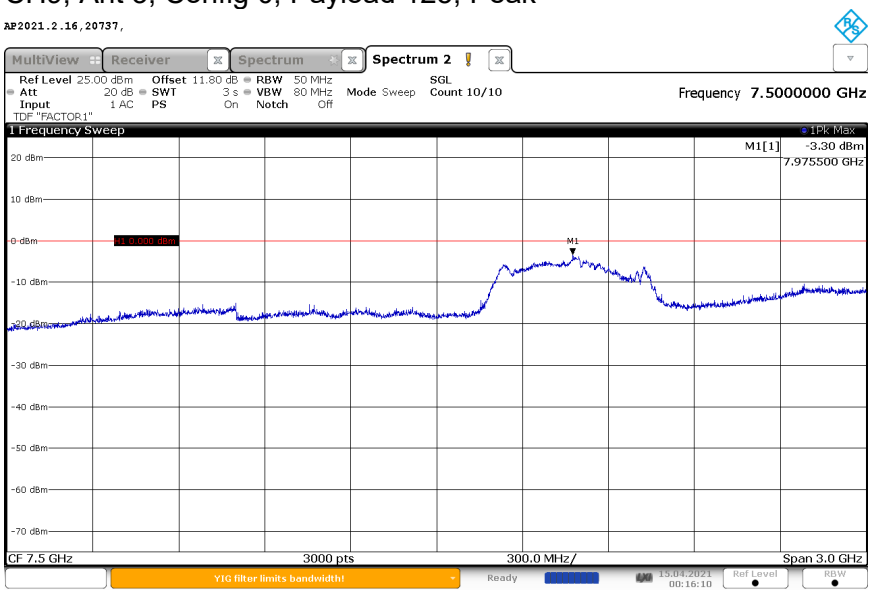
CH9, Ant 3, Config 0, Payload 125, Peak



CH9, Ant 3, Config 0, Payload 125, Avg.

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9.4. CESSATION TIME

LIMITS

FCC

§15.519(a)(1) A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

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Section 5.3.1 (b) The device is to transmit only when it is sending information to an associated receiver. The device shall cease transmission of information within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB device at least every 10 seconds or the UWB device shall cease transmitting any information other than periodic signals used for the establishment or re-establishment of a communication link with an associated receiver.

TEST PROCEDURES

* Initiator = EUT
* Responder = associated receiver

Transmissions are monitored for two cases:

1. The Initiator ends the UWB link.
2. The Responder ends the UWB link.

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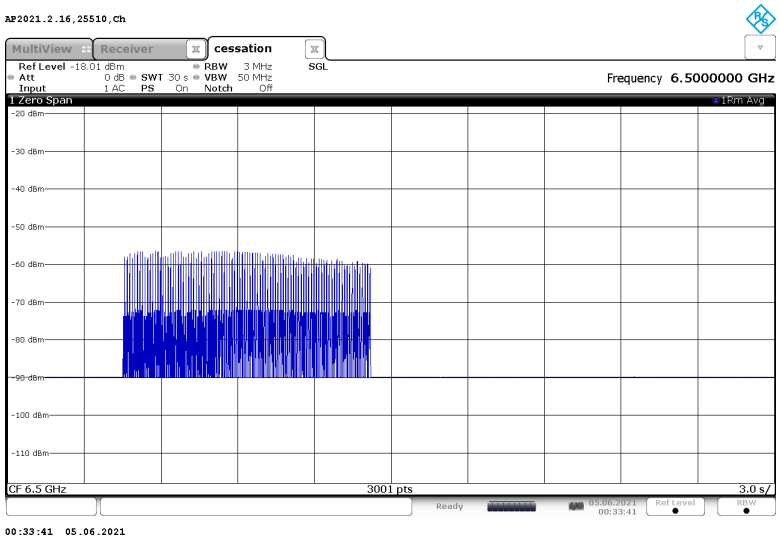
RESULTS

Employee ID: 19419
Location: Chamber D
Test Date: 06/04/2021

Signal Levels on all Plots

- Initiator is Low Amplitude
- Responder is High Amplitude

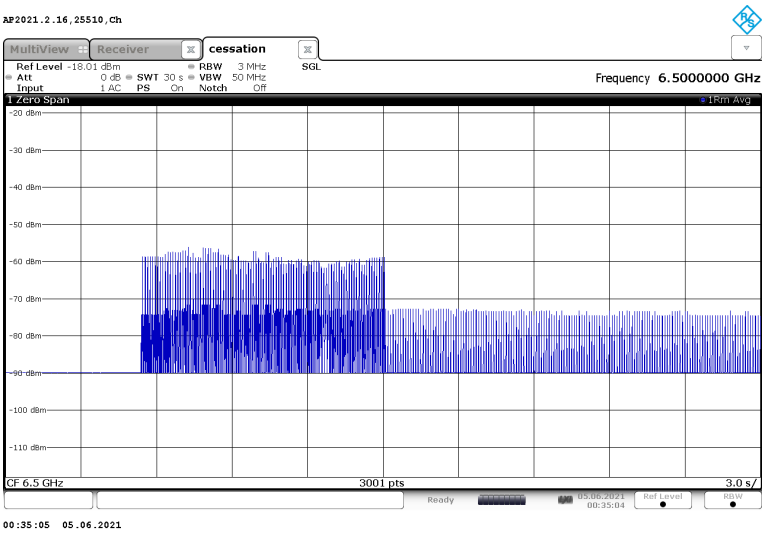
Case 1: Initiator ends the UWB link



RESULT

- All devices, including the Responder, cease transmissions.

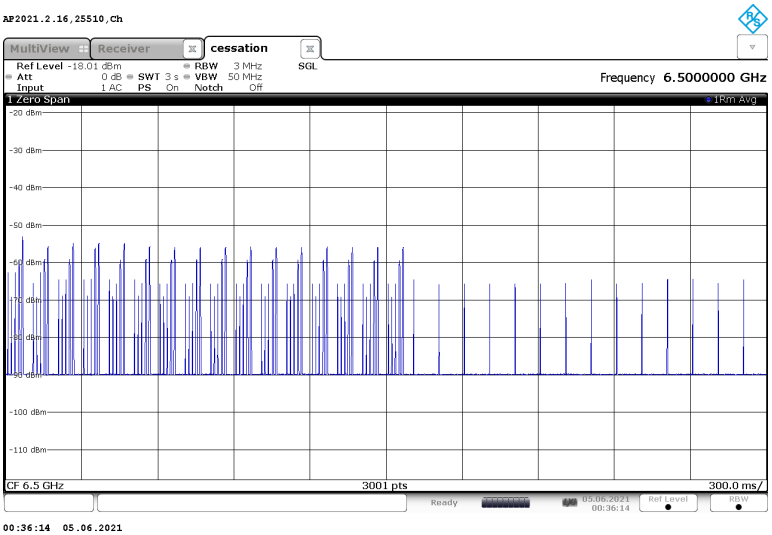
Case 2: Responder ends the UWB link



RESULT

- Responder ends the link, Initiator stops Acknowledgements but continues Polling.
    - Responder ceases transmissions, does not respond to Polling Signals.

Zoom-in Plot during On-Off Transition



RESULT

- Shows Link Traffic, Acknowledgements and Polling Signals while Link is established
- Shows Polling Signals after Link has ended

9.5. EMISSIONS BELOW 960 MHz

LIMITS

FCC

§15.519 (c) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

15.209 (a)

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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

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Section 3.4 Radiated emissions at or below 960 MHz for all subclasses of UWB device shall not exceed the following limits. Measurements of radiated emissions at and below 960 MHz are to be made using a CISPR quasi-peak detector. CISPR measurement bandwidth specifications are to be used.

Frequency (MHz)	Field Strength (Microvolts/m)	Measurement Distance (Metres)	E.i.r.p. (dBmW)
0.009-0.490	2,400/F (F in kHz)	300	10 log (17.28 / F^2) (F in kHz)
0.490-1.705	24,000/F (F in kHz)	30	10 log (17.28 / F^2) (F in kHz)
1.705-30	30	30	-45.7
30-88	100	3	-55.2
88-216	150	3	-51.7
216-960	200	3	-49.2

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average emissions detector.

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TEST PROCEDURE

ANSI C63.10 Clause 10.2

RSS-220 Annex

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 3m from the EUT.

For below 30 MHz testing, investigation was done on three antenna orientations: RX antenna Face-on, Face-off and horizontal (parallel to ground). The worst-case configurations were determined on RX antenna Face-on and Face-off; therefore, all final tests were performed using these two orientations.

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

A final test is made at any frequencies at which emissions are found. During this final scan, the antenna is kept no further from the EUT than the maximum distance calculated for each band that yields a minimum system noise floor.

RESULTS

Employee IDs: 19419, 19190, 12471, 20737
Location: Chamber F
Test Date: 04/05/2021 – 05/04/2021

Emissions Summary

					Frequency Range	
Ant	CH	Config	Payload	Power Setting	9 kHz - 30 MHz	30 - 960 MHz
0	9	3	125	Max	PASS	PASS
1	9	3	125	Max	PASS	PASS
2	5	3	125	Max	PASS	PASS
2	9	3	125	Max	PASS	PASS
3	5	3	125	Max	PASS	PASS
3	9	3	125	Max	PASS	PASS

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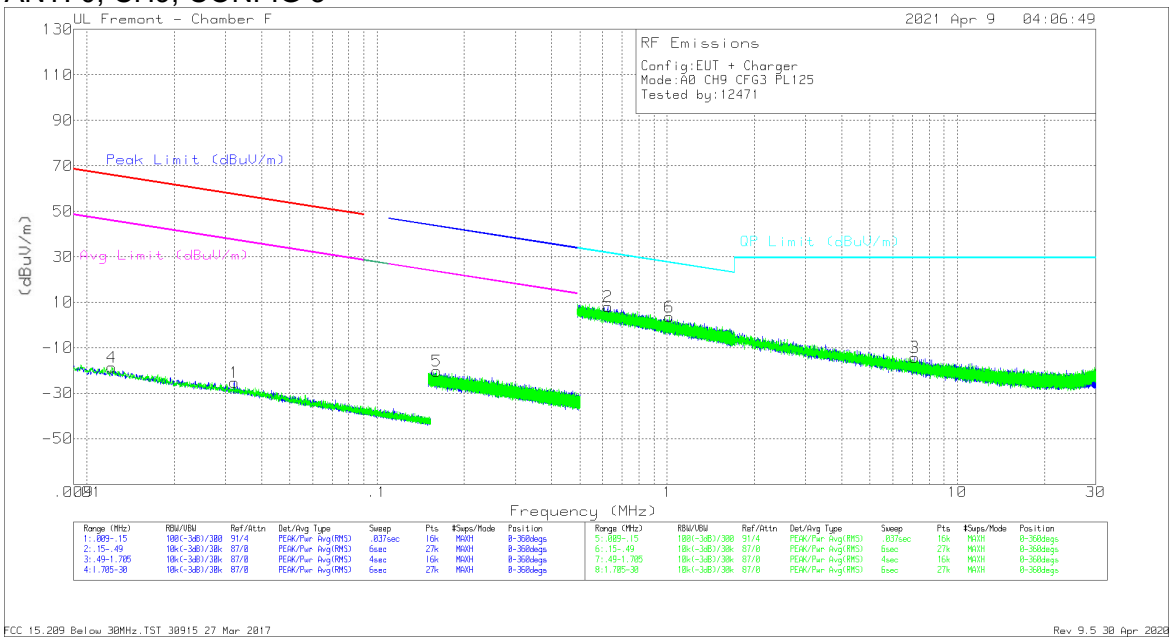
9.5.1. EMISSIONS, 9 kHz – 30 MHz

ANT. 0, CH9, CONFIG 3



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading ((dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.03225	40.97	Pk	13.9	0	-80	-25.13	57.42	-82.55	37.42	-62.55	-	-	-	-	0-360	On
4	.0122	43.46	Pk	18	0	-80	-18.54	65.86	-84.4	45.86	-64.4	-	-	-	-	0-360	Off
5	.16092	48.41	Pk	11.2	.1	-80	-20.29	-	-	-	-	43.49	-63.78	23.49	-43.78	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
2	.62422	37.32	Pk	10.8	.1	-40	8.22	31.7	-23.48	0-360	On
3	7.14831	14.73	Pk	10.8	.3	-40	-14.17	29.5	-43.67	0-360	On
6	1.01987	32.8	Pk	10.8	.1	-40	3.7	27.45	-23.75	0-360	Off

Pk - Peak detector

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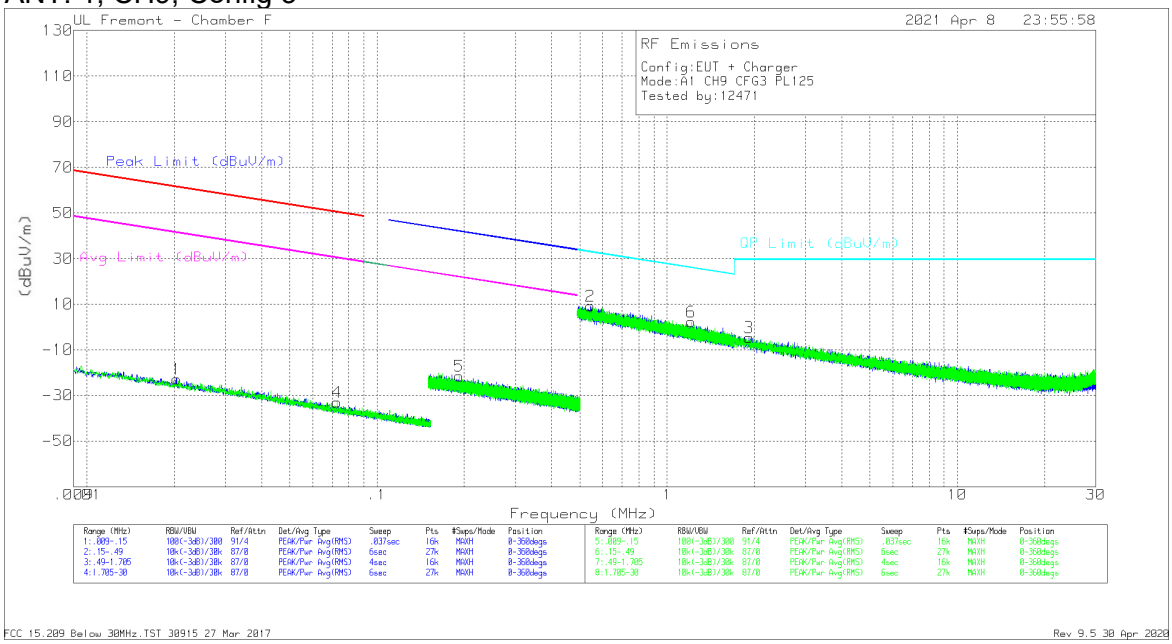
ANT. 1, CH9, Config 3



Trace Markers

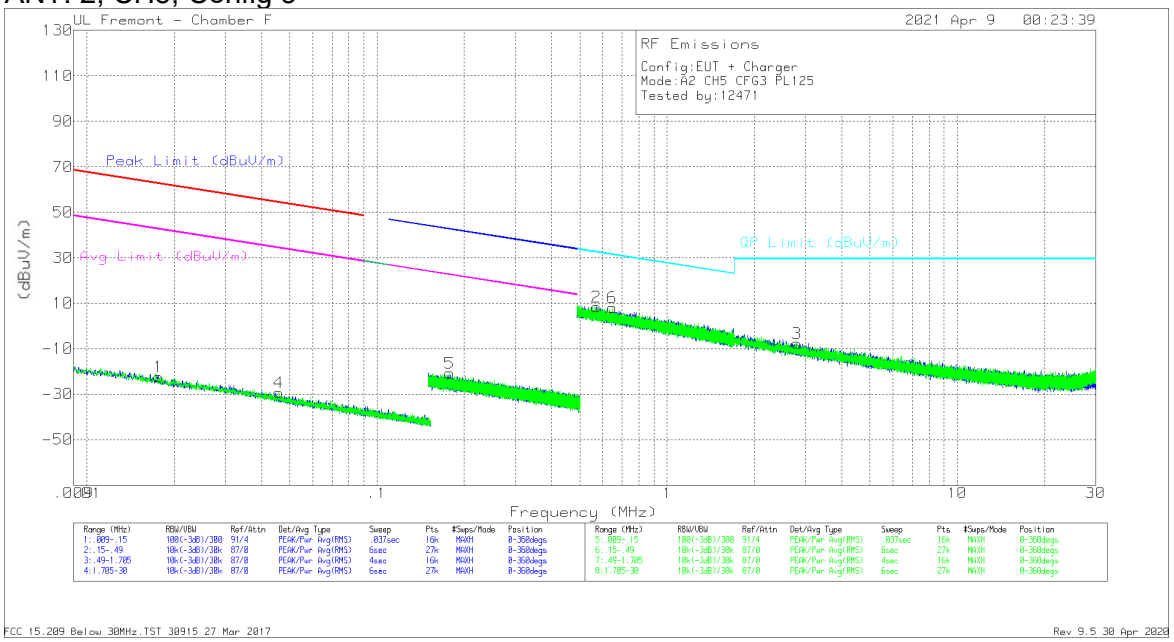
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.02038	42.29	Pk	15	0	-80	-22.71	61.4	-84.11	41.4	-64.11	-	-	-	-	0-360	On
4	.07277	35.03	Pk	11.9	0	-80	-33.07	50.35	-83.42	30.35	-63.42	-	-	-	-	0-360	Off
5	.19169	47.29	Pk	11.1	.1	-80	-21.51	-	-	-	-	41.97	-63.48	21.97	-43.48	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
2	.54343	38.29	Pk	10.8	.1	-40	9.19	32.9	-23.71	0-360	On
3	1.91565	24.44	Pk	10.8	.2	-40	-4.56	29.5	-34.06	0-360	On
6	1.21284	31.39	Pk	10.8	.1	-40	2.29	25.95	-23.66	0-360	Off

Pk - Peak detector

ANT. 2, CH5, Config 3



Trace Markers

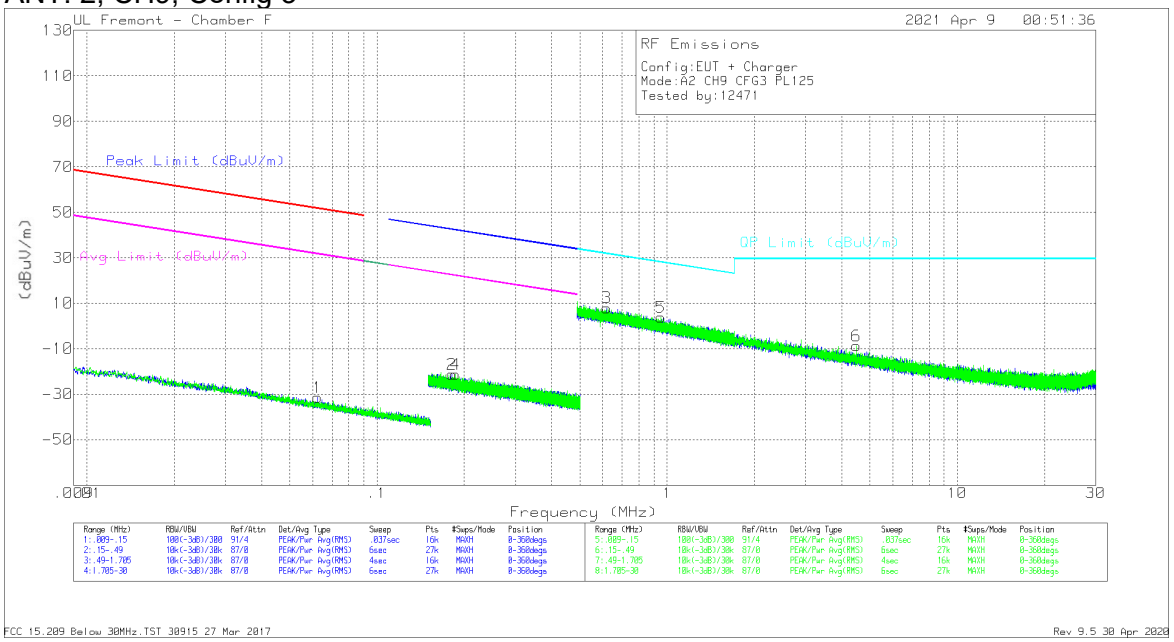
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.01769	41.83	Pk	15.9	0	-80	-22.27	62.63	-84.9	42.63	-64.9	-	-	-	-	0-360	On
4	.04584	37.89	Pk	12.8	0	-80	-29.31	54.36	-83.67	34.36	-63.67	-	-	-	-	0-360	Off
5	.17815	48.15	Pk	11.1	.1	-80	-20.65	-	-	-	-	42.6	-63.25	22.6	-43.25	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
2	.57026	37.54	Pk	10.8	.1	-40	8.44	32.49	-24.05	0-360	On
3	2.8054	21.45	Pk	10.8	.2	-40	-7.55	29.5	-37.05	0-360	On
6	.64656	37.15	Pk	10.8	.1	-40	8.05	31.4	-23.35	0-360	Off

Pk - Peak detector

ANT. 2, CH9, Config 3



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.06247	36.42	Pk	12.1	0	-80	-31.48	51.67	-83.15	31.67	-63.15	-	-	-	-	0-360	On
2	.18127	47.52	Pk	11.1	.1	-80	-21.28	-	-	-	-	42.45	-63.73	22.45	-43.73	0-360	On
4	.18611	47.69	Pk	11.1	.1	-80	-21.11	-	-	-	-	42.22	-63.33	22.22	-43.33	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
3	.62034	37.09	Pk	10.8	.1	-40	7.99	31.76	-23.77	0-360	On
5	.95033	32.94	Pk	10.8	.1	-40	3.84	28.06	-24.22	0-360	Off
6	4.48954	20.09	Pk	10.9	.2	-40	-8.81	29.5	-38.31	0-360	Off

Pk - Peak detector

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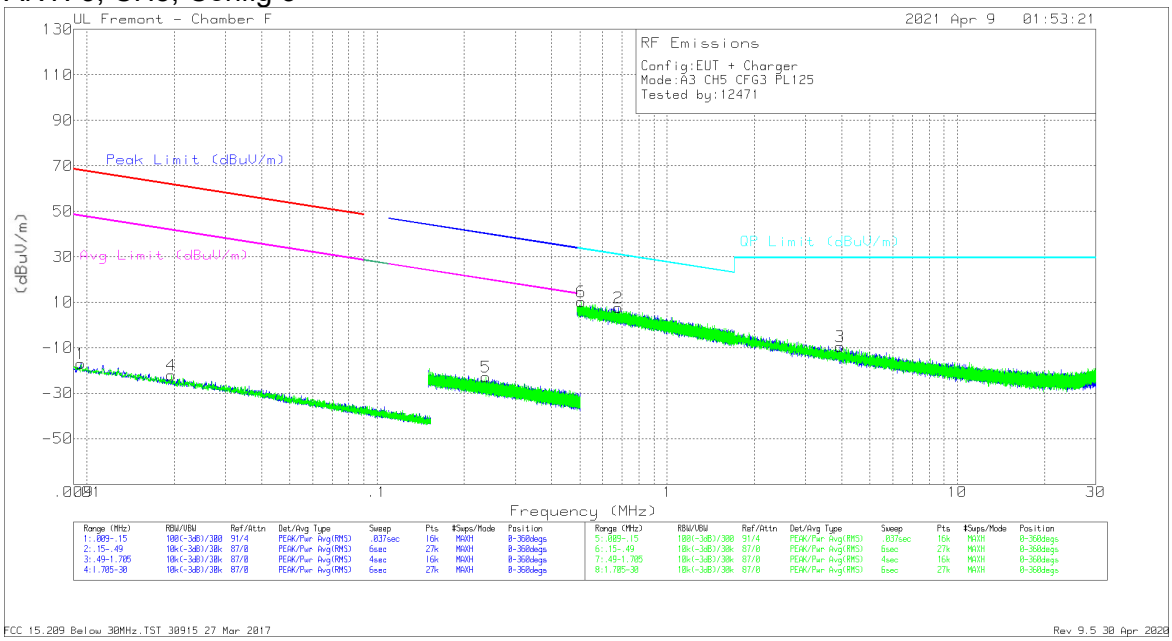
ANT. 3, CH5, Config 3



Trace Markers

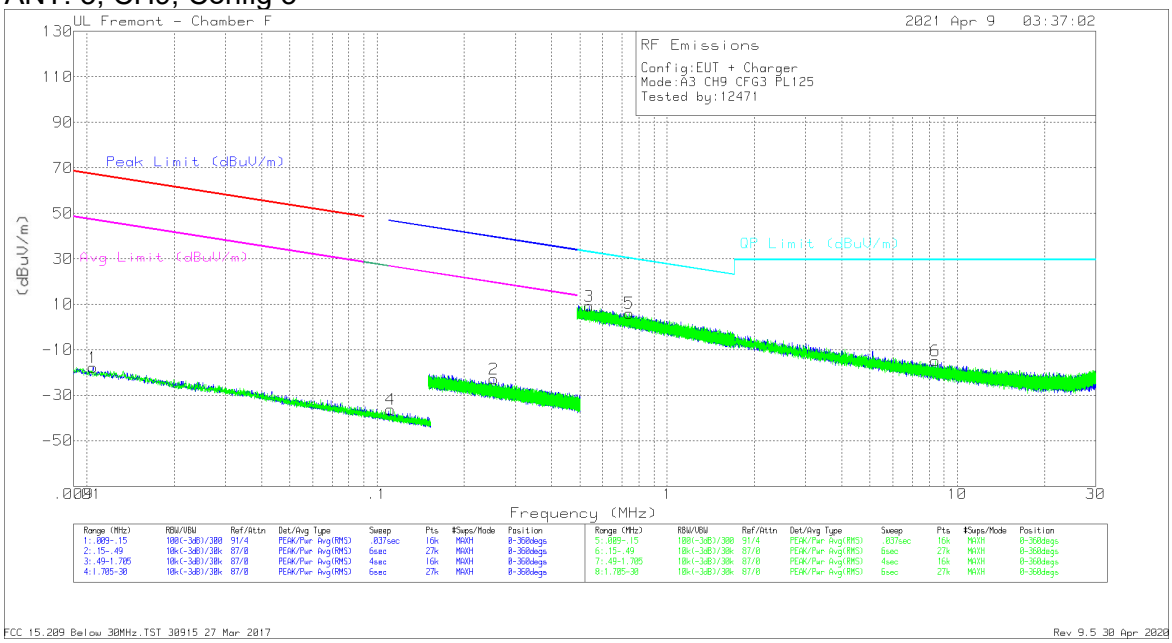
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.00954	43.64	Pk	19.3	0	-80	-17.06	67.99	-85.05	47.99	-65.05	-	-	-	-	0-360	On
4	.01957	42.69	Pk	15.2	0	-80	-22.11	61.75	-83.86	41.75	-63.86	-	-	-	-	0-360	Off
5	.23758	46.16	Pk	11	.1	-80	-22.74	-	-	-	-	40.1	-62.84	20.1	-42.84	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
2	.68015	36.6	Pk	10.8	.1	-40	7.5	30.96	-23.46	0-360	On
3	3.93829	19.49	Pk	10.9	.2	-40	-9.41	29.5	-38.91	0-360	On
6	.50558	39.28	Pk	10.8	.1	-40	10.18	33.53	-23.35	0-360	Off

