

TEST REPORT

Report Number: R16238088-E24c

Applicant : Samsung Electronics Co Ltd
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Rep. of Korea

Model : SC-56G, SCG39

FCC ID : A3LSMF976JPN

EUT : GSM/WCDMA/LTE/NR/SCS Phone + BT/BLE, DTS/UNII
Description a/b/g/n/ac/ax/be, UWB, WPT and NFC

Test : FCC 47 CFR PART 15 SUBPART F
Standard(s) ISSED RSS-220 ISSUE 1 + AMD. 1
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2026-06-03

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2026-06-03	Initial Issue	M. Antola

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Samsung Electronics Co Ltd
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Rep. of Korea

EUT DESCRIPTION: GSM/WCDMA/LTE/NR/SCS Phone + BT/BLE, DTS/UNII
a/b/g/n/ac/ax/be, UWB, WPT and NFC

MODEL: SC-56G, SCG39

SERIAL NUMBER: ZBK0239M

SAMPLE RECEIPT DATE: 2026-03-03

DATE TESTED: 2026-04-09 to 2026-04-27

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart F	Refer to Section 2
ISED RSS-220 Issue 1 + A1	Refer to Section 2
ISED RSS-GEN Issue 5 + A1 + A2	Refer to Section 2

UL LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released For
UL LLC By:



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2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer. Below is a list of the data provided by the customer:

- Antenna gain and type (see section 6.4)

FCC Clause	ISED Clause	Requirement	Results	Comment
-	RSS-Gen Section 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.4
15.519 (a) (1)	RSS-220 Section 3.3.1 (b)	Cessession Time	Complies	None
15.503 & 15.519 (b)	RSS-220 Section 5.1 (a)	-10 dB Bandwidth	Complies	None
15.519 (c) (e)	RSS-220 Section 5.3.1 (d) (g)	Pk and Max Av Emissions	Complies	None
15.519 (c) & 15.209	RSS-220 Section 3.4 & 5.3.1 (c)	Emissions Below 960 MHz	Complies	None
15.519 (c) (d)	RSS-220 Section 5.3.1 (d) (e)	Emissions Above 960 MHz	Complies	None
15.207 (a)	RSS-Gen Section 8.8	AC Line Conducted Emissions	Complies	None

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024
- ISED ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024
- KDB 414788 D01 Radiated Test Site v01r01
- RSS-GEN Issue 5 + A1 + A2
- RSS-220 Issue 1 + AMD. 1

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, Certificate Number 0751.06, 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 2800 Suite Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

5. DECISION RULE AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{EIRP (dBm)} &= \text{Meter Reading (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \\ &\text{Preamp Gain (dB)} + \text{dBm-to-dBm Unit Conversion Factor @ 3m (dB)} \\ -60 \text{ dBm} + 28 \text{ dB/m} + 2 \text{ dB} - 30 \text{ dB} + 11.8 &= -48.2 \text{ dBm} \end{aligned}$$

5.3. 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.

5.4. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radiated Emissions, All ranges	6 dB

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

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE/NR/SCS Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax/be, UWB, WPT and NFC. This reports covers testing on the UWB radio.

This report applies data referencing from FCC ID: A2LSMF976U. The test data to validate data referencing is included in Test Report R16238088-E28.

Model differences:

Representative Model	Difference	Derivative Model
		SCG39
SC-56G	Hardware	Same as SC-56U
	Software	Different UI

6.2. OPERATING FREQUENCY RANGE

The UWB radio operates at the following channels, maximum operating bandwidths:

Channel	Center Frequency	Bandwidth	Region
5	6489.6 MHz	600.9 MHz	US, Canada
9	7987.2 MHz	533.5 MHz	US, Canada

6.3. MAXIMUM OUTPUT POWER

The UWB transmitter has a maximum radiated average output power as follows:

Channel	Center Frequency	Average Power (dBm EIRP)
5	6489.6 MHz	-44.83
9	7987.2 MHz	-45.17

6.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two (2) inverted -F antennas, with the following maximum gains:

Frequency (GHz)	Antenna Gain (dBi)
6.75	-8.50
8.25	-4.54

6.5. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was F976USQU0AZB7.

6.6. WORST-CASE CONFIGURATION

The fundamental of the EUT was investigated in three orthogonal axes, X, Y, and Z. In addition, the EUT can open 180 degrees. Fully closed, fully opened 180 degrees, and open 90 degrees were investigated. It was found that EUT closed and Z orientation was worst case. Therefore, all testing was performed with the EUT in the these orientations. Additionally, all operating modes of the EUT (PRF, preamble code, etc.) were investigated and final testing was performed in the worst-case mode.

6.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Power Adapter	Sony	XQZ-UC11-010-236-21	NA	NA

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB-C	1	USB-C	Shielded	<3m	EUT to power adapter

TEST SETUP

The EUT is configured using its own built-in software.

SETUP DIAGRAM

Refer to R16238088-EP1c for setup diagrams

7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 1)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
65682	Active Loop Antenna	ETS-Lindgren	6502	2025-10-14	2027-10-14
	30-1000 MHz				
90629	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2026-03-16	2028-03-16
	1-18 GHz				
88761	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2025-11-19	2027-11-19
	18-40 GHz				
91186	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2024-05-16	2026-05-16
91187	Horn Antenna, 26-40GHz	ARA	MWH-2640/B	2024-05-17	2026-05-17
	Gain-Loss Chains				
91974	Gain-loss string: 0.009-30MHz	Various	Various	2025-05-31	2026-05-31
91976	Gain-loss string: 25-1000MHz	Various	Various	2025-05-31	2026-05-31
91979	Gain-loss string: 1-18GHz	Various	Various	2025-05-31	2026-05-31
135999	Gain-loss string: 18-40GHz	Various	Various	2025-05-31	2026-05-31
	Receiver & Software				
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-07-29	2026-07-29
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241205	Environmental Meter	Fisher Scientific	15-077-963	2025-08-05	2027-08-05
261056	9GHz high-pass filter	RF-Lambda	RHPF23G09G18	2026-04-01	2027-04-01

Test Equipment Used – Cessation Time Test

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
168467	Microwave Analyzer	Keysight	N9951A	2025-09-29	2026-09-26

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
86408	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2025-07-15	2027-07-15
	Gain-Loss Chains				
91977	Gain-loss string: 1-18GHz	Various	Various	2025-05-31	2026-05-31
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-05-12	2026-05-12
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
239540	Environmental Meter	Fisher Scientific	15-077-963	2025-08-05	2027-08-05

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2025-04-30	2026-04-30
179892	Environmental Meter	Fisher Scientific	15-077-963	2025-08-05	2026-08-06
80391	LISN, 50-ohm/50-uH, 250uH 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50/250-25-2-01	2025-09-29	2026-09-29
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2025-7-30	2026-07-30
52859	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2025-7-30	2026-07-30
PS214	AC Power Source	Elgar	CW2501M	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
84681	ANSI C63.4 1m extension cable.	UL	Per Annex B of ANSI C63.4	2025-04-30	2026-04-30

8. LIMITS AND RESULTS

8.1. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

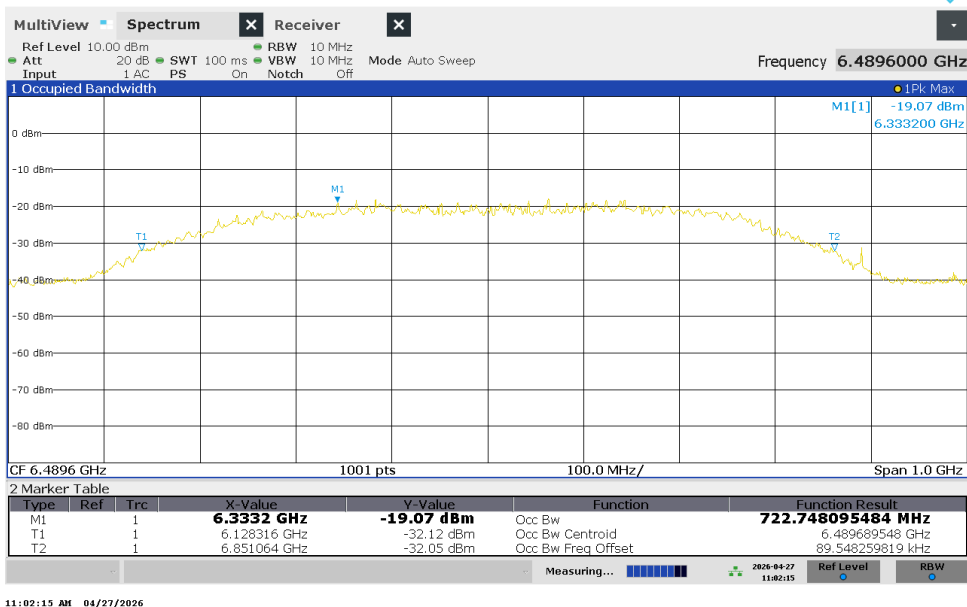
ANSI C63.10 Section 6.9.3

All measurements are made via radiated method. The RBW is in the range of 1% to 5% of the occupied bandwidth. The VBW is set to the highest available analyzer setting. The sweep time is coupled.

RESULTS

Employee IDs: 11322
Location: Chamber 2
Test Date: 2026-04-27

Channel	Center Frequency	99% Bandwidth
5	6489.6 MHz	722.7 MHz
9	7955.9 MHz	616.4 MHz



Channel 5



Channel 9

8.2. 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 f_H and the lower boundary is designated f_L . The frequency at which the highest radiated emission occurs is designated f_M .

§15.503 (b) *Center frequency*. The center frequency, f_C , equals $(f_H + f_L)/2$.

§15.503 (c) *Fractional bandwidth*. The fractional bandwidth equals $2(f_H - f_L) / (f_H + f_L)$.

§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.

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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

Radiated measurements are made using the procedures described above. The detection mode is set to peak detection, the sweep time is AUTO, and the Max Hold trace function is utilized.

The frequency at which the maximum EIRP is measured is designated as f_M . A major graticule line of the plot is adjusted to exactly equal the peak EIRP at f_M . The spectral envelope at the major graticule line that is 10 dB below the reference graticule is examined to determine the frequency band bounded by the points that are 10 dB below the highest radiated emission. The upper boundary is designated f_H and the lower boundary is designated f_L .

The center frequency, f_C , is calculated as $(f_H + f_L)/2$.

