TEST REPORT

Report Number: R14622069-E2

Applicant	:	Ascensia Diabetes Care Holdings AG Peter Merian-Strasse 90 4052 Basel, Switzerland
Model	:	7035 and 7036
FCC ID	:	VN5-CPB
IC	:	7347A-9
EUT Description	:	Contour Plus BLUE Blood Glucose Monitoring System
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C: 2024 ISED RSS-247 ISSUE 3: 2023 ISED RSS-GEN ISSUE 5 + A2: 2021

Date Of Issue:
2024-08-26

Prepared by:
UL LLC
12 Laboratory Dr.
Research Triangle Park, NC 27709 U.S.A.
TEL: (919) 549-1400

CERT #0751.06

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2023-06-23	Initial Issue	Charles Moody
V2	2024-08-26	Revised: FCC reference to 2024, RSS-247 to Issue 3, Antenna Gain to 0.57 dBi and model designations to 7035 and 7036. Added Model difference section.	Jeff Moser

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

TABLE OF CONTENTS

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Ascensia Diabetes Care Holdings AG
Peter Merian-Strasse 90 4052
Basel, Switzerland

EUT DESCRIPTION: Contour Plus BLUE Blood Glucose Monitoring System

MODEL: 7035 and 7036

SERIAL NUMBER: P403802, P403800

SAMPLE RECEIPT DATE: 2023-05-31

DATE TESTED: 2023-06-05 TO 2023-06-19

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C:2024	Complies
ISED RSS-247 Issue 3: 2023	Complies
ISED RSS-GEN Issue 5 +A2: 2021	Complies

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:

Brian Kiewra
Project Engineer
Consumer, Medical and IT Segment
UL LLC

Prepared By:

Charles Moody and Jeff Moser
Engineer and Operations Manager
Consumer, Medical and IT Segment
UL LLC

2. TEST RESULTS SUMMARY

This report contain data provided by the applicant 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:
1) Antenna gain and type (see section 6.3)
2) Cable loss (see section 9.4 and 9.5)

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 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Compliant	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power		
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Compliant	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions		
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions		
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Not Performed	EUT is coin cell battery powered and AC lines testing is not required. EUT does not obtain power through the USB-C cable

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A2, and RSS-247 Issue 3.

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 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

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}
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Contour Plus BLUE Blood Glucose Monitoring System is a quantitative measurement device of the glucose in fresh capillary whole blood drawn from the fingertips and utilizes a BLE radio. This report covers the full emissions testing of the BLE radio.

6.2. MODEL DIFFERENCES

The models are identical from an electrical schematic, board trace layout and enclosure perspective. The models use the same radio. SKU 7036 will be the commercially available SKU while SKU 7035 is the 'Free Goods' SKU.

6.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	-0.02	1.00

6.4. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

The radio utilizes a pattern antenna, with a maximum gain of 0.57 dBi.

6.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was DE (Digital Engine): 02.13 and RFE (RF Engine): 02.40.

6.6. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz and above 18GHz were performed with the EUT set to transmit at the channel with highest power spectral density as worst-case scenario. This was found to be mid channel.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low and high channels as well as middle channel for radiated emissions between 1GHz and 18GHz.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

6.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	T450	PC-0A2UQT	PD97265NGU
AC Adapter	Lenovo	ADLX65NLC2A	11S36200283ZZ1004CH2W9	N/A

I/O CABLES

I/O Cable List						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USBC	1	USBC-USBA	Shielded	<3m	Used to populate EUT USB-C port

TEST SETUP

The EUT is configured, and the radio card is exercised by using buttons located on the EUT housing.

SETUP DIAGRAMS

Please refer to R14622069-EP1 for setup diagrams

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

7. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

6 dB BW: ANSI C63.10 Subclause -11.8.1

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Output Power: ANSI C63.10 Subclause -11.9.2.3.1 Method PKPM1 Peak-reading power meter
ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

PSD: ANSI C63.10 Subclause -11.10.2 Method PKPSD (peak PSD)

Emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11 and 6.10.4

Emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1 and 6.10.5

General Radiated Spurious Emissions: ANSI C63.10-2013 Section 6.3 to 6.6

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

8. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Common Equipment				
	Conducted Room 2				
HI0090	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
134477	RF Power Meter	Keysight Technologies	N1912A	2022-08-30	2023-08-30
135124	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-07-07	2023-07-07
SA0026	Spectrum Analyzer	Keysight Technologies	N9030A	2022-08-02	2023-08-02
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16		

Test Equipment Used - Wireless Conducted Attenuators, Cables, and Couplers

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Common Equipment				
	Attenuators				
226561	SMA Coaxial 20dB Attenuator 25MHz-18GHz	CentricRF	C18S2-20	2023-02-16	2024-02-16
	Cables				
CBL100	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2023-05-28	2024-05-28

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	0.009-30MHz				
135144	Active Loop Antenna	ETS-Lindgren	6502	2023-01-17	2024-01-17
	30-1000 MHz				
90629	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2023-01-06	2024-01-06
	1-18 GHz				
89509	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-05-23	2025-05-23
	18-40 GHz				
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-626	2022-07-11	2023-07-11
	Gain-Loss Chains				
207638	Gain-loss string: 0.009-30MHz	Various	Various	2023-05-17	2024-05-17
207639	Gain-loss string: 25-1000MHz	Various	Various	2023-05-17	2024-05-17
207640	Gain-loss string: 1-18GHz	Various	Various	2023-05-17	2024-05-17
225795	Gain-loss string: 18-40GHz	Various	Various	2023-05-17	2024-05-17
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-04-10	2024-04-10
90416	Spectrum Analyzer	Keysight	N9030A	2023-06-09	2024-06-30
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
21642	Environmental Meter	Fisher Scientific	15-077-963 (s/n 210701692)	2021-08-16	2023-08-16

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

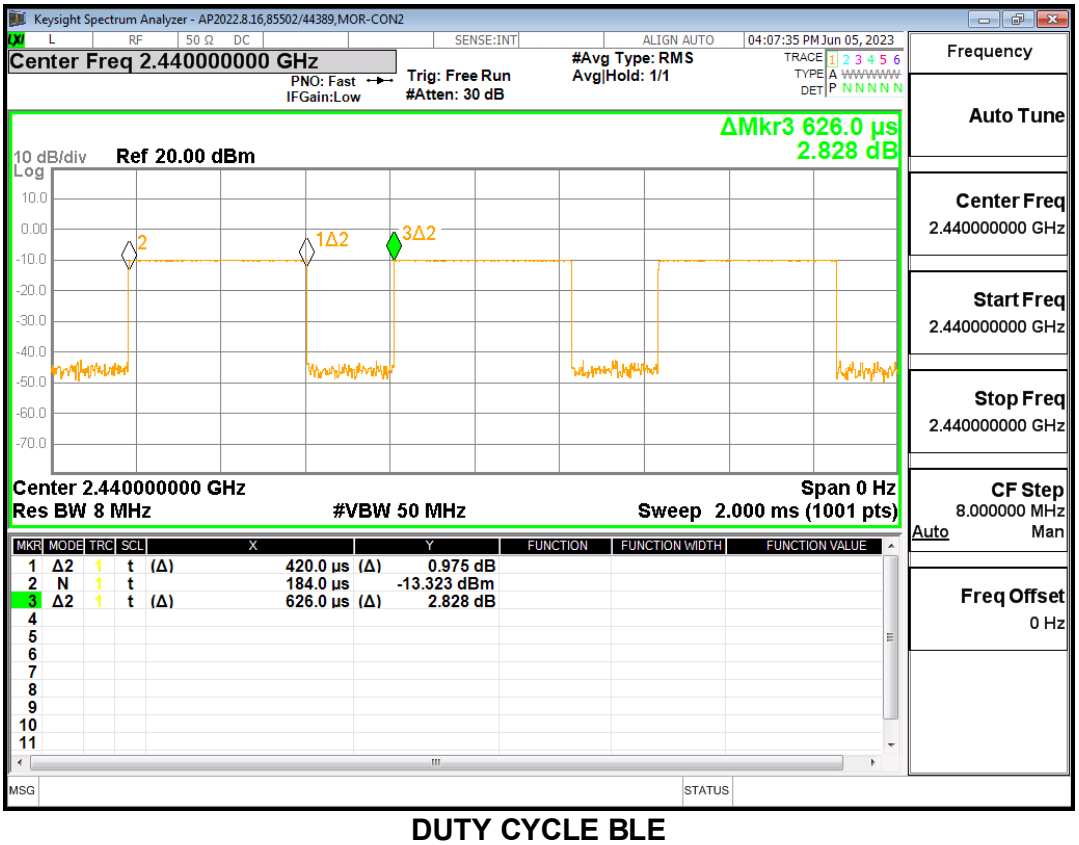
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
BLE	0.420	0.626	0.671	67.09	3.47	2.381

DUTY CYCLE PLOTS



DUTY CYCLE BLE

9.2. 99% BANDWIDTH

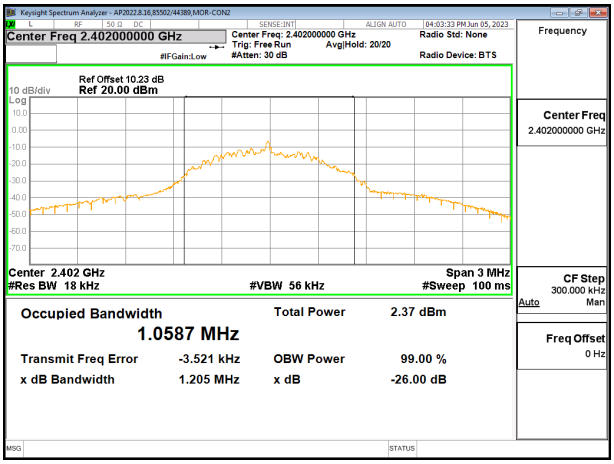
LIMITS

None; for reporting purposes only.