Pk - Peak detector

ANT. 3, CH9, Config 3



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr 300m	Corrected Reading ((dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
1	.01051	43.46	Pk	18.7	0	-80	-17.84	67.15	-84.99	47.15	-64.99	-	-	-	-	0-360	On
2	.25295	46.09	Pk	11	.1	-80	-22.81	-	-	-	-	39.55	-62.36	19.55	-42.36	0-360	On
4	.11125	32.3	Pk	11.4	0	-80	-36.3	-	-	-	-	46.7	-83	26.7	-63	0-360	Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dBm)	Cables (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Antenna Face
3	.53826	38.38	Pk	10.8	.1	-40	9.28	32.99	-23.71	0-360	On
5	.74004	35.22	Pk	10.8	.1	-40	6.12	30.23	-24.11	0-360	Off
6	8.4143	14.11	Pk	10.7	.3	-40	-14.89	29.5	-44.39	0-360	Off

Pk - Peak detector

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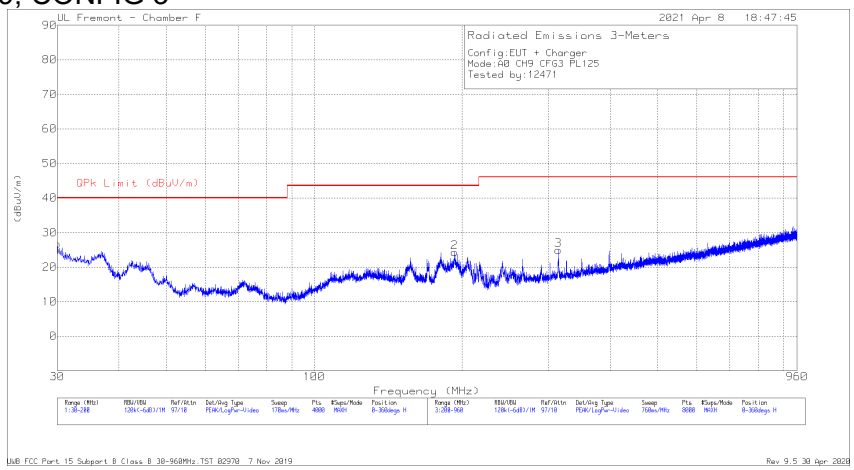
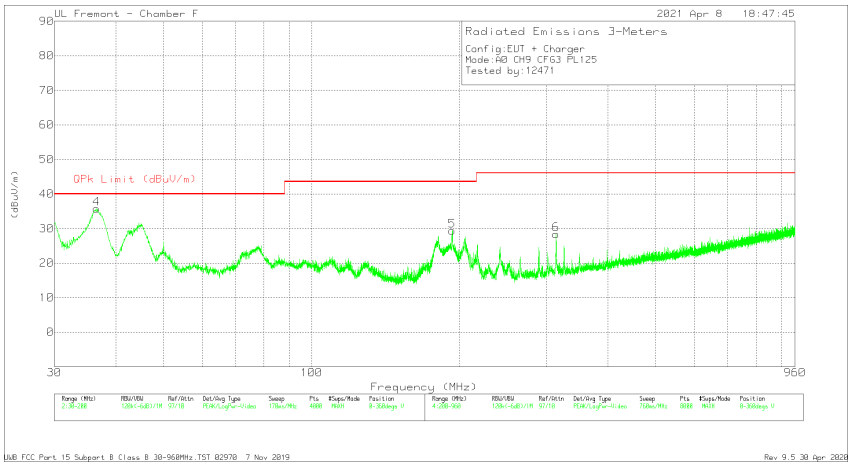
9.5.2. EMISSIONS, 30 - 960 MHz

ANT. 0, CH9, CONFIG 3



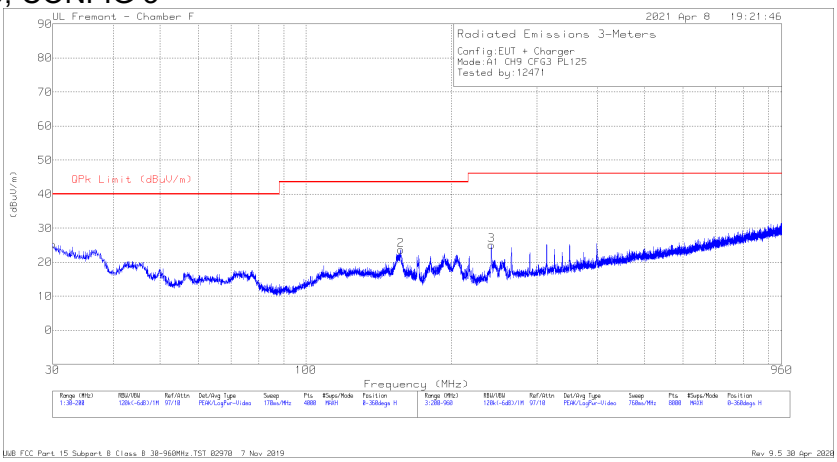


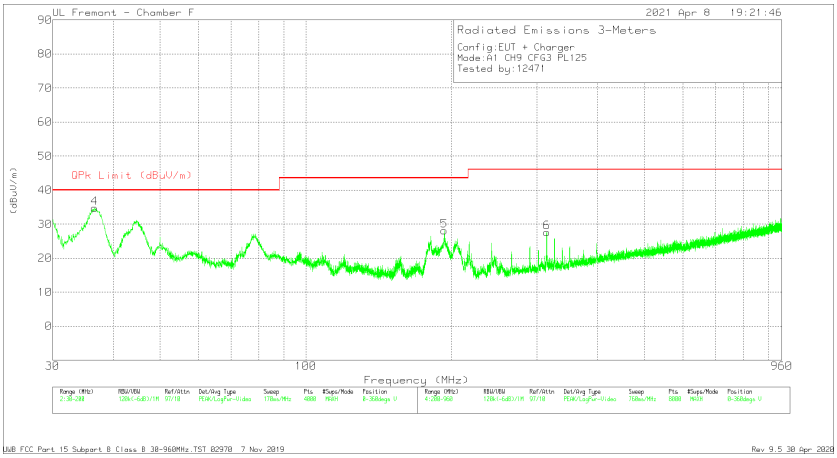
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30	30.36	Pk	28.2	-31.9	26.66	40	-13.34	0-360	301	H
2	193.1572	36.65	Pk	18	-30.4	24.25	43.52	-19.27	0-360	201	H
4	36.5467	44.45	Pk	23.1	-31.8	35.75	40	-4.25	0-360	100	V
	36.2707	39.92	Qp	23.3	-31.8	31.42	40	-8.58	261	103	V
5	193.1572	41.77	Pk	18	-30.4	29.37	43.52	-14.15	0-360	100	V
3	313.7294	34.41	Pk	20.3	-29.8	24.91	46.02	-21.11	0-360	99	H
6	314.0144	37.87	Pk	20.3	-29.8	28.37	46.02	-17.65	0-360	99	V

Pk - Peak detector

ANT. 1, CH9, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30	28.98	Pk	28.2	-31.9	25.28	40	-14.72	0-360	400	H
2	156.9378	35.93	Pk	18.5	-30.8	23.63	43.52	-19.89	0-360	201	H
4	36.6317	43.57	Pk	23	-31.8	34.77	40	-5.23	0-360	100	V
	36.9187	40.07	Qp	22.8	-31.8	31.07	40	-8.93	250	102	V
5	193.1572	40.52	Pk	18	-30.4	28.12	43.52	-15.4	0-360	100	V
3	241.3302	37.1	Pk	18.1	-30.2	25	46.02	-21.02	0-360	99	H
6	314.1094	37.09	Pk	20.3	-29.8	27.59	46.02	-18.43	0-360	99	V

Pk - Peak detector

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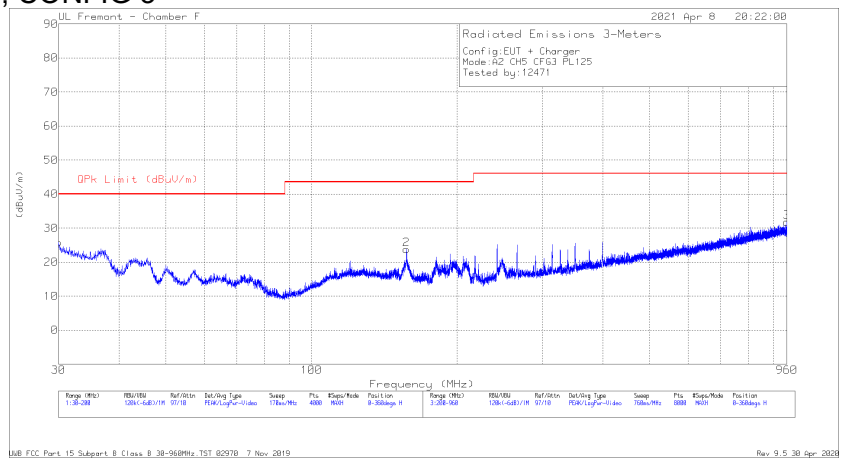
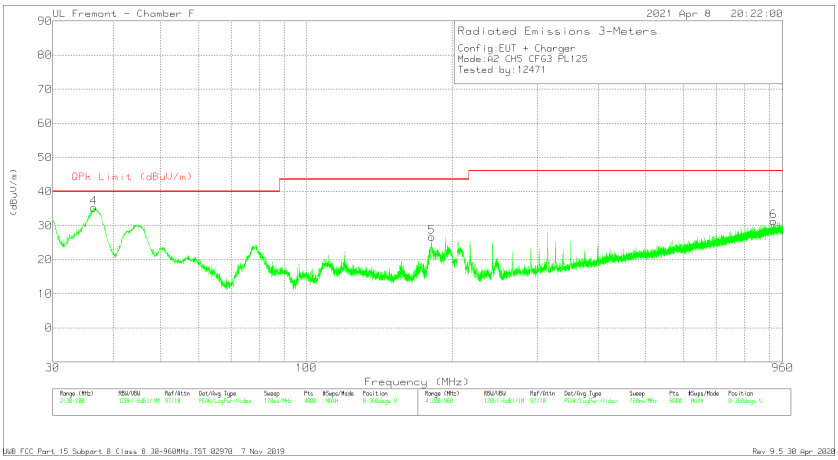
ANT.2, CH5, CONFIG 3



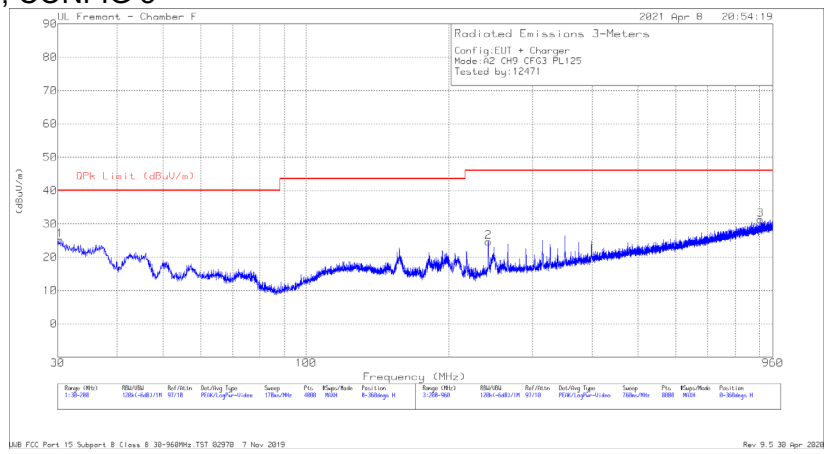


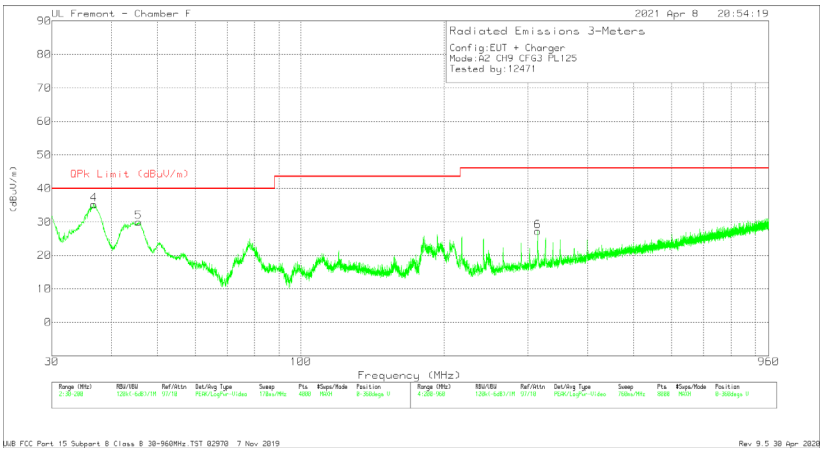
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30	29.53	Pk	28.2	-31.9	25.83	40	-14.17	0-360	400	H
2	157.1929	36.04	Pk	18.5	-30.8	23.74	43.52	-19.78	0-360	201	H
4	36.5042	43.93	Pk	23.1	-31.8	35.23	40	-4.77	0-360	100	V
	36.7982	39.88	Qp	22.9	-31.8	30.98	40	-9.02	236	105	V
5	181.3392	39.86	Pk	17.4	-30.6	26.66	43.52	-16.86	0-360	100	V
3	959.0509	28.75	Pk	29.2	-26.2	31.75	46.02	-14.27	0-360	200	H
6	919.6209	29.08	Pk	28.9	-26.7	31.28	46.02	-14.74	0-360	99	V

Pk - Peak detector

ANT. 2, CH9, CONFIG 3



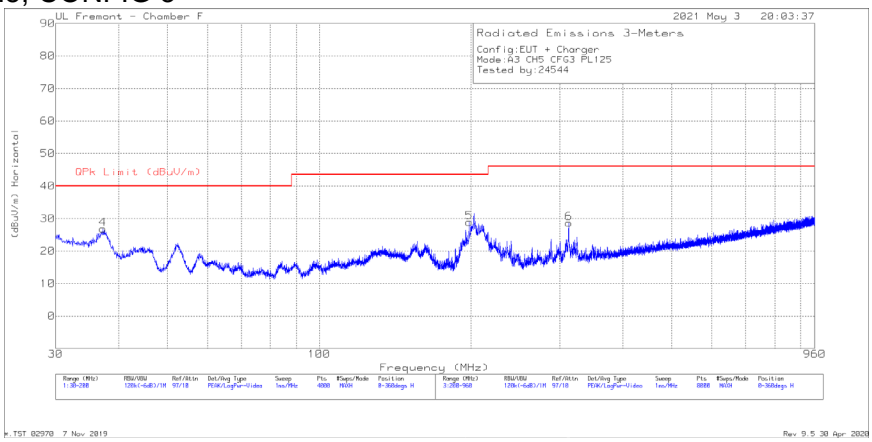


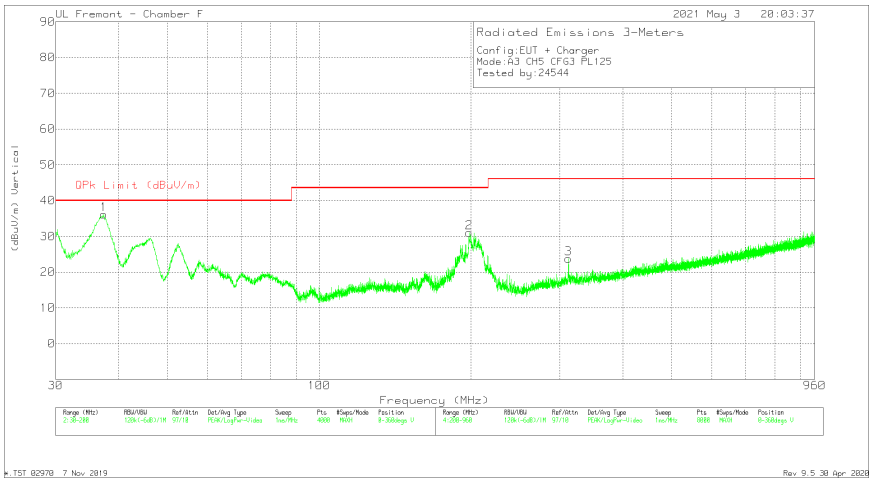
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.3401	29.13	Pk	27.9	-31.9	25.13	40	-14.87	0-360	301	H
4	36.7592	44.1	Pk	22.9	-31.8	35.2	40	-4.8	0-360	100	V
	37.0672	39.41	Qp	22.6	-31.8	30.21	40	-9.79	202	105	V
5	45.6866	45.32	Pk	16.4	-31.7	30.02	40	-9.98	0-360	100	V
2	241.9003	36.77	Pk	18.1	-30.2	24.67	46.02	-21.35	0-360	99	H
3	903.6589	29.38	Pk	28.7	-26.8	31.28	46.02	-14.74	0-360	99	H
6	314.2044	36.71	Pk	20.3	-29.8	27.21	46.02	-18.81	0-360	99	V

Pk - Peak detector

ANT. 3, CH5, CONFIG 3



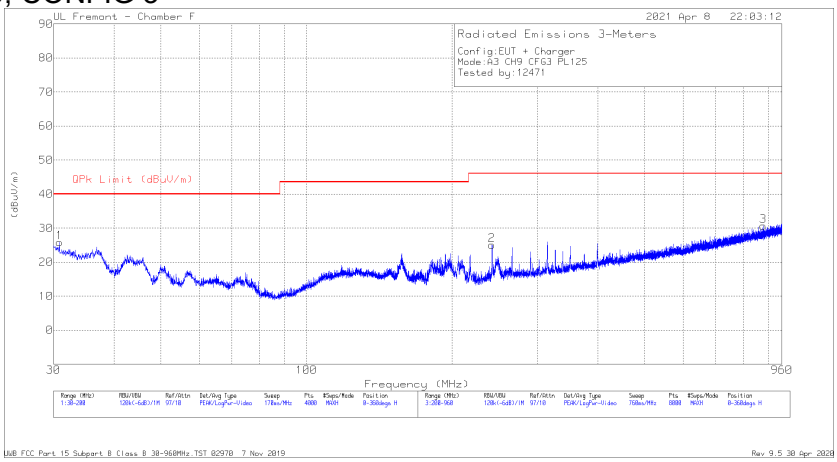


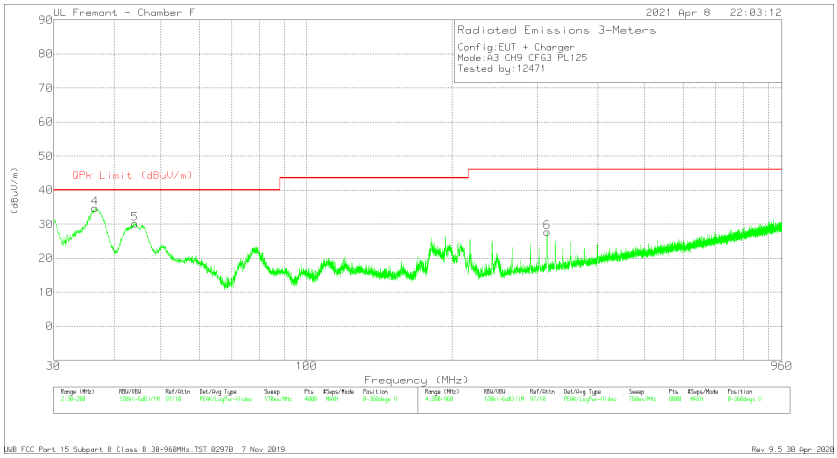
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	37.2694	35.7	Pk	22.9	-31.8	26.8	40	-13.2	0-360	201	H
5	198.216	41.02	Pk	18.3	-30.5	28.82	43.52	-14.7	0-360	101	H
1	37.3969	45.12	Pk	22.8	-31.8	36.12	40	-3.88	0-360	100	V
	46.32	40.55	Qp	16.1	-31.7	24.95	40	-15.05	53	100	V
2	198.0885	43.35	Pk	18.2	-30.5	31.05	43.52	-12.47	0-360	100	V
6	312.2092	38.56	Pk	19.8	-29.8	28.56	46.02	-17.46	0-360	99	H
3	312.1142	33.79	Pk	19.8	-29.8	23.79	46.02	-22.23	0-360	99	V

Pk - Peak detector

ANT. 3, CH9, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.8502	30.25	Pk	27.5	-31.9	25.85	40	-14.15	0-360	201	H
4	36.5467	43.42	Pk	23.1	-31.8	34.72	40	-5.28	0-360	100	V
	36.9147	39.15	Qp	22.8	-31.8	30.15	40	-9.85	272	110	V
5	44.1562	44.52	Pk	17.3	-31.7	30.12	40	-9.88	0-360	100	V
2	241.7103	37.11	Pk	18.1	-30.2	25.01	46.02	-21.01	0-360	201	H
3	879.1458	29.31	Pk	28.3	-27	30.61	46.02	-15.41	0-360	400	H
6	314.2994	37.23	Pk	20.3	-29.8	27.73	46.02	-18.29	0-360	99	V

Pk - Peak detector

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9.6. AVERAGE EMISSIONS ABOVE 960 MHz

LIMITS

FCC

15.519 (c)

Frequency in MHz	EIRP in dBm
960-1610	−75.3
1610-1990	−63.3
1990-3100	−61.3
3100-10600	−41.3
Above 10600	−61.3

§15.519 (d) In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency in MHz	EIRP in dBm
1164-1240	−85.3
1559-1610	−85.3

RSS-220

Section 5.3.1 (d) Radiated emissions above 960 MHz from a device shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz.

Hand-held (Outdoor) Communication, Measurement, Location Sensing, and Tracking Devices	
Frequency	E.i.r.p. in a Resolution Bandwidth of 1 MHz
960-1 610 MHz	-75.3 dBm
1.61-4.75 GHz	-70.0 dBm
4.75-10.6 GHz	-41.3 dBm
Above 10.6 GHz	-61.3 dBm

Section 5.3.1 (e) In addition to the limits specified in paragraph (d) of this section, radiated emissions shall not exceed the following average limits when measured using a resolution bandwidth greater than or equal to 1 kHz. The measurements shall demonstrate compliance with the stated limits at whatever resolution bandwidth is used.

Frequency	E.i.r.p. in a Resolution Bandwidth of no less than 1 kHz
1 164-1 240 MHz	-85.3 dBm
1 559-1 610 MHz	-85.3 dBm

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TEST PROCEDURE

ANSI C63.10 Clause 10.3

RSS-220 Annex

Exploratory measurements for all frequency ranges are performed with the measurement antenna at close distances to the EUT as described in ANSI C63.10 6.6.4.2. Where emissions are observed the measurement antenna is then positioned at a height of 1.5m and a distance of 0.5m from the EUT and final measurements are made at the frequencies observed in the exploratory scans using the alternative measurement procedures detailed in ANSI C63.10 section 6.6.5. If no emissions are observed, a plot is made at a test distance of 0.5m from the EUT to show the measurement system noise floor.

PROCEDURE FOR 0.96 TO 6 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

A low pass filter with a cut off frequency of 6 GHz is used to suppress the fundamental and perform measurement for 0.96 - 6 GHz.

RESULTS FOR 6 GHz TO 9 GHz

The 6 - 9 GHz frequency band is covered in Section 9.3.

PROCEDURE FOR 9 GHz TO 18 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

A high pass filter with pass band frequency beyond 9 GHz is used to suppress the fundamental and perform measurement for 9 - 18 GHz.

PROCEDURE FOR 1.164 TO 1.240 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

RBW = 120 kHz & VBW = 360 kHz were used at pre-scan.

A low pass filter with a cut off frequency of 6 GHz is used to suppress the fundamental and perform measurement for 1.164 – 1.240 GHz.

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PROCEDURE FOR 1.559 TO 1.610 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

RBW = 120 kHz & VBW = 360 kHz were used at pre-scan.

A low pass filter with a cut off frequency of 6 GHz is used to suppress the fundamental and perform measurement for 1.559 – 1.610 GHz.

PROCEDURE FOR 18 GHz TO 40 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables, at a maximum distance of 0.5m from the EUT.

A final test is made at any frequencies at which emissions are found. During this final scan, the antenna is kept no further from the EUT than the maximum distance calculated for each band that yields a minimum system noise floor.