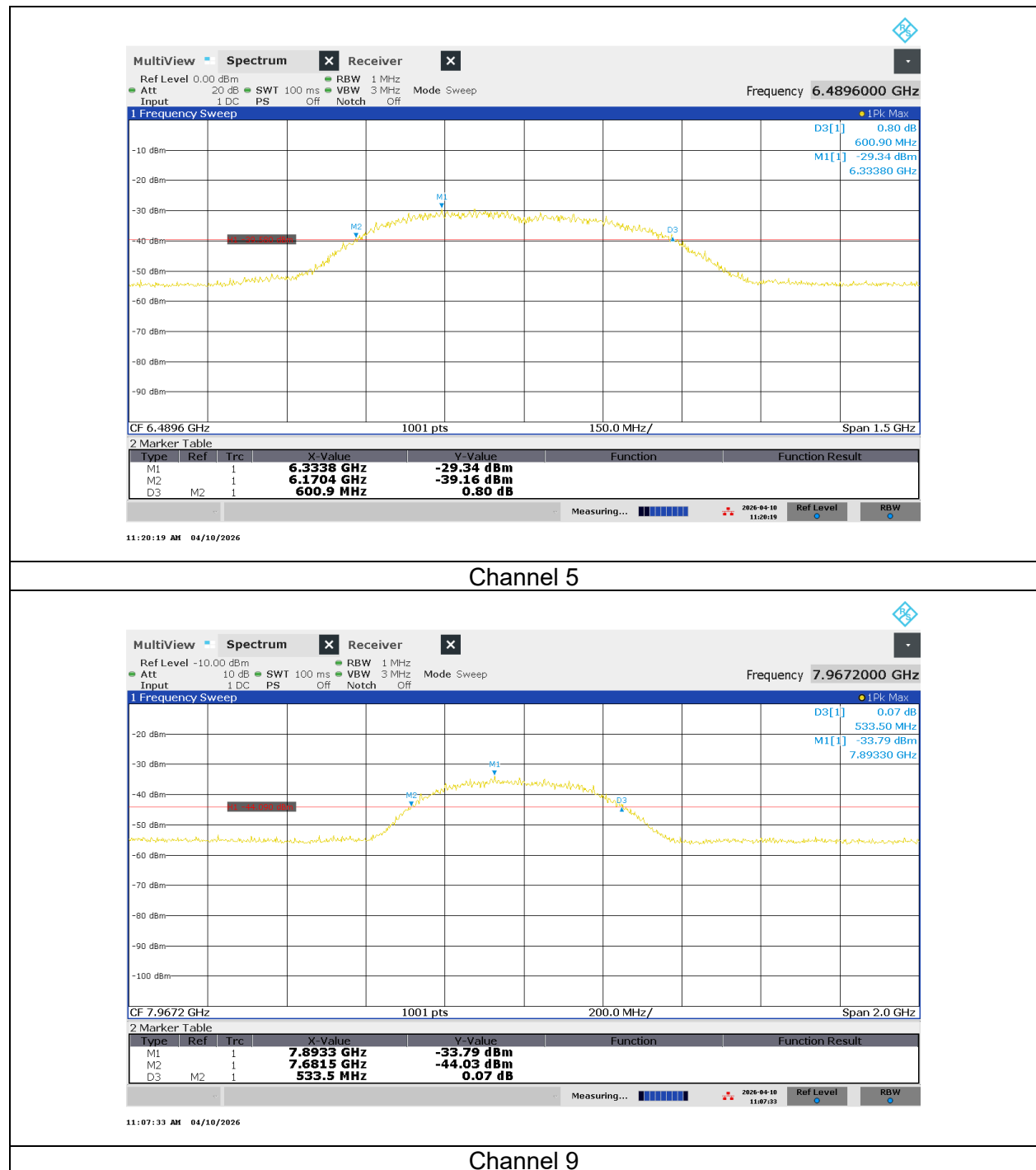
The antenna polarization that yields the highest EIRP at f_M is used to calculate the above parameters.

Calculations are made independently for each channel.

RESULTS

Employee IDs: 115620/11322/11993
Location: Chamber 1
Test Date: 2026-04-10

<u>Channel</u>	<u>F_M (GHz)</u>	<u>F_L (GHz)</u>	<u>F_H (GHz)</u>	<u>F_C (GHz)</u>	<u>-10dB BW (MHz)</u>	<u>Min. BW (MHz)</u>	<u>Margin (MHz)</u>
5	6.3338	6.1704	6.7713	6.47085	600.9	500	100.9
9	7.8933	7.6815	8.215	7.94825	533.5	500	33.5



8.3. PEAK POWER & MAXIMUM AVERAGE EMISSIONS

LIMIT

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. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in Section 15.521 of this chapter.

§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:

Frequency in MHz	EIRP in dBm
3100 – 10600	-41.3

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Section 5.3.1 (g) The peak level of the transmissions shall not exceed the peak equivalency of the average limit contained within any 50 MHz bandwidth, as defined in section 4 of the Annex.

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.

Indoor Communication, Measurement, Location Sensing and Tracking Devices	
Frequency	EIRP in 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 EIRP power is measured using an RBW of 50 MHz. Radiated emissions of these in-band measurements are performed at a 3-meter distance.

RESULTS

Employee IDs: 115620/11322/11993
Location: Chamber 1
Test Date: 2026-04-08

<u>Channel</u>	<u>Antenna Polarity</u>	<u>F_M (GHz)</u>	<u>Pk Value (dBm)</u>	<u>Pk Limit (dB)</u>	<u>Margin (dB)</u>	<u>F_M (GHz)</u>	<u>Av Value (dBm)</u>	<u>Av Limit (dB)</u>	<u>Margin (dB)</u>
5	H	6.4896	-2.61	0	-2.61	6.4556	-45.04	-41.3	-3.74
5	V	6.4891	-2.08	0	-2.08	6.3226	-44.83	-41.3	-3.53
9	H	8.0082	-6.11	0	-6.11	7.8872	-49.75	-41.3	-8.45
9	V	8.0072	-1.71	0	-1.71	7.9542	-45.17	-41.3	-3.87

Note: Worst-case plots are provided in this test report.





8.4. 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.

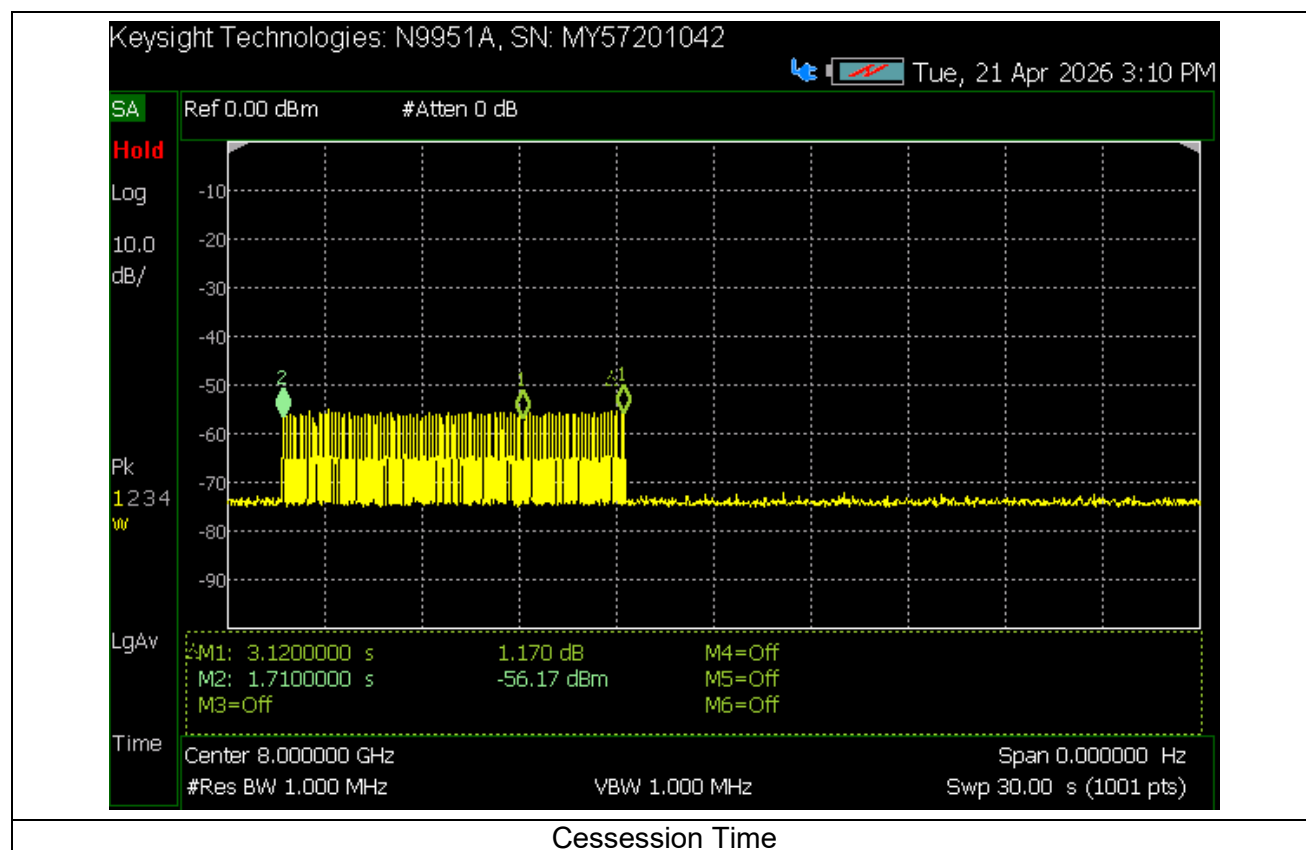
RSS-220

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 PROCEDURE

RESULTS

Employee IDs: 11322
Location: Commissioning Room
Test Date: 2026-04-21



Marker #2: Initiator and Responder established connection with each other

Marker #1: Ranging function on the Responded was stopped

Marker 1 Delta: Time from when Responder ranging was disable to when Initiator ceased transmission

The EUT ceased transmission in less than 10 seconds, thus meeting the criteria.

8.5. RADIATED EMISSIONS AT OR 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 Section 15.209 of this chapter.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

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

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

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Section 3.4 Radiated emissions at or below 960 MHz for all subclauses 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/meter)	Measurement distance (meters)	E.i.r.p. (dBmW)
0.009-0.490	2400/F (F in kHz)	300	10 log (17.28 / F ²) (F in kHz)
0.490-1.705	24000/F (F in kHz)	30	10 log (17.28 / F ²) (F in kHz)
1.705-30.0	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 9-90kHz and 110-490kHz are based on measurements employing an average detector.

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.

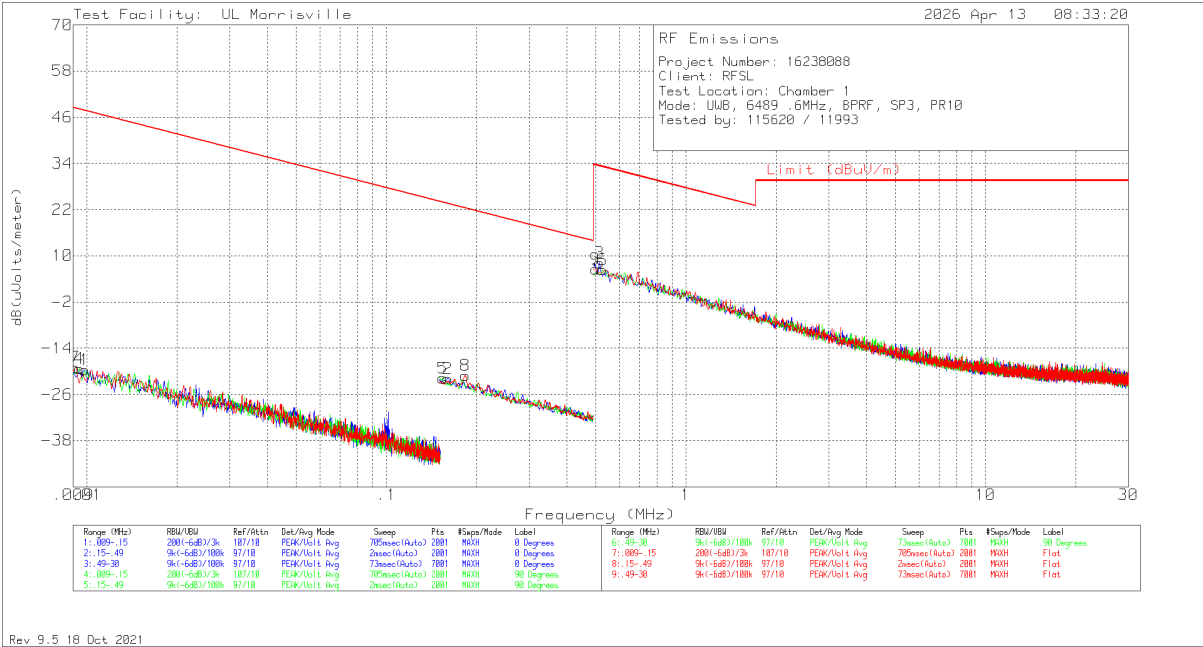
For below 30 MHz testing, investigation was done on three antenna orientations: RX antenna Face-on, Face-off and horizontal (parallel to ground).