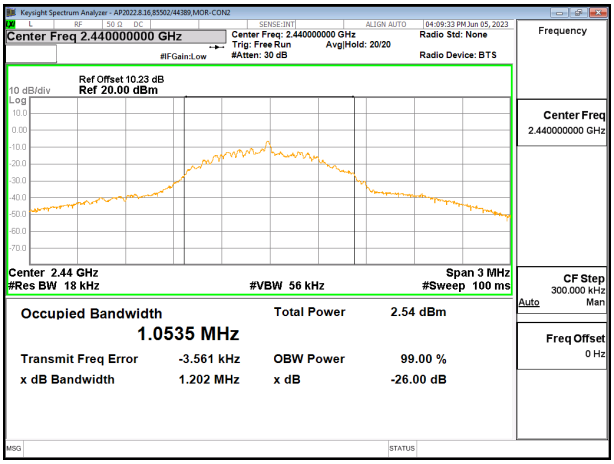
RESULTS

9.2.1. BLE (1Mbps)

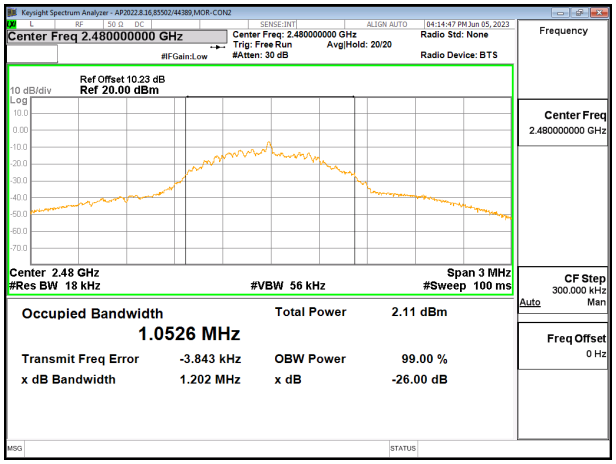
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0587
Middle	2440	1.0535
High	2480	1.0526



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.3. 6 dB BANDWIDTH

LIMITS

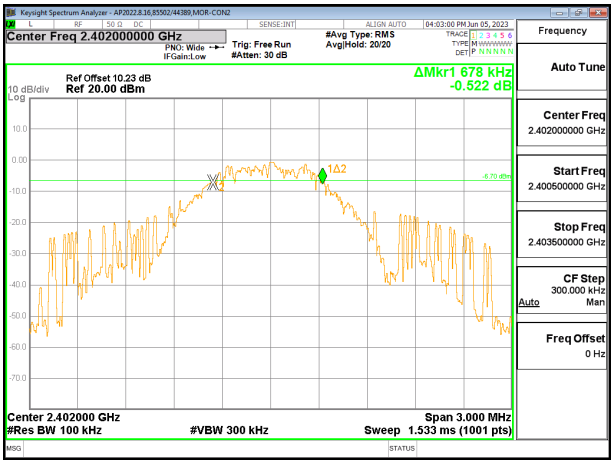
FCC §15.247 (a) (2)
RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

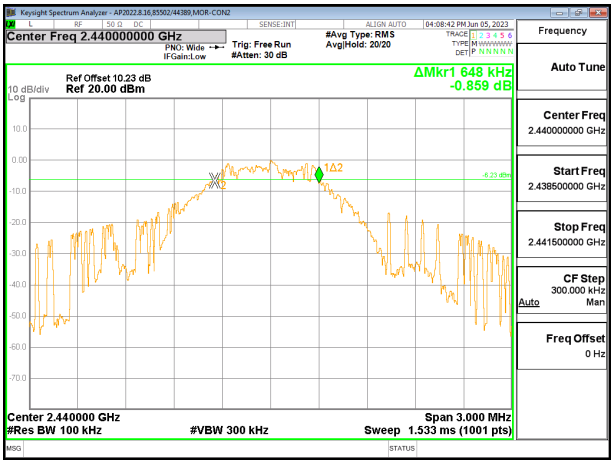
RESULTS

9.3.1. BLE (1Mbps)

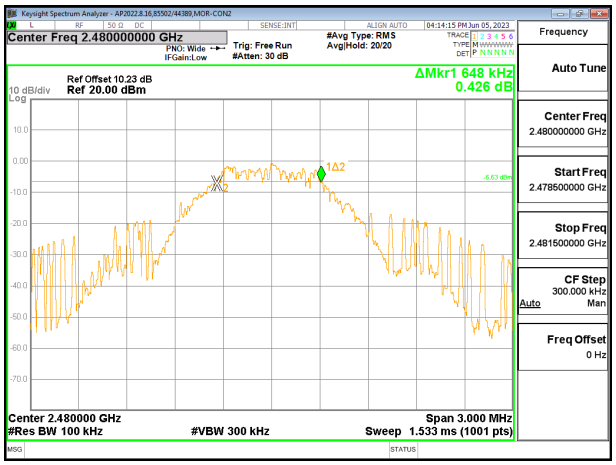
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.678	0.5
Middle	2440	0.648	0.5
High	2480	0.648	0.5



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)
RSS-247 5.4 (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE
The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.23 dB (including 9.72 dB pad, 0.35 dB test cable, and 0.16 dB EUT cable) was entered as an offset in the power meter.

RESULTS

9.4.1. BLE (1Mbps)

Tested By:	85502/44389
Date:	2023-06-05

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-0.08	30	-30.080
Middle	2440	-0.02	30	-30.020
High	2480	-0.28	30	-30.280

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE
The transmitter output is connected to a gated average power meter.

The cable assembly insertion loss of 10.23 dB (including 9.72 dB pad, 0.35 dB test cable, and 0.16 dB EUT cable) was entered as an offset in the power meter.

RESULTS

9.5.1. BLE (1Mbps)

Tested By:	85502/44389
Date:	2023-06-05

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	-0.63
Middle	2440	-0.29
High	2480	-0.56

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

9.6. POWER SPECTRAL DENSITY

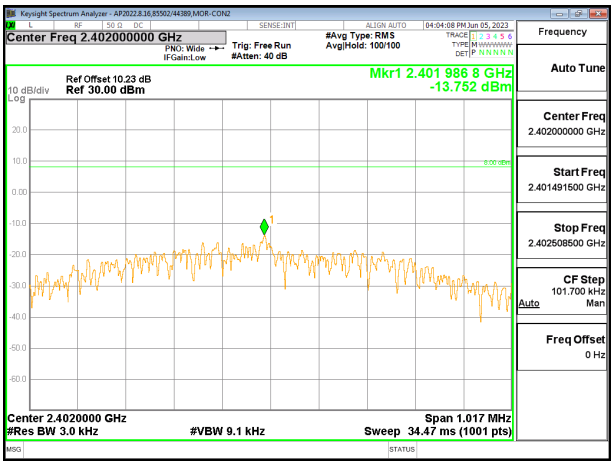
LIMITS

FCC §15.247 (e)
RSS-247 (5.2) (b)
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

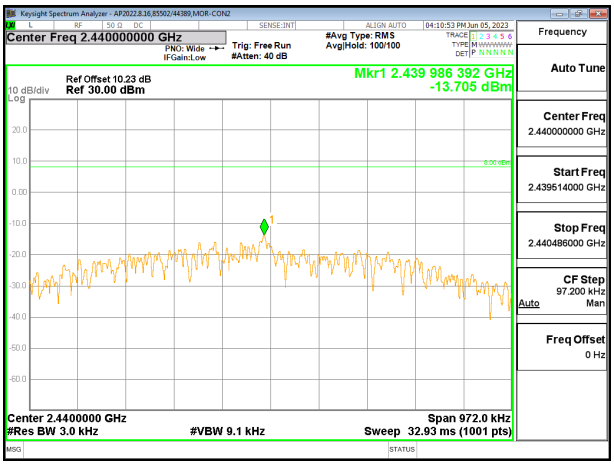
RESULTS

9.6.1. BLE (1Mbps)

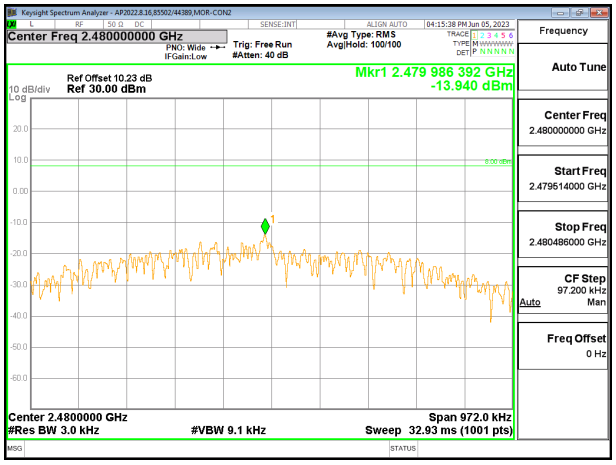
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-13.752	8	-21.75
Middle	2440	-13.705	8	-21.71
High	2480	-13.940	8	-21.94



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

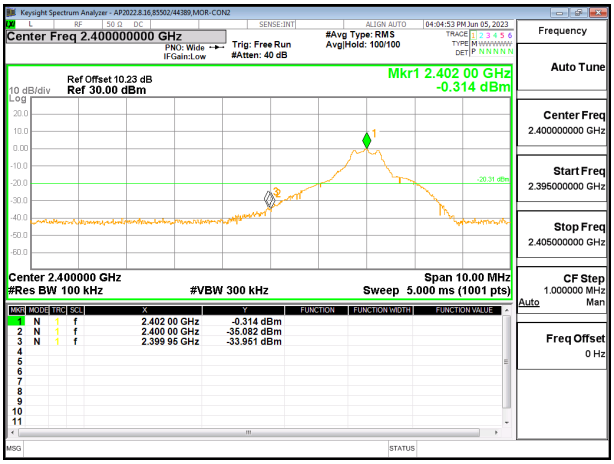
FCC §15.247 (d)
RSS-247 5.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is -20 dBc.