Distance Correction Factor from 3m to 0.5m = 20*log(0.5m/3m) = -15.56 dB

RESULTS

Employee IDs: 19419, 19190, 12471, 20737
Location: Chamber F
Test Date: 04/05/2021 – 05/13/2021

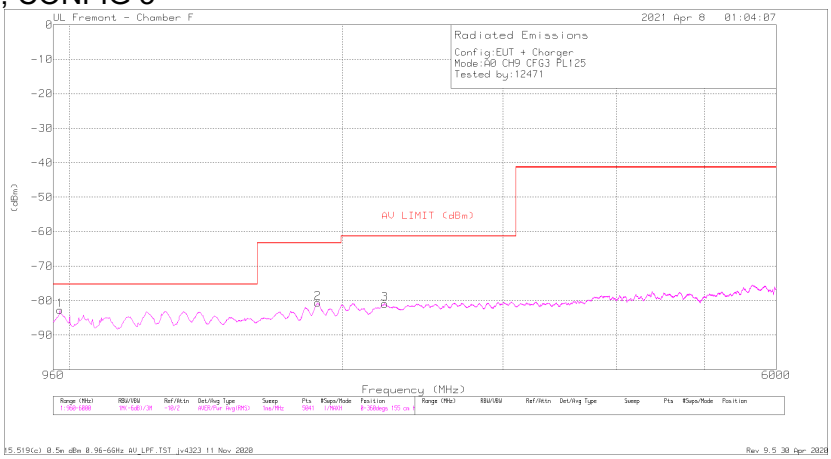
Average Emissions Summary

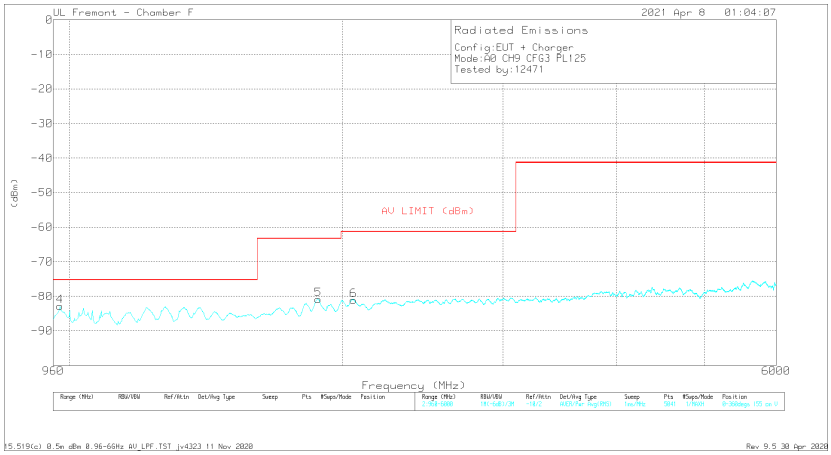
Ant	CH	Config	Payload	Power Setting	1164 - 1240 MHz	1559 - 1610 MHz	0.96 - 18 GHz	18 - 26 GHz	26 - 40 GHz
0	9	3	125	Max	PASS	PASS	PASS	PASS	PASS
1	9	3	125	Max	PASS	PASS	PASS	PASS	PASS
2	5	3	125	Max	PASS	PASS	PASS	PASS	PASS
2	9	3	125	Max	PASS	PASS	PASS	PASS	PASS
3	5	3	125	Max	PASS	PASS	PASS	PASS	PASS
3	9	3	125	Max	PASS	PASS	PASS	PASS	PASS

9.6.1. AVERAGE EMISSIONS, 0.96 – 6 GHz

9.6.1.1. FCC15.519 (C)

ANT. 0, CH9, CONFIG 3





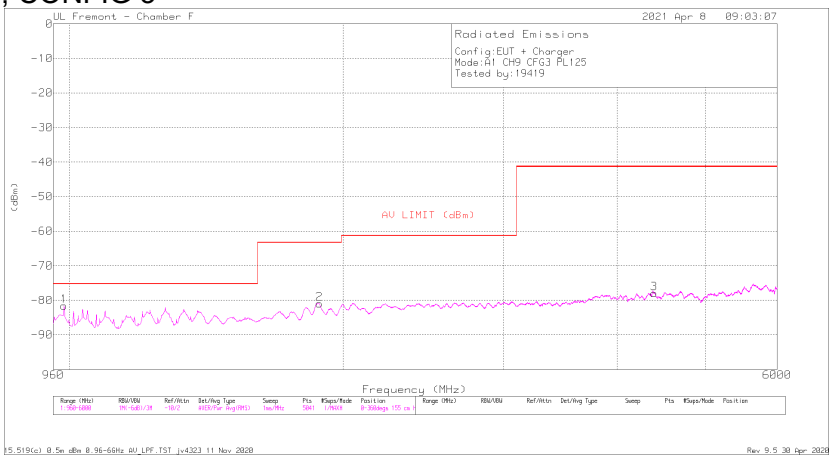
Trace Markers

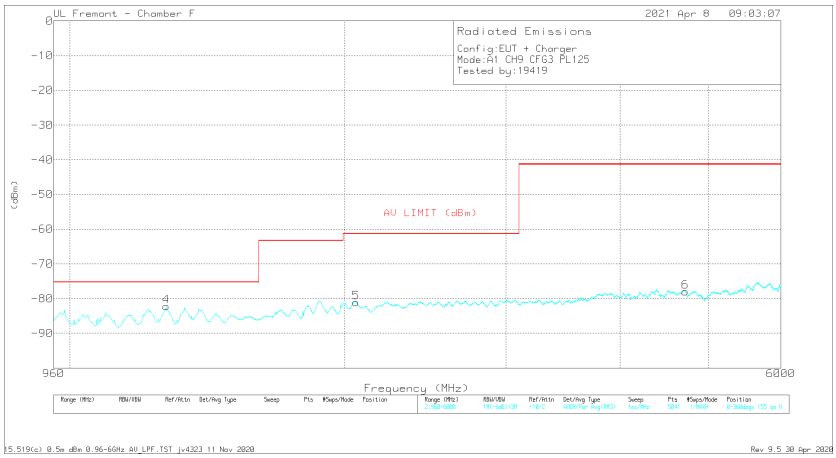
Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	977	-61.77	RMS	27.8	-45.1	-15.6	11.8	.2	-82.67	-75.3	-7.37	207	155	H
2	1877	-62.94	RMS	30.8	-45	-15.6	11.8	.3	-80.64	-63.3	-17.34	251	155	H
3	2225	-63.81	RMS	31.7	-45.3	-15.6	11.8	.3	-80.91	-61.3	-19.61	163	155	H
4	977	-61.96	RMS	27.8	-45.1	-15.6	11.8	.2	-82.86	-75.3	-7.56	176	155	V
5	1879	-63.05	RMS	30.7	-45	-15.6	11.8	.3	-80.85	-63.3	-17.55	132	155	V
6	2055	-63.47	RMS	31.3	-45.4	-15.6	11.8	.3	-81.07	-61.3	-19.77	220	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to supress CH9 fundamental signal.

ANT. 1, CH9, CONFIG 3





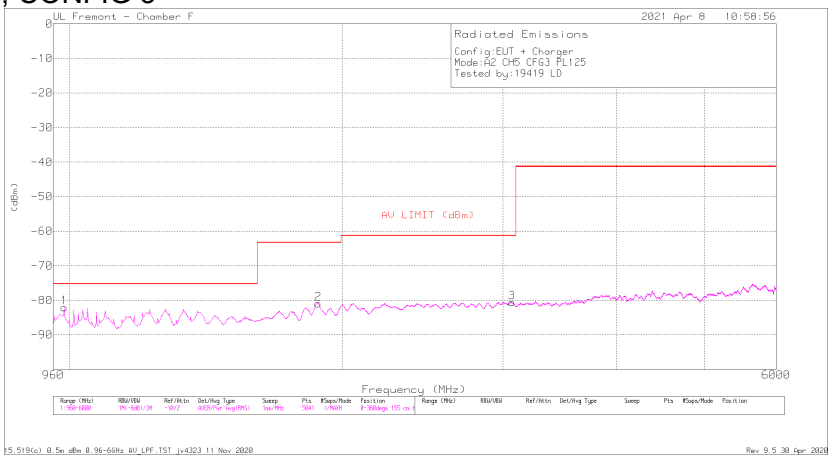
Trace Markers

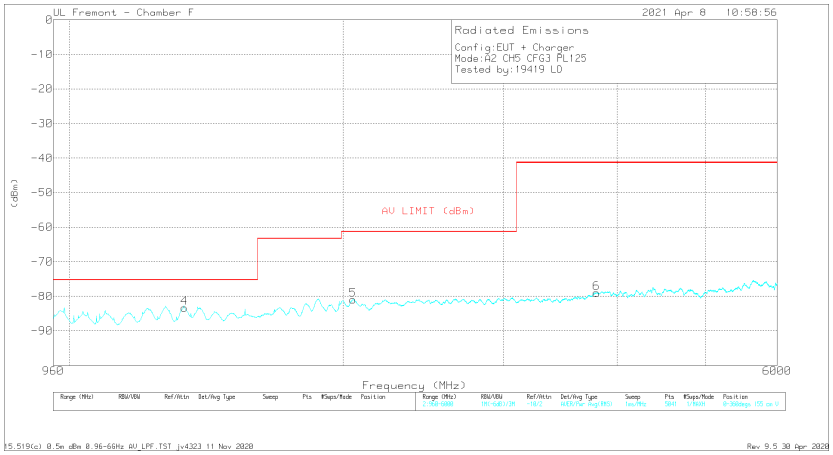
Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	986	-60.59	RMS	27.7	-45.1	-15.6	11.8	.2	-81.59	-75.3	-6.29	251	155	H
2	1883	-63.11	RMS	30.6	-45	-15.6	11.8	.3	-81.01	-63.3	-17.71	317	155	H
3	4394	-64.89	RMS	33.9	-43.7	-15.6	11.8	.5	-77.99	-41.3	-36.69	75	155	H
4	1275	-62.34	RMS	29	-45.3	-15.6	11.8	.2	-82.24	-75.3	-6.94	242	155	V
5	2057	-63.52	RMS	31.3	-45.4	-15.6	11.8	.3	-81.12	-61.3	-19.82	131	155	V
6	4716	-65.15	RMS	34.1	-43.6	-15.6	11.8	.5	-77.95	-41.3	-36.65	242	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to supress CH9 fundamental signal.

ANT. 2, CH5, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-61.14	RMS	27.8	-45.1	-15.6	11.8	.2	-82.04	-75.3	-6.74	251	155	H
2	1879	-63.14	RMS	30.7	-45	-15.6	11.8	.3	-80.94	-63.3	-17.64	360	155	H
3	3072	-65.86	RMS	32.9	-44.1	-15.6	11.8	.3	-80.56	-61.3	-19.26	339	155	H
4	1338	-63.39	RMS	29.1	-45.3	-15.6	11.8	.1	-83.29	-75.3	-7.99	242	155	V
5	2051	-63.34	RMS	31.3	-45.4	-15.6	11.8	.3	-80.94	-61.3	-19.64	44	155	V
6	3798	-65.94	RMS	33.7	-43.4	-15.6	11.8	.4	-79.04	-41.3	-37.74	263	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to surpress CH5 fundamental signal.

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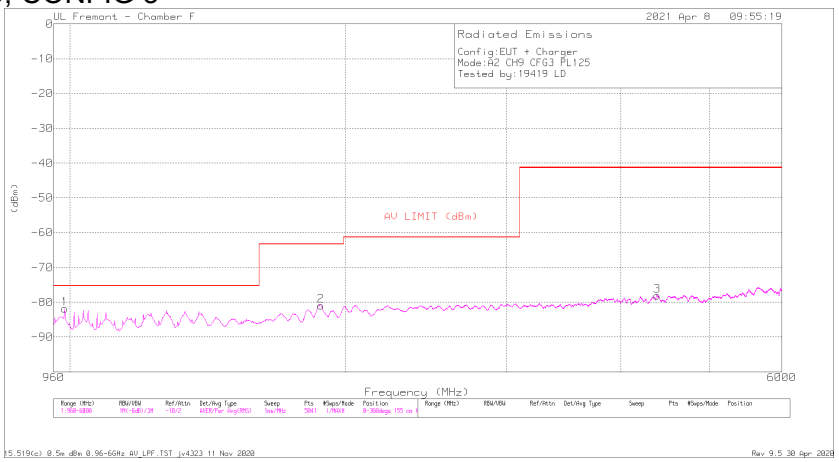
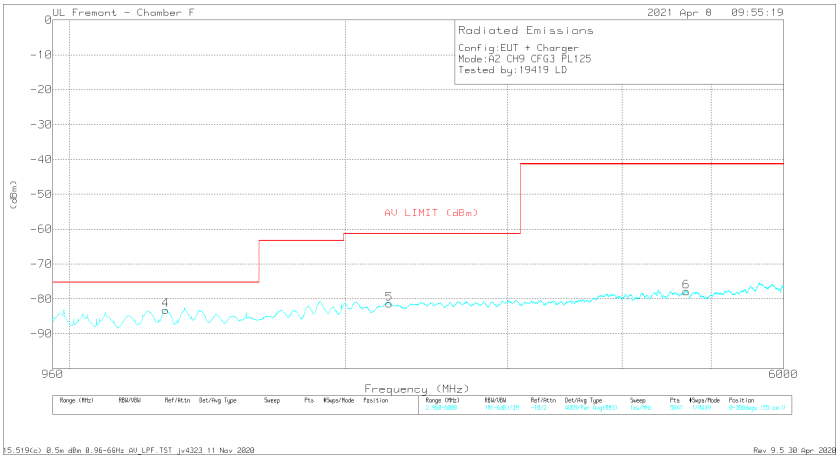
ANT. 2, CH9, CONFIG 3





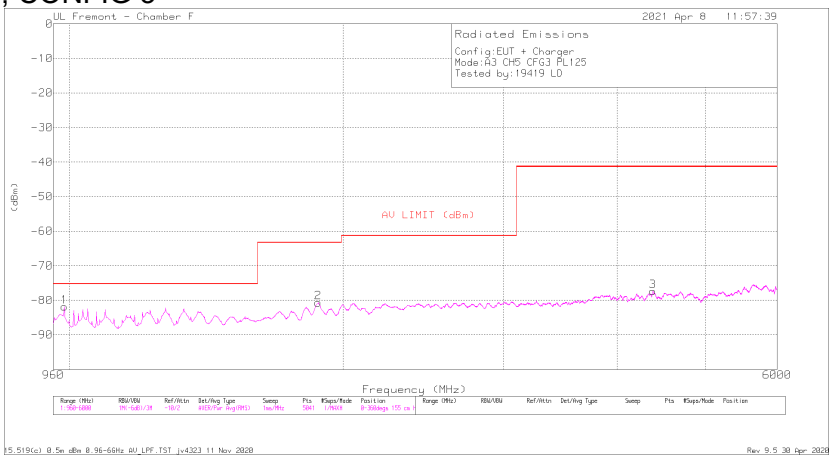
Trace Markers

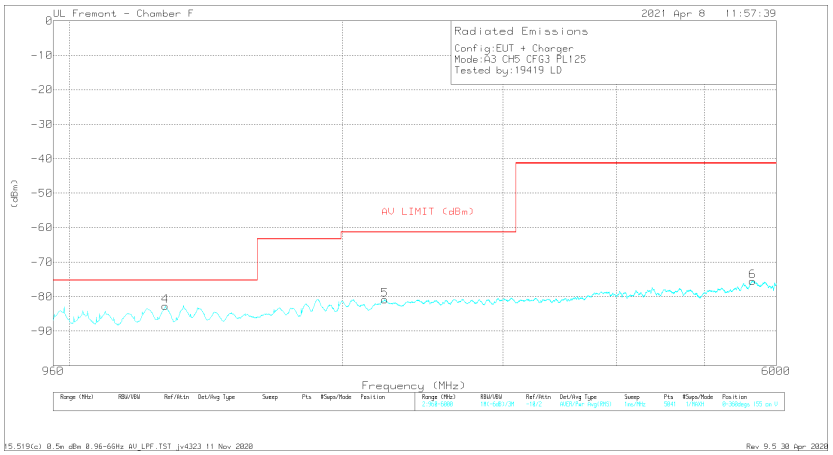
Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-60.94	RMS	27.8	-45.1	-15.6	11.8	.2	-81.84	-75.3	-6.54	251	155	H
2	1881	-63.13	RMS	30.6	-45	-15.6	11.8	.3	-81.03	-63.3	-17.73	75	155	H
3	4385	-65.39	RMS	33.9	-43.3	-15.6	11.8	.5	-78.09	-41.3	-36.79	185	155	H
4	1274	-63.26	RMS	29	-45.3	-15.6	11.8	.2	-83.16	-75.3	-7.86	88	155	V
5	2232	-64.01	RMS	31.6	-45.4	-15.6	11.8	.3	-81.31	-61.3	-20.01	176	155	V
6	4701	-64.95	RMS	34.1	-43.7	-15.6	11.8	.5	-77.85	-41.3	-36.55	220	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to surpress CH9 fundamental signal.

ANT. 3, CH5, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-60.96	RMS	27.8	-45.1	-15.6	11.8	.2	-81.86	-75.3	-6.56	251	155	H
2	1878	-62.86	RMS	30.7	-45	-15.6	11.8	.3	-80.66	-63.3	-17.36	96	155	H
3	4381	-64.76	RMS	33.9	-43.2	-15.6	11.8	.5	-77.36	-41.3	-36.06	338	155	H
4	1276	-62.86	RMS	29.1	-45.3	-15.6	11.8	.2	-82.66	-75.3	-7.36	242	155	V
5	2225	-63.79	RMS	31.7	-45.3	-15.6	11.8	.3	-80.89	-61.3	-19.59	263	155	V
6	5649	-67.13	RMS	34.9	-41.5	-15.6	11.8	2	-75.53	-41.3	-34.23	263	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to surpress CH5 fundamental signal.

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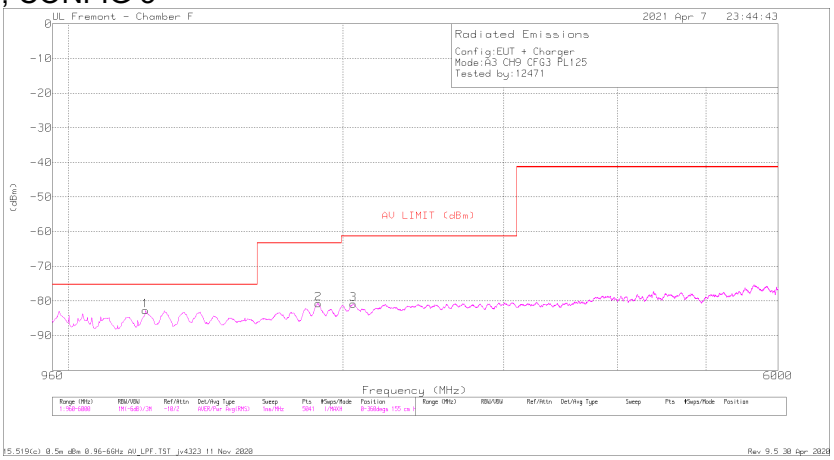
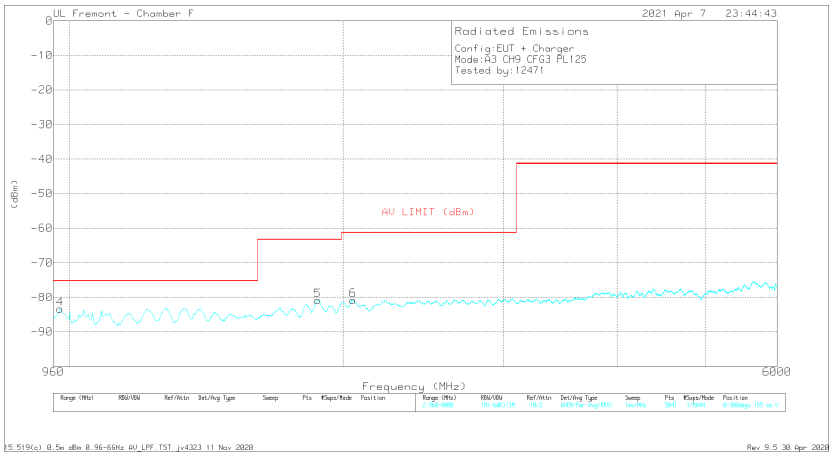
ANT. 3, CH9, CONFIG 3





Trace Markers

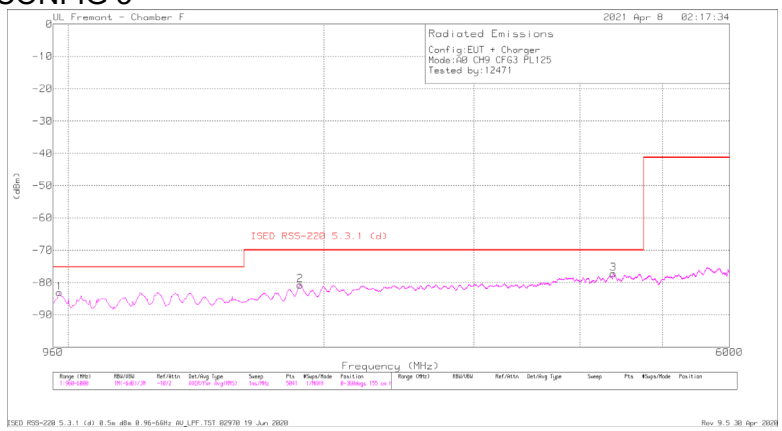
Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1215	-62.36	RMS	28.4	-45.2	-15.6	11.8	.2	-82.76	-75.3	-7.46	176	155	H
2	1879	-62.95	RMS	30.7	-45	-15.6	11.8	.3	-80.75	-63.3	-17.45	110	155	H
3	2052.5	-63.27	RMS	31.3	-45.4	-15.6	11.8	.3	-80.87	-61.3	-19.57	307	155	H
4	977	-62.41	RMS	27.8	-45.1	-15.6	11.8	.2	-83.31	-75.3	-8.01	163	155	V
5	1875	-63.01	RMS	30.8	-45.1	-15.6	11.8	.3	-80.81	-63.3	-17.51	141	155	V
6	2051	-63.19	RMS	31.3	-45.4	-15.6	11.8	.3	-80.79	-61.3	-19.49	339	155	V

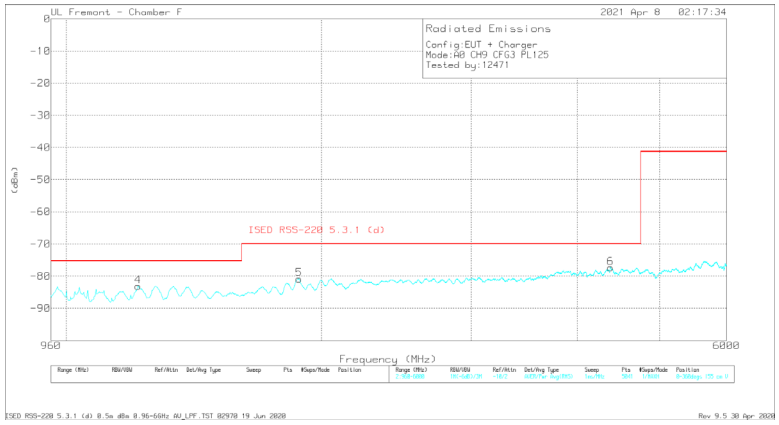
RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 6 GHz to surpress CH9 fundamental signal.

9.6.1.2. RSS-220 5.3.1 (d)

ANT. 0, CH9, CONFIG 3





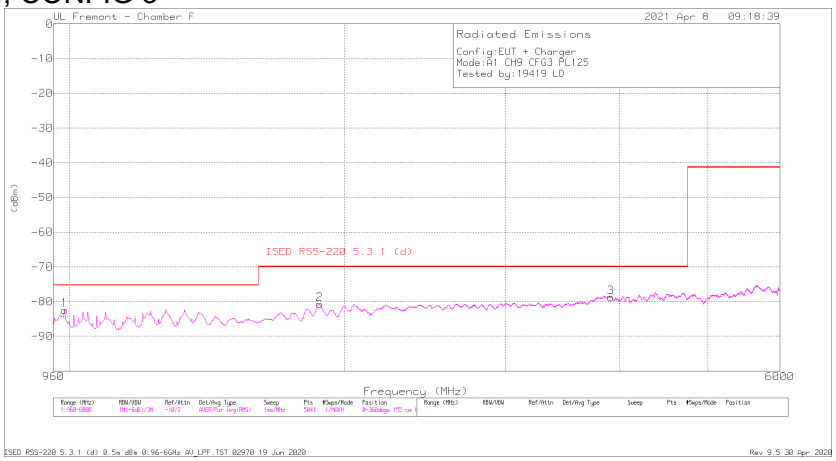
Trace Markers

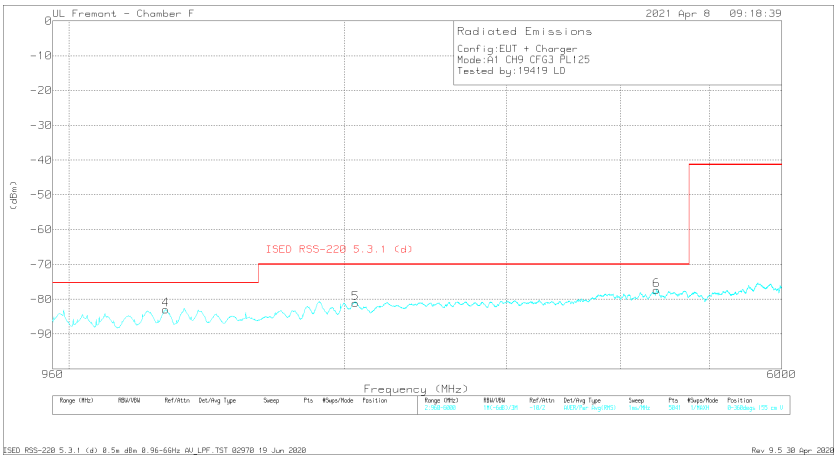
Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	977	-62.25	RMS	27.8	-45.1	-15.6	11.8	.2	-83.15	-75.3	-7.85	198	155	H
2	1875	-62.91	RMS	30.8	-45.1	-15.6	11.8	.3	-80.71	-70	-10.71	154	155	H
3	4382	-64.62	RMS	33.9	-43.2	-15.6	11.8	.5	-77.22	-70	-7.22	110	155	H
4	1216	-62.75	RMS	28.5	-45.2	-15.6	11.8	.2	-83.05	-75.3	-7.75	207	155	V
5	1881	-62.97	RMS	30.6	-45	-15.6	11.8	.3	-80.87	-70	-10.87	97	155	V
6	4381	-64.74	RMS	33.9	-43.2	-15.6	11.8	.5	-77.34	-70	-7.34	339	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to surpress CH9 fundamental signal.

ANT. 1, CH9, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-61.51	RMS	27.8	-45.1	-15.6	11.8	.2	-82.41	-75.3	-7.11	251	155	H
2	1879	-62.93	RMS	30.7	-45	-15.6	11.8	.3	-80.73	-70	-10.73	229	155	H
3	3915	-66.08	RMS	33.7	-43.1	-15.6	11.8	.5	-78.78	-70	-8.78	273	155	H
4	1275	-63.01	RMS	29	-45.3	-15.6	11.8	.2	-82.91	-75.3	-7.61	242	155	V
5	2055	-63.46	RMS	31.3	-45.4	-15.6	11.8	.3	-81.06	-70	-11.06	285	155	V
6	4380	-64.66	RMS	33.9	-43.3	-15.6	11.8	.5	-77.36	-70	-7.36	44	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to surpress CH9 fundamental signal.