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

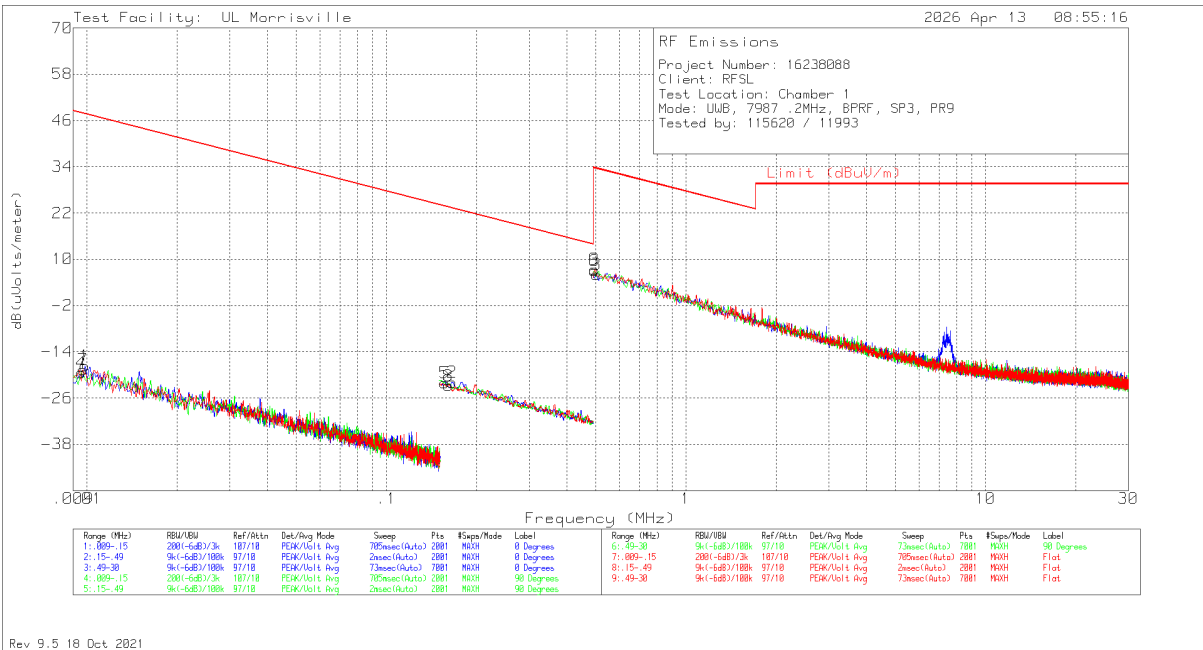
8.5.1. RADIATED EMISSIONS 9 kHz – 30 MHz



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ANT (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
7	.00914	41.29	Pk	19.6	.1	-80	-19.01	48.38	-67.39	0-360	Flat
4	.00943	41.17	Pk	19.4	.1	-80	-19.33	48.12	-67.45	0-360	90 degs
1	.00985	41.21	Pk	19.1	.1	-80	-19.59	47.73	-67.32	0-360	0 degs
5	.15451	47.09	Pk	11	.1	-80	-21.81	23.83	-45.64	0-360	90 degs
2	.16063	47.07	Pk	11	.1	-80	-21.83	23.49	-45.32	0-360	0 degs
8	.18307	47.82	Pk	11	.1	-80	-21.08	22.35	-43.43	0-360	Flat
9	.49843	35.43	Pk	11	.1	-40	6.53	33.65	-27.12	0-360	Flat
3	.5153	37.1	Pk	11	.1	-40	8.2	33.36	-25.16	0-360	0 degs
6	.52794	35.31	Pk	11	.1	-40	6.41	33.15	-26.74	0-360	90 degs

Pk - Peak detector

Channel 5

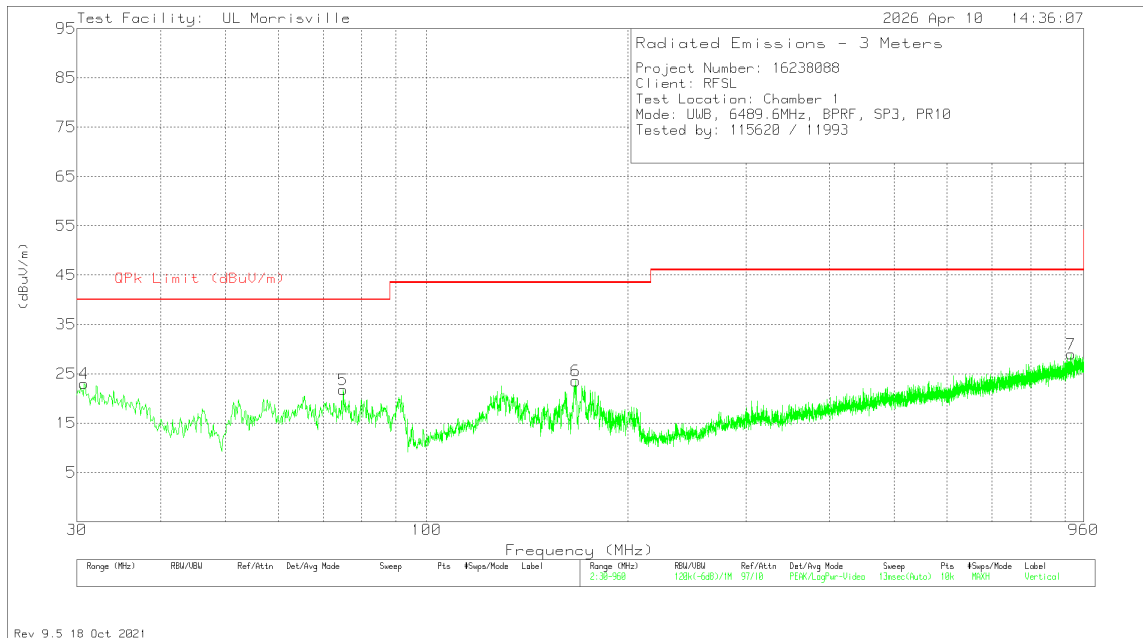
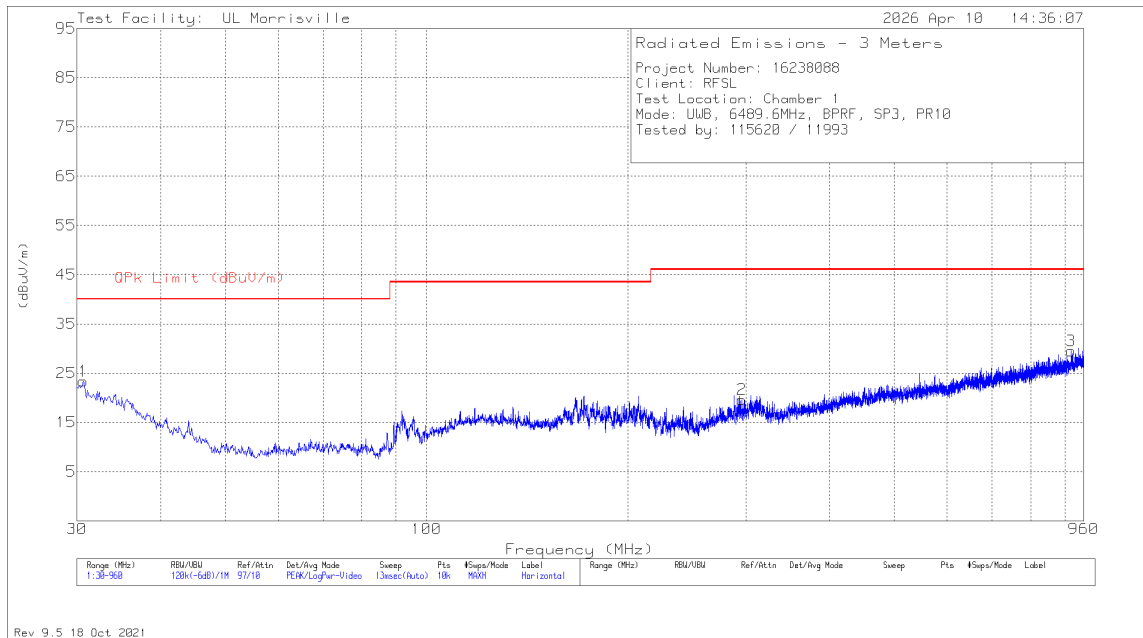


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ANT (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
4	.00957	41.19	Pk	19.3	.1	-80	-19.41	47.99	-67.4	0-360	90 degs
7	.00971	42.05	Pk	19.2	.1	-80	-18.65	47.86	-66.51	0-360	Flat
1	.00985	43.07	Pk	19.1	.1	-80	-17.73	47.73	-65.46	0-360	0 degs
5	.1568	46.82	Pk	11	.1	-80	-22.08	23.7	-45.78	0-360	90 degs
8	.16071	46.1	Pk	11	.1	-80	-22.8	23.48	-46.28	0-360	Flat
2	.16564	47.01	Pk	11	.1	-80	-21.89	23.22	-45.11	0-360	0 degs
6	.49422	36	Pk	11	.1	-40	7.1	33.73	-26.63	0-360	90 degs
9	.49422	36.32	Pk	11	.1	-40	7.42	33.73	-26.31	0-360	Flat
3	.50265	35	Pk	11	.1	-40	6.1	33.58	-27.48	0-360	0 degs

Pk - Peak detector

Channel 9

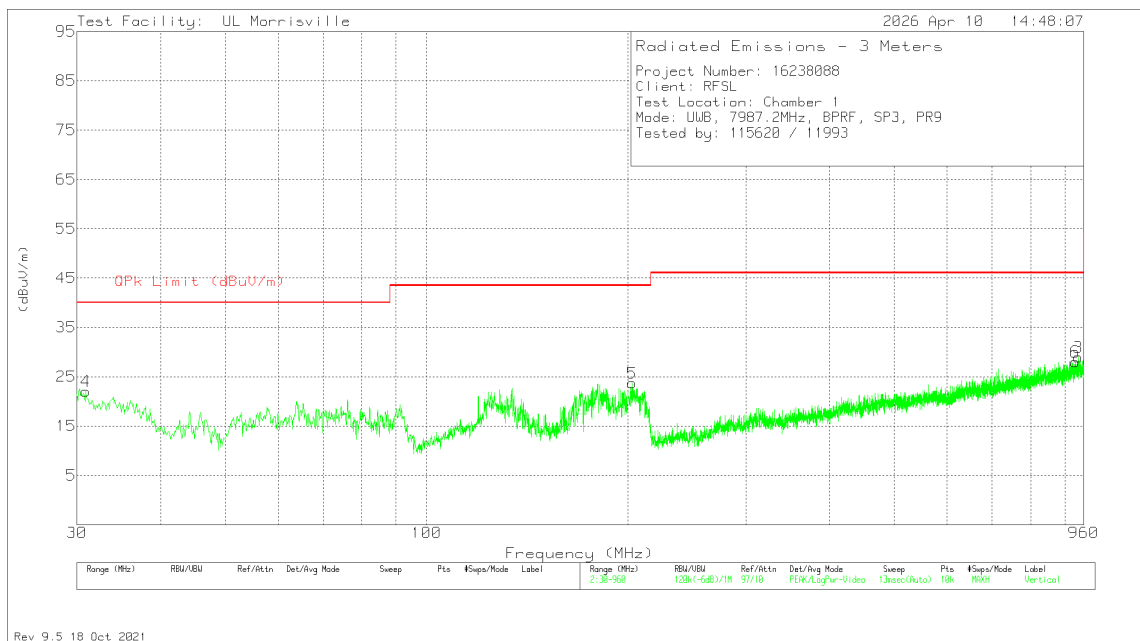
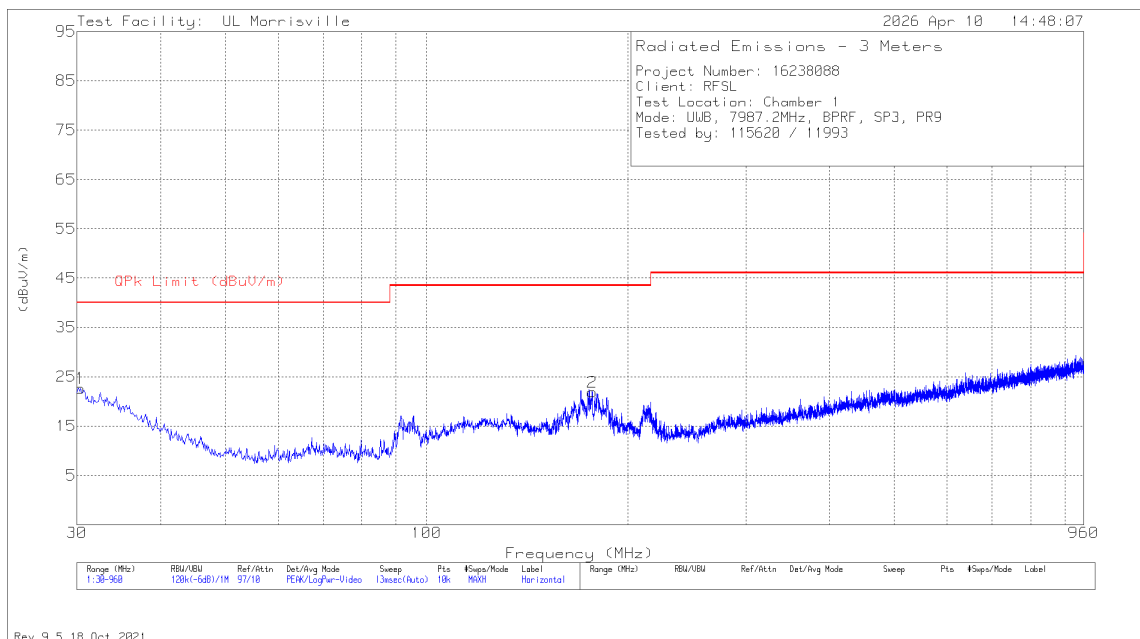
8.5.2. RADIATED EMISSIONS 30 – 960 MHz



