

TEST REPORT

Report Number: R16215818-E4

Applicant : Microsoft Corporation
One Microsoft Way
Redmond, Washington
United States 98052-6399

MODEL : 2148

FCC ID : C3K2148

EUT Description : Portable Computing Device

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
2026-07-21

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2026-07-07	Initial Issue	Manish Baral
V2	2026-07-21	Removed 2149 Data	Charles Moody

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Microsoft Corporation
One Microsoft Way
Redmond, Washington
United States 98052-6399

EUT DESCRIPTION: Portable Computing Device

MODEL: 2148

SERIAL NUMBER: 0F38QDQ26103WK (2148)

SAMPLE RECEIPT DATE: 2026-04-07

DATE TESTED: 2026-05-12 to 2026-06-01

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	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:

Prepared By:



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



Manish Baral
Engineer
Consumer, Medical and IT Segment
UL LLC

2. TEST METHODOLOGY

This report contains data provided by the customer which can impact the validity of results. UL LLC. is only responsible for correctly integrating customer-provided data with measurements performed by UL LLC .

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

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- ANSI C63.10-2020+A1:2023+Corr:2024
- KDB 414788 D01 Radiated Test Site v01r01

3. 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: 12 Laboratory Dr Durham, NC 27713, U.S.A	US0067	2180C	825374
☒	Building 2800 Suite Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A		27265	

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. 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.

4.2. 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.)

4.3. 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	6.01 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%.

4.4. 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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

dBuV + 0 dB + 10.1 dB + 0 dB = 46.6 dBuV

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Portable Computing Device. This report covers WPT testing.

5.2. MAXIMUM ELECTRIC FIELD STENGTH

The transmitter has maximum peak radiated electric and magnetic field strength as follows:

Fundamental Frequency (MHz)	Model	E field (300m distance) FCC (dBuV/m)
13.56	2148	-12.64

5.3. WORST-CASE CONFIGURATION AND MODE

The EUT is operates at 13.56 MHz. This report covers testing on the EUT was performed in the following configuration:

Config	Model	Descriptions
1	2148	EUT with WPT Enabled

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 300 m 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 D01.

The 2148 Fundamental were investigated in all three orthogonal orientations. It was determined through pretesting that Z was the worst-case orientation for 2148. Therefore all final testing was performed with the EUT transmitting in this orientation.

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Power Adapter	Microsoft	2105	0C130X03XFD5B	N/A

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	Phone to power adapter

TEST SETUP

The EUT was set to transmit on its WPT mode.

SETUP DIAGRAM

Refer to Setup Photo Exhibit R16215818-EP1 for setup diagrams and photos.

6. 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.
	Conducted Room 1				
206459	Spectrum Analyzer	Rohde & Schwarz	FSW50	2025-09-15	2026-09-15
179892	Environmental Meter	Fisher Scientific	15-077-963	2025-08-05	2026-08-05
SOFTEMI	Antenna Port Software	UL	Version 2024.2.23	-	-
NA	NFC Probe Kit	EMCO	7405	NA	NA

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				
65682	Active Loop Antenna	ETS-Lindgren	6502	2025-10-14	2027-10-14
	30-1000 MHz				
90628	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2026-02-09	2028-02-09
	Gain-Loss Chains				
207638	Gain-loss string: 0.009-30MHz	Various	Various	2025-06-13	2026-06-13
207639	Gain-loss string: 25-1000MHz	Various	Various	2025-06-13	2026-06-13
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2026-05-13	2027-05-13
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241204	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	2026-05-11	2027-05-11
179892	Environmental Meter	Fisher Scientific	15-077-963	2025-08-05	2026-08-05
80391	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2025-08-01	2026-08-01
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2025-07-30	2026-07-30
52859	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2026-05-11	2027-05-11
PS214	AC Power Source	Elgar	CW2501M	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Miscellaneous (if needed)					
84681	ANSI C63.4 1m extension cable.	UL	Per Annex B of ANSI C63.4	2026-05-11	2027-05-11