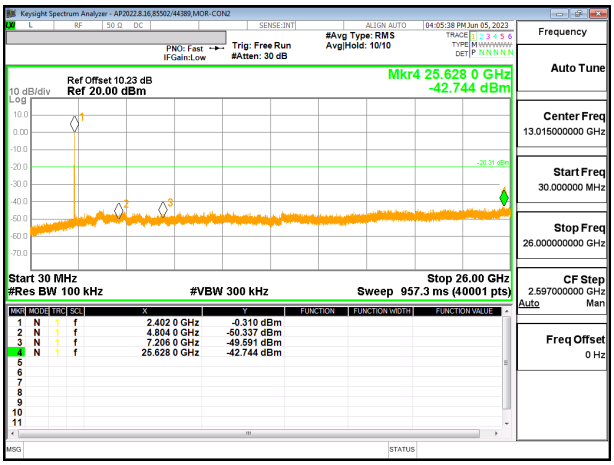
RESULTS

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

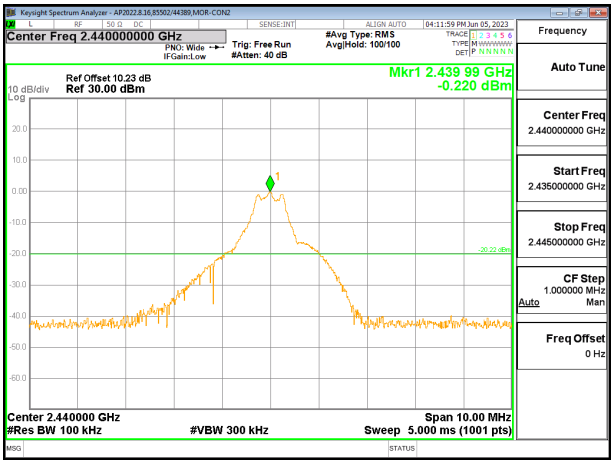
9.7.1. BLE (1Mbps)



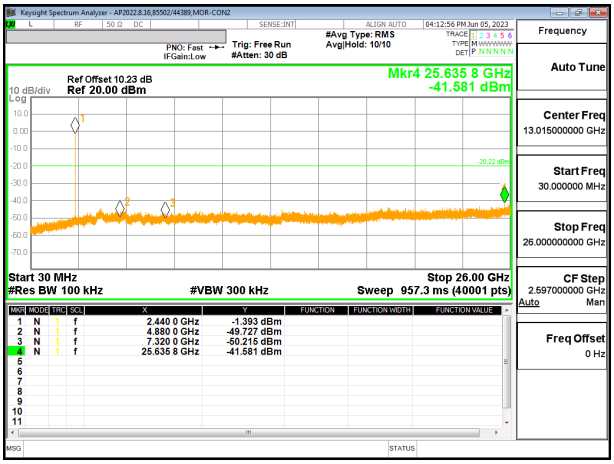
LOW CHANNEL BANDEDGE



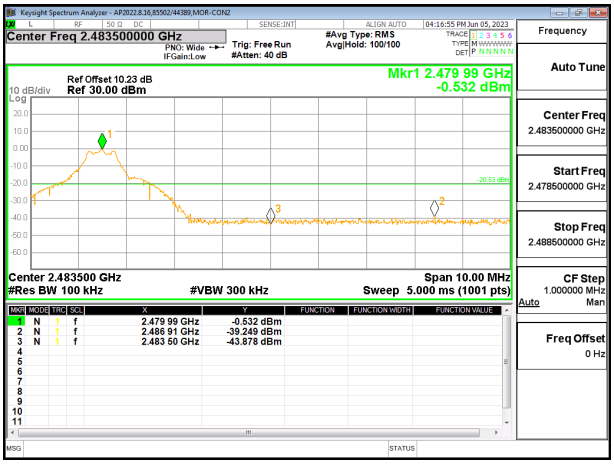
OUT-OF-BAND LOW CHANNEL



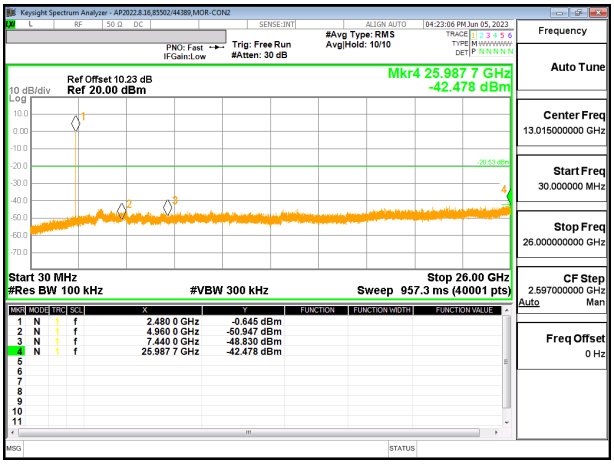
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuA/m) at 3 m
0.009-0.490	6.37/F(kHz) @ 300 m	-
0.490-1.705	63.7/F(kHz) @ 30 m	-
1.705 - 30	0.08 @ 30m	-
Frequency Range (MHz)	**Field Strength Limit (uV/m) at 3 m**	**Field Strength Limit (dBuV/m) at 3 m**
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements. Linear Voltage Averaging was used.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest power spectral density was tested.

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

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

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

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

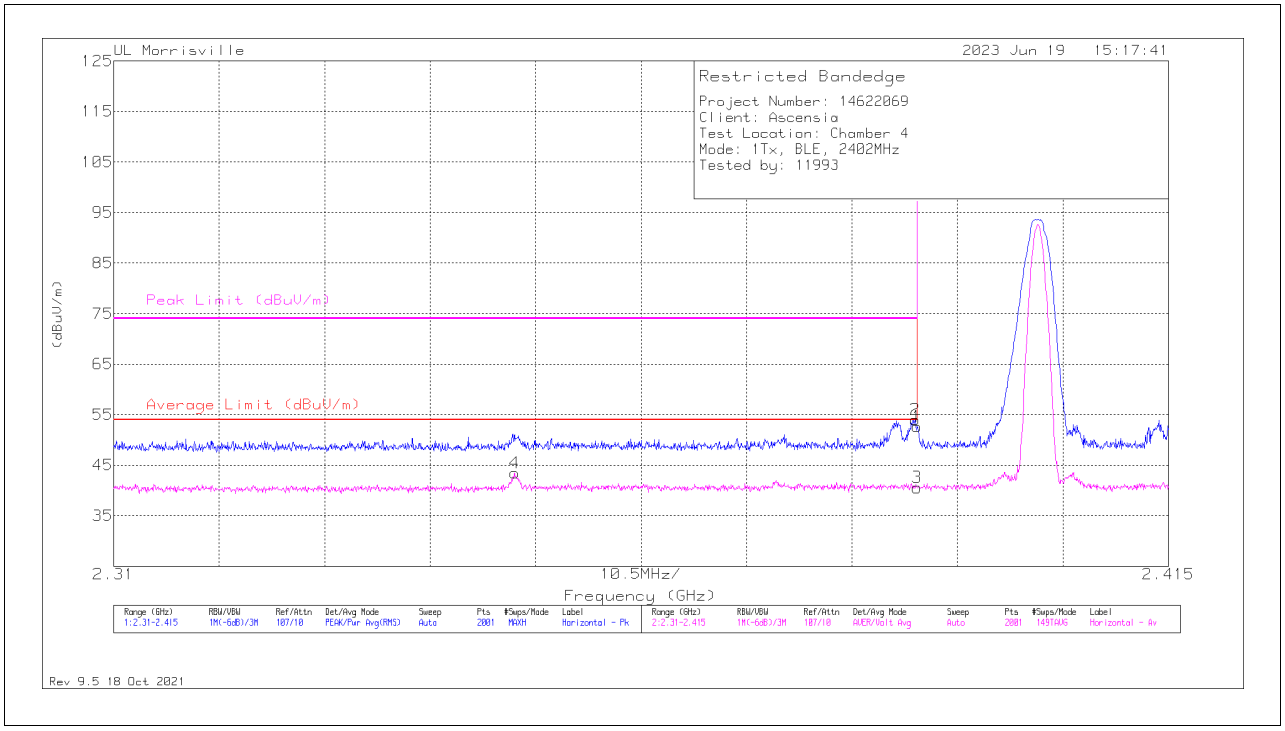
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. BLE (1Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT

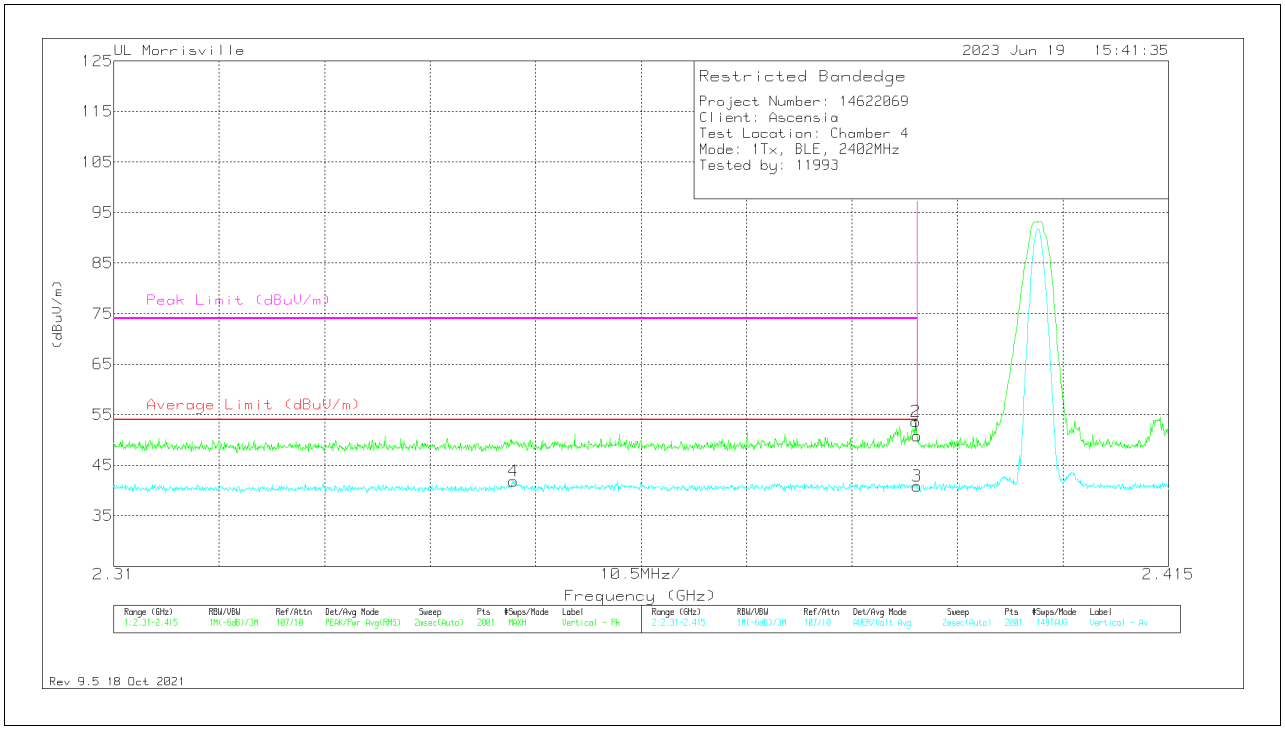


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	33.86	Pk	32	-13.2	0	52.66	-	-	74	-21.34	130	347	H
2	* ** 2.3898	35.23	Pk	32	-13.2	0	54.03	-	-	74	-19.97	130	347	H
3	* ** 2.38996	18.28	ADV	32	-13.2	3.47	40.55	54	-13.45	-	-	130	347	H
4	* ** 2.3499	21.3	ADV	31.8	-13.1	3.47	43.47	54	-10.53	-	-	130	347	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