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90629 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.651	28.07	Pk	26.5	-31.2	23.37	40	-16.63	0-360	100	H
4	30.744	27.91	Pk	26.4	-31.3	23.01	40	-16.99	0-360	100	V
5	75.012	38.58	Pk	14.4	-31.2	21.78	40	-18.22	0-360	100	V
6	167.175	35.46	Pk	18.3	-30.2	23.56	43.52	-19.96	0-360	100	V
2	295.794	29.45	Pk	19.4	-29.2	19.65	46.02	-26.37	0-360	100	H
7	918.708	26.85	Pk	28.7	-26.6	28.95	46.02	-17.07	0-360	100	V
3	919.173	27.53	Pk	28.7	-26.7	29.53	46.02	-16.49	0-360	200	H

Pk - Peak detector

Channel 5



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90629 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.372	27.07	Pk	26.8	-31.2	22.67	40	-17.33	0-360	399	H
4	30.93	27.24	Pk	26.3	-31.5	22.04	40	-17.96	0-360	100	V
2	176.847	34.38	Pk	17.6	-30.1	21.88	43.52	-21.64	0-360	199	H
5	202.701	35.32	Pk	18.5	-30.1	23.72	43.52	-19.8	0-360	100	V
6	933.123	25.52	Pk	28.7	-26.2	28.02	46.02	-18	0-360	100	V
3	942.051	25.45	Pk	28.9	-25.4	28.95	46.02	-17.07	0-360	100	V

Pk - Peak detector

Channel 9

8.6. RADIATED EMISSIONS ABOVE 960 MHz

LIMITS

FCC

§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
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 above table, 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.

Indoor Communication, Measurement, Location Sensing and Tracking Devices	
Frequency	EIRP in a Resolution Bandwidth of 1 MHz
960-1610 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 5.2.1. (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	EIRP in a Resolution Bandwidth of no less than 1 kHz
1164-1240 MHz	-85.3 dBm
1559-1610 MHz	-85.3 dBm

Section 5.3.1. (f) Within the tables in paragraphs (d) and (e) above, the tighter emission limit applies at the band edges.

TEST PROCEDURE

ANSI C63.10 Clause 10.3

RSS-220 Annex

PROCEDURE FOR 0.96 TO 18 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables at a maximum distance of 0.5-meter from the EUT per ANSI C63.10 Section 6.6.4.2. A high pass filter with a pass band frequency beyond 9 GHz was used to suppress the fundamental and perform measurements up to 18 GHz. A RBW of 1MHz and VBW of 3MHz was used for these measurements.

PROCEDURE FOR 1.164 TO 1.240 GHz & 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 1-meter from the EUT per ANSI C63.10 Section 6.6.4.2. A RBW of 3 kHz and VBW of 10 kHz was used for the pre-scans. A RBW of 3kHz and VBW of 10kHz was used for these measurements.

PROCEDURE FOR 18 TO 40 GHz

Measurements are made with the antenna feeding a spectrum analyzer via a preamplifier and cables at a maximum distance of 0.5-meters from the EUT per ANSI C63.10 Section 6.6.5.

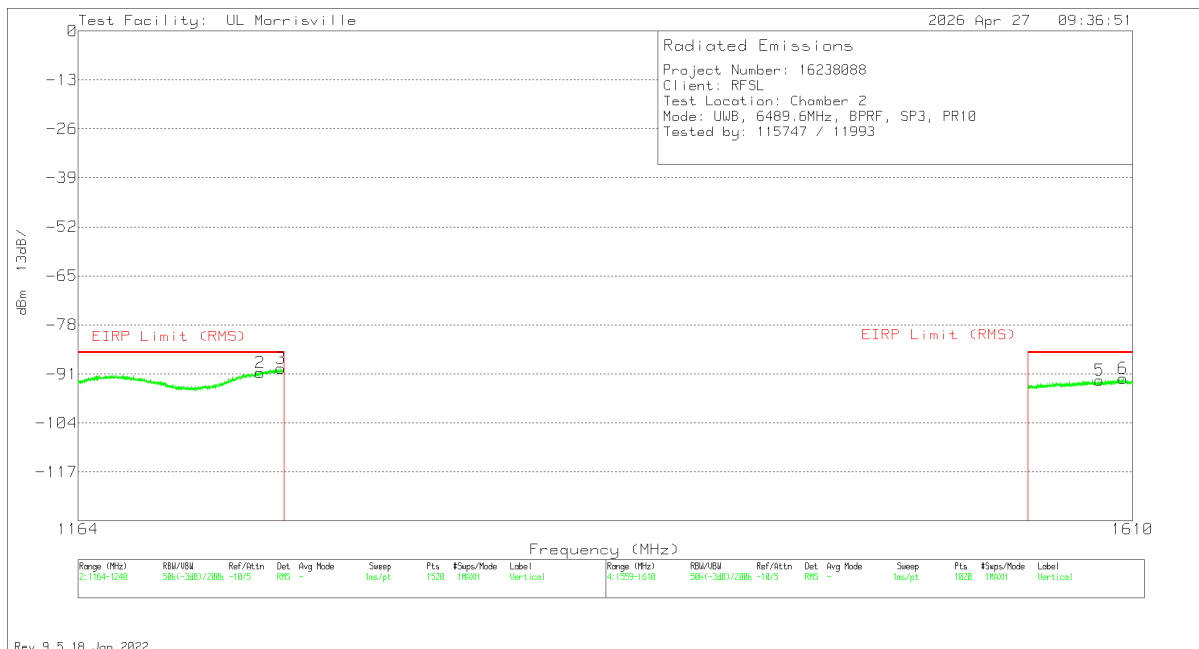
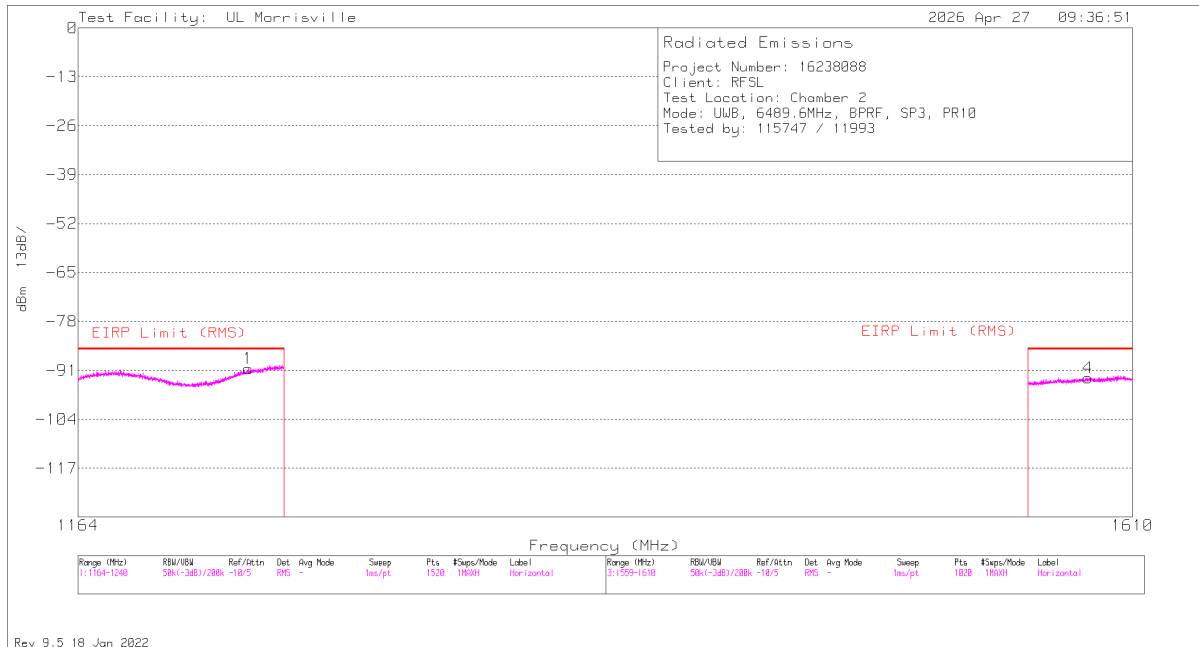
EIRP values are derived using equations G.7, G.8, G.9 from Annex G of ANSI C63.10. Correction factors are pre-loaded onto the spectrum analyzer.

Distance correction factor from 3-meter to 0.5-meter = $20 \log (0.5/3) = -15.56\text{dB}$

Distance correction factor from 3-meter to 1-meter = $20 \log (1/3) = -9.5\text{dB}$