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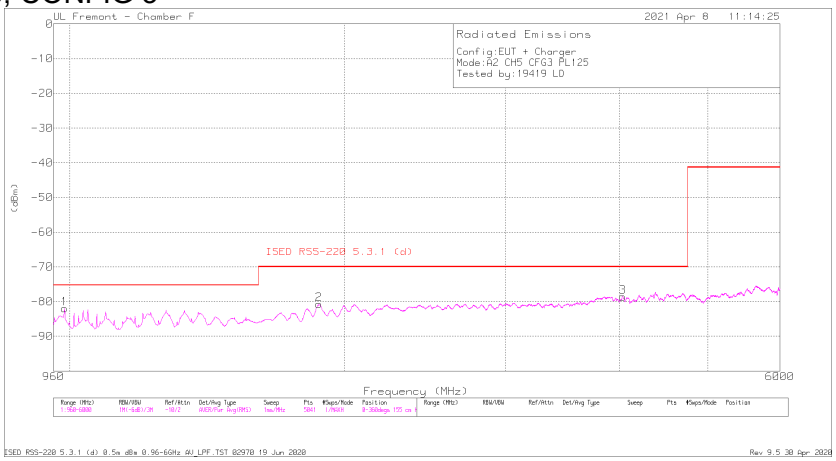
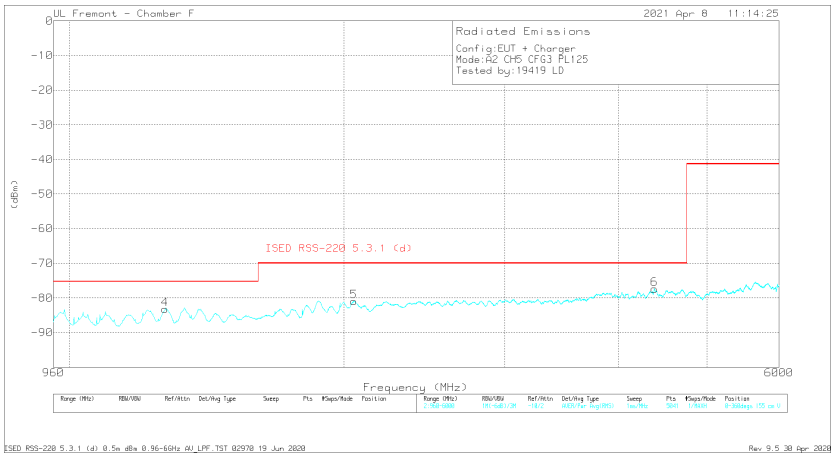
ANT. 2, CH5, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-61.02	RMS	27.8	-45.1	-15.6	11.8	.2	-81.92	-75.3	-6.62	251	155	H
2	1875	-62.88	RMS	30.8	-45.1	-15.6	11.8	.3	-80.68	-70	-10.68	360	155	H
3	4036	-65.82	RMS	33.8	-43.4	-15.6	11.8	.6	-78.62	-70	-8.62	75	155	H
4	1273	-63.35	RMS	29	-45.3	-15.6	11.8	.2	-83.25	-75.3	-7.95	197	155	V
5	2050	-63.36	RMS	31.3	-45.4	-15.6	11.8	.3	-80.96	-70	-10.96	88	155	V
6	4381	-64.82	RMS	33.9	-43.2	-15.6	11.8	.5	-77.42	-70	-7.42	242	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to surpress CH5 fundamental signal.

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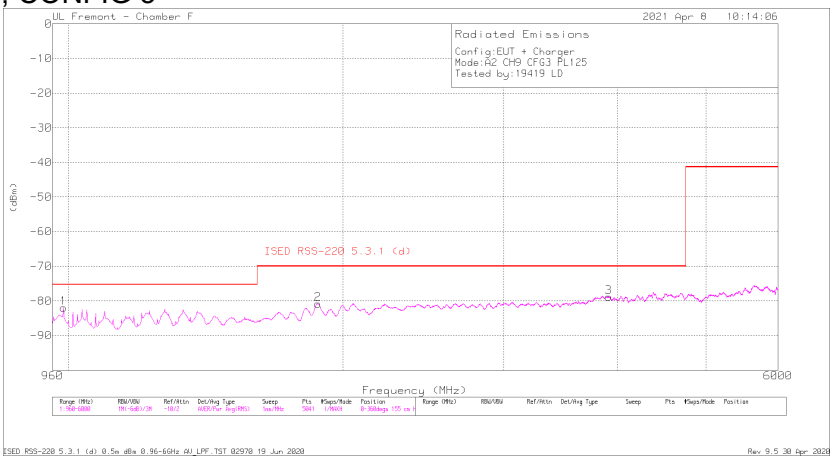
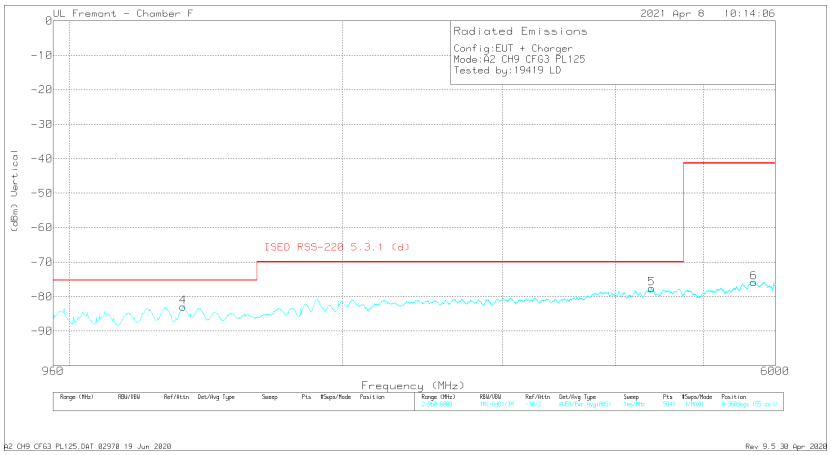
ANT. 2, CH9, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-61.12	RMS	27.8	-45.1	-15.6	11.8	.2	-82.02	-75.3	-6.72	251	155	H
2	1877	-63.12	RMS	30.8	-45	-15.6	11.8	.3	-80.82	-70	-10.82	339	155	H
3	3911	-66.2	RMS	33.7	-43.1	-15.6	11.8	.5	-78.9	-70	-8.9	273	155	H
4	1335	-62.96	RMS	29	-45.3	-15.6	11.8	.1	-82.96	-75.3	-7.66	242	155	V
5	4383	-65.01	RMS	33.9	-43.2	-15.6	11.8	.5	-77.61	-70	-7.61	88	155	V
6	5684	-67.13	RMS	34.9	-41.8	-15.6	11.8	2	-75.83	-41.3	-34.53	109	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to surpress CH9 fundamental signal.

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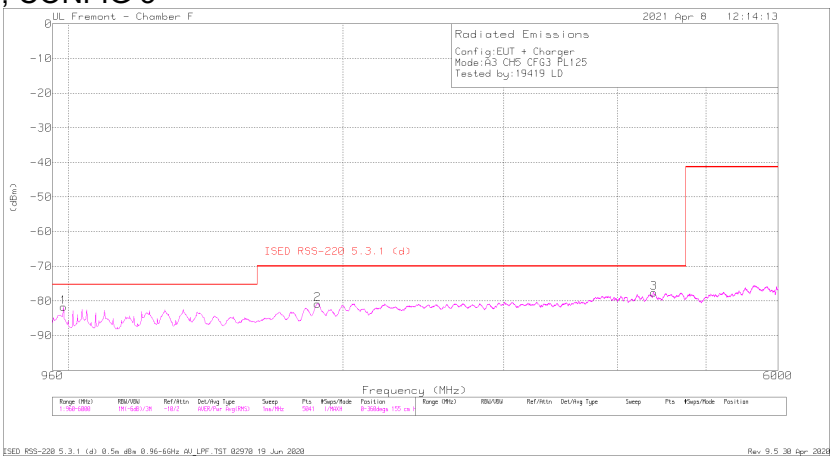
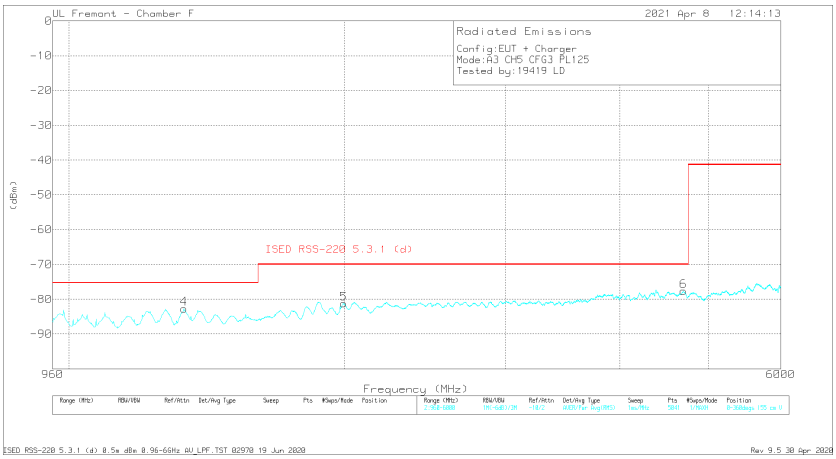
ANT. 3, CH5, CONFIG 3





Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-60.81	RMS	27.8	-45.1	-15.6	11.8	.2	-81.71	-75.3	-6.41	251	155	H
2	1875	-63	RMS	30.8	-45.1	-15.6	11.8	.3	-80.8	-70	-10.8	185	155	H
3	4385	-64.88	RMS	33.9	-43.3	-15.6	11.8	.5	-77.58	-70	-7.58	251	155	H
4	1336	-62.66	RMS	29	-45.3	-15.6	11.8	.1	-82.66	-75.3	-7.36	242	155	V
5	1998	-63.64	RMS	31.3	-45.4	-15.6	11.8	.3	-81.24	-70	-11.24	242	155	V
6	4698	-64.73	RMS	34.2	-43.8	-15.6	11.8	.5	-77.63	-70	-7.63	1	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 6 GHz to surpress CH5 fundamental signal.

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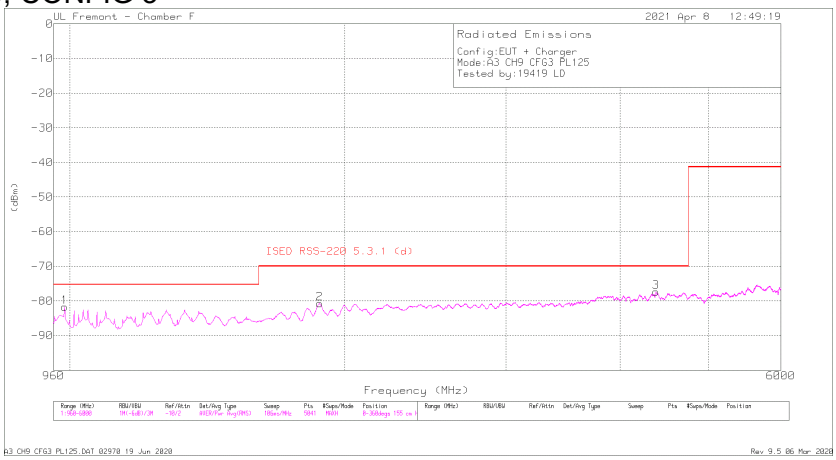
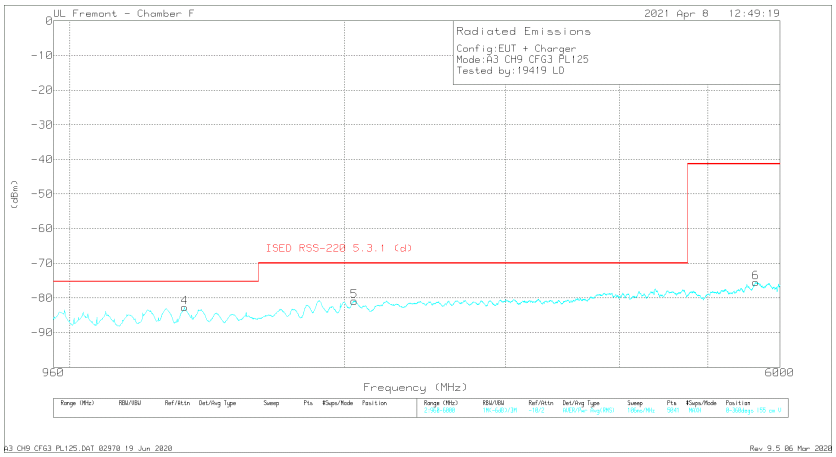
ANT. 3, CH9, CONFIG 3





Trace Markers

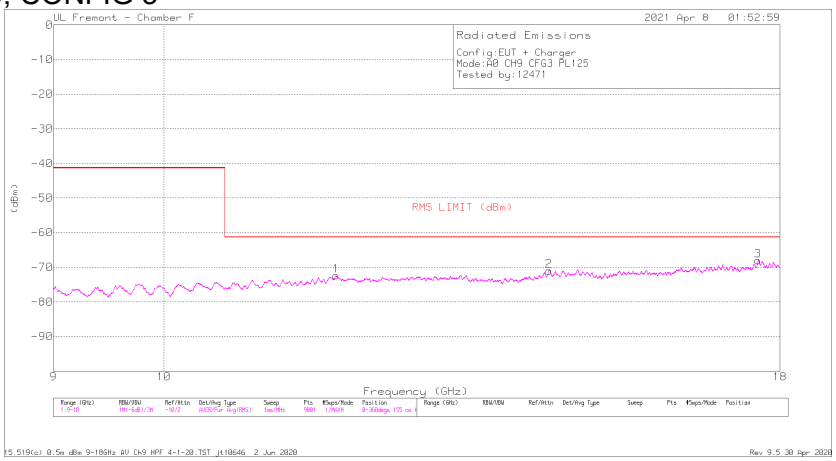
Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	Corrected Reading (dBm)	ISED RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	987	-60.77	RMS	27.8	-45.1	-15.6	11.8	.2	-81.67	-75.3	-6.37	251	155	H
2	1877	-63.06	RMS	30.8	-45	-15.6	11.8	.3	-80.76	-70	-10.76	141	155	H
3	4379	-64.67	RMS	33.9	-43.3	-15.6	11.8	.5	-77.37	-70	-7.37	360	155	H
4	1336	-62.72	RMS	29	-45.3	-15.6	11.8	.1	-82.72	-75.3	-7.42	242	155	V
5	2051	-63.31	RMS	31.3	-45.4	-15.6	11.8	.3	-80.91	-70	-10.91	329	155	V
6	5647	-67.14	RMS	35	-41.5	-15.6	11.8	2	-75.44	-41.3	-34.14	263	155	V

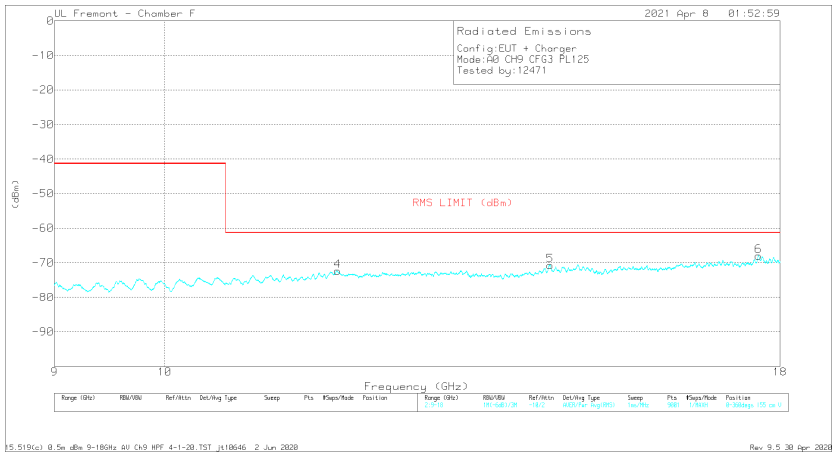
RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 6 GHz to surpress CH9 fundamental signal.

9.6.2. AVERAGE EMISSIONS, 9 – 18 GHz

ANT. 0, CH9, CONFIG 3





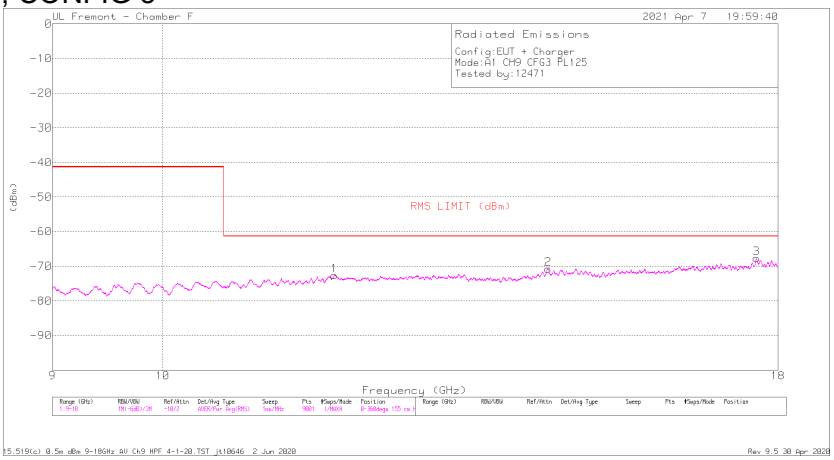
Trace Markers

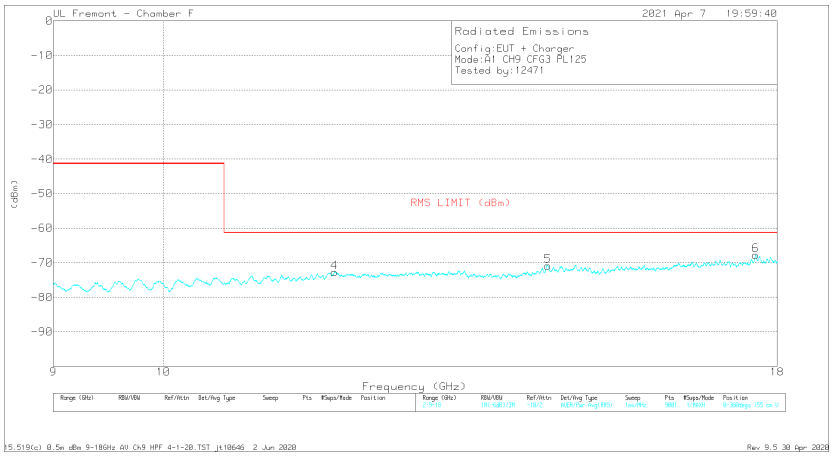
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	CH9_HPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	11.787	-70.62	RMS	38.9	-37.4	-15.6	11.8	.5	-72.42	-61.3	-11.12	88	155	H
2	14.44	-71.55	RMS	39.7	-35.6	-15.6	11.8	.3	-70.95	-61.3	-9.65	198	155	H
3	17.626	-71.42	RMS	41.5	-34.7	-15.6	11.8	.4	-68.02	-61.3	-6.72	88	155	H
4	11.796	-70.46	RMS	38.9	-37.5	-15.6	11.8	.5	-72.36	-61.3	-11.06	338	155	V
5	14.452	-71.8	RMS	39.8	-35.4	-15.6	11.8	.4	-70.8	-61.3	-9.5	317	155	V
6	17.633	-71.5	RMS	41.5	-34.6	-15.6	11.8	.4	-68	-61.3	-6.7	228	155	V

RMS - RMS detection

*Note: Test was performed with a high-pass filter with pass-band frequency starting at 9 GHz to surpress CH9 fundamental signal.

ANT. 1, CH9, CONFIG 3





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	CH9_HPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	11.783	-70.81	RMS	38.9	-37.4	-15.6	11.8	.5	-72.61	-61.3	-11.31	220	155	H
2	14.454	-71.61	RMS	39.8	-35.5	-15.6	11.8	.4	-70.71	-61.3	-9.41	241	155	H
3	17.631	-71.18	RMS	41.5	-34.6	-15.6	11.8	.4	-67.68	-61.3	-6.38	2	155	H
4	11.782	-70.81	RMS	38.9	-37.4	-15.6	11.8	.4	-72.71	-61.3	-11.41	185	155	V
5	14.454	-71.79	RMS	39.8	-35.5	-15.6	11.8	.4	-70.89	-61.3	-9.59	360	155	V
6	17.634	-71.32	RMS	41.5	-34.6	-15.6	11.8	.5	-67.72	-61.3	-6.42	97	155	V

RMS - RMS detection

*Note: Test was performed with a high-pass filter with pass-band frequency starting at 9 GHz to surpress CH9 fundamental signal.

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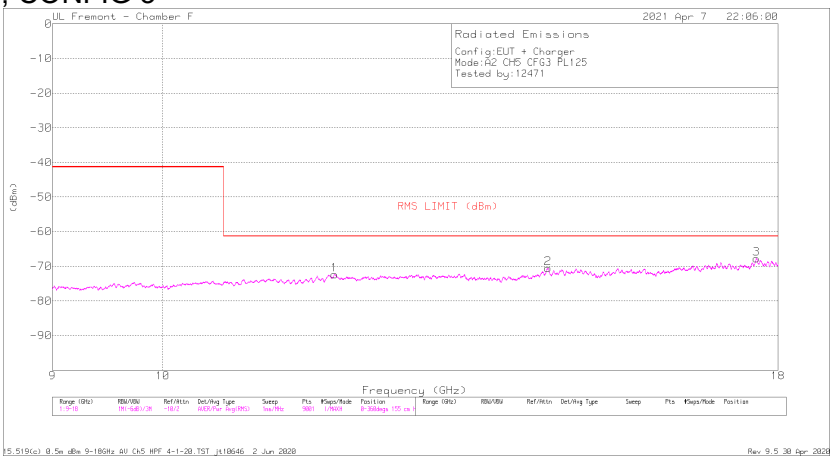
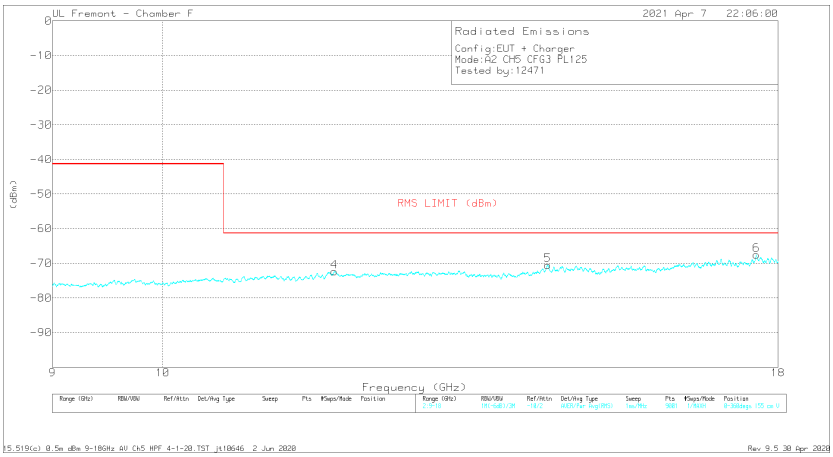
ANT. 2, CH5, CONFIG 3





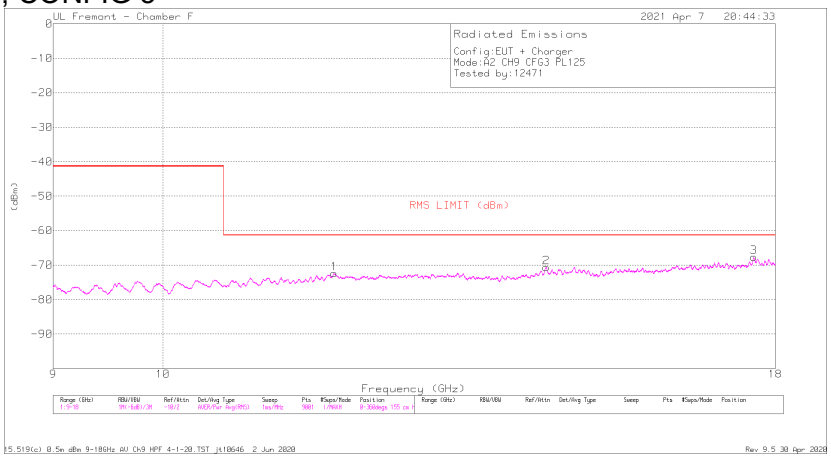
Trace Markers

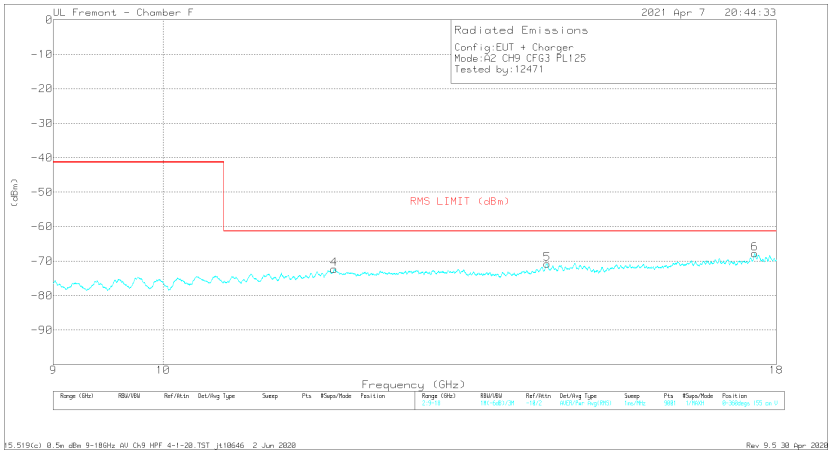
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	CH5_HPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	11.784	-70.62	RMS	38.9	-37.4	-15.6	11.8	.6	-72.32	-61.3	-11.02	53	155	H
2	14.449	-71.66	RMS	39.8	-35.4	-15.6	11.8	.5	-70.56	-61.3	-9.26	31	155	H
3	17.631	-71.43	RMS	41.5	-34.6	-15.6	11.8	.6	-67.73	-61.3	-6.43	338	155	H
4	11.781	-70.65	RMS	38.9	-37.4	-15.6	11.8	.6	-72.35	-61.3	-11.05	43	155	V
5	14.448	-71.63	RMS	39.7	-35.4	-15.6	11.8	.6	-70.53	-61.3	-9.23	308	155	V
6	17.632	-71.23	RMS	41.5	-34.6	-15.6	11.8	.6	-67.53	-61.3	-6.23	176	155	V

RMS - RMS detection

*Note: Test was performed with a high-pass filter with pass-band frequency starting at 9 GHz to surpress CH5 fundamental signal.