VERTICAL RESULT



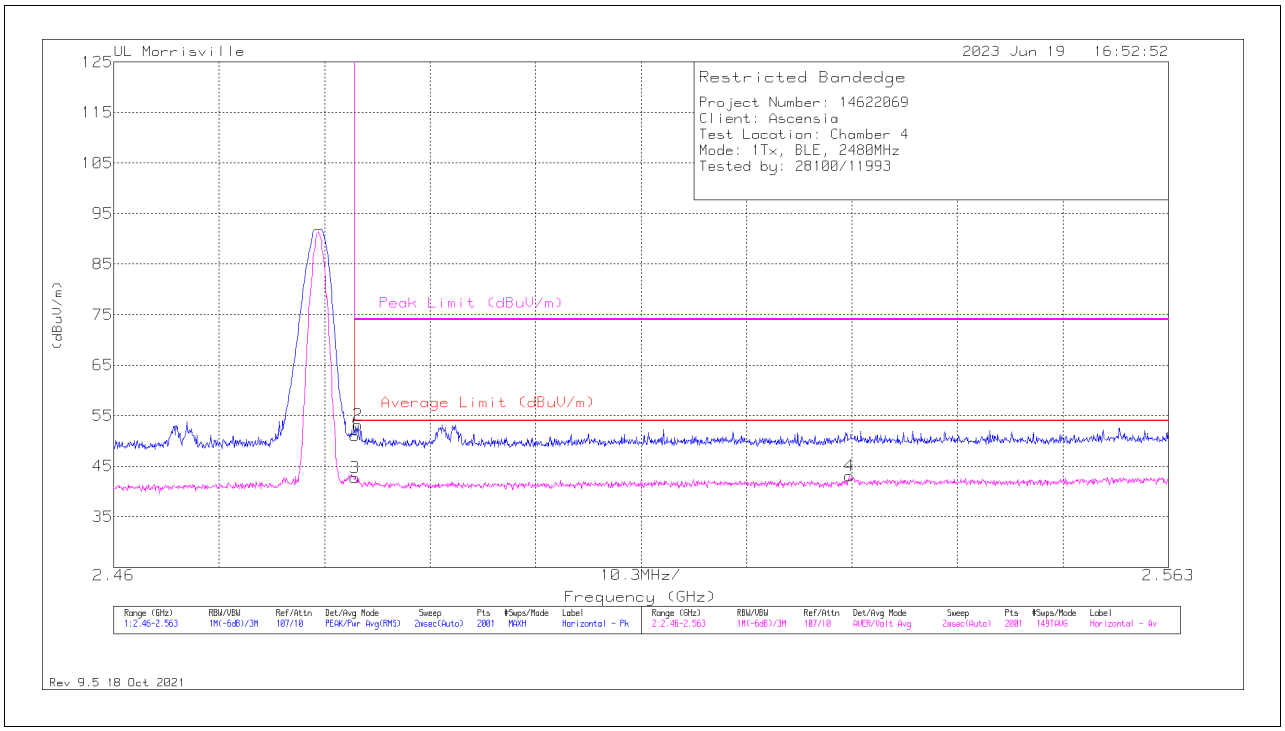
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	32.05	Pk	32	-13.2	0	50.85	-	-	74	-23.15	54	381	V
2	* ** 2.38985	34.84	Pk	32	-13.2	0	53.64	-	-	74	-20.36	54	381	V
3	* ** 2.38996	18.54	ADV	32	-13.2	3.47	40.81	54	-13.19	-	-	54	381	V
4	* ** 2.3498	19.71	ADV	31.8	-13.1	3.47	41.88	54	-12.12	-	-	54	381	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV -Linear Voltage Average

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

BANDEDGE (HIGH CHANNEL)

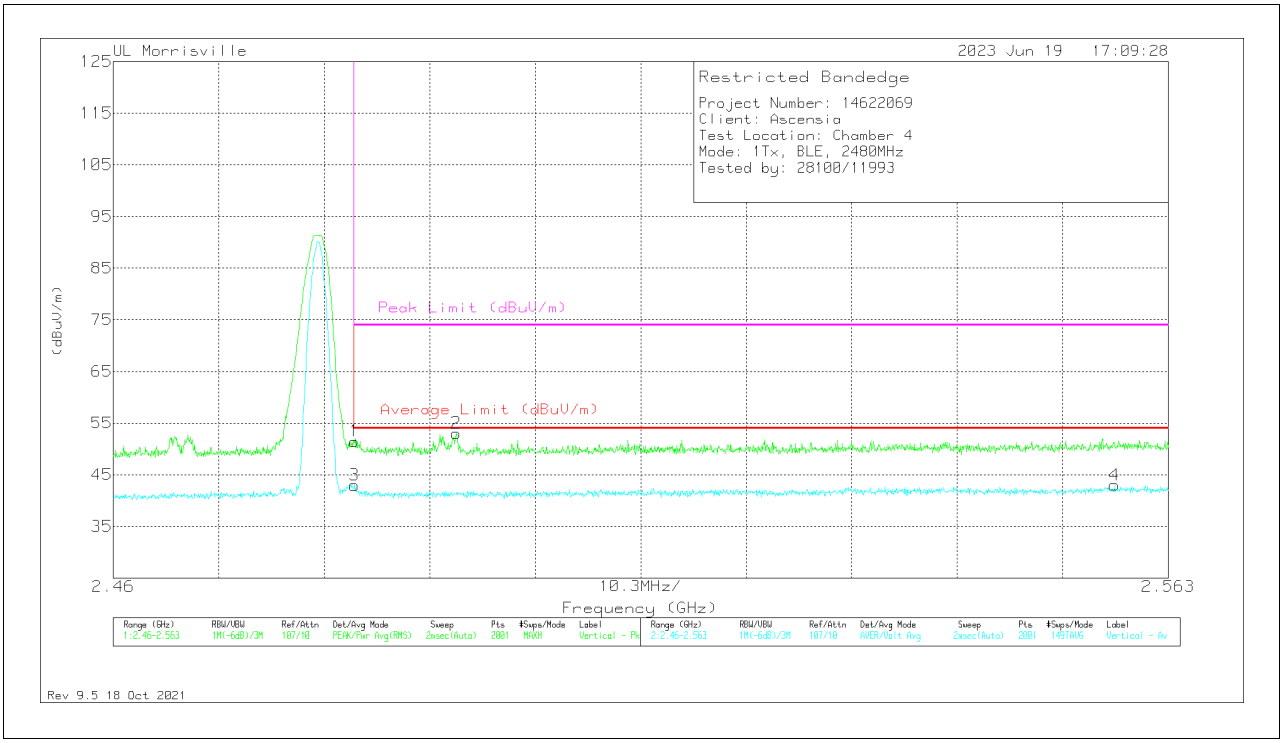
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	31.68	Pk	32.3	-12.9	0	51.08	-	-	74	-22.92	277	192	H
2	* ** 2.48384	33.79	Pk	32.3	-12.9	0	53.19	-	-	74	-20.81	277	192	H
3	* ** 2.48354	19.87	ADV	32.3	-12.9	3.47	42.74	54	-11.26	-	-	277	192	H
4	** 2.53184	20.25	ADV	32.4	-13	3.47	43.12	54	-10.88	-	-	277	192	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