RESULTS

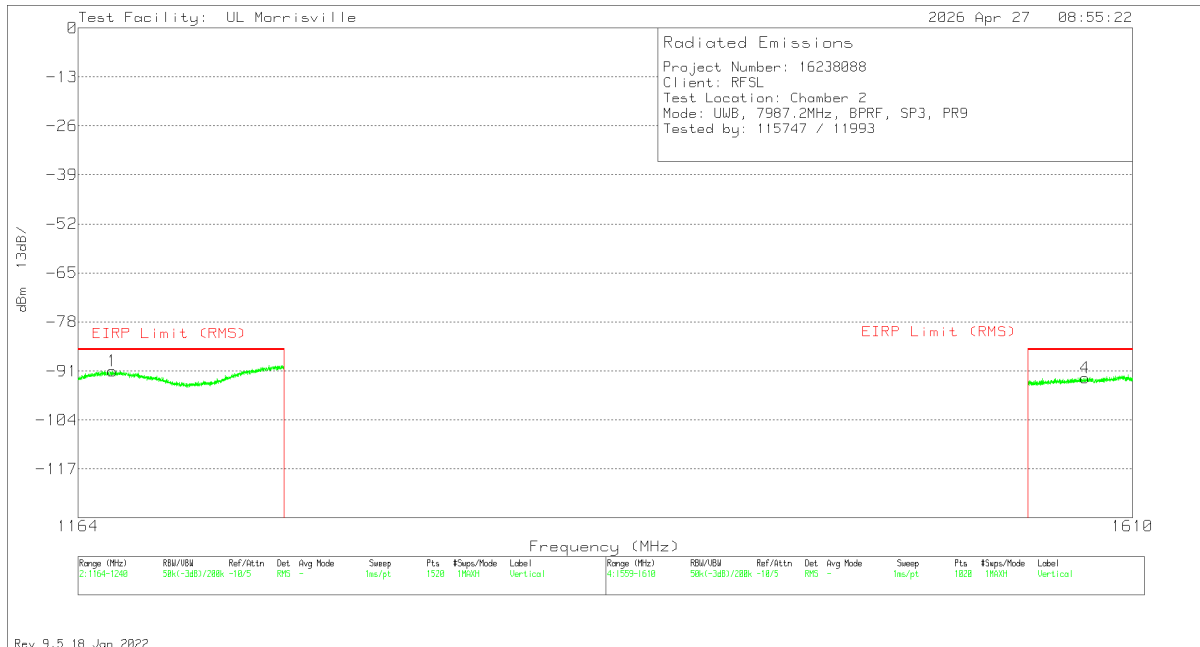
8.6.1. RADIATED EMISSIONS 1164 - 1240 MHz & 1559 - 1610 MHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	88761 ACF (dB)	Gain/Loss (dB)	Conv factor (dB)	DCF (dB)	Corrected Reading dBm	EIRP Limit (RMS)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1226.541	-71.72	RMS	29	-50.1	11.8	-9.5	-90.52	-85.3	-5.22	0	160	H
2	1231.094	-71.84	RMS	29	-50.1	11.8	-9.5	-90.64	-85.3	-5.34	119	160	V
3	1238.849	-71.16	RMS	29	-49.7	11.8	-9.5	-89.56	-85.3	-4.26	75	160	V
4	1588.129	-72.91	RMS	28.2	-50.6	11.8	-9.5	-93.01	-85.3	-7.71	329	160	H
5	1593.784	-72.51	RMS	28.2	-50.6	11.8	-9.5	-92.61	-85.3	-7.31	74	160	V
6	1605.195	-72.61	RMS	28.4	-50.3	11.8	-9.5	-92.21	-85.3	-6.91	119	160	V

RMS - RMS detection

Channel 5

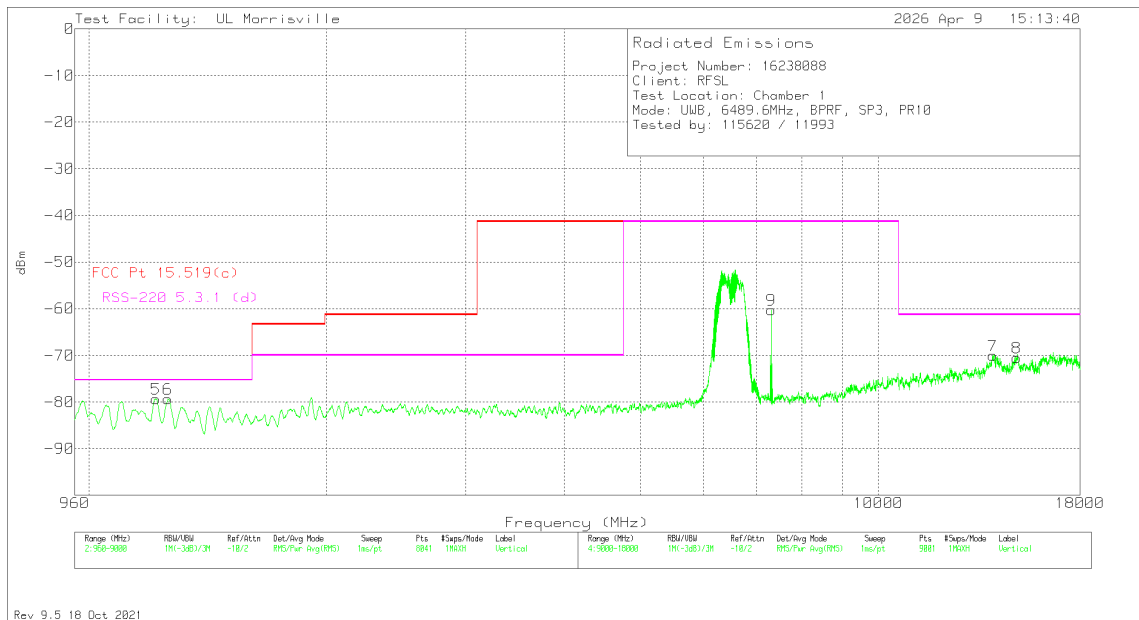
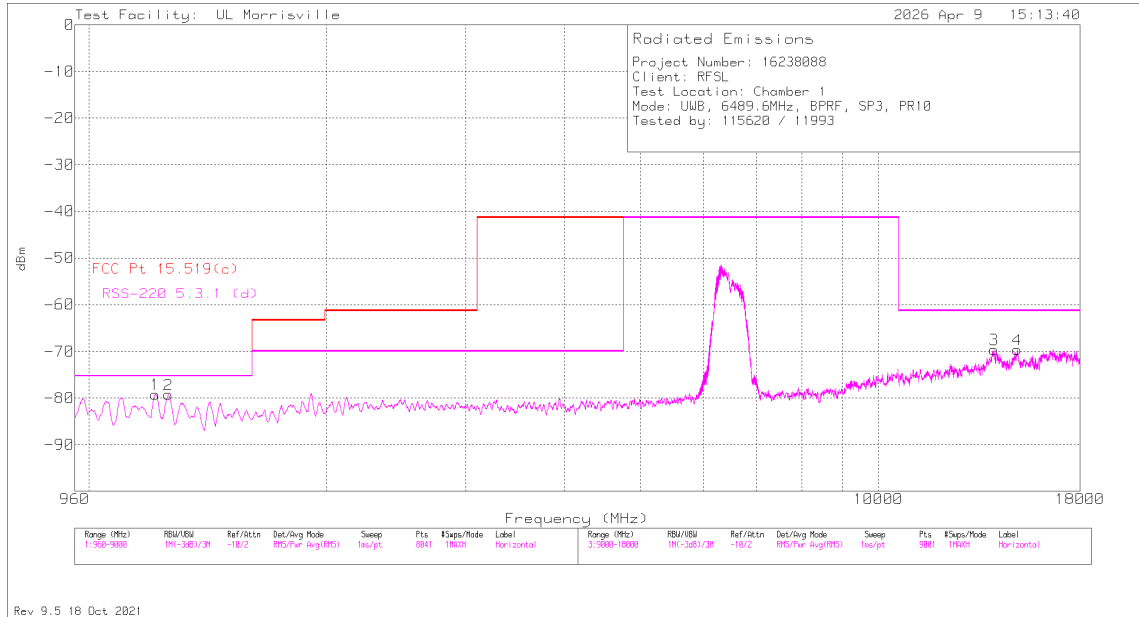


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	88761 ACF (dB)	Gain/Loss (dB)	Conv factor (dB)	DCF (dB)	Corrected Reading dBm	EIRP Limit (RMS)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1176.308	-70.78	RMS	28.4	-50.9	11.8	-9.5	-90.98	-85.3	-5.68	53	160	V
2	1226.291	-71.67	RMS	29	-50	11.8	-9.5	-90.37	-85.3	-5.07	88	160	H
3	1233.796	-70.67	RMS	29	-50	11.8	-9.5	-89.37	-85.3	-4.07	22	160	H
4	1586.727	-72.73	RMS	28.2	-50.6	11.8	-9.5	-92.83	-85.3	-7.53	185	160	V
5	1594.084	-72.84	RMS	28.2	-50.6	11.8	-9.5	-92.94	-85.3	-7.64	22	160	H
6	1605.295	-72.61	RMS	28.4	-50.3	11.8	-9.5	-92.21	-85.3	-6.91	154	160	H

RMS - RMS detection

Channel 9

8.6.2. RADIATED EMISSIONS 960 MHz – 18 GHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	88761 ACF (dB)	Gain/Loss (dB)	DCF (dB)	Conv factor (dB)	Filter (dB)	Corrected Reading dBm	FCC Pt 15.519(c)	Margin (dB)	RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1213	-58.76	RMS	28.6	-45.3	-15.6	11.8	0	-79.26	-75.3	-3.96	-75.3	-3.96	22	161	H
5	1215	-58.89	RMS	28.6	-45.2	-15.6	11.8	0	-79.29	-75.3	-3.99	-75.3	-3.99	132	161	V
6	1260	-58.61	RMS	29	-45.9	-15.6	11.8	0	-79.31	-75.3	-4.01	-75.3	-4.01	198	161	V
2	1262	-58.67	RMS	29	-45.8	-15.6	11.8	0	-79.27	-75.3	-3.97	-75.3	-3.97	110	161	H
9	7322	-45.83	RMS	35.5	-46.1	-15.6	11.8	0	-60.23	-41.3	-18.93	-41.3	-18.93	22	161	V
3	14.014	-67.25	RMS	38.7	-38	-15.6	11.8	.7	-69.65	-61.3	-8.35	-61.3	-8.35	176	161	H
4	14.997	-67.37	RMS	39.7	-38.9	-15.6	11.8	.7	-69.67	-61.3	-8.37	-61.3	-8.37	22	161	H
7	13.952	-67.75	RMS	38.6	-37.8	-15.6	11.8	.7	-70.05	-61.3	-8.75	-61.3	-8.75	294	161	V
8	14.9545	-67.16	RMS	39.7	-39.9	-15.6	11.8	.7	-70.46	-61.3	-9.16	-61.3	-9.16	96	161	V