ANT. 2, CH9, CONFIG 3





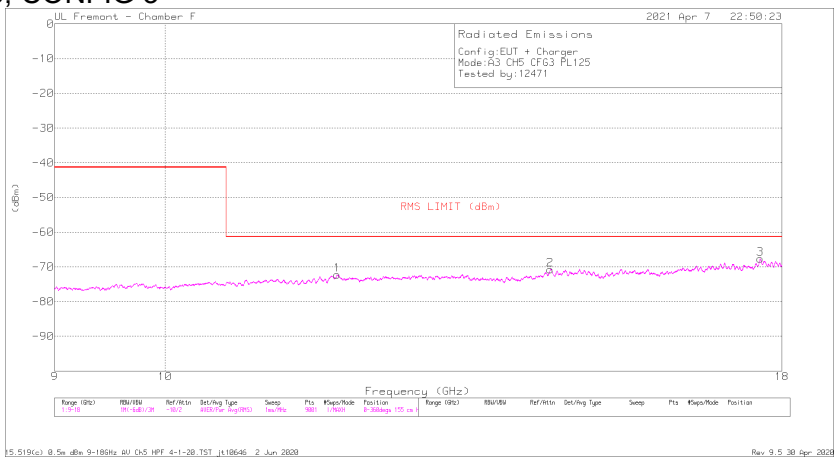
Trace Markers

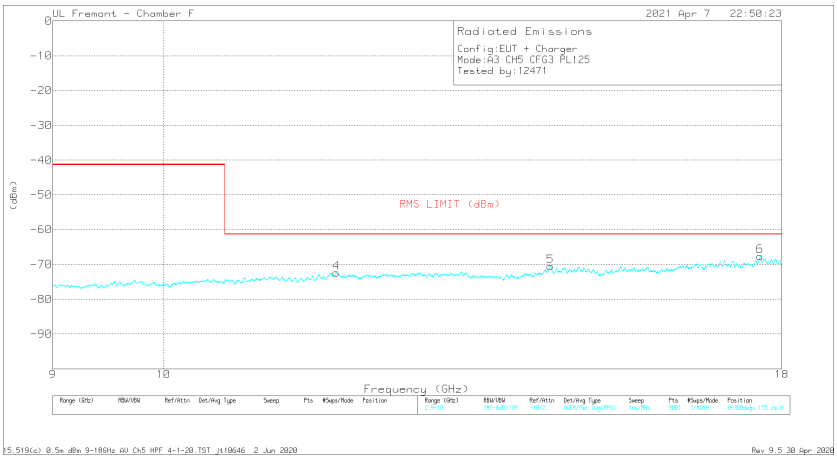
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	CH9_HPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	11.785	-70.61	RMS	38.9	-37.4	-15.6	11.8	.5	-72.41	-61.3	-11.11	141	155	H
2	14.449	-71.58	RMS	39.8	-35.4	-15.6	11.8	.4	-70.58	-61.3	-9.28	273	155	H
3	17.632	-71.1	RMS	41.5	-34.6	-15.6	11.8	.4	-67.6	-61.3	-6.3	250	155	H
4	11.783	-70.51	RMS	38.9	-37.4	-15.6	11.8	.5	-72.31	-61.3	-11.01	141	155	V
5	14.45	-71.74	RMS	39.8	-35.4	-15.6	11.8	.4	-70.74	-61.3	-9.44	53	155	V
6	17.634	-71.35	RMS	41.5	-34.6	-15.6	11.8	.5	-67.75	-61.3	-6.45	163	155	V

RMS - RMS detection

*Note: Test was performed with a high-pass filter with pass-band frequency starting at 9 GHz to surpress CH9 fundamental signal.

ANT. 3, CH5, CONFIG 3





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	CH5_HPF (dB)	EIRP (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	11.782	-70.57	RMS	38.9	-37.4	-15.6	11.8	.6	-72.27	-61.3	-10.97	242	155	H
2	14.436	-71.59	RMS	39.7	-35.7	-15.6	11.8	.6	-70.79	-61.3	-9.49	330	155	H
3	17.633	-71.37	RMS	41.5	-34.6	-15.6	11.8	.6	-67.67	-61.3	-6.37	198	155	H
4	11.786	-70.63	RMS	38.9	-37.4	-15.6	11.8	.6	-72.33	-61.3	-11.03	44	155	V
5	14.448	-71.61	RMS	39.7	-35.4	-15.6	11.8	.6	-70.51	-61.3	-9.21	220	155	V
6	17.634	-71.28	RMS	41.5	-34.6	-15.6	11.8	.6	-67.58	-61.3	-6.28	132	155	V

RMS - RMS detection

*Note: Test was performed with a high-pass filter with pass-band frequency starting at 9 GHz to surpress CH5 fundamental signal.

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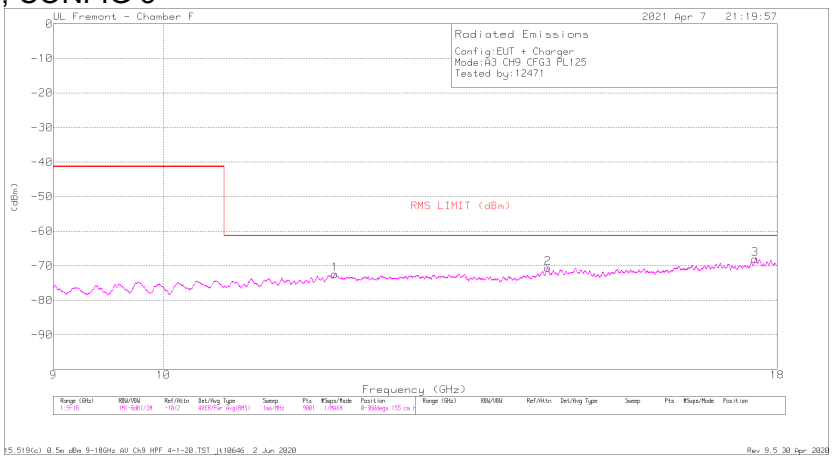
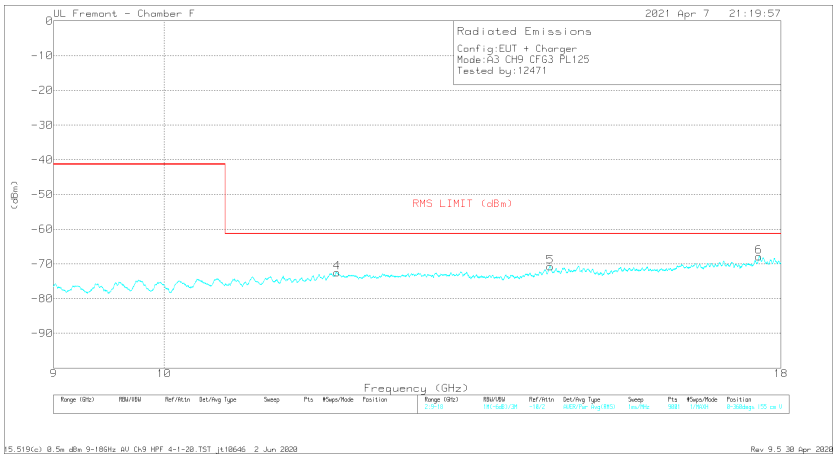
ANT. 3, CH9, CONFIG 3





Trace Markers

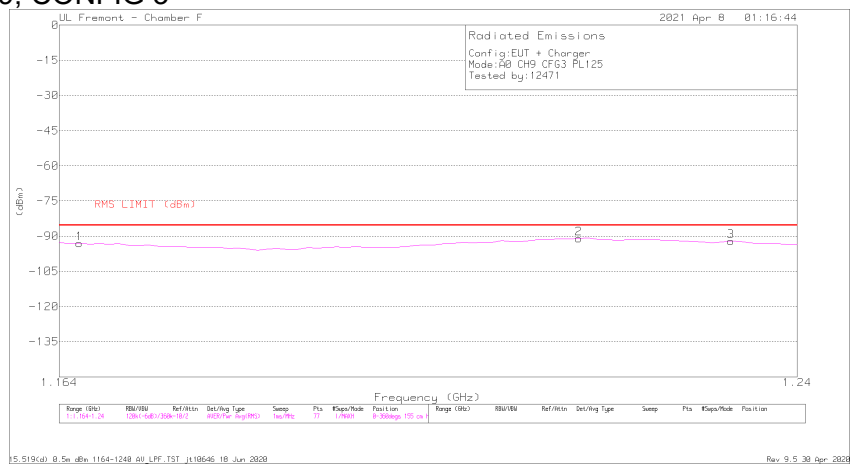
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	CH9_HPF (dB)	Corrected Reading (dBm)	FCC15.519(c) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	11.786	-70.59	RMS	38.9	-37.4	-15.6	11.8	.5	-72.39	-61.3	-11.09	242	155	H
2	14.45	-71.65	RMS	39.8	-35.4	-15.6	11.8	.4	-70.65	-61.3	-9.35	43	155	H
3	17.628	-71.43	RMS	41.4	-34.6	-15.6	11.8	.4	-68.03	-61.3	-6.73	308	155	H
4	11.789	-70.66	RMS	38.9	-37.4	-15.6	11.8	.5	-72.46	-61.3	-11.16	22	155	V
5	14.449	-71.71	RMS	39.8	-35.4	-15.6	11.8	.4	-70.71	-61.3	-9.41	198	155	V
6	17.628	-71.25	RMS	41.4	-34.6	-15.6	11.8	.4	-67.85	-61.3	-6.55	154	155	V

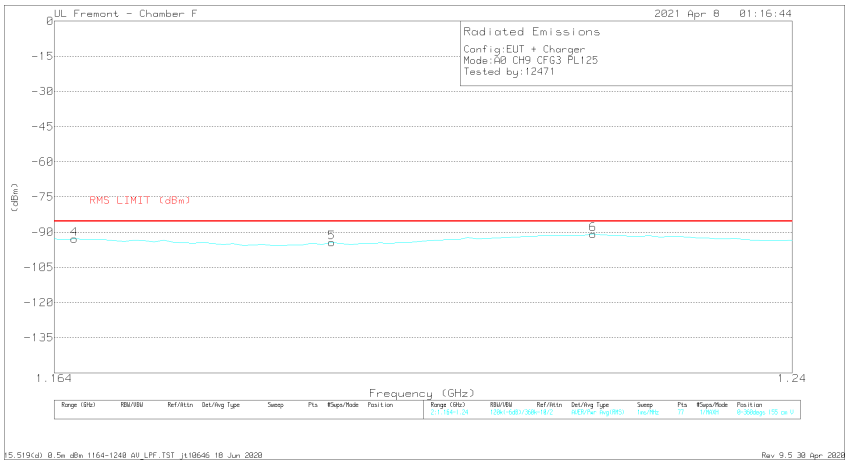
RMS - RMS detection

*Note: Test was performed with a high-pass filter with pass-band frequency starting at 9 GHz to surpress CH9 fundamental signal.

9.6.3. AVERAGE EMISSIONS, 1.164 – 1.240 GHz

ANT. 0, CH9, CONFIG 3





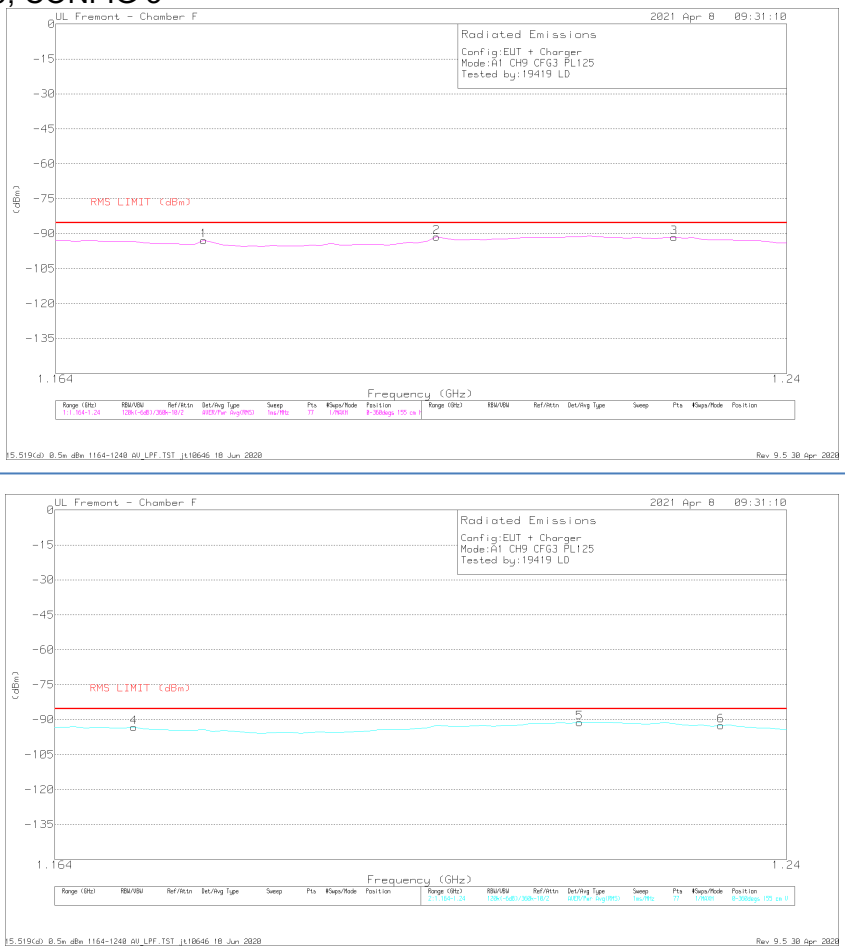
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.166	-72.52	RMS	28.5	-45.4	-15.6	11.8	.2	-93.02	-85.3	-7.72	21	155	H
2	1.217	-72.09	RMS	29.9	-45.2	-15.6	11.8	.2	-90.99	-85.3	-5.69	153	155	H
3	1.233	-72.92	RMS	29.8	-45.4	-15.6	11.8	.2	-92.12	-85.3	-6.82	176	155	H
4	1.166	-72.41	RMS	28.5	-45.4	-15.6	11.8	.2	-92.91	-85.3	-7.61	207	155	V
5	1.192	-74.82	RMS	29.2	-45.1	-15.6	11.8	.2	-94.32	-85.3	-9.02	207	155	V
6	1.219	-71.86	RMS	29.9	-45.3	-15.6	11.8	.2	-90.86	-85.3	-5.56	53	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH9 fundamental signal.

ANT. 1, CH9, CONFIG 3



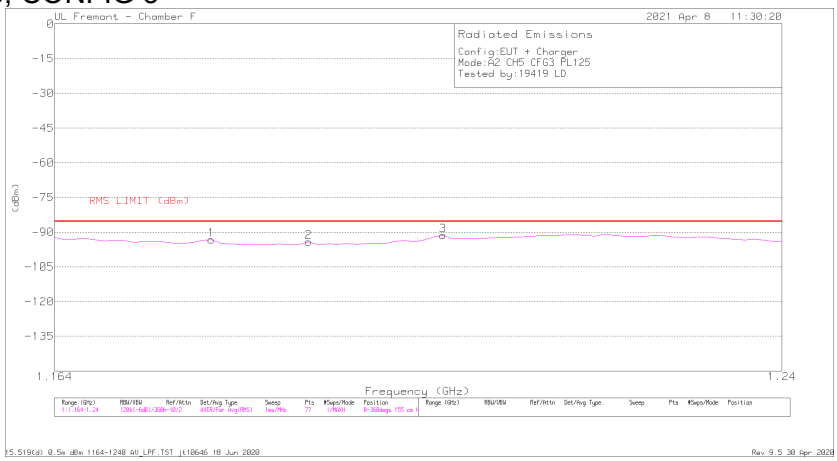
Trace Markers

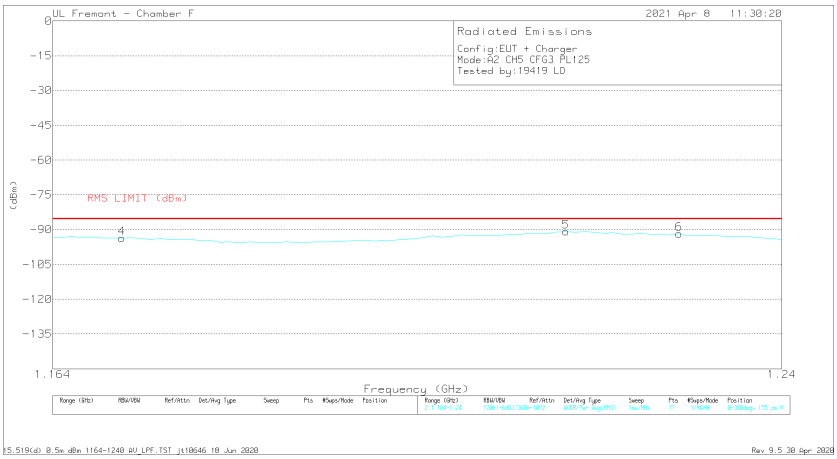
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.179	-72.68	RMS	28.8	-45.4	-15.6	11.8	.2	-92.88	-85.3	-7.58	229	155	H
2	1.203	-72.19	RMS	29.6	-45.2	-15.6	11.8	.2	-91.39	-85.3	-6.09	229	155	H
3	1.228	-72.41	RMS	29.8	-45.4	-15.6	11.8	.2	-91.61	-85.3	-6.31	75	155	H
4	1.172	-72.87	RMS	28.6	-45.4	-15.6	11.8	.2	-93.27	-85.3	-7.97	330	155	V
5	1.218	-72.26	RMS	29.9	-45.2	-15.6	11.8	.2	-91.16	-85.3	-5.86	219	155	V
6	1.233	-73.33	RMS	29.8	-45.4	-15.6	11.8	.2	-92.53	-85.3	-7.23	154	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH9 fundamental signal.

ANT. 2, CH5, CONFIG 3





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.18	-73.16	RMS	28.9	-45.4	-15.6	11.8	.2	-93.26	-85.3	-7.96	229	155	H
2	1.19	-74.51	RMS	29.1	-45.2	-15.6	11.8	.2	-94.21	-85.3	-8.91	229	155	H
3	1.204	-72.25	RMS	29.6	-45.2	-15.6	11.8	.2	-91.45	-85.3	-6.15	229	155	H
4	1.171	-73.19	RMS	28.6	-45.4	-15.6	11.8	.2	-93.59	-85.3	-8.29	198	155	V
5	1.217	-71.85	RMS	29.9	-45.2	-15.6	11.8	.2	-90.75	-85.3	-5.45	220	155	V
6	1.229	-72.54	RMS	29.8	-45.4	-15.6	11.8	.2	-91.74	-85.3	-6.44	154	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH5 fundamental signal.

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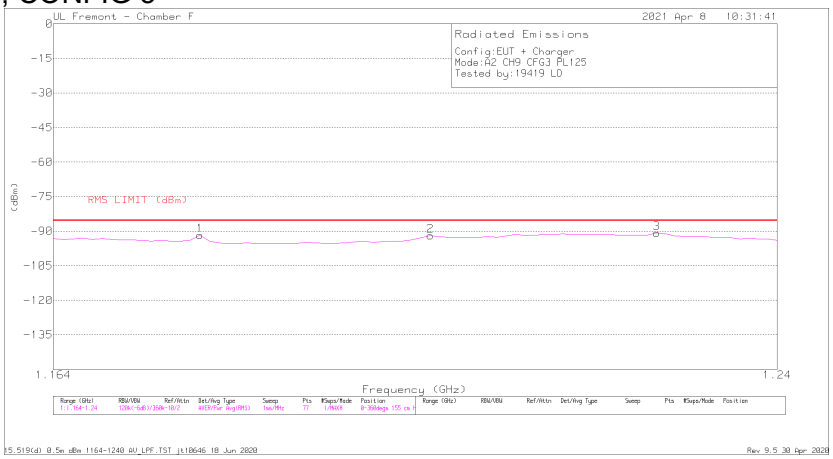
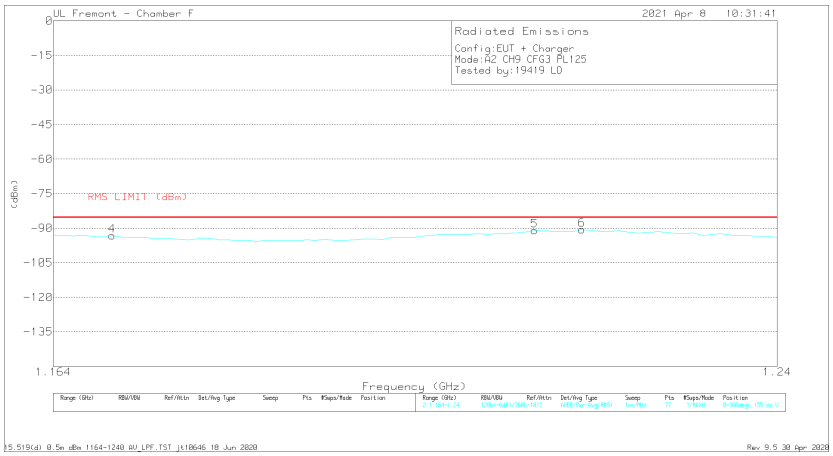
ANT. 2, CH9, CONFIG 3





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.179	-71.57	RMS	28.8	-45.4	-15.6	11.8	.2	-91.77	-85.3	-6.47	229	155	H
2	1.203	-72.76	RMS	29.6	-45.2	-15.6	11.8	.2	-91.96	-85.3	-6.66	229	155	H
3	1.227	-71.61	RMS	29.8	-45.4	-15.6	11.8	.2	-90.81	-85.3	-5.51	229	155	H
4	1.17	-72.83	RMS	28.6	-45.4	-15.6	11.8	.2	-93.23	-85.3	-7.93	176	155	V
5	1.214	-72.06	RMS	29.8	-45.2	-15.6	11.8	.2	-91.06	-85.3	-5.76	264	155	V
6	1.219	-71.58	RMS	29.9	-45.3	-15.6	11.8	.2	-90.58	-85.3	-5.28	242	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH9 fundamental signal.

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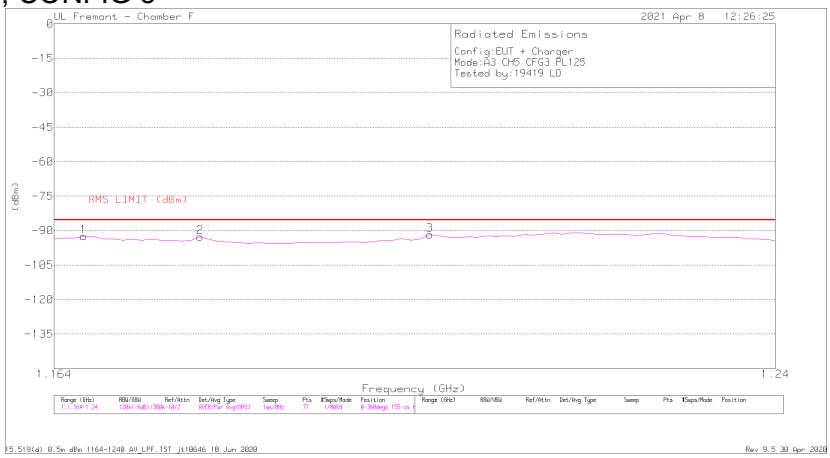
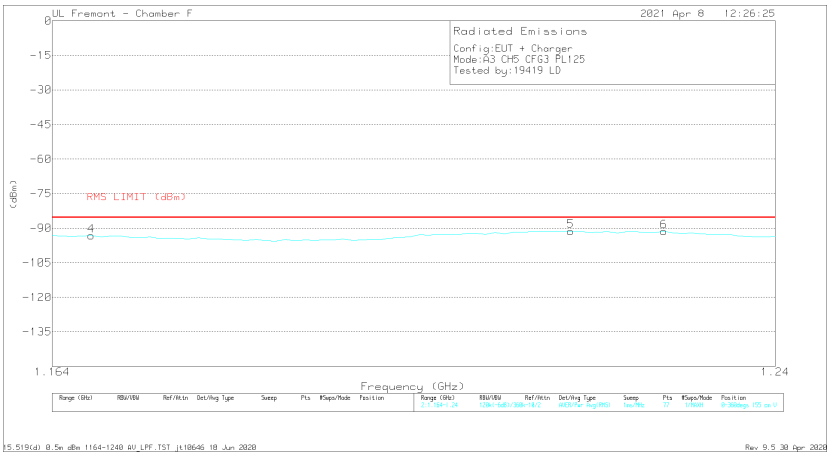
ANT. 3, CH5, CONFIG 3





Trace Markers

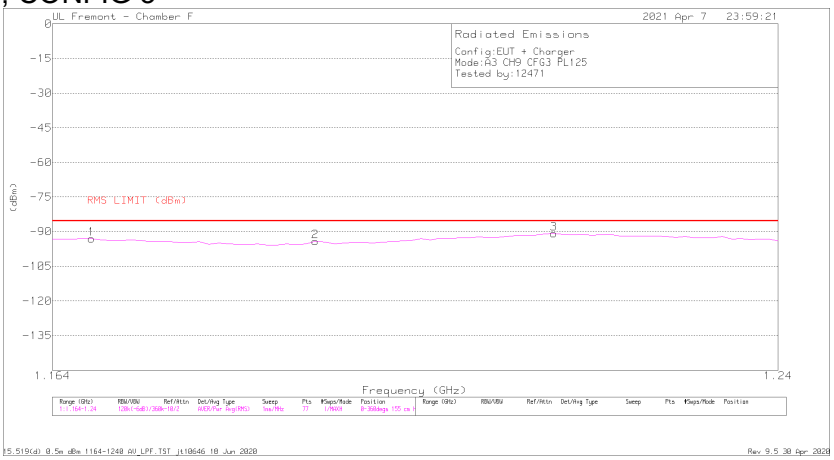
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.167	-72.11	RMS	28.6	-45.4	-15.6	11.8	.2	-92.51	-85.3	-7.21	229	155	H
2	1.179	-72.44	RMS	28.8	-45.4	-15.6	11.8	.2	-92.64	-85.3	-7.34	229	155	H
3	1.203	-72.5	RMS	29.6	-45.2	-15.6	11.8	.2	-91.7	-85.3	-6.4	229	155	H
4	1.168	-72.85	RMS	28.6	-45.4	-15.6	11.8	.2	-93.25	-85.3	-7.95	241	155	V
5	1.218	-72.37	RMS	29.9	-45.2	-15.6	11.8	.2	-91.27	-85.3	-5.97	264	155	V
6	1.228	-72.2	RMS	29.8	-45.4	-15.6	11.8	.2	-91.4	-85.3	-6.1	241	155	V

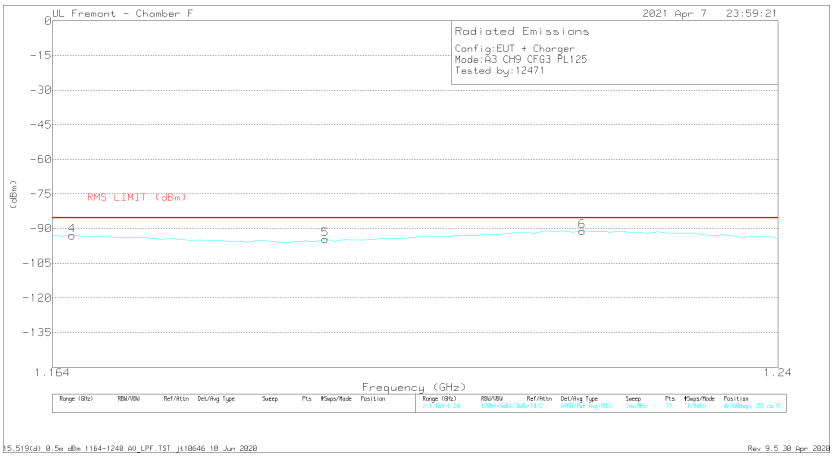
RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH5 fundamental signal.