7. 20 dB BANDWIDTH

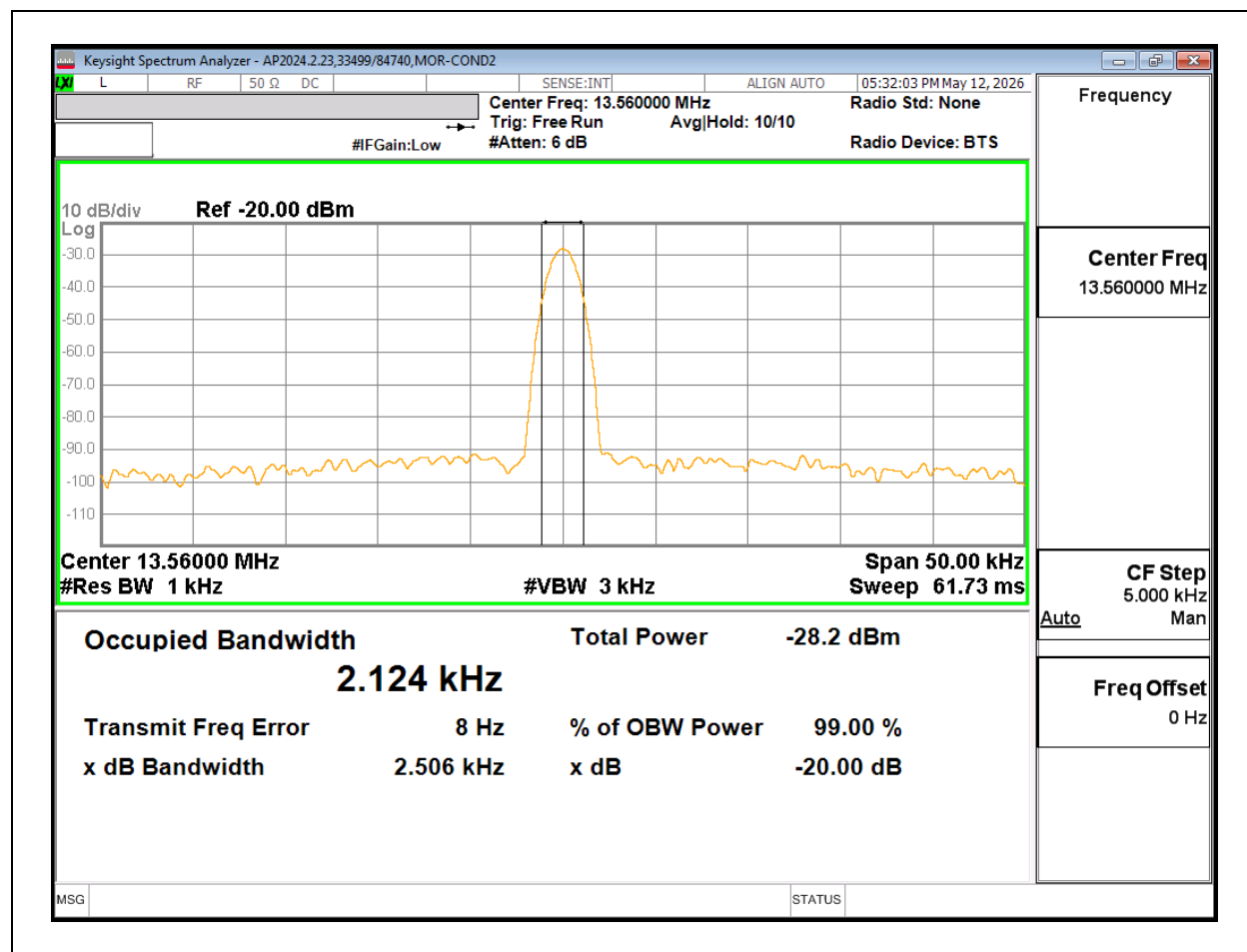
TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1-5% of the 20dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 20dB bandwidth function is utilized.

Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

RESULTS

7.1.1. CONFIG 1



8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMIT

FCC §15.209 (a)

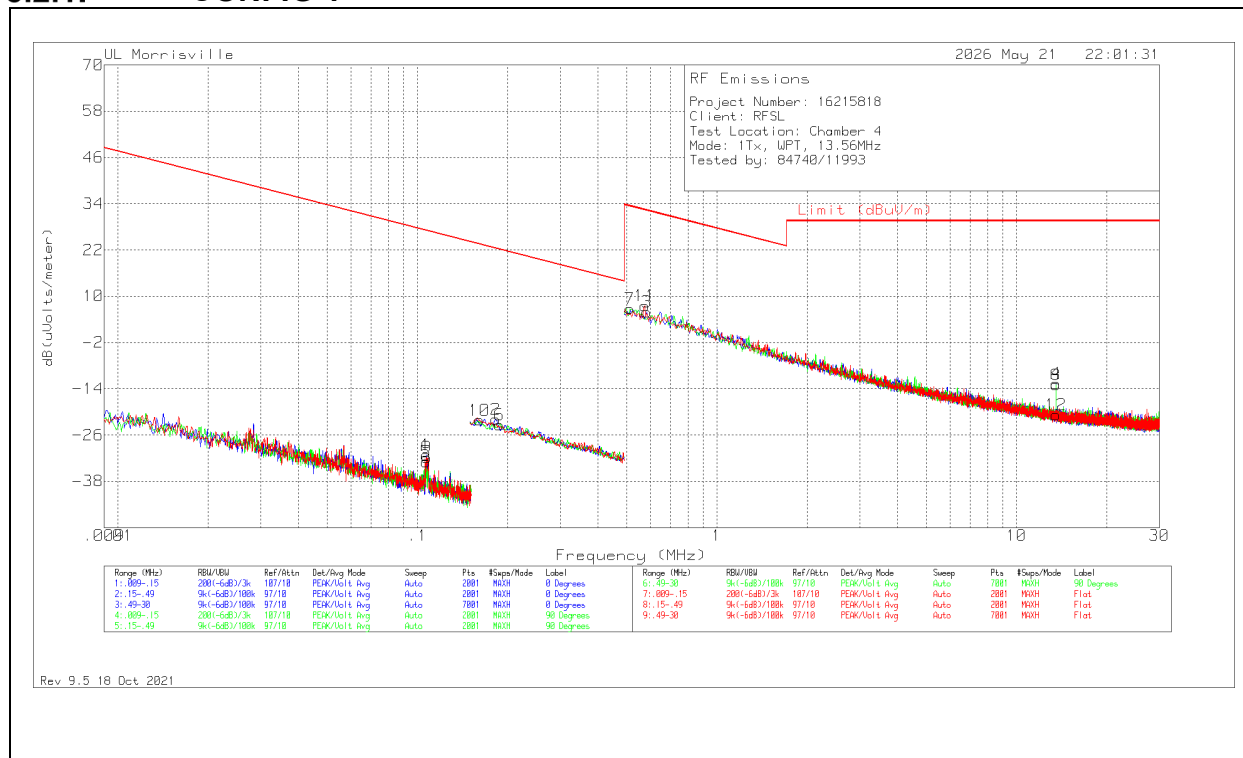
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (m)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960 MHz	500	3
Note: The lower limit shall apply at the transition frequency.		