RMS - RMS detection

Channel 5

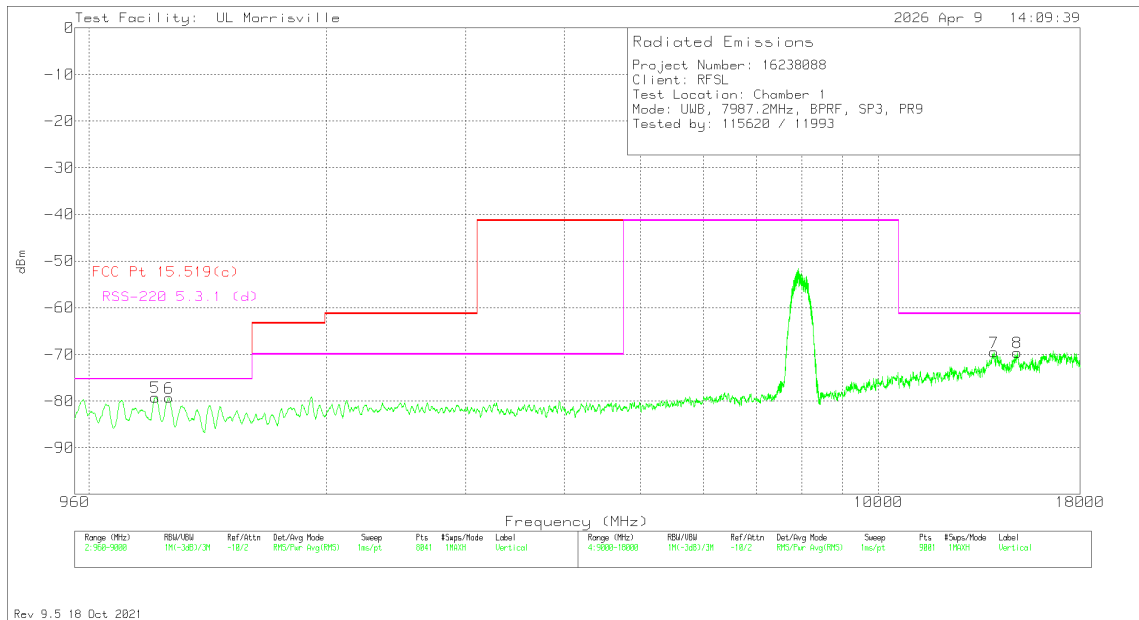
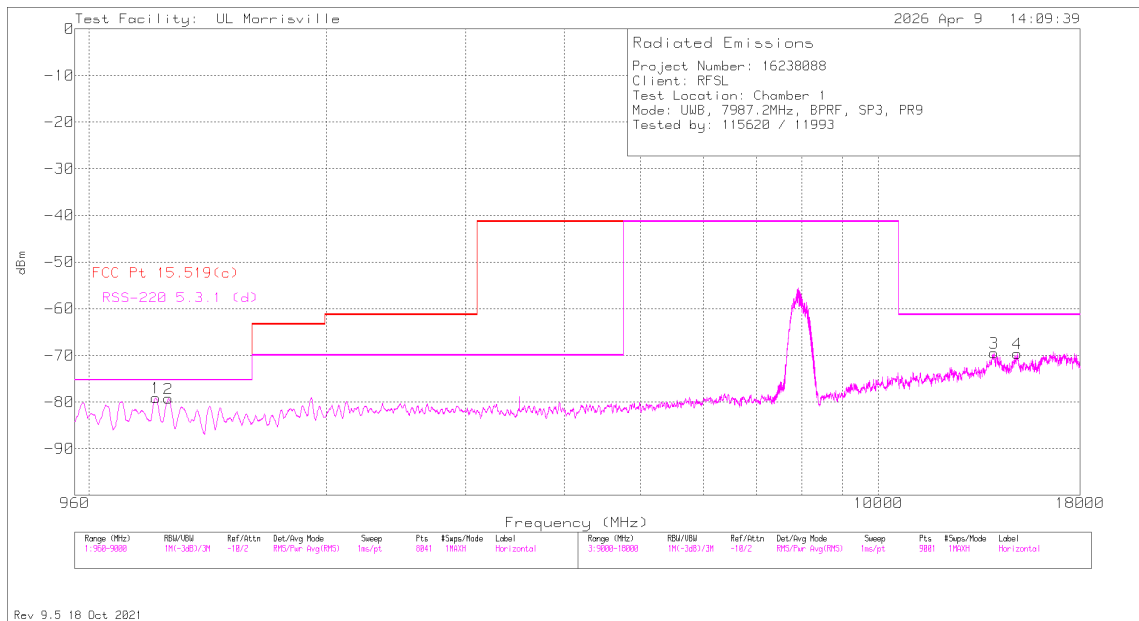
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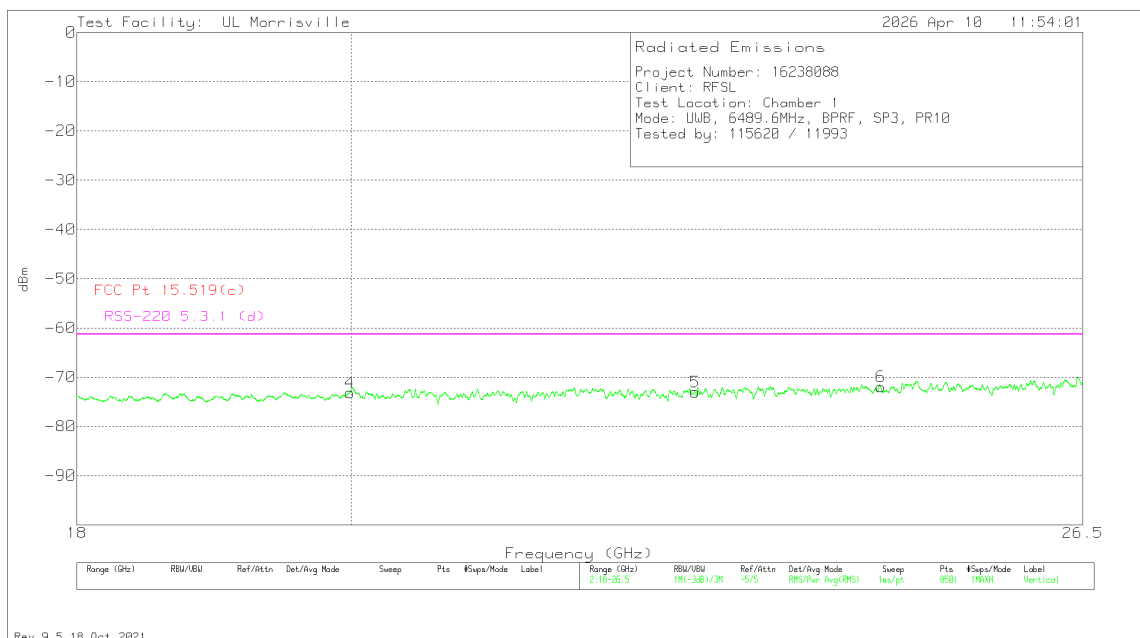
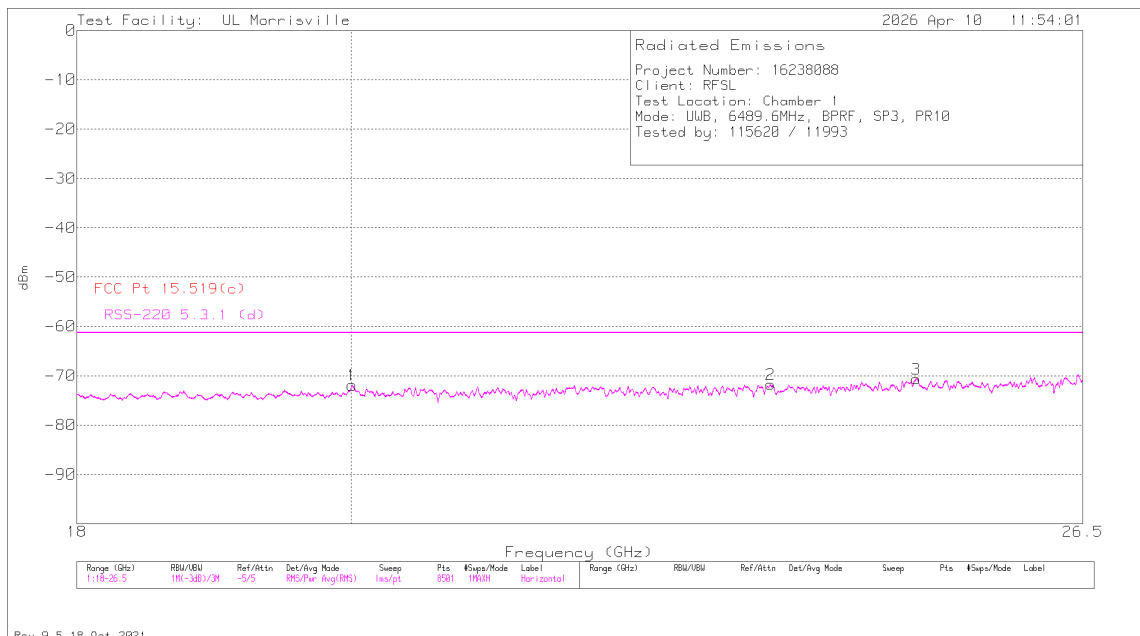


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	88761 ACF (dB)	Gain/Loss (dB)	DCF (dB)	Conv factor (dB)	Filter (dB)	Corrected Reading dBm	FCC Pt 15.519(c)	Margin (dB)	RSS-220 5.3.1 (d)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	1213	-58.72	RMS	28.6	-45.3	-15.6	11.8	0	-79.22	-75.3	-3.92	-75.3	-3.92	163	161	V
1	1216	-58.64	RMS	28.6	-45.2	-15.6	11.8	0	-79.04	-75.3	-3.74	-75.3	-3.74	110	161	H
2	1262	-58.67	RMS	29	-45.8	-15.6	11.8	0	-79.27	-75.3	-3.97	-75.3	-3.97	220	161	H
6	1263	-58.68	RMS	29	-45.8	-15.6	11.8	0	-79.28	-75.3	-3.98	-75.3	-3.98	206	161	V
7	14.012	-67.15	RMS	38.7	-38	-15.6	11.8	.7	-69.55	-61.3	-8.25	-61.3	-8.25	295	161	V
3	14.015	-67	RMS	38.7	-38.1	-15.6	11.8	.7	-69.5	-61.3	-8.2	-61.3	-8.2	176	161	H
8	14.997	-67.36	RMS	39.7	-38.9	-15.6	11.8	.7	-69.66	-61.3	-8.36	-61.3	-8.36	162	161	V
4	14.999	-67.2	RMS	39.7	-39	-15.6	11.8	.7	-69.6	-61.3	-8.3	-61.3	-8.3	220	161	H
5	1213	-58.72	RMS	28.6	-45.3	-15.6	11.8	0	-79.22	-75.3	-3.92	-75.3	-3.92	163	161	V

RMS - RMS detection

Channel 9

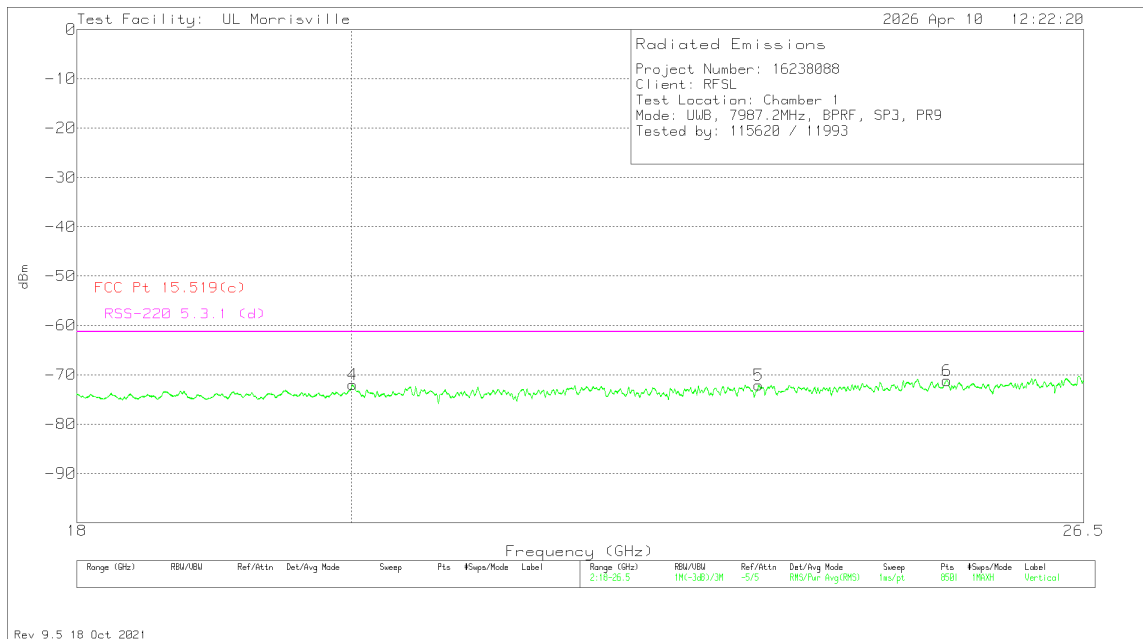
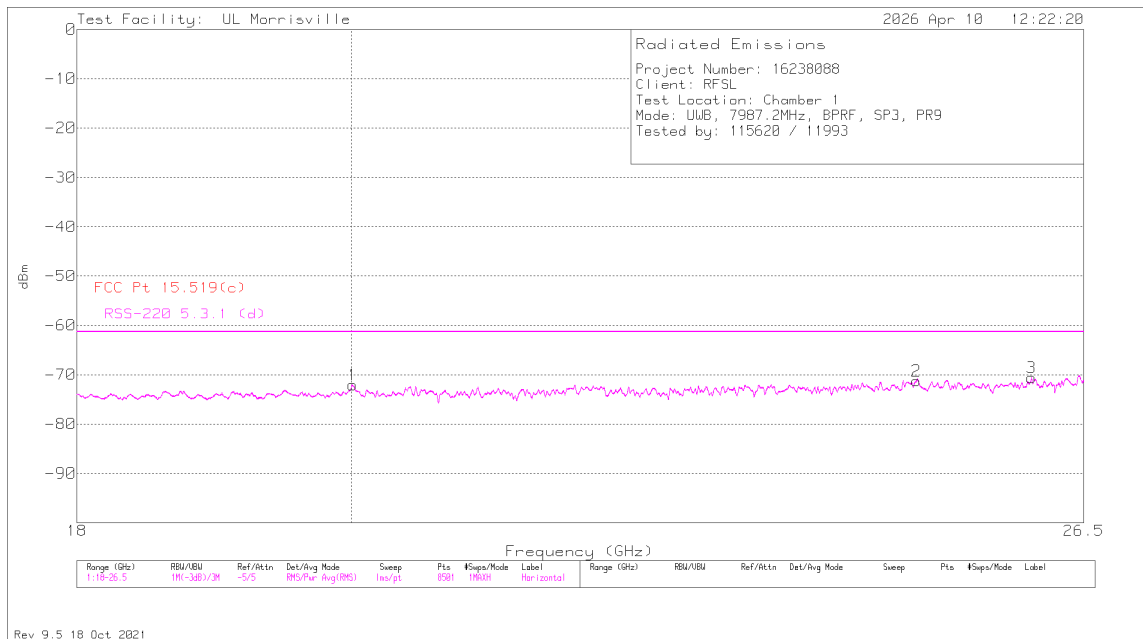
8.6.3. RADIATED EMISSIONS 18 – 26.5 GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	91186 (dB/m)	Gain/Loss (dB)	DCF (dB)	Conv factor (dB)	Corrected Reading dBm	FCC / RSS-220 Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	19.992	-68.45	RMS	32.7	-39.7	-9.5	11.8	-73.15	-61.3	-11.85	162	155	V
1	20.009	-68.22	RMS	32.6	-38.6	-9.5	11.8	-71.92	-61.3	-10.62	154	155	H
5	22.829	-69.52	RMS	33.5	-39.3	-9.5	11.8	-73.02	-61.3	-11.72	338	155	V
2	23.502	-68.96	RMS	34	-39.1	-9.5	11.8	-71.76	-61.3	-10.46	0	155	H
6	24.519	-69.64	RMS	34.1	-38.7	-9.5	11.8	-71.94	-61.3	-10.64	185	155	V
3	24.855	-69.07	RMS	34.1	-38	-9.5	11.8	-70.67	-61.3	-9.37	88	155	H