UL VERIFICATION SERVICES INC
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

ANT. 3, CH9, CONFIG 3





Trace Markers

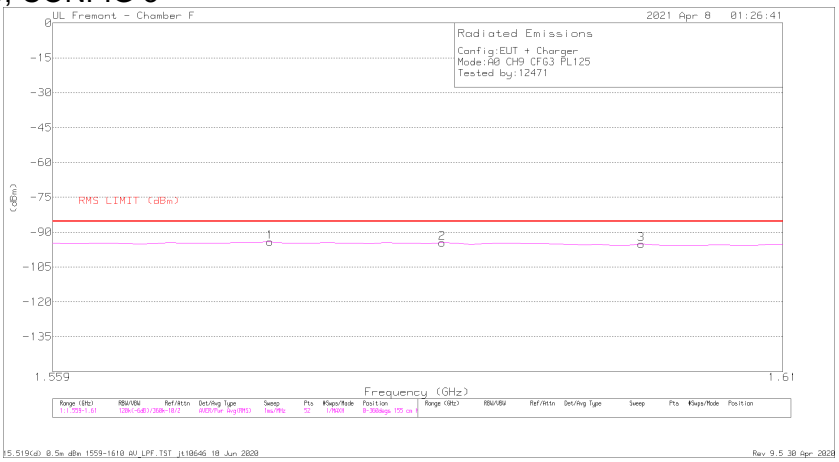
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.168	-72.64	RMS	28.6	-45.4	-15.6	11.8	.2	-93.04	-85.3	-7.74	53	155	H
2	1.191	-74.61	RMS	29.2	-45.1	-15.6	11.8	.2	-94.11	-85.3	-8.81	185	155	H
3	1.216	-71.94	RMS	29.9	-45.2	-15.6	11.8	.2	-90.84	-85.3	-5.54	185	155	H
4	1.166	-72.45	RMS	28.5	-45.4	-15.6	11.8	.2	-92.95	-85.3	-7.65	44	155	V
5	1.192	-75.11	RMS	29.2	-45.1	-15.6	11.8	.2	-94.61	-85.3	-9.31	132	155	V
6	1.219	-72.03	RMS	29.9	-45.3	-15.6	11.8	.2	-91.03	-85.3	-5.73	242	155	V

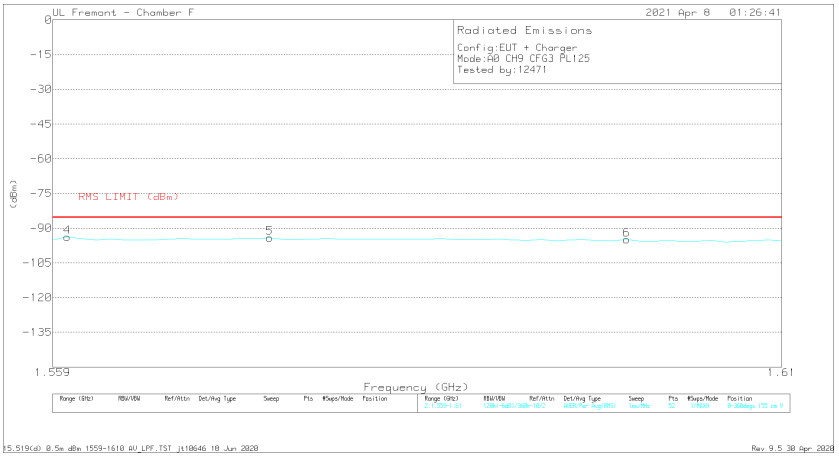
RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH9 fundamental signal.

9.6.4. AVERAGE EMISSIONS, 1.559 – 1.610 GHz

ANT. 0, CH9, CONFIG 3





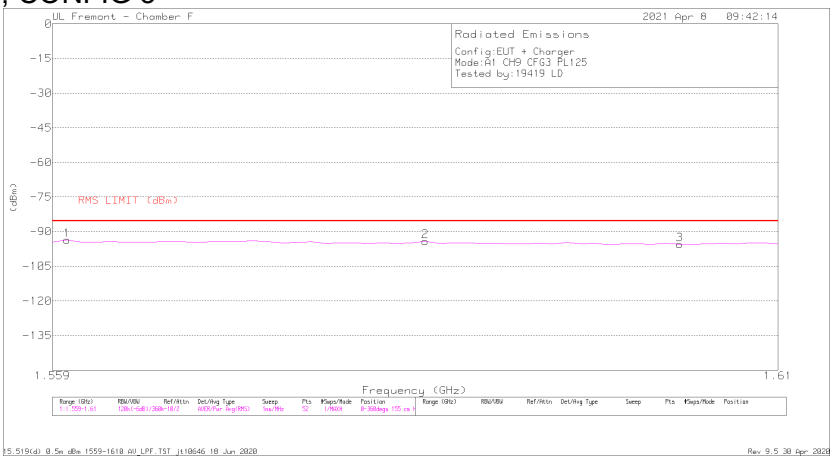
Trace Markers

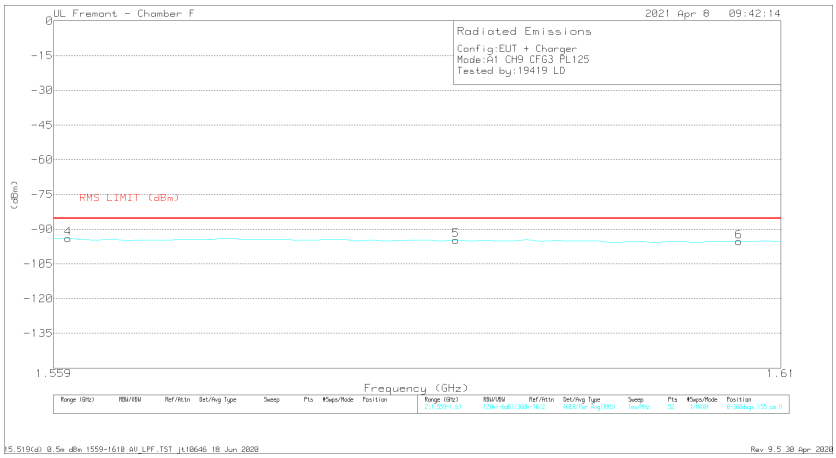
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	18196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.574	-73.31	RMS	28	-45.2	-15.6	11.8	.2	-94.11	-85.3	-8.81	110	155	H
2	1.586	-73.7	RMS	28	-45.2	-15.6	11.8	.2	-94.5	-85.3	-9.2	88	155	H
3	1.6	-74.13	RMS	28	-45.3	-15.6	11.8	.2	-95.03	-85.3	-9.73	1	155	H
4	1.56	-72.93	RMS	27.9	-45.2	-15.6	11.8	.2	-93.83	-85.3	-8.53	184	155	V
5	1.574	-73.31	RMS	28	-45.2	-15.6	11.8	.2	-94.11	-85.3	-8.81	53	155	V
6	1.599	-74.16	RMS	28	-45.2	-15.6	11.8	.2	-94.96	-85.3	-9.66	141	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH5 fundamental signal.

ANT. 1, CH9, CONFIG 3





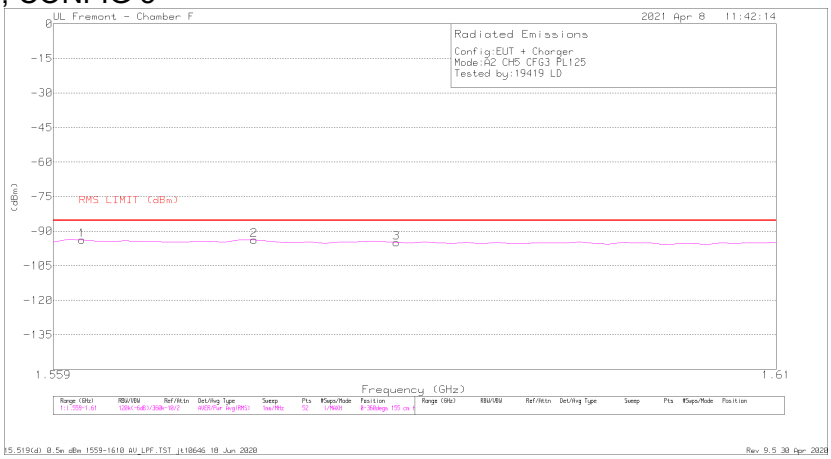
Trace Markers

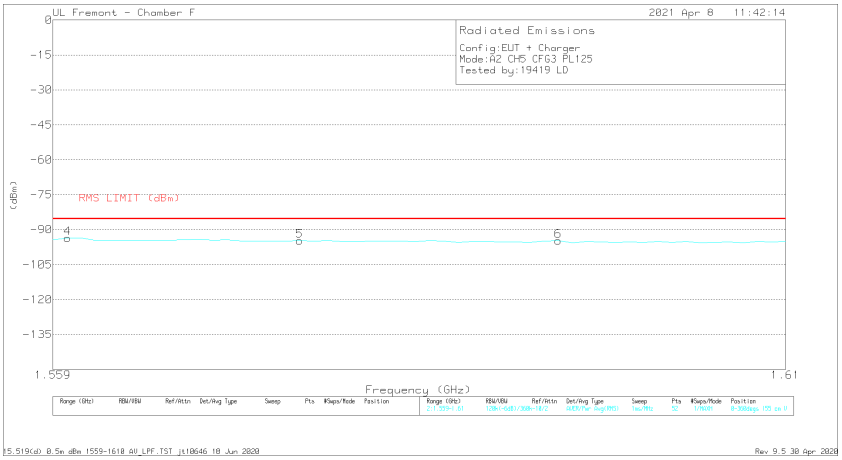
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.56	-72.76	RMS	27.9	-45.2	-15.6	11.8	.2	-93.66	-85.3	-8.36	207	155	H
2	1.585	-73.18	RMS	27.9	-45.2	-15.6	11.8	.2	-94.08	-85.3	-8.78	97	155	H
3	1.603	-74.57	RMS	28	-45.3	-15.6	11.8	.2	-95.47	-85.3	-10.17	119	155	H
4	1.56	-73.08	RMS	27.9	-45.2	-15.6	11.8	.2	-93.98	-85.3	-8.68	242	155	V
5	1.587	-73.88	RMS	28	-45.3	-15.6	11.8	.2	-94.78	-85.3	-9.48	1	155	V
6	1.607	-74.31	RMS	28	-45.3	-15.6	11.8	.2	-95.21	-85.3	-9.91	132	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH9 fundamental signal.

ANT. 2, CH5, CONFIG 3





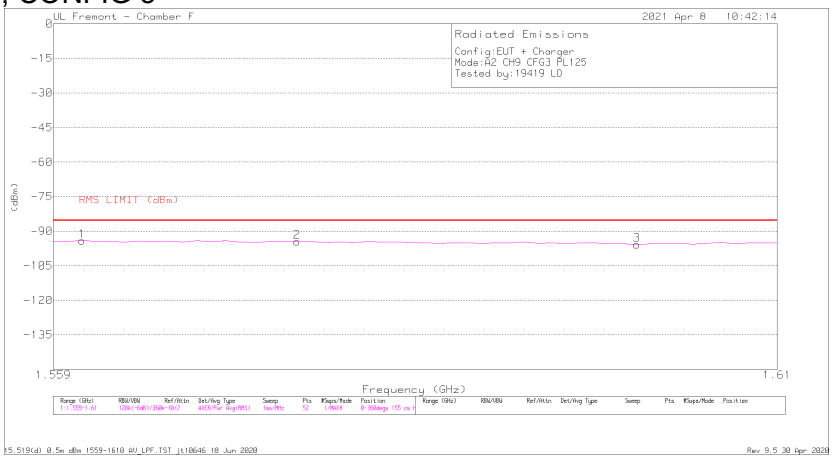
Trace Markers

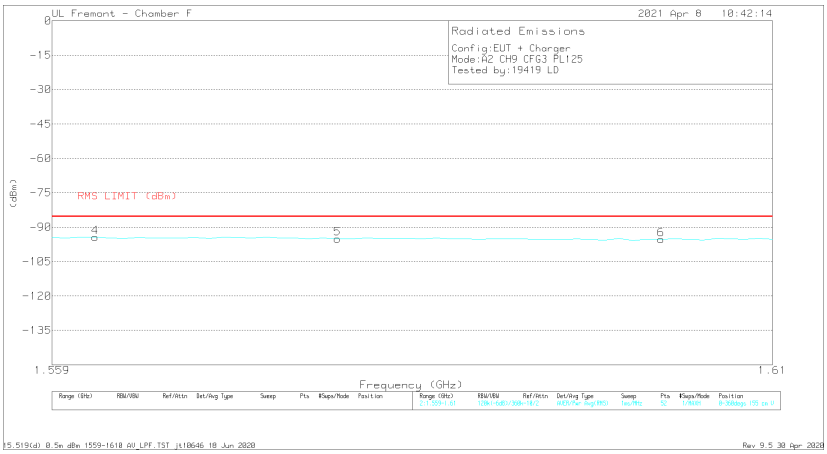
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.561	-72.98	RMS	27.9	-45.2	-15.6	11.8	.2	-93.88	-85.3	-8.58	141	155	H
2	1.573	-73.06	RMS	28	-45.2	-15.6	11.8	.2	-93.86	-85.3	-8.56	360	155	H
3	1.583	-73.96	RMS	27.9	-45.2	-15.6	11.8	.2	-94.86	-85.3	-9.56	31	155	H
4	1.56	-72.7	RMS	27.9	-45.2	-15.6	11.8	.2	-93.6	-85.3	-8.3	219	155	V
5	1.576	-73.99	RMS	28	-45.2	-15.6	11.8	.2	-94.79	-85.3	-9.49	0	155	V
6	1.594	-73.89	RMS	28	-45.2	-15.6	11.8	.2	-94.69	-85.3	-9.39	308	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH5 fundamental signal.

ANT. 2, CH9, CONFIG 3





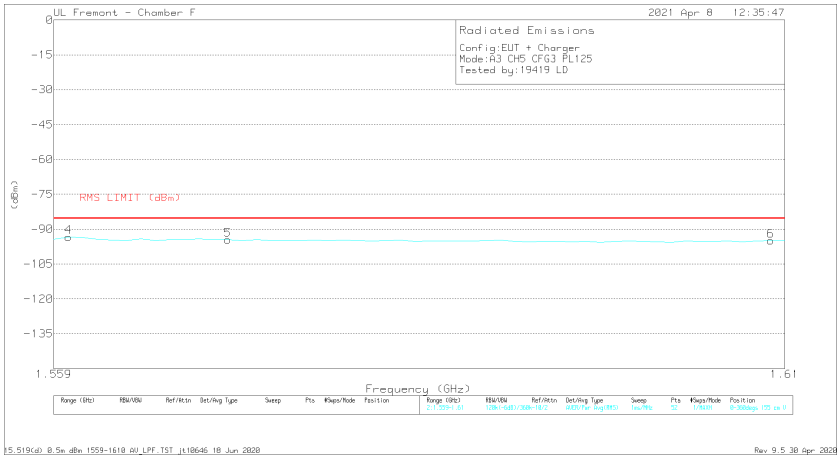
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.561	-73.27	RMS	27.9	-45.2	-15.6	11.8	.2	-94.17	-85.3	-8.87	251	155	H
2	1.576	-73.75	RMS	28	-45.2	-15.6	11.8	.2	-94.55	-85.3	-9.25	163	155	H
3	1.6	-74.9	RMS	28	-45.3	-15.6	11.8	.2	-95.8	-85.3	-10.5	97	155	H
4	1.562	-73.53	RMS	27.9	-45.2	-15.6	11.8	.2	-94.43	-85.3	-9.13	198	155	V
5	1.579	-74.11	RMS	28	-45.3	-15.6	11.8	.2	-95.01	-85.3	-9.71	88	155	V
6	1.602	-74.4	RMS	28	-45.3	-15.6	11.8	.2	-95.3	-85.3	-10	44	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 5.4 GHz to suppress CH9 fundamental signal.

ANT. 3, CH5, CONFIG 3



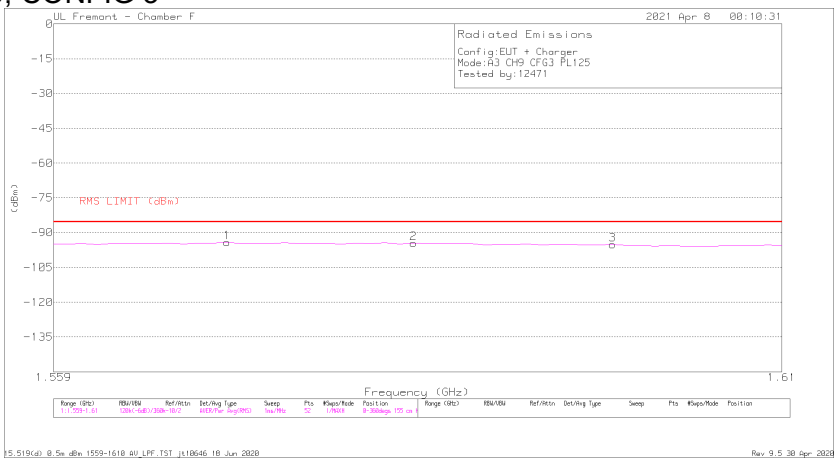
Trace Markers

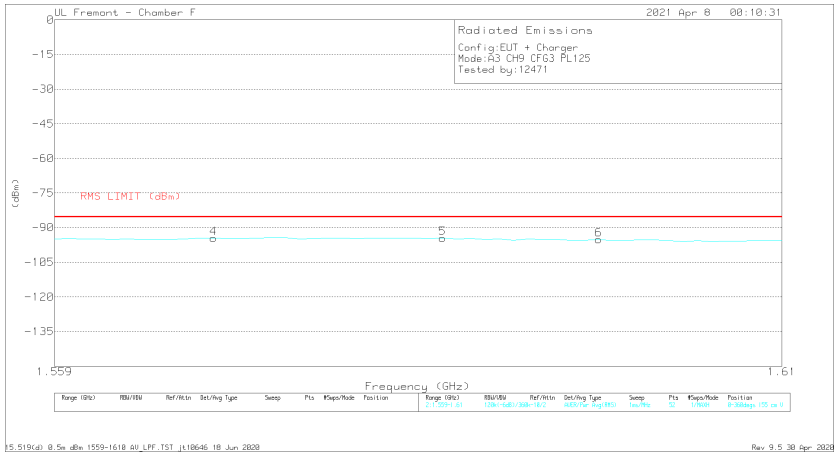
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.56	-73.01	RMS	27.9	-45.2	-15.6	11.8	.2	-93.91	-85.3	-8.61	185	155	H
2	1.568	-73.16	RMS	27.9	-45.2	-15.6	11.8	.2	-94.06	-85.3	-8.76	163	155	H
3	1.596	-73.91	RMS	28	-45.2	-15.6	11.8	.2	-94.71	-85.3	-9.41	339	155	H
4	1.56	-72.43	RMS	27.9	-45.2	-15.6	11.8	.2	-93.33	-85.3	-8.03	220	155	V
5	1.571	-73.7	RMS	28	-45.2	-15.6	11.8	.2	-94.5	-85.3	-9.2	330	155	V
6	1.609	-73.98	RMS	28	-45.3	-15.6	11.8	.2	-94.88	-85.3	-9.58	66	155	V

RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 6 GHz to surpress CH5 fundamental signal.

ANT. 3, CH9, CONFIG 3





Trace Markers

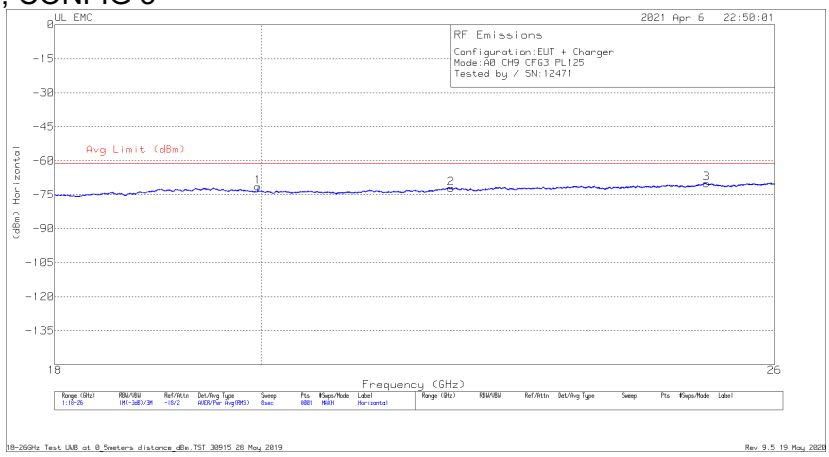
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Correction (dB)	Conversion Factor (dB)	188196 LPF (dB)	EIRP (dBm)	FCC15.519(d) EIRP RMS (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.571	-73.33	RMS	28	-45.2	-15.6	11.8	.2	-94.13	-85.3	-8.83	132	155	H
2	1.584	-73.59	RMS	27.9	-45.2	-15.6	11.8	.2	-94.49	-85.3	-9.19	219	155	H
3	1.598	-74.22	RMS	28	-45.2	-15.6	11.8	.2	-95.02	-85.3	-9.72	242	155	H
4	1.57	-73.77	RMS	28	-45.2	-15.6	11.8	.2	-94.57	-85.3	-9.27	338	155	V
5	1.586	-73.68	RMS	28	-45.2	-15.6	11.8	.2	-94.48	-85.3	-9.18	338	155	V
6	1.597	-74.35	RMS	28	-45.2	-15.6	11.8	.2	-95.15	-85.3	-9.85	207	155	V

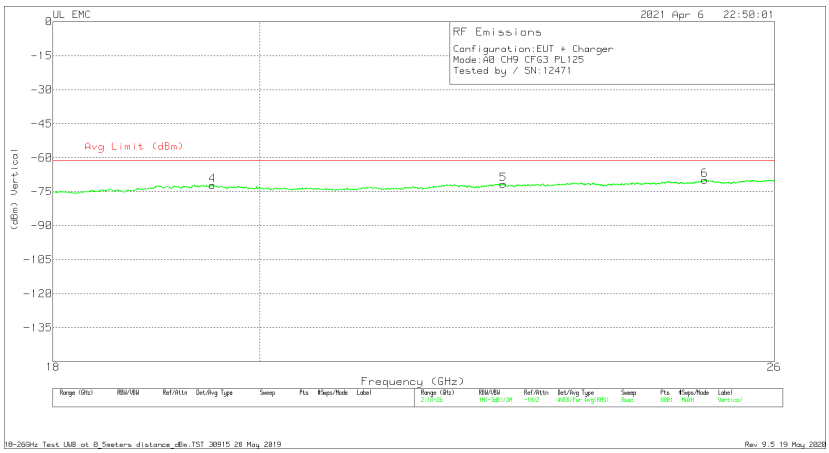
RMS - RMS detection

*Note: Test was performed with a low-pass filter with cutoff frequency at 6 GHz to surpress CH9 fundamental signal.