VERTICAL RESULT

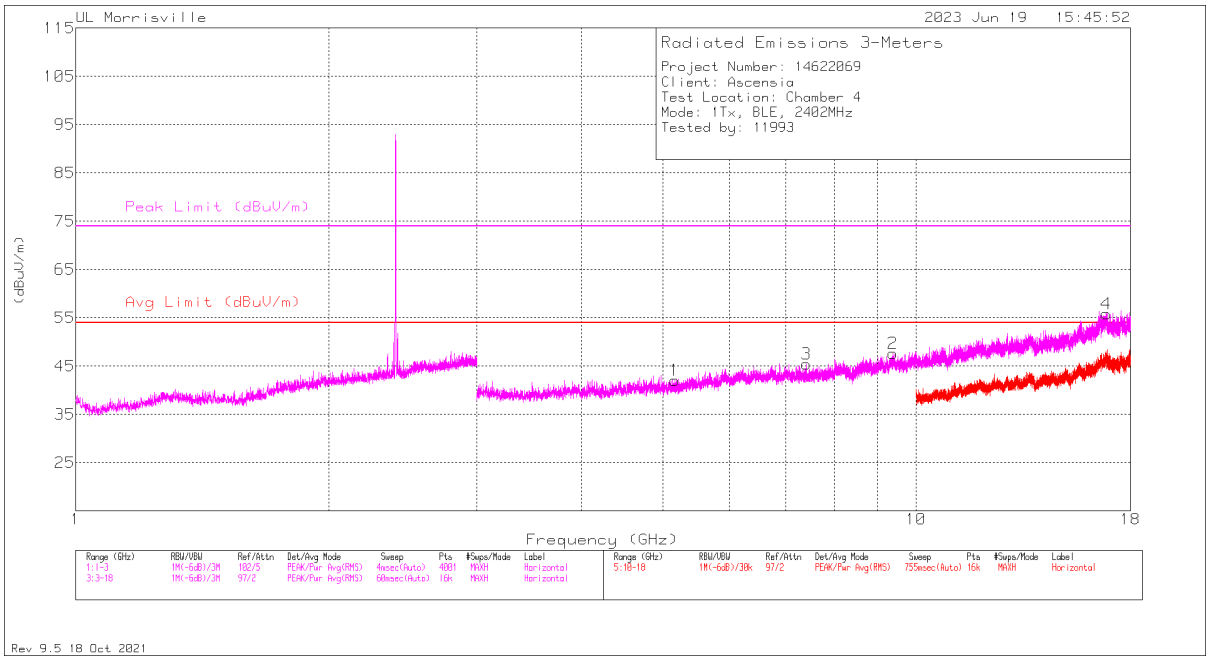


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	32.07	Pk	32.3	-12.9	0	51.47	-	-	74	-22.53	53	356	V
2	* ** 2.49348	33.71	Pk	32.3	-13	0	53.01	-	-	74	-20.99	53	356	V
3	* ** 2.48354	20.09	ADV	32.3	-12.9	3.47	42.96	54	-11.04	-	-	53	356	V
4	** 2.55775	19.72	ADV	32.5	-12.7	3.47	42.99	54	-11.01	-	-	53	356	V

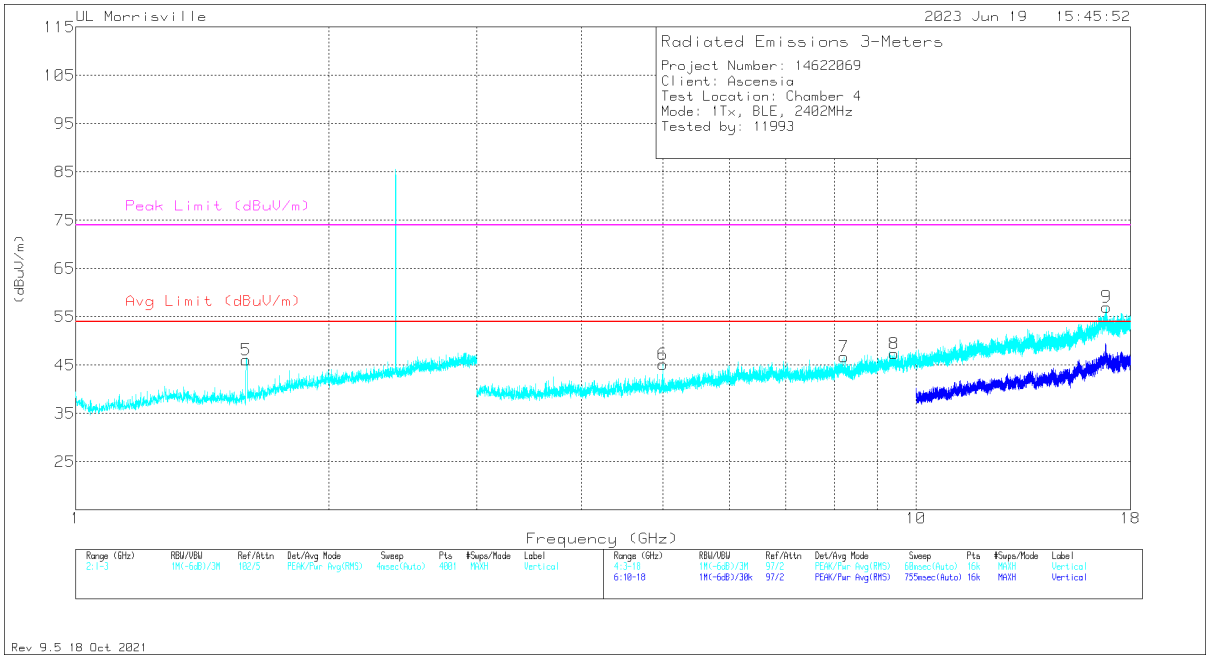
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

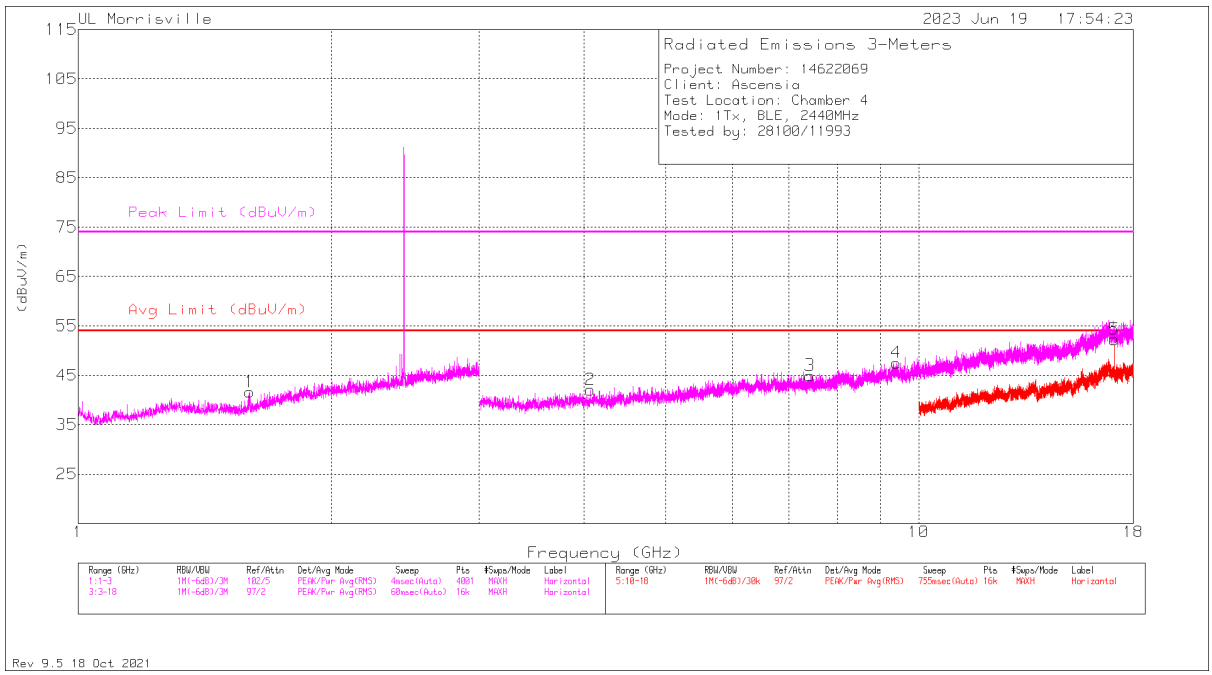
RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* ** 1.595	32.37	Pk	28	-14.3	46.07	54	-7.93	74	-27.93	0-360	200	V
1	** 5.16	38.71	Pk	34.2	-30.9	42.01	54	-11.99	74	-31.99	0-360	100	H
2	* ** 9.39094	36.73	Pk	36.6	-25.7	47.63	54	-6.37	74	-26.37	0-360	100	H
3	* ** 7.40813	37.79	Pk	35.6	-27.9	45.49	54	-8.51	74	-28.51	0-360	100	H
6	* ** 4.995	42.82	Pk	34.1	-31.7	45.22	54	-8.78	74	-28.78	0-360	200	V
7	* ** 8.20781	37.53	Pk	35.8	-26.6	46.73	54	-7.27	74	-27.27	0-360	200	V
8	* ** 9.42375	36.41	Pk	36.6	-25.6	47.41	54	-6.59	74	-26.59	0-360	191	V
4	16.84734	33.16	Pk	41.9	-19.2	55.86	-	-	-	-	0-360	100	H
9	16.85156	34.56	Pk	41.9	-19.4	57.06	-	-	-	-	0-360	191	V

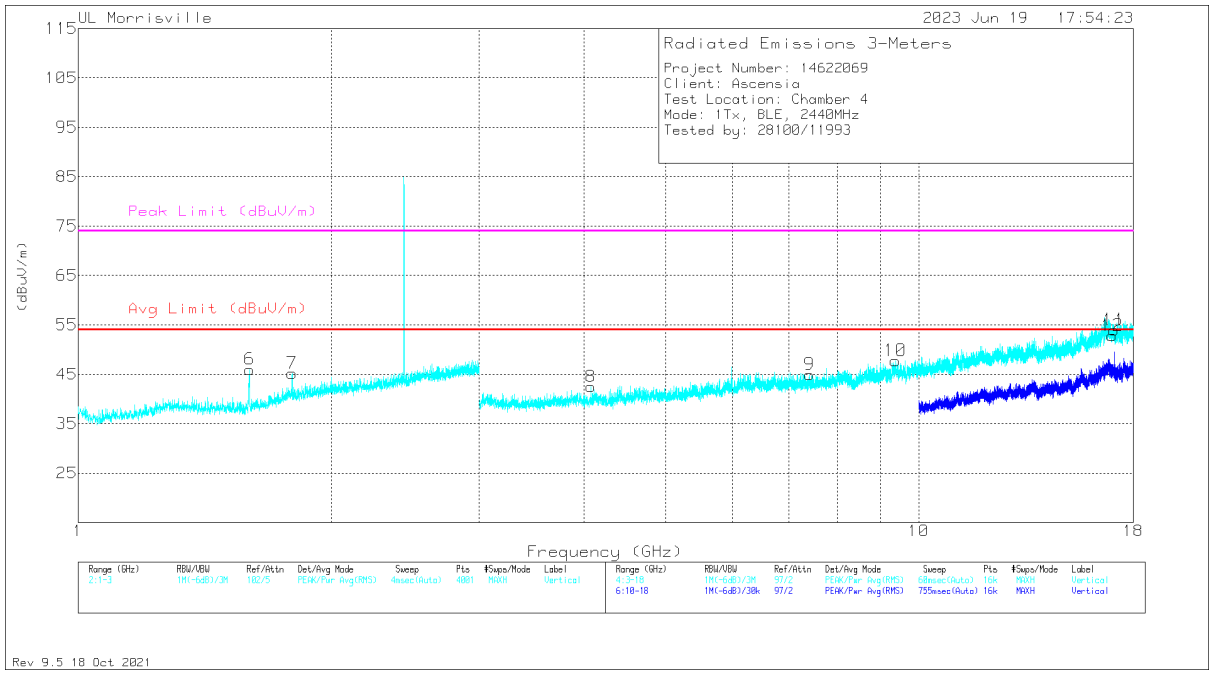
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