RMS - RMS detection

Channel 5

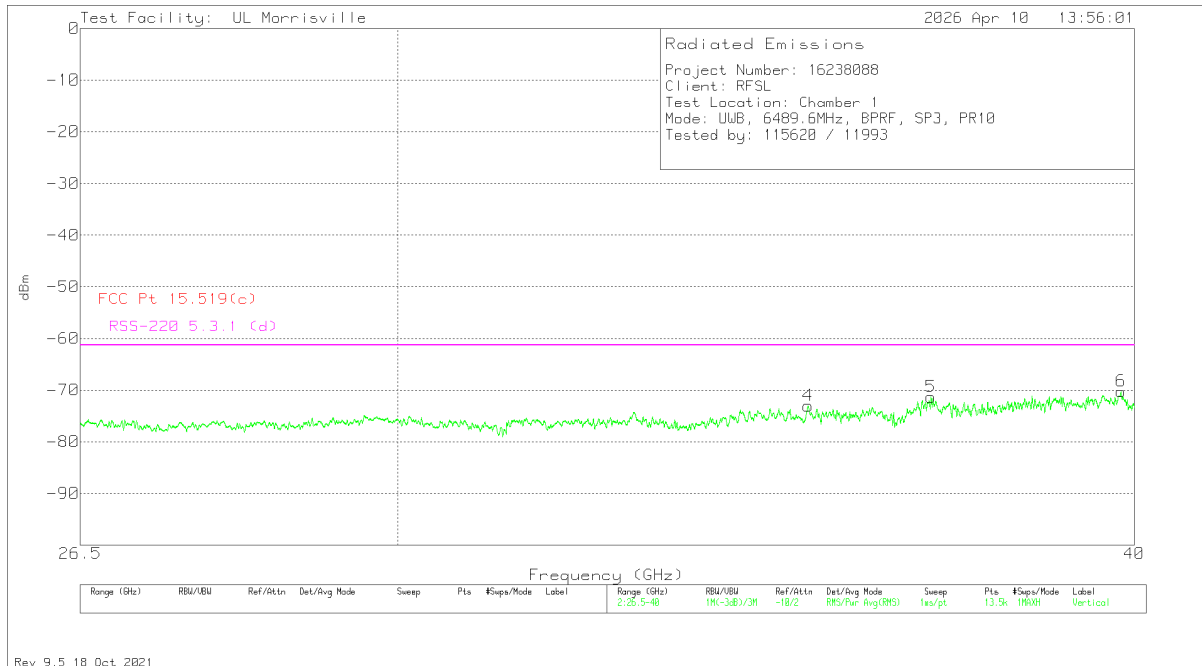
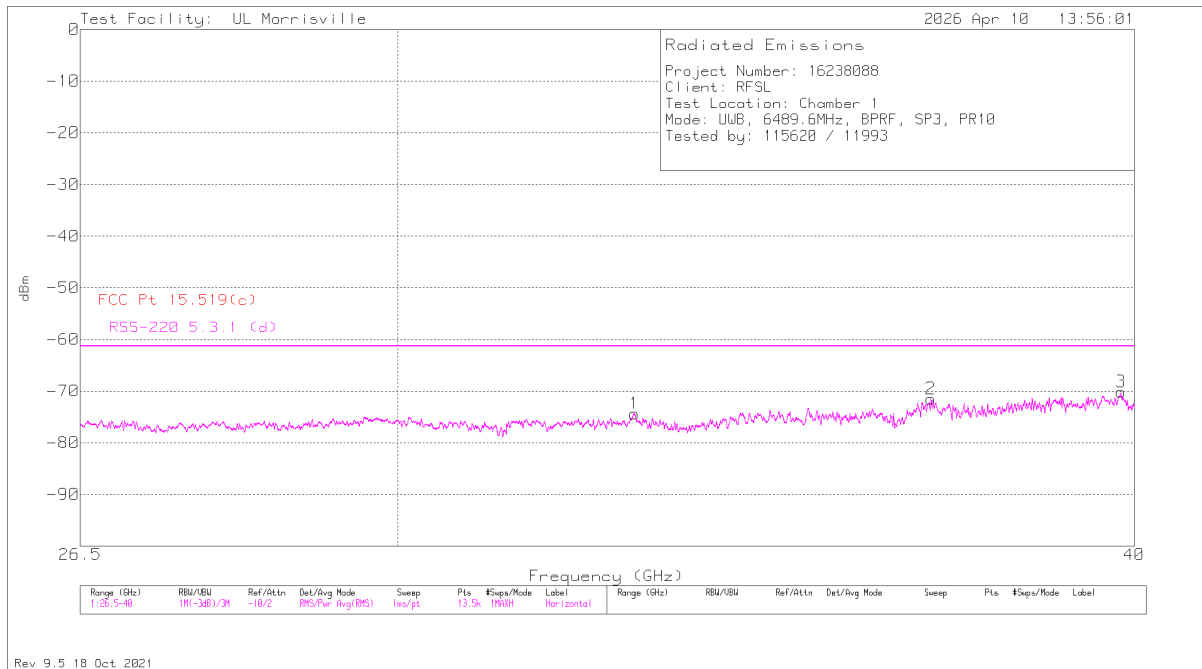


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	91186 (dB/m)	Gain/Loss (dB)	DCF (dB)	Conv factor (dB)	Corrected Reading dBm	FCC / RSS-220 Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	20.01	-68.35	RMS	32.6	-38.6	-9.5	11.8	-72.05	-61.3	-10.75	330	155	H
4	20.012	-68.29	RMS	32.6	-38.6	-9.5	11.8	-71.99	-61.3	-10.69	118	155	V
5	23.39	-69	RMS	33.9	-39.3	-9.5	11.8	-72.1	-61.3	-10.8	339	155	V
2	24.848	-69.46	RMS	34.1	-38.2	-9.5	11.8	-71.26	-61.3	-9.96	176	155	H
6	25.142	-69.49	RMS	34.1	-38.1	-9.5	11.8	-71.19	-61.3	-9.89	294	155	V
3	25.975	-70.29	RMS	34.6	-37.2	-9.5	11.8	-70.59	-61.3	-9.29	29	155	H

RMS - RMS detection

Channel 9

8.6.4. RADIATED EMISSIONS 26.5 – 40 GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	91187 (dB/m)	Gain/Loss (dB)	DCF (dB)	Conv factor (dB)	Corrected Reading dBm	FCC / RSS-220 Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.903	-71.77	RMS	36.6	-35.4	-15.6	11.8	-74.37	-61.3	-13.07	154	155	H
4	35.215	-70.93	RMS	37.3	-35.6	-15.6	11.8	-73.03	-61.3	-11.73	163	155	V
2	36.947	-70.18	RMS	37.4	-34.9	-15.6	11.8	-71.48	-61.3	-10.18	22	155	H
5	36.947	-70.02	RMS	37.4	-34.9	-15.6	11.8	-71.32	-61.3	-10.02	207	155	V
6	39.792	-72.24	RMS	38.4	-32.6	-15.6	11.8	-70.24	-61.3	-8.94	31	155	V
3	39.793	-72.24	RMS	38.4	-32.5	-15.6	11.8	-70.14	-61.3	-8.84	286	155	H