9.6.5. AVERAGE EMISSIONS, 18 – 26 GHz

ANT. 0, CH9, CONFIG 3



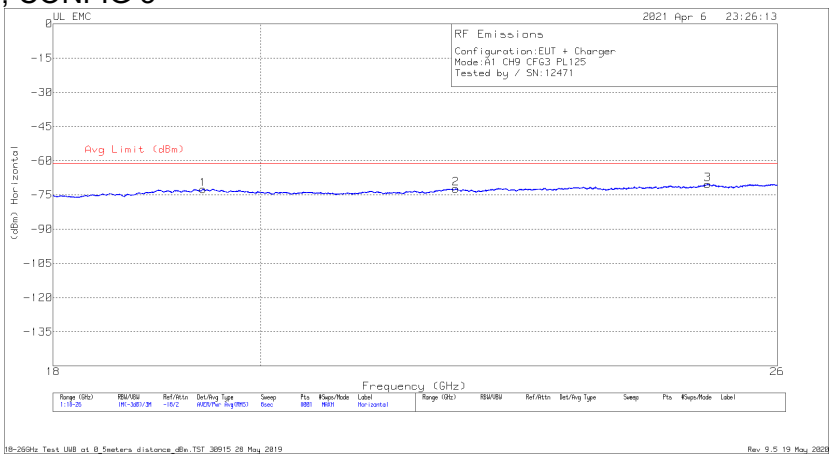


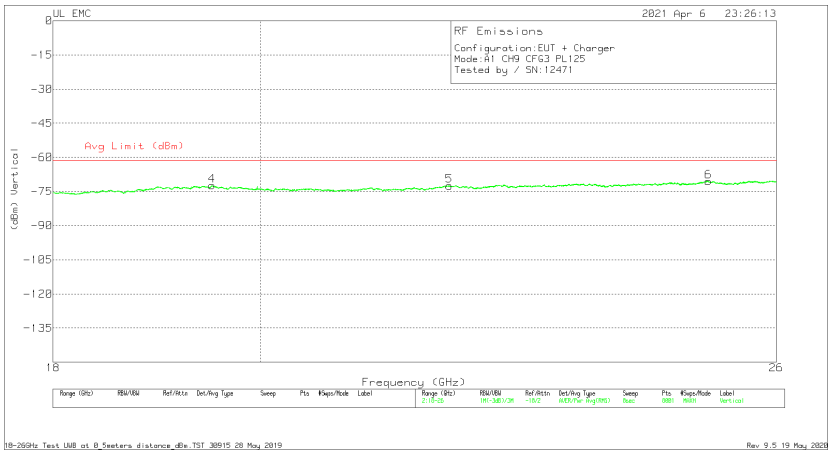
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)
1	19.968	-80.07	RMS	32.8	-20.3	-15.6	11.8	-71.37	-61.3	-10.07
2	22.039	-81.51	RMS	33.4	-20.2	-15.6	11.8	-72.11	-61.3	-10.81
3	25.112	-81.25	RMS	34.3	-19.2	-15.6	11.8	-69.95	-61.3	-8.65
4	19.524	-81.97	RMS	32.8	-19.1	-15.6	11.8	-72.07	-61.3	-10.77
5	22.643	-81.21	RMS	33.4	-20	-15.6	11.8	-71.61	-61.3	-10.31
6	25.092	-81.22	RMS	34.3	-19.1	-15.6	11.8	-69.82	-61.3	-8.52

RMS - RMS detection

ANT. 1, CH9, CONFIG 3





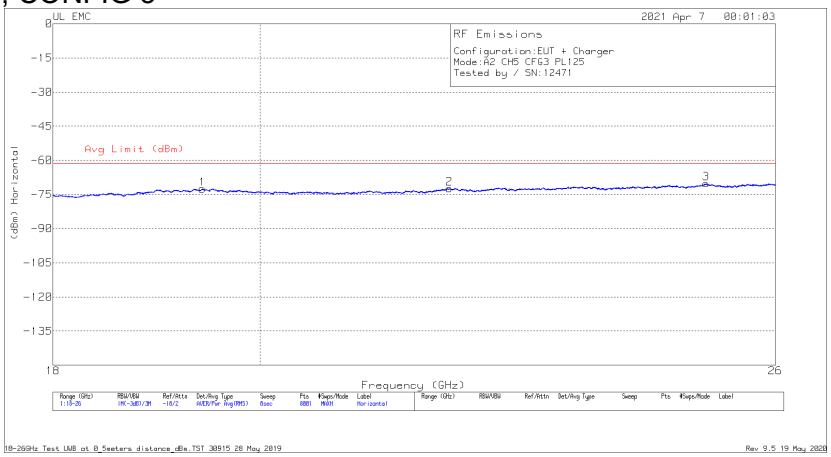
Trace Markers

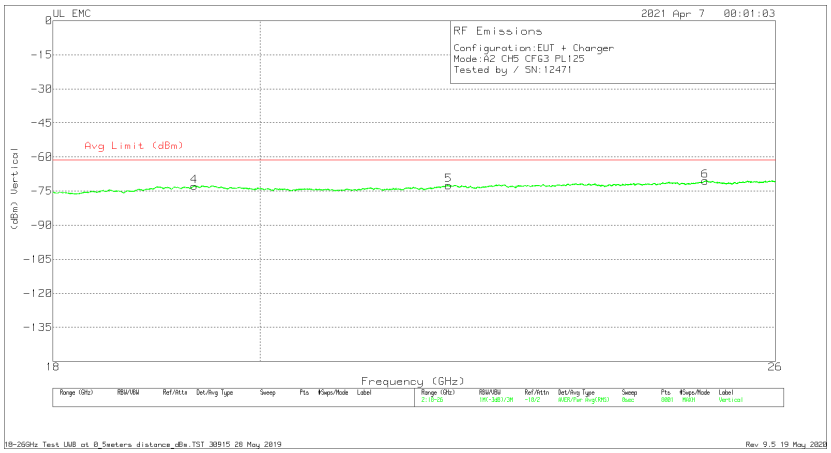
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)
1	19.424	-82.79	RMS	32.7	-18.6	-15.6	11.8	-72.49	-61.3	-11.19
2	22.085	-81.93	RMS	33.4	-19.9	-15.6	11.8	-72.23	-61.3	-10.93
3	25.098	-81.66	RMS	34.3	-19.1	-15.6	11.8	-70.26	-61.3	-8.96
4	19.515	-82.28	RMS	32.8	-19	-15.6	11.8	-72.28	-61.3	-10.98
5	22.018	-81.76	RMS	33.4	-20.3	-15.6	11.8	-72.46	-61.3	-11.16
6	25.118	-81.83	RMS	34.3	-19.2	-15.6	11.8	-70.53	-61.3	-9.23

RMS - RMS detection

UL VERIFICATION SERVICES INC
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

ANT. 2, CH5, CONFIG 3



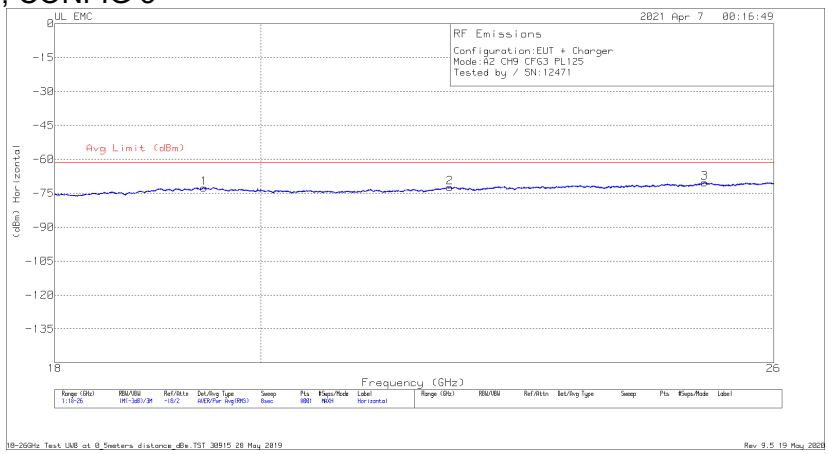


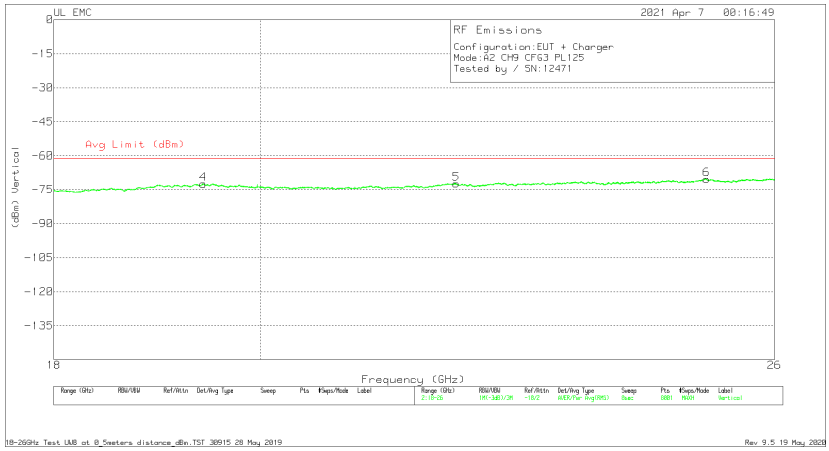
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)
1	19.423	-82.69	RMS	32.6	-18.6	-15.6	11.8	-72.49	-61.3	-11.19
2	22.025	-81.61	RMS	33.4	-20.3	-15.6	11.8	-72.31	-61.3	-11.01
3	25.1	-81.5	RMS	34.3	-19.1	-15.6	11.8	-70.1	-61.3	-8.8
4	19.342	-82.94	RMS	32.6	-18.6	-15.6	11.8	-72.74	-61.3	-11.44
5	22.015	-81.75	RMS	33.4	-20.3	-15.6	11.8	-72.45	-61.3	-11.15
6	25.089	-81.83	RMS	34.3	-19.1	-15.6	11.8	-70.43	-61.3	-9.13

RMS - RMS detection

ANT. 2, CH9, CONFIG 3



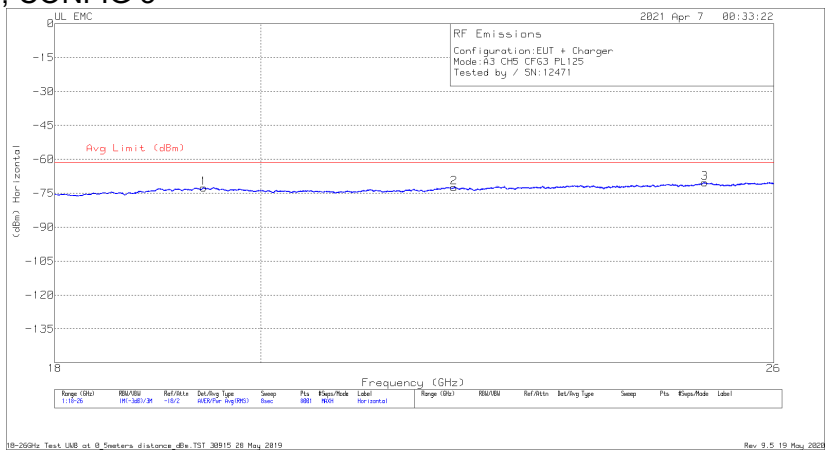


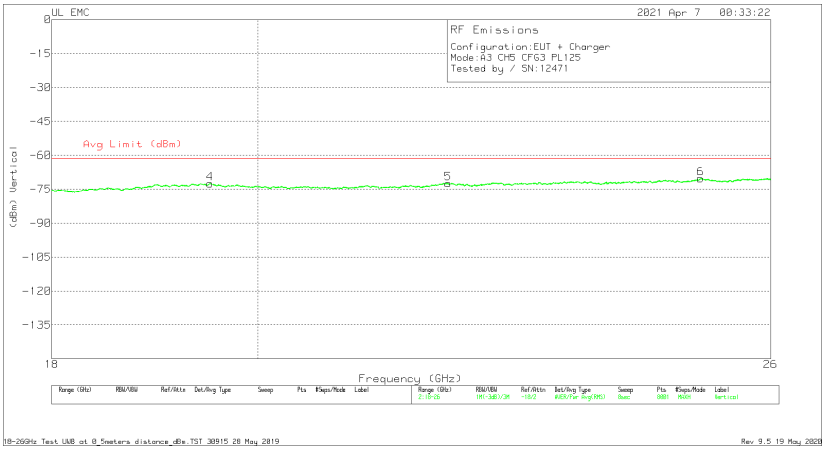
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)
1	19.427	-82.88	RMS	32.7	-18.6	-15.6	11.8	-72.58	-61.3	-11.28
2	22.032	-81.81	RMS	33.4	-20.2	-15.6	11.8	-72.41	-61.3	-11.11
3	25.098	-81.66	RMS	34.3	-19.1	-15.6	11.8	-70.26	-61.3	-8.96
4	19.426	-82.78	RMS	32.7	-18.6	-15.6	11.8	-72.48	-61.3	-11.18
5	22.102	-81.88	RMS	33.4	-20	-15.6	11.8	-72.28	-61.3	-10.98
6	25.115	-81.66	RMS	34.3	-19.2	-15.6	11.8	-70.36	-61.3	-9.06

RMS - RMS detection

ANT. 3, CH5, CONFIG 3



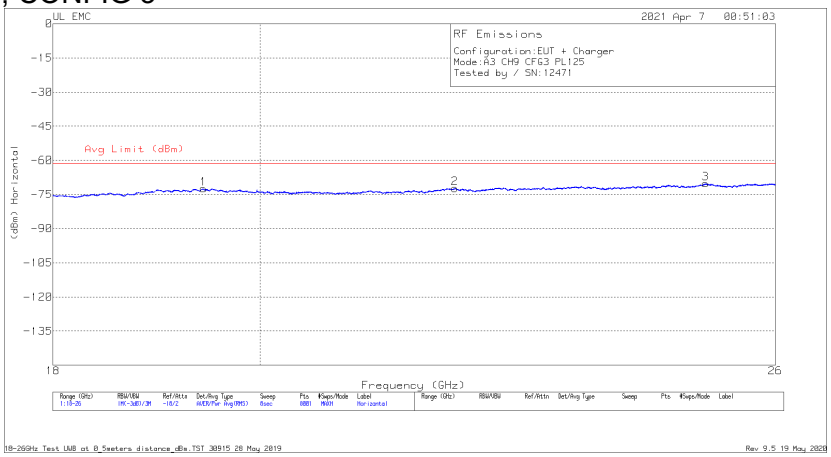


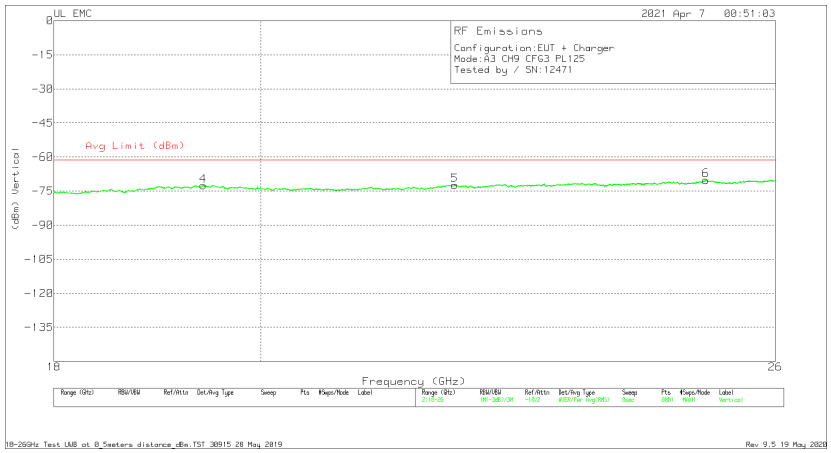
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)
1	19.426	-82.87	RMS	32.7	-18.6	-15.6	11.8	-72.57	-61.3	-11.27
2	22.079	-82	RMS	33.4	-20	-15.6	11.8	-72.4	-61.3	-11.1
3	25.101	-81.69	RMS	34.3	-19.1	-15.6	11.8	-70.29	-61.3	-8.99
4	19.518	-82.45	RMS	32.8	-19	-15.6	11.8	-72.45	-61.3	-11.15
5	22.048	-81.71	RMS	33.4	-20.3	-15.6	11.8	-72.41	-61.3	-11.11
6	25.085	-81.51	RMS	34.3	-19.2	-15.6	11.8	-70.21	-61.3	-8.91

RMS - RMS detection

ANT. 3, CH9, CONFIG 3





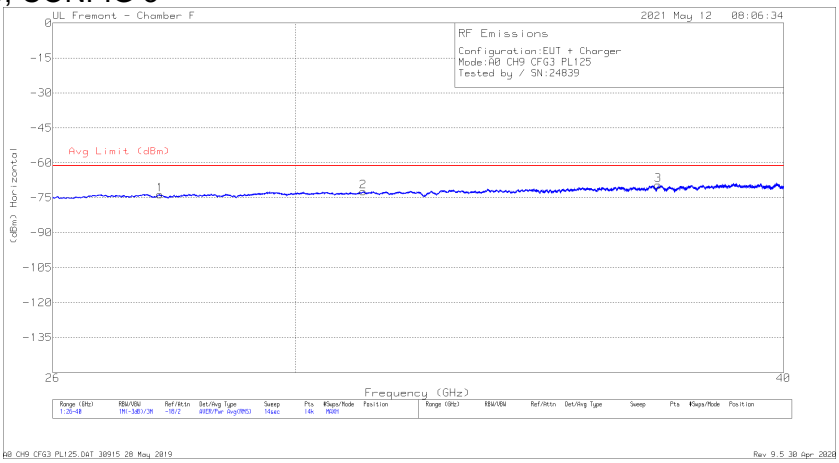
Trace Markers

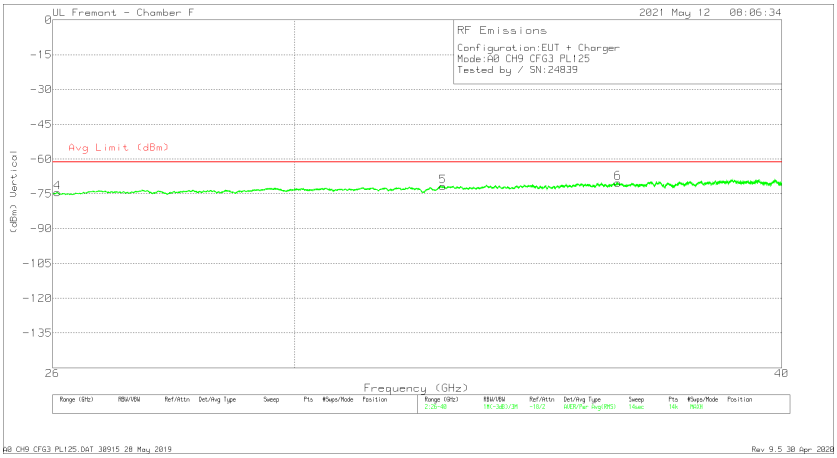
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)
1	19.432	-82.64	RMS	32.7	-18.7	-15.6	11.8	-72.44	-61.3	-11.14
2	22.087	-81.92	RMS	33.4	-19.9	-15.6	11.8	-72.22	-61.3	-10.92
3	25.094	-81.52	RMS	34.3	-19.1	-15.6	11.8	-70.12	-61.3	-8.82
4	19.425	-82.82	RMS	32.7	-18.6	-15.6	11.8	-72.52	-61.3	-11.22
5	22.079	-81.89	RMS	33.4	-20	-15.6	11.8	-72.29	-61.3	-10.99
6	25.095	-81.57	RMS	34.3	-19.1	-15.6	11.8	-70.17	-61.3	-8.87

RMS - RMS detection

9.6.6. AVERAGE EMISSIONS, 26 – 40 GHz

ANT. 0, CH9, CONFIG 3



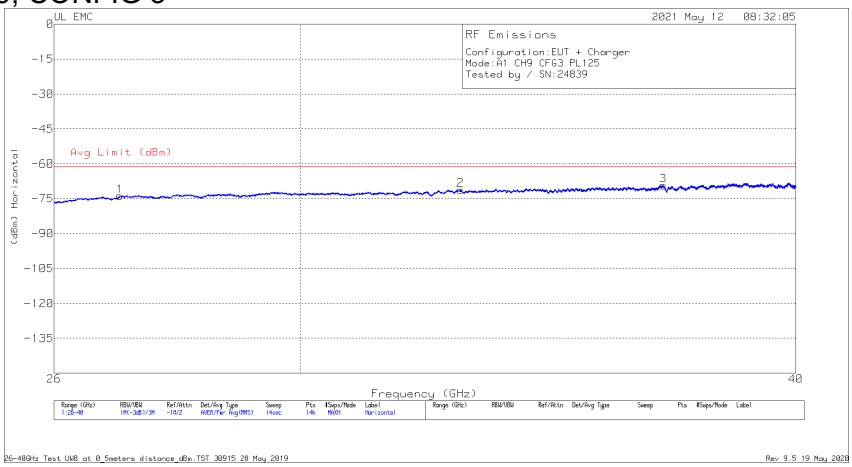


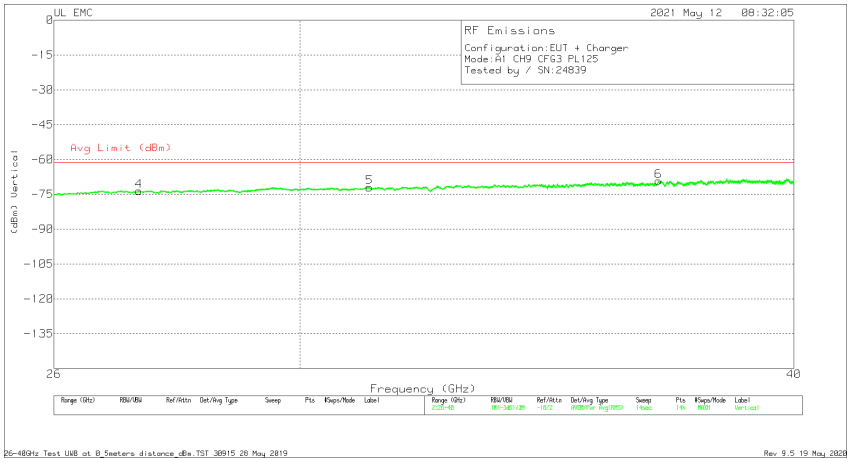
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	EIRP (dBm)	Avg Limit (dBm)	Margin (dB)
1	27.698	-78.87	RMS	36	-26.9	-15.6	11.8	-73.57	-61.3	-12.27
2	31.223	-80.43	RMS	36.9	-25	-15.6	11.8	-72.33	-61.3	-11.03
3	37.15	-80.53	RMS	38.1	-23.2	-15.6	11.8	-69.43	-61.3	-8.13
4	26.072	-76.77	RMS	35.5	-29.2	-15.6	11.8	-74.27	-61.3	-12.97
5	32.744	-80.17	RMS	37.1	-24.8	-15.6	11.8	-71.67	-61.3	-10.37
6	36.313	-80.65	RMS	37.7	-23.4	-15.6	11.8	-70.15	-61.3	-8.85

RMS - RMS detection

ANT. 1, CH9, CONFIG 3



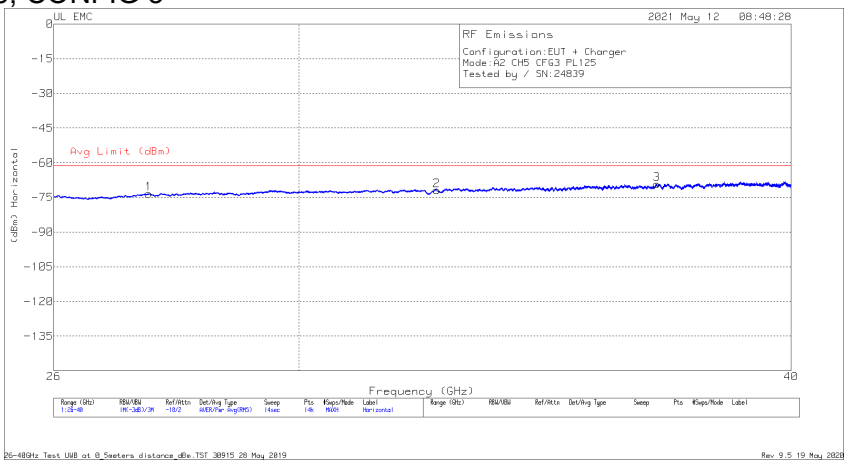


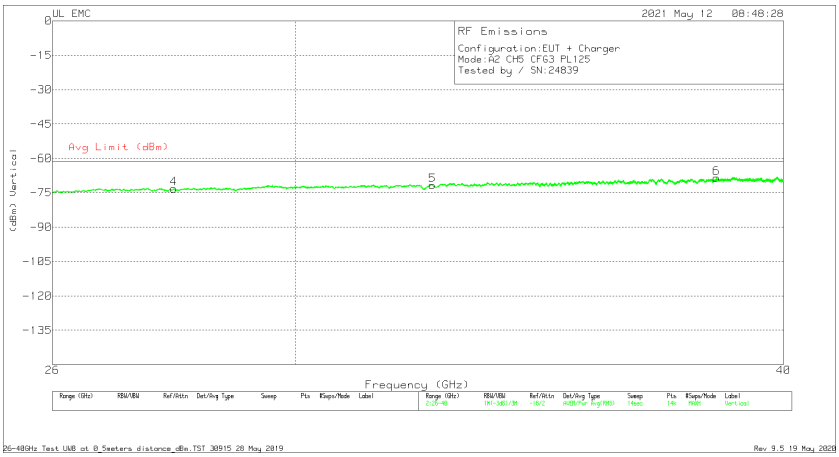
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	EIRP (dBm)	Avg Limit (dBm)	Margin (dB)
1	27.011	-77.76	RMS	35.9	-28.2	-15.6	11.8	-73.86	-61.3	-12.56
2	32.917	-79.66	RMS	37.2	-24.9	-15.6	11.8	-71.16	-61.3	-9.86
3	37.031	-80.69	RMS	38.1	-22.9	-15.6	11.8	-69.29	-61.3	-7.99
4	27.317	-78.09	RMS	36	-27.7	-15.6	11.8	-73.59	-61.3	-12.29
5	31.24	-80	RMS	36.8	-25	-15.6	11.8	-72	-61.3	-10.7
6	36.966	-80.45	RMS	38	-23	-15.6	11.8	-69.25	-61.3	-7.95