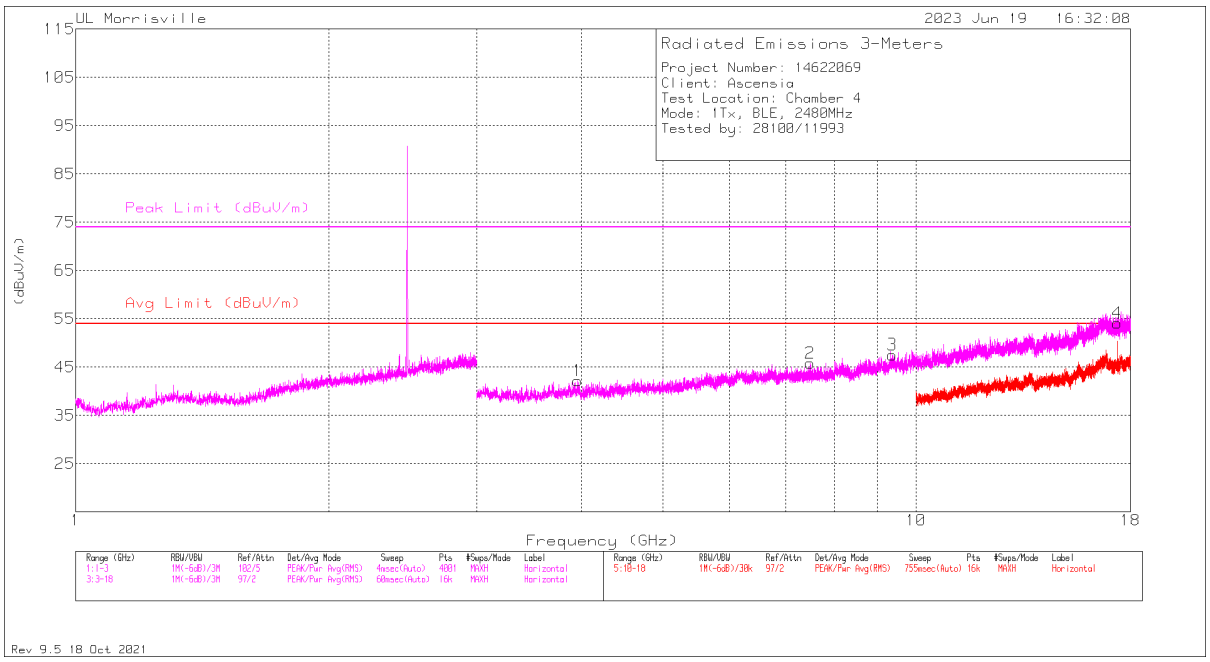
RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.5985	27.86	Pk	28	-14.2	41.66	54	-12.34	74	-32.34	0-360	100	H
6	* ** 1.5995	32.21	Pk	28	-14.2	46.01	54	-7.99	74	-27.99	0-360	200	V
2	* ** 4.06406	41.07	Pk	33.3	-32.3	42.07	54	-11.93	74	-31.93	0-360	100	H
3	* ** 7.42313	37.74	Pk	35.6	-28.4	44.94	54	-9.06	74	-29.06	0-360	100	H
4	* ** 9.40688	36.84	Pk	36.6	-25.9	47.54	54	-6.46	74	-26.46	0-360	100	H
8	* ** 4.07531	41.39	Pk	33.4	-32.3	42.49	54	-11.51	74	-31.51	0-360	200	V
9	* ** 7.41281	37.37	Pk	35.6	-28	44.97	54	-9.03	74	-29.03	0-360	200	V
10	* ** 9.38156	36.08	Pk	36.6	-24.9	47.78	54	-6.22	74	-26.22	0-360	200	V
7	1.7965	29.23	Pk	30	-14	45.23	-	-	-	-	0-360	200	V
12	16.99219	31.14	Pk	41.8	-20.1	52.84	-	-	-	-	0-360	200	V
11	17.07938	32.58	Pk	41.6	-20.2	53.98	-	-	-	-	0-360	200	V
5	17.08031	30.87	Pk	41.6	-20.2	52.27	-	-	-	-	0-360	100	H

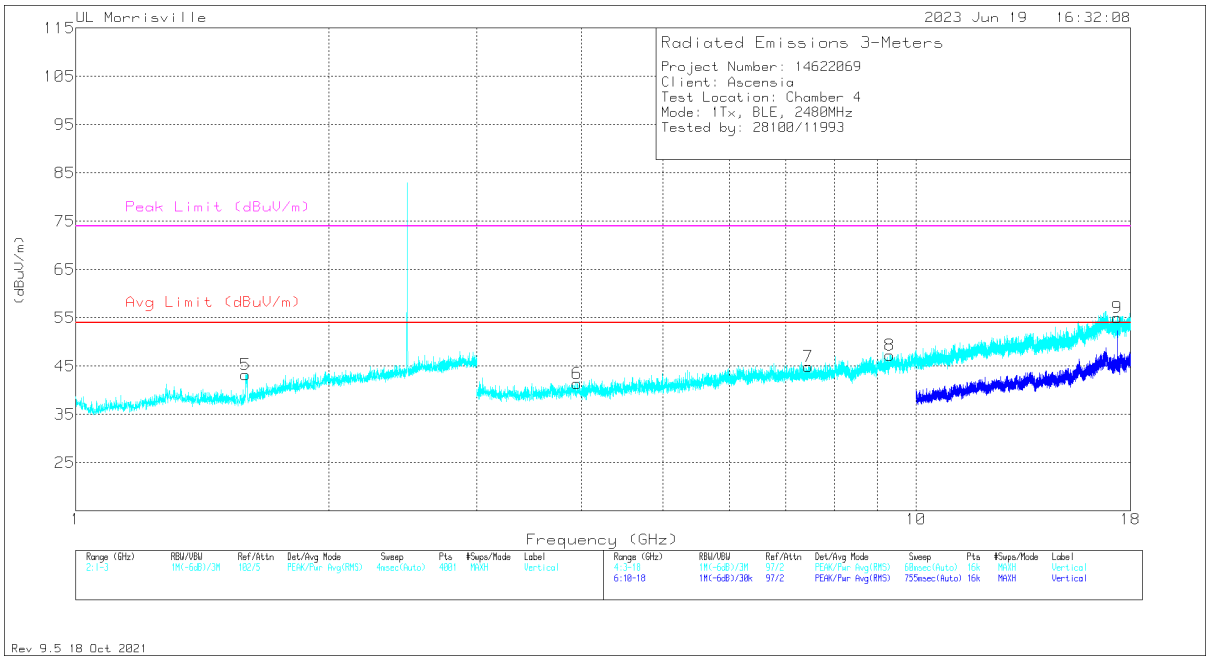
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* ** 1.5925	29.68	Pk	27.9	-14.3	43.28	54	-10.72	74	-30.72	0-360	200	V
1	* ** 3.95813	40.65	Pk	33.4	-31.9	42.15	54	-11.85	74	-31.85	0-360	100	H
2	* ** 7.48875	38.4	Pk	35.6	-28.2	45.8	54	-8.2	74	-28.2	0-360	100	H
3	* ** 9.36375	35.78	Pk	36.5	-24.7	47.58	54	-6.42	74	-26.42	0-360	100	H
6	* ** 3.9525	39.82	Pk	33.4	-31.8	41.42	54	-12.58	74	-32.58	0-360	200	V
7	* ** 7.44375	37.28	Pk	35.7	-28	44.98	54	-9.02	74	-29.02	0-360	200	V
8	* ** 9.31313	35.96	Pk	36.4	-25.1	47.26	54	-6.74	74	-26.74	0-360	200	V
4	17.35969	31.91	Pk	41.2	-19	54.11	-	-	-	-	0-360	100	H
9	17.3625	32.67	Pk	41.2	-18.8	55.07	-	-	-	-	0-360	200	V

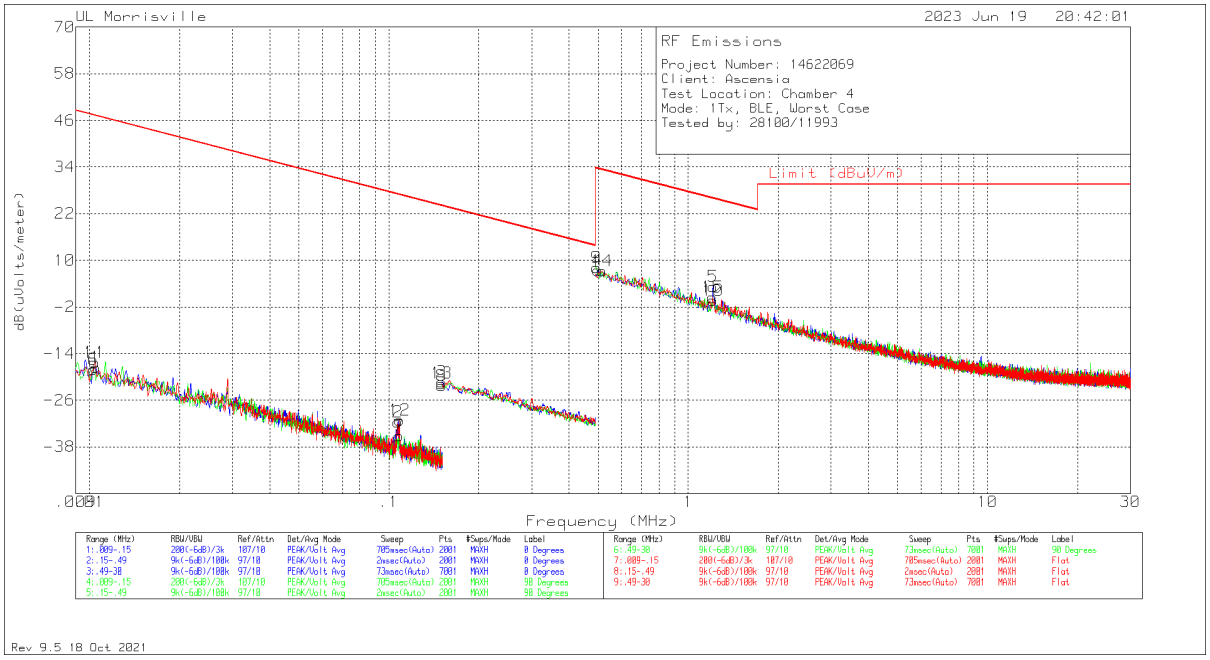
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