RMS - RMS detection

Channel 5

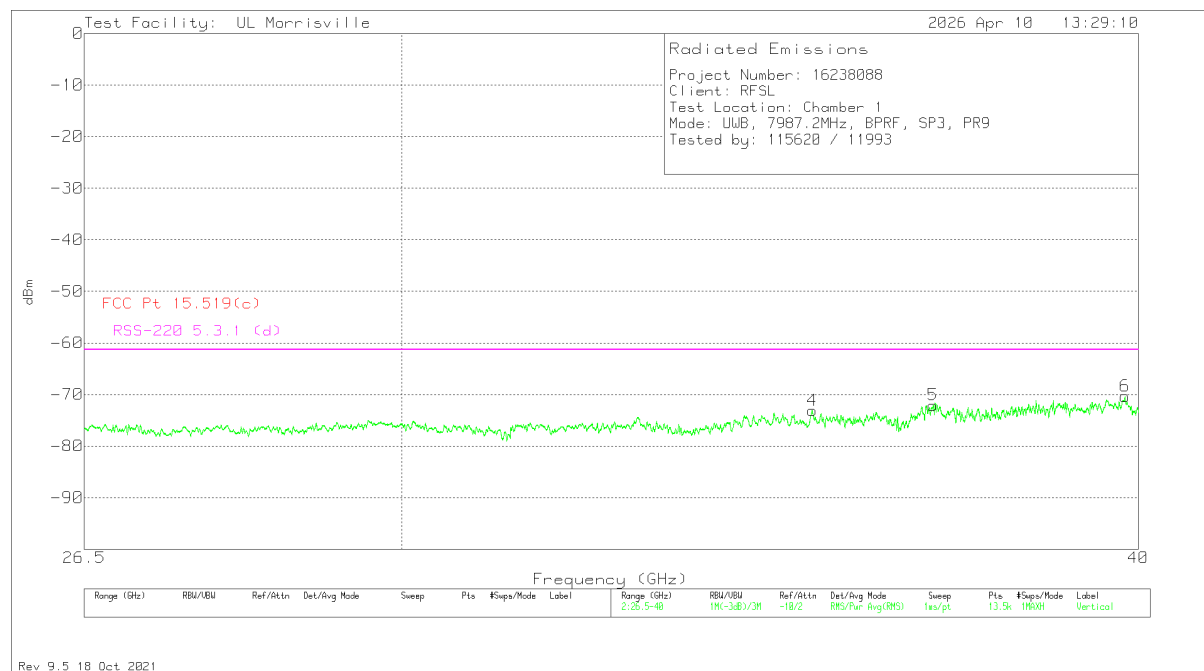
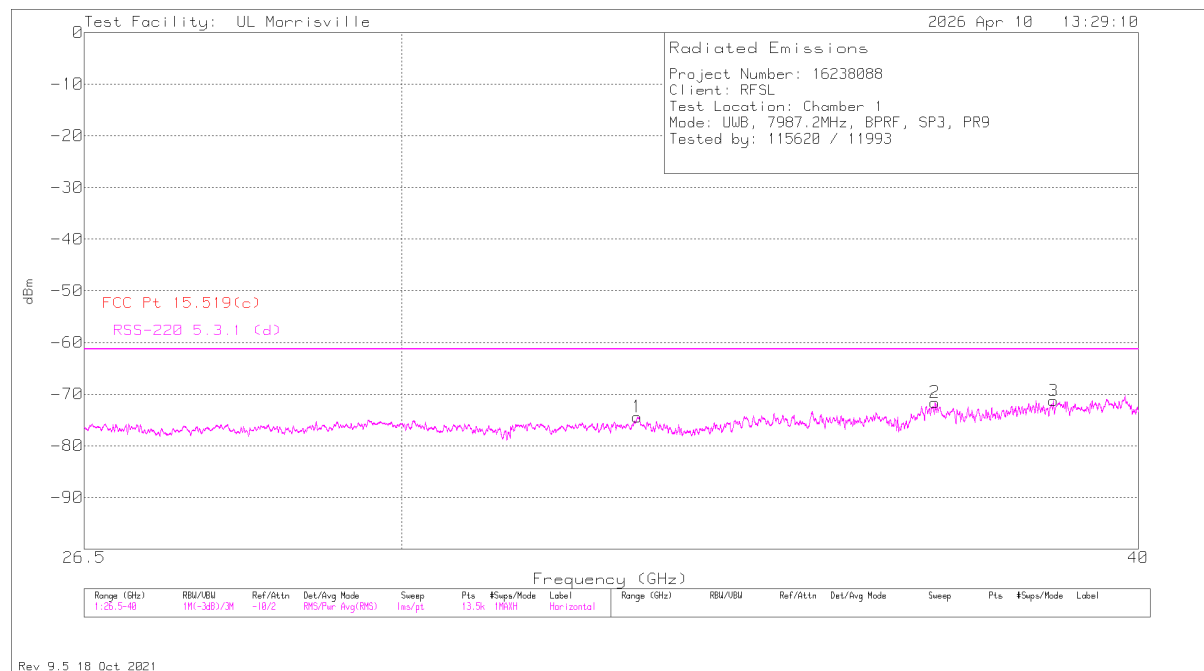
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Marker	Frequency (GHz)	Meter Reading (dBm)	Det	91187 (dB/m)	Gain/Loss (dB)	DCF (dB)	Conv factor (dB)	Corrected Reading dBm	FCC / RSS-220 Limit (dBm)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.891	-71.72	RMS	36.6	-35.5	-15.6	11.8	-74.42	-61.3	-13.12	132	155	H
4	35.216	-70.91	RMS	37.3	-35.7	-15.6	11.8	-73.11	-61.3	-11.81	96	155	V
5	36.92	-70.17	RMS	37.4	-35.5	-15.6	11.8	-72.07	-61.3	-10.77	360	155	V
2	36.947	-70.32	RMS	37.4	-34.9	-15.6	11.8	-71.62	-61.3	-10.32	66	155	H
3	38.693	-72.9	RMS	38.5	-33.1	-15.6	11.8	-71.3	-61.3	-10	242	155	H
6	39.794	-72.45	RMS	38.4	-32.5	-15.6	11.8	-70.35	-61.3	-9.05	74	155	V

RMS - RMS detection

Channel 9

8.7. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

Frequency range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Notes: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

TEST PROCEDURE

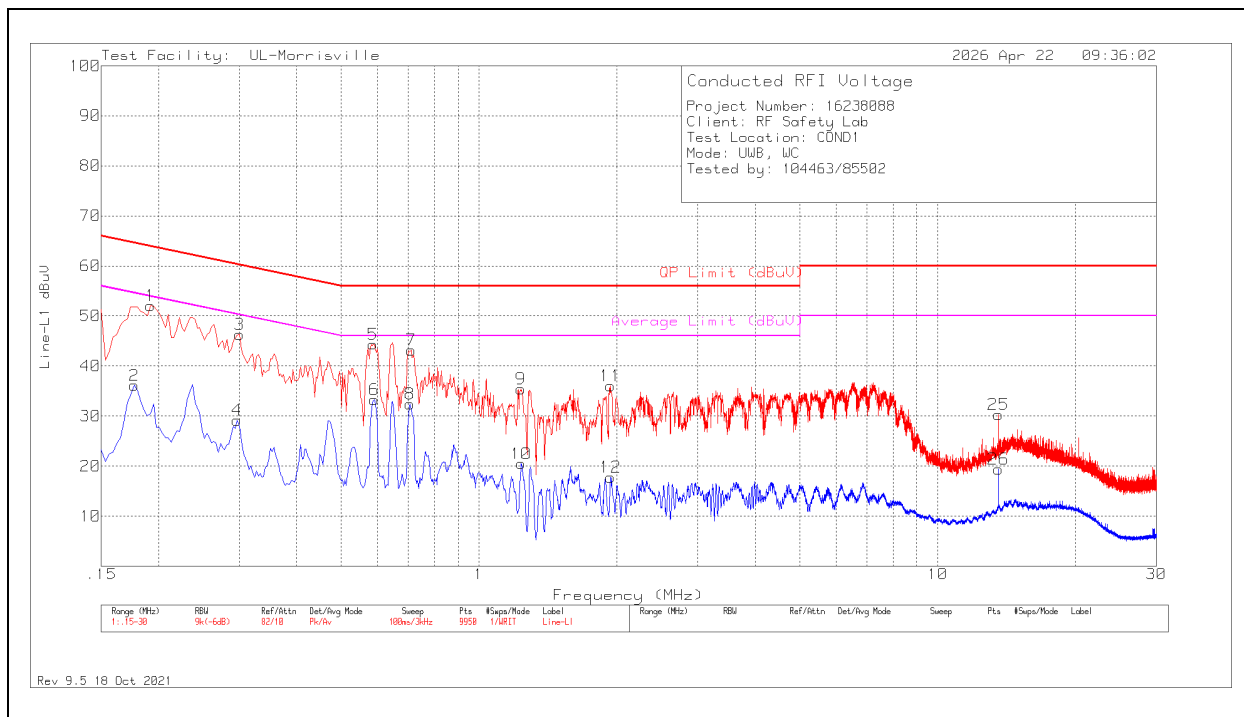
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

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

Note: Testing was performed on the channel that yielded the worst-case, highest EIRP.

LINE 1 RESULTS

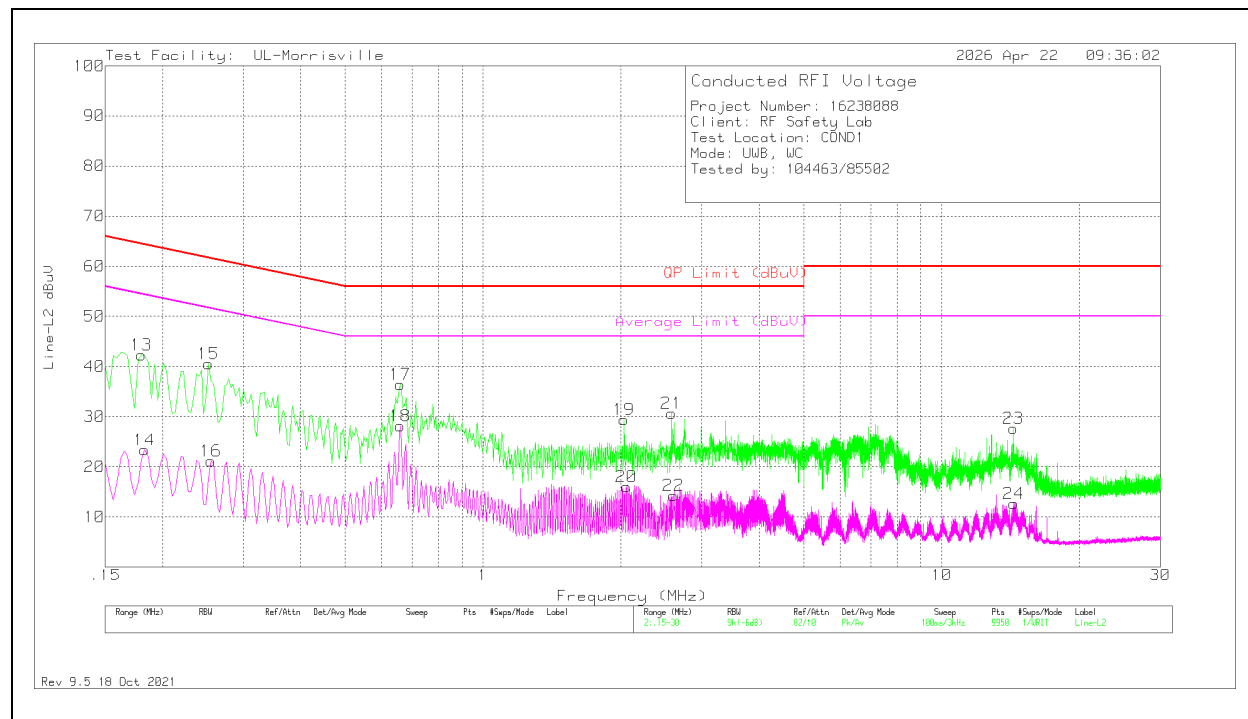


Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBUV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBUV	QP Limit (dBUV)	Margin (dB)	Average Limit (dBUV)	Margin (dB)
2	.177	26.21	Av	.2	9.7	36.11	-	-	54.63	-18.52
1	.192	42.18	Pk	.2	9.7	52.08	63.95	-11.87	-	-
4	.297	19.32	Av	.1	9.7	29.12	-	-	50.33	-21.21
3	.3	36.48	Pk	.1	9.7	46.28	60.24	-13.96	-	-
5	.588	34.66	Pk	0	9.7	44.36	56	-11.64	-	-
6	.591	23.58	Av	0	9.7	33.28	-	-	46	-12.72
8	.708	22.68	Av	0	9.7	32.38	-	-	46	-13.62
7	.711	33.47	Pk	0	9.7	43.17	56	-12.83	-	-
9	1.233	25.73	Pk	0	9.7	35.43	56	-20.57	-	-
10	1.236	10.76	Av	0	9.7	20.46	-	-	46	-25.54
11	1.935	26.37	Pk	0	9.7	36.07	56	-19.93	-	-
12	1.938	8.05	Av	0	9.7	17.75	-	-	46	-28.25
26	13.56	9.52	Av	.1	9.8	19.42	-	-	50	-30.58
25	13.563	20.42	Pk	.1	9.8	30.32	60	-29.68	-	-

Pk - Peak detector

Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.18	32.4	Pk	.2	9.7	42.3	64.49	-22.19	-	-
14	.183	13.44	Av	.2	9.7	23.34	-	-	54.35	-31.01
15	.252	30.75	Pk	.1	9.7	40.55	61.69	-21.14	-	-
16	.255	11.37	Av	.1	9.7	21.17	-	-	51.59	-30.42
17	.66	26.7	Pk	0	9.7	36.4	56	-19.6	-	-
18	.66	18.48	Av	0	9.7	28.18	-	-	46	-17.82
19	2.031	19.7	Pk	0	9.7	29.4	56	-26.6	-	-
20	2.052	6.35	Av	0	9.7	16.05	-	-	46	-29.95
21	2.58	21.01	Pk	0	9.7	30.71	56	-25.29	-	-
22	2.601	4.53	Av	0	9.7	14.23	-	-	46	-31.77
23	14.34	17.76	Pk	.1	9.8	27.66	60	-32.34	-	-
24	14.346	2.73	Av	.1	9.8	12.63	-	-	50	-37.37

Pk - Peak detector
Av - Average detection

9. SETUP PHOTOS

Refer to R16238088-EP1c for setup photos.

END OF TEST REPORT