RMS - RMS detection

ANT. 2, CH5, CONFIG 3



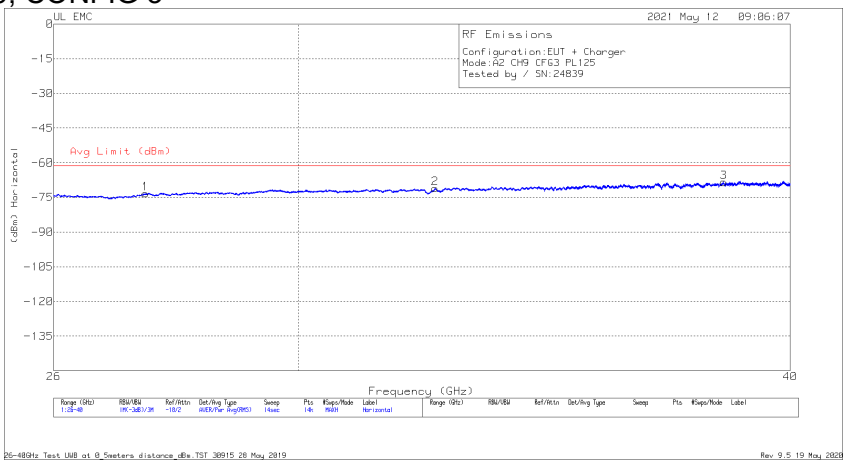


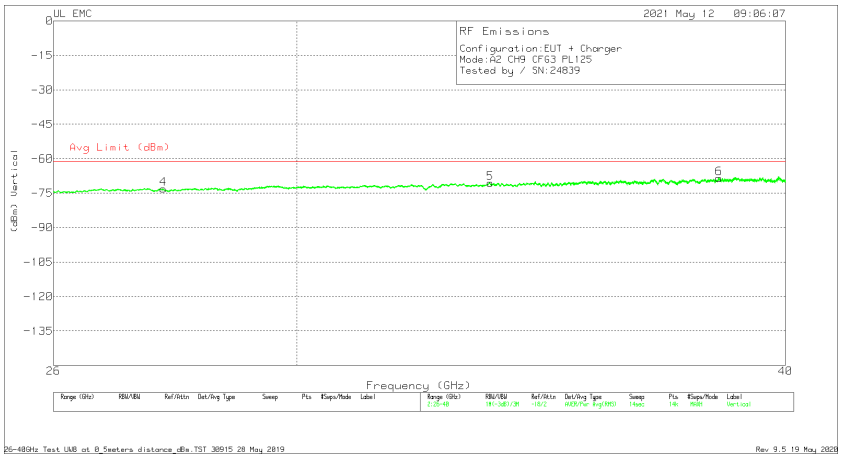
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	EIRP (dBm)	Avg Limit (dBm)	Margin (dB)
1	27.483	-78.06	RMS	36	-27.5	-15.6	11.8	-73.36	-61.3	-12.06
2	32.52	-80.16	RMS	37.3	-25.2	-15.6	11.8	-71.86	-61.3	-10.56
3	36.98	-80.2	RMS	38.1	-23.3	-15.6	11.8	-69.2	-61.3	-7.9
4	27.926	-78.96	RMS	36	-26.4	-15.6	11.8	-73.16	-61.3	-11.86
5	32.523	-79.88	RMS	37.2	-25.2	-15.6	11.8	-71.68	-61.3	-10.38
6	38.446	-80.84	RMS	38.4	-22.2	-15.6	11.8	-68.44	-61.3	-7.14

RMS - RMS detection

ANT. 2, CH9, CONFIG 3



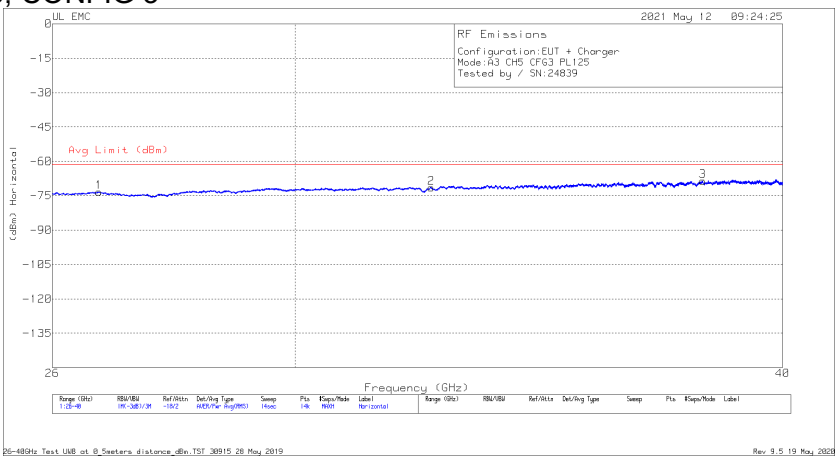


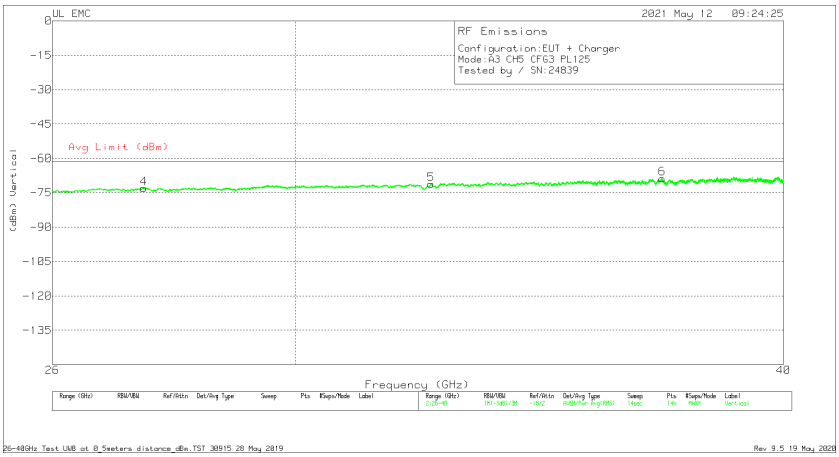
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	EIRP (dBm)	Avg Limit (dBm)	Margin (dB)
1	27.431	-77.74	RMS	35.8	-27.6	-15.6	11.8	-73.34	-61.3	-12.04
2	32.495	-79.47	RMS	37.4	-25.2	-15.6	11.8	-71.07	-61.3	-9.77
3	38.47	-80.78	RMS	38.4	-22.2	-15.6	11.8	-68.38	-61.3	-7.08
4	27.738	-78.38	RMS	35.9	-26.8	-15.6	11.8	-73.08	-61.3	-11.78
5	33.619	-79.6	RMS	37.2	-24.4	-15.6	11.8	-70.6	-61.3	-9.3
6	38.465	-80.93	RMS	38.4	-22.1	-15.6	11.8	-68.43	-61.3	-7.13

RMS - RMS detection

ANT. 3, CH5, CONFIG 3





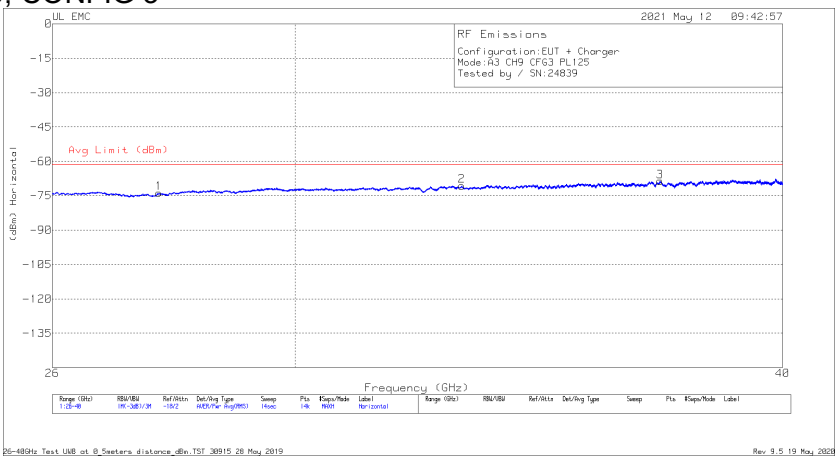
Trace Markers

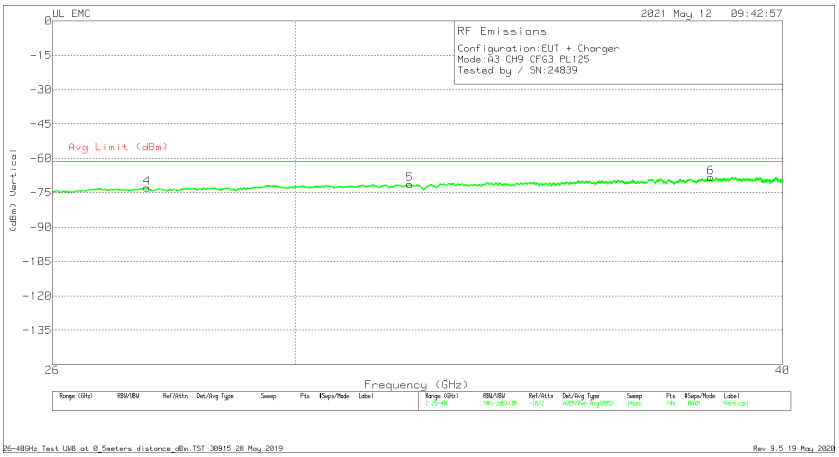
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	EIRP (dBm)	Avg Limit (dBm)	Margin (dB)
1	26.723	-76.63	RMS	35.9	-28.8	-15.6	11.8	-73.33	-61.3	-12.03
2	32.511	-79.74	RMS	37.3	-25.2	-15.6	11.8	-71.44	-61.3	-10.14
3	38.159	-79.81	RMS	38.1	-23	-15.6	11.8	-68.51	-61.3	-7.21
4	27.437	-77.51	RMS	35.9	-27.6	-15.6	11.8	-73.01	-61.3	-11.71
5	32.498	-79.61	RMS	37.4	-25.2	-15.6	11.8	-71.21	-61.3	-9.91
6	37.237	-79.54	RMS	38.1	-23.5	-15.6	11.8	-68.74	-61.3	-7.44

RMS - RMS detection

UL VERIFICATION SERVICES INC
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

ANT. 3, CH9, CONFIG 3





Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Conversion Factor (dB)	EIRP (dBm)	Avg Limit (dBm)	Margin (dB)
1	27.687	-79.05	RMS	35.9	-26.8	-15.6	11.8	-73.75	-61.3	-12.45
2	33.102	-79.05	RMS	37.2	-25	-15.6	11.8	-70.65	-61.3	-9.35
3	37.209	-79.73	RMS	38.2	-23.3	-15.6	11.8	-68.63	-61.3	-7.33
4	27.493	-77.79	RMS	36.1	-27.3	-15.6	11.8	-72.79	-61.3	-11.49
5	32.098	-79.33	RMS	36.9	-25	-15.6	11.8	-71.23	-61.3	-9.93
6	38.336	-80.02	RMS	38.3	-22.7	-15.6	11.8	-68.22	-61.3	-6.92

RMS - RMS detection

UL VERIFICATION SERVICES INC
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888

9.7. AC POWER-LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a) & RSS-Gen 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

ANSI C63.10 Section 6.2

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.

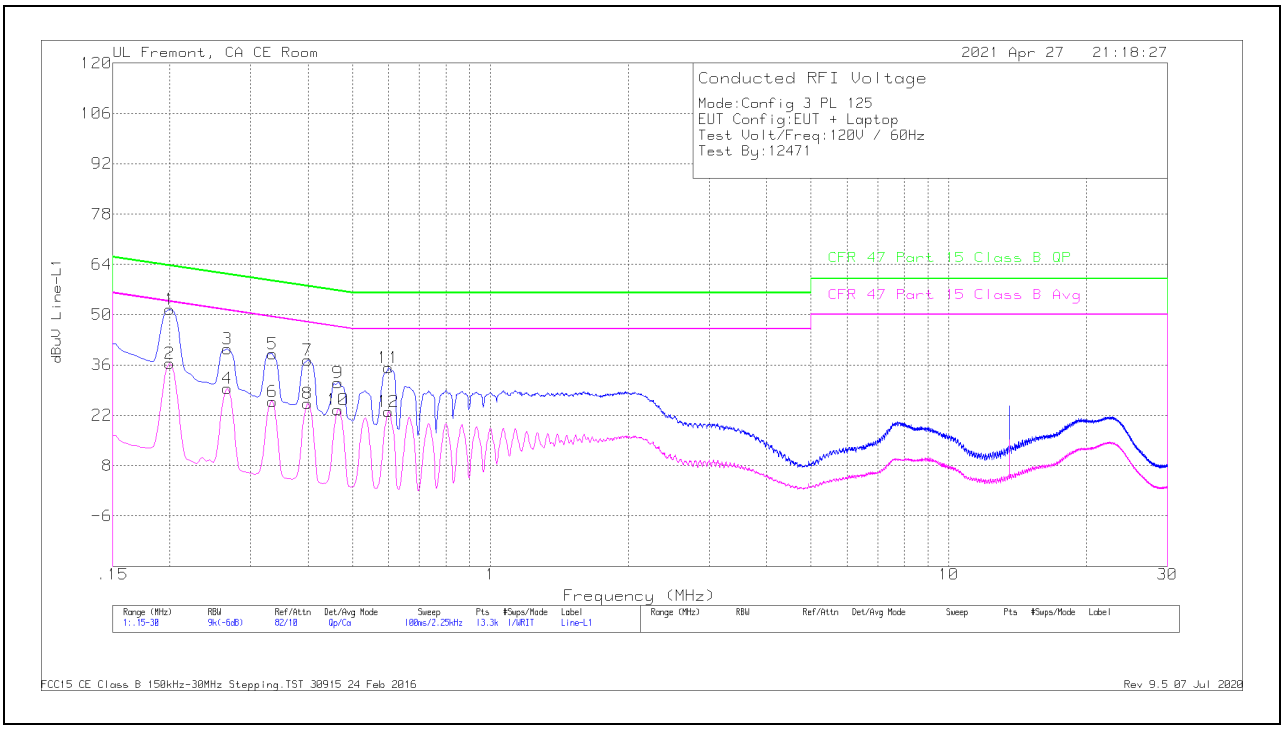
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

Employee IDs: 12471
Location: Immunity Test Room
Test Date: 04/27/2021

9.7.1. AC Power Line With Laptop

LINE 1 RESULTS

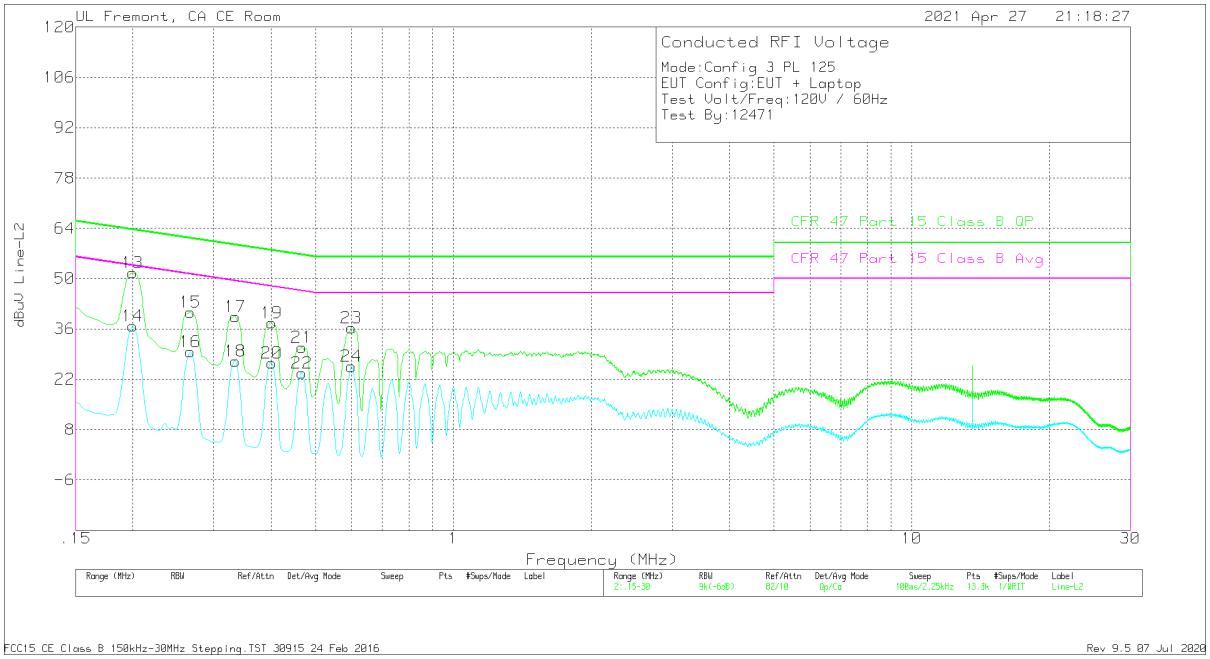


Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.1995	41.34	Qp	0	0	10.1	51.44	63.63	-12.19	-	-
2	.1995	26.45	Ca	0	0	10.1	36.55	-	-	53.63	-17.08
3	.267	30.37	Qp	0	0	10.1	40.47	61.21	-20.74	-	-
4	.267	19.4	Ca	0	0	10.1	29.5	-	-	51.21	-21.71
5	.3345	28.98	Qp	0	0	10.1	39.08	59.34	-20.26	-	-
6	.3345	15.79	Ca	0	0	10.1	25.89	-	-	49.34	-23.45
7	.39975	27.3	Qp	0	0	10.1	37.4	57.86	-20.46	-	-
8	.39975	15.22	Ca	0	0	10.1	25.32	-	-	47.86	-22.54
9	.465	20.91	Qp	0	0	10.1	31.01	56.6	-25.59	-	-
10	.465	13.41	Ca	0	0	10.1	23.51	-	-	46.6	-23.09
11	.6	25.07	Qp	0	0	10.1	35.17	56	-20.83	-	-
12	.6	12.96	Ca	0	0	10.1	23.06	-	-	46	-22.94

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



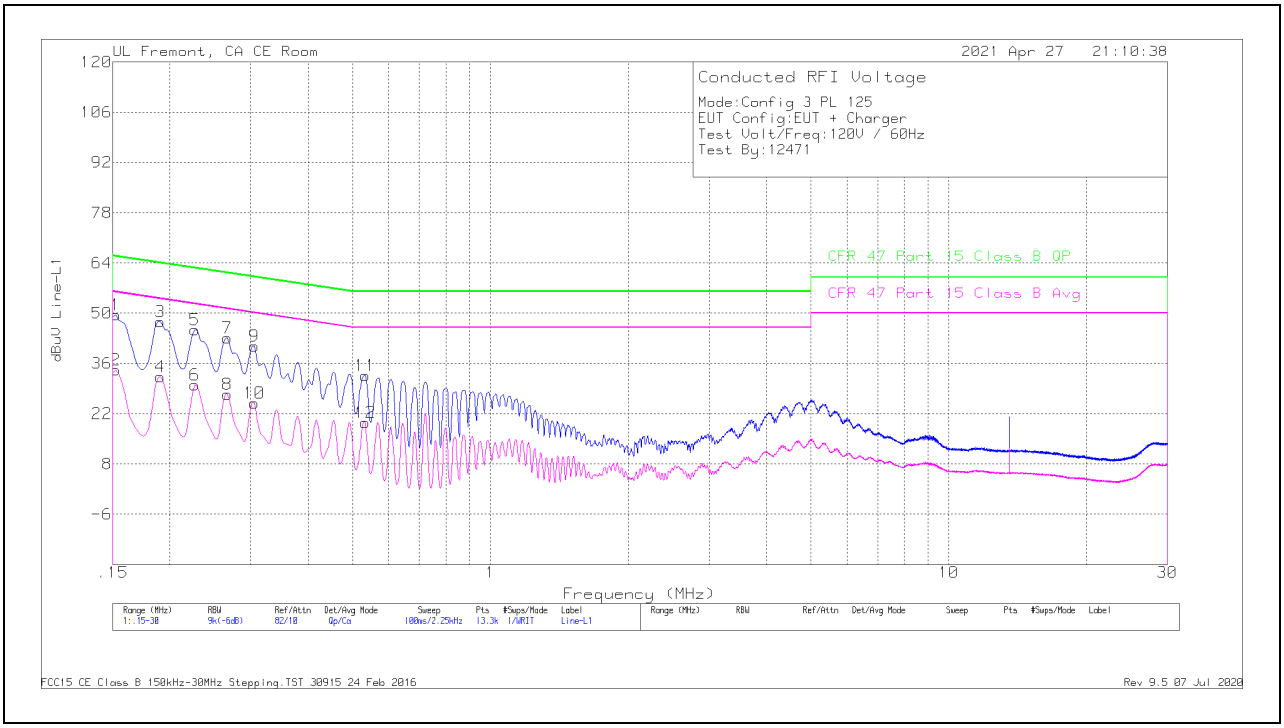
Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.1995	41.54	Qp	0	0	10.1	51.64	63.63	-11.99	-	-
14	.1995	26.7	Ca	0	0	10.1	36.8	-	-	53.63	-16.83
15	.267	30.49	Qp	0	0	10.1	40.59	61.21	-20.62	-	-
16	.267	19.54	Ca	0	0	10.1	29.64	-	-	51.21	-21.57
17	.3345	29.39	Qp	0	0	10.1	39.49	59.34	-19.85	-	-
18	.3345	16.96	Ca	0	0	10.1	27.06	-	-	49.34	-22.28
19	.402	27.67	Qp	0	0	10.1	37.77	57.81	-20.04	-	-
20	.402	16.5	Ca	0	0	10.1	26.6	-	-	47.81	-21.21
21	.46725	20.8	Qp	0	0	10.1	30.9	56.56	-25.66	-	-
22	.46725	13.67	Ca	0	0	10.1	23.77	-	-	46.56	-22.79
23	.6	26.15	Qp	0	0	10.1	36.25	56	-19.75	-	-
24	.6	15.47	Ca	0	0	10.1	25.57	-	-	46	-20.43

Qp - Quasi-Peak detector
Ca - CISPR average detection

9.7.2. AC Power Line With AC/DC Adapter

LINE 1 RESULTS

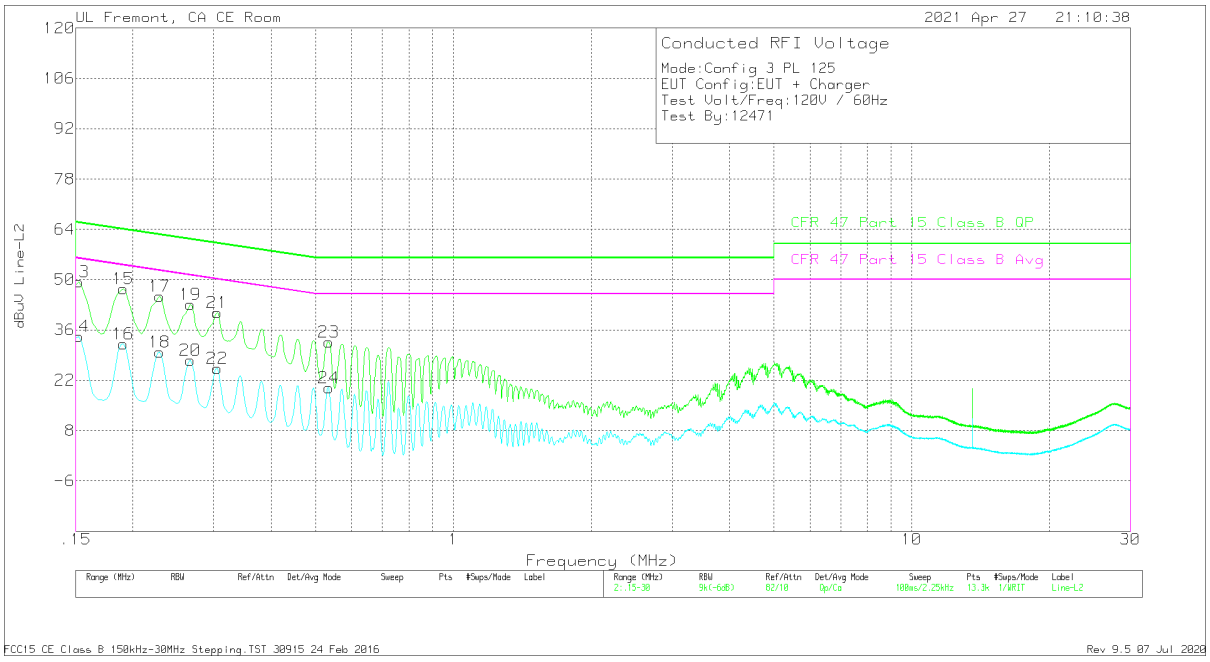


Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.15225	39.3	Qp	.1	0	10.1	49.5	65.88	-16.38	-	-
2	.15225	24.06	Ca	.1	0	10.1	34.26	-	-	55.88	-21.62
3	.1905	37.58	Qp	0	0	10.1	47.68	64.01	-16.33	-	-
4	.1905	22.15	Ca	0	0	10.1	32.25	-	-	54.01	-21.76
5	.2265	35.34	Qp	0	0	10.1	45.44	62.58	-17.14	-	-
6	.2265	19.85	Ca	0	0	10.1	29.95	-	-	52.58	-22.63
7	.267	32.98	Qp	0	0	10.1	43.08	61.21	-18.13	-	-
8	.267	17.32	Ca	0	0	10.1	27.42	-	-	51.21	-23.79
9	.30525	30.67	Qp	0	0	10.1	40.77	60.1	-19.33	-	-
10	.30525	14.84	Ca	0	0	10.1	24.94	-	-	50.1	-25.16
11	.5325	22.51	Qp	0	0	10.1	32.61	56	-23.39	-	-
12	.5325	9.4	Ca	0	0	10.1	19.5	-	-	46	-26.5

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.15225	39.22	Qp	0	0	10.1	49.32	65.88	-16.56	-	-
14	.15225	24.04	Ca	0	0	10.1	34.14	-	-	55.88	-21.74
15	.1905	37.42	Qp	0	0	10.1	47.52	64.01	-16.49	-	-
16	.1905	21.98	Ca	0	0	10.1	32.08	-	-	54.01	-21.93
17	.22875	35.29	Qp	0	0	10.1	45.39	62.49	-17.1	-	-
18	.22875	19.77	Ca	0	0	10.1	29.87	-	-	52.49	-22.62
19	.267	32.99	Qp	0	0	10.1	43.09	61.21	-18.12	-	-
20	.267	17.46	Ca	0	0	10.1	27.56	-	-	51.21	-23.65
21	.30525	30.78	Qp	0	0	10.1	40.88	60.1	-19.22	-	-
22	.30525	15.25	Ca	0	0	10.1	25.35	-	-	50.1	-24.75
23	.53475	22.55	Qp	0	0	10.1	32.65	56	-23.35	-	-
24	.53475	9.75	Ca	0	0	10.1	19.85	-	-	46	-26.15

Qp - Quasi-Peak detector
Ca - CISPR average detection

END OF REPORT

UL VERIFICATION SERVICES INC
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10. SETUP PHOTOS

Please refer to 13587903-EP14V1 for setup photos.

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