10.3. WORST CASE BELOW 30MHZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance)

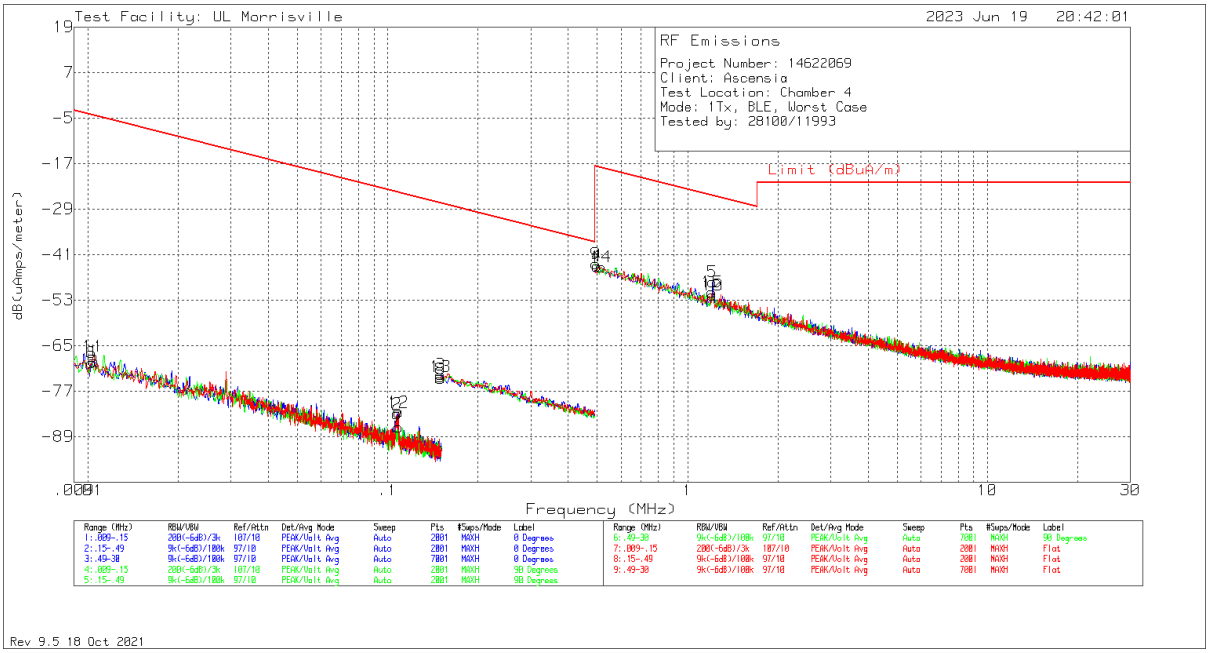


ANTENNA- THREE ORIENTATIONS E-FIELD

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
6	.01028	42.68	Pk	19.2	.1	-80	-18.02	47.37	67.37	-65.39	0-360	90 degs
11	.01042	44.51	Pk	19.1	.1	-80	-16.29	47.25	67.25	-63.54	0-360	Flat
1	.01049	43.21	Pk	19.1	.1	-80	-17.59	47.19	67.19	-64.78	0-360	0 degs
2	.10734	36.14	Pk	12.2	.1	-80	-31.56	26.99	-	-58.55	0-360	0 degs
7	.10826	32.6	Pk	12.2	.1	-80	-35.1	26.92	-	-62.02	0-360	90 degs
12	.10861	36.54	Pk	12.2	.1	-80	-31.16	26.89	-	-58.05	0-360	Flat
13	.15	46.02	Pk	12.2	.1	-80	-21.68	24.08	44.08	-45.76	0-360	Flat
3	.15026	46.45	Pk	12.2	.1	-80	-21.25	24.07	44.07	-45.32	0-360	0 degs
8	.15026	45.41	Pk	12.2	.1	-80	-22.29	24.07	44.07	-46.36	0-360	90 degs
9	.49422	35.64	Pk	12.2	.2	-40	8.04	33.73	-	-25.69	0-360	90 degs
4	.49843	35.02	Pk	12.2	.2	-40	7.42	33.65	-	-26.23	0-360	0 degs
14	.5153	34.82	Pk	12.2	.2	-40	7.22	33.36	-	-26.14	0-360	Flat
15	1.20672	28.15	Pk	12.2	.2	-40	.55	25.97	-	-25.42	0-360	Flat
5	1.21094	30.87	Pk	12.2	.2	-40	3.27	25.94	-	-22.67	0-360	0 degs
10	1.21094	27.35	Pk	12.2	.2	-40	-.25	25.94	-	-26.19	0-360	90 degs

Pk - Peak detector



ANTENNA- THREE ORIENTATIONS H-FIELD

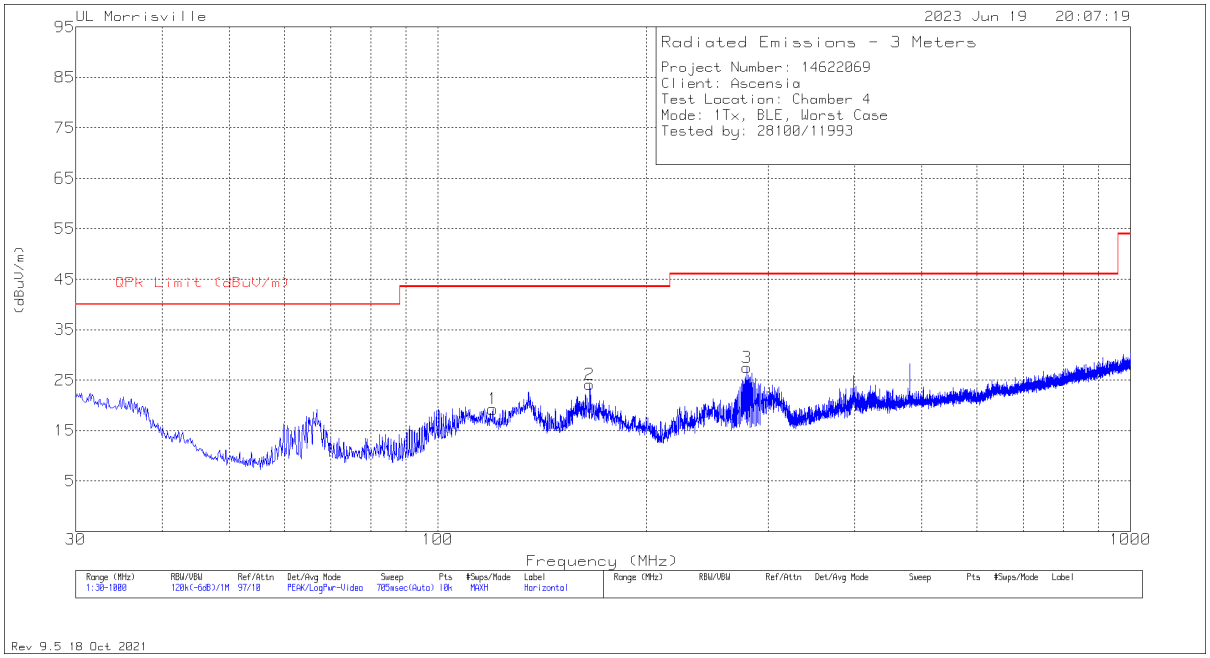
Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuA)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	QP/AV Limit (dBuA/m)	PK Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
6	.01028	42.68	Pk	-32.3	.1	-80	-69.52	-4.13	15.87	-65.39	0-360	90 degs
11	.01042	44.51	Pk	-32.4	.1	-80	-67.79	-4.25	15.75	-63.54	0-360	Flat
1	.01049	43.21	Pk	-32.4	.1	-80	-69.09	-4.31	15.69	-64.78	0-360	0 degs
2	.10734	36.14	Pk	-39.3	.1	-80	-83.06	-24.51	-	-58.55	0-360	0 degs
7	.10826	32.6	Pk	-39.3	.1	-80	-86.6	-24.58	-	-62.02	0-360	90 degs
12	.10861	36.54	Pk	-39.3	.1	-80	-82.66	-24.61	-	-58.05	0-360	Flat
13	.15	46.02	Pk	-39.3	.1	-80	-73.18	-27.42	-7.42	-45.76	0-360	Flat
3	.15026	46.45	Pk	-39.3	.1	-80	-72.75	-27.43	-7.43	-45.32	0-360	0 degs
8	.15026	45.41	Pk	-39.3	.1	-80	-73.79	-27.43	-7.43	-46.36	0-360	90 degs
9	.49422	35.64	Pk	-39.3	.2	-40	-43.46	-17.77	-	-25.69	0-360	90 degs
4	.49843	35.02	Pk	-39.3	.2	-40	-44.08	-17.85	-	-26.23	0-360	0 degs
14	.5153	34.82	Pk	-39.3	.2	-40	-44.28	-18.14	-	-26.14	0-360	Flat
15	1.20672	28.15	Pk	-39.3	.2	-40	-50.95	-25.53	-	-25.42	0-360	Flat
5	1.21094	30.87	Pk	-39.3	.2	-40	-48.23	-25.56	-	-22.67	0-360	0 degs
10	1.21094	27.35	Pk	-39.3	.2	-40	-51.75	-25.56	-	-26.19	0-360	90 degs