RESULTS

8.2. FCC TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz

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 $40 \cdot \log(\text{test distance} / \text{specification distance})$.

8.2.1. CONFIG 1



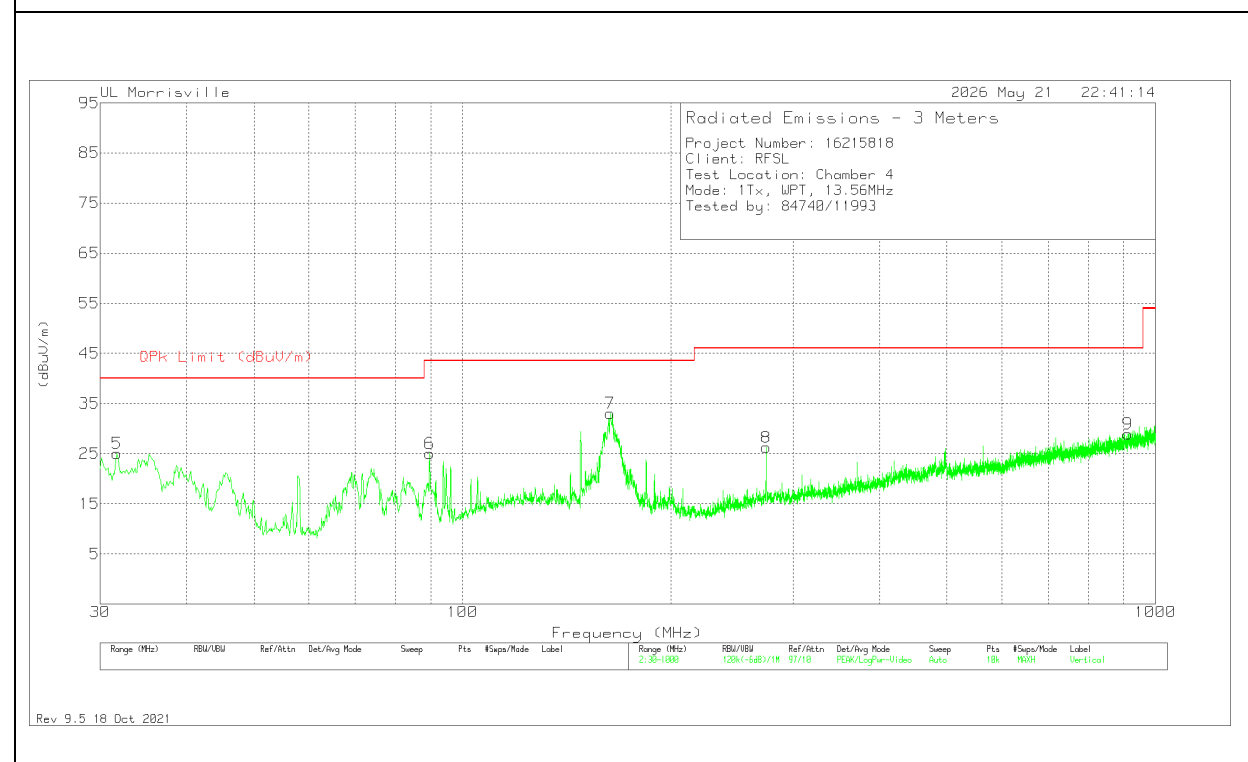