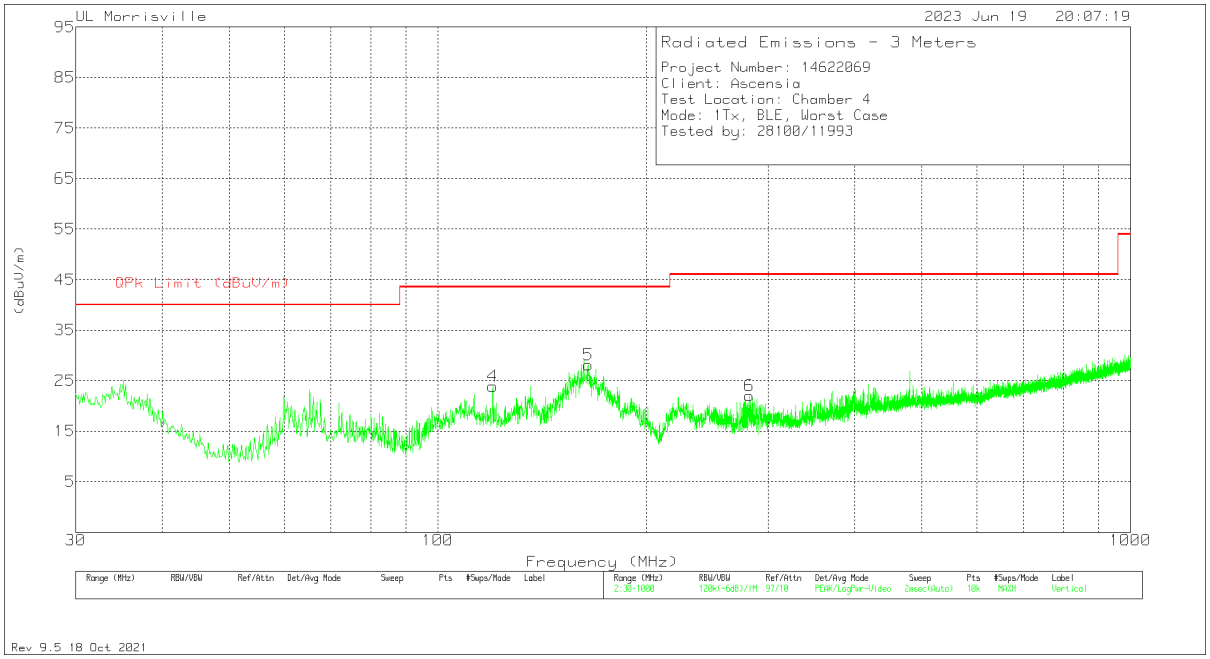
Pk - Peak detector

10.4. WORST CASE BELOW 1 GHZ

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



HORIZONTAL



VERTICAL

Below 1GHz Data

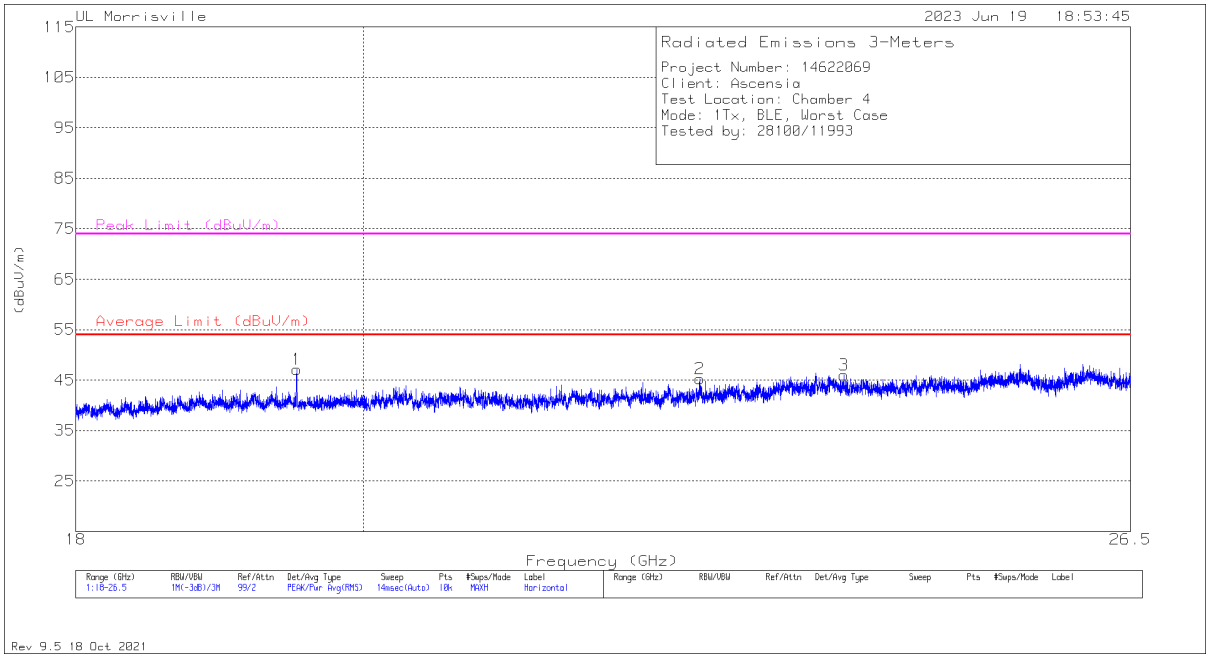
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90629 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 120.016	29.64	Pk	20	-30.4	19.24	43.52	-24.28	0-360	200	H
2	* ** 165.703	36.17	Pk	18.2	-30.2	24.17	43.52	-19.35	0-360	100	H
3	* ** 279.29	37.4	Pk	19.4	-29.3	27.5	46.02	-18.52	0-360	100	H
4	* ** 120.016	34.27	Pk	20	-30.4	23.87	43.52	-19.65	0-360	100	V
5	* ** 164.927	39.84	Pk	18.3	-30	28.14	43.52	-15.38	0-360	100	V
6	* ** 281.618	31.98	Pk	19.4	-29.3	22.08	46.02	-23.94	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector

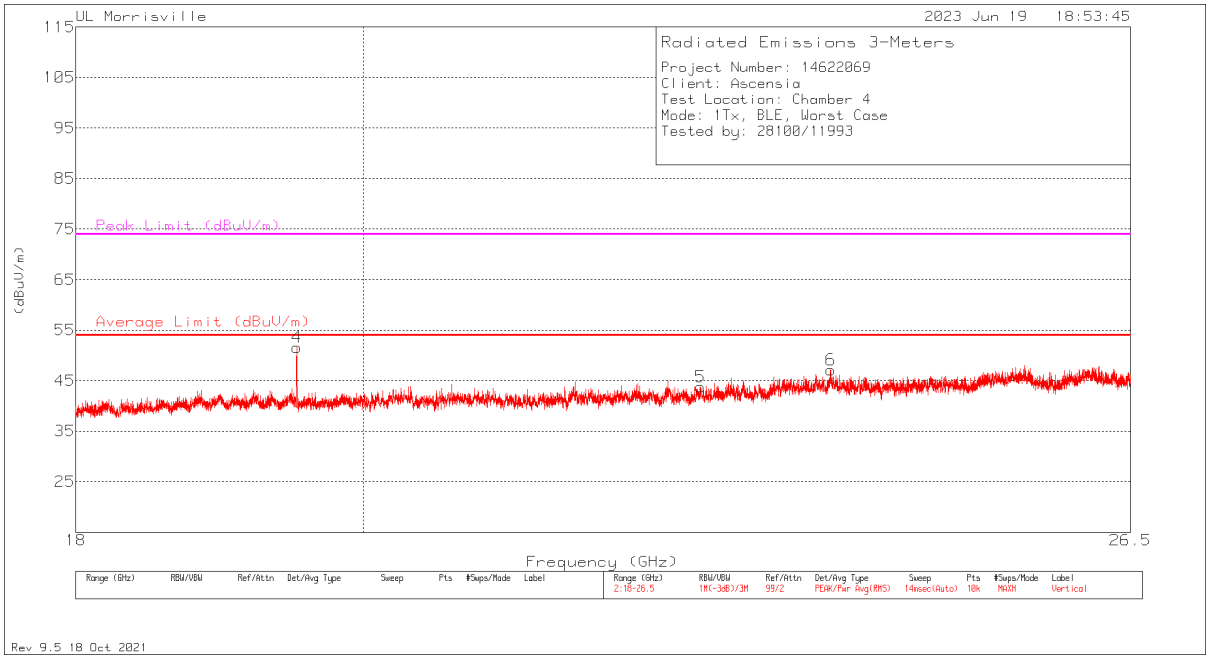
UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

10.5. WORST CASE 18-26 GHZ

SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION)



HORIZONTAL



VERTICAL

18 – 26GHz Data

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	204704 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 19.52165	53.57	Pk	33.5	-40	0	47.07	54	-6.93	74	-26.93	0-360	150	H
2	* ** 22.62786	49.34	Pk	34.4	-38.5	0	45.24	54	-8.76	74	-28.76	0-360	150	H
3	* ** 23.85709	47.85	Pk	35.1	-36.9	0	46.05	54	-7.95	74	-27.95	0-360	200	H
4	* ** 19.51999	59.64	PK2	33.5	-40.1	0	53.04	-	-	74	-20.96	260	139	V
	* ** 19.52178	47.51	ADV	33.5	-40	3.47	44.48	54	-9.52	-	-	260	139	V
5	* ** 22.63551	47.41	Pk	34.4	-38	0	43.81	54	-10.19	74	-30.19	0-360	200	V
6	* ** 23.74062	48.96	Pk	35.1	-36.9	0	47.16	54	-6.84	74	-26.84	0-360	300	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
ADV -Linear Voltage Average

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400

11. SETUP PHOTOS

Please refer to R146622069-EP1 for setup photos

END OF TEST REPORT

UL LLC
2800 Suite Perimeter Park Dr. Suite B, Morrisville, NC 27560; USA TEL:(919) 549-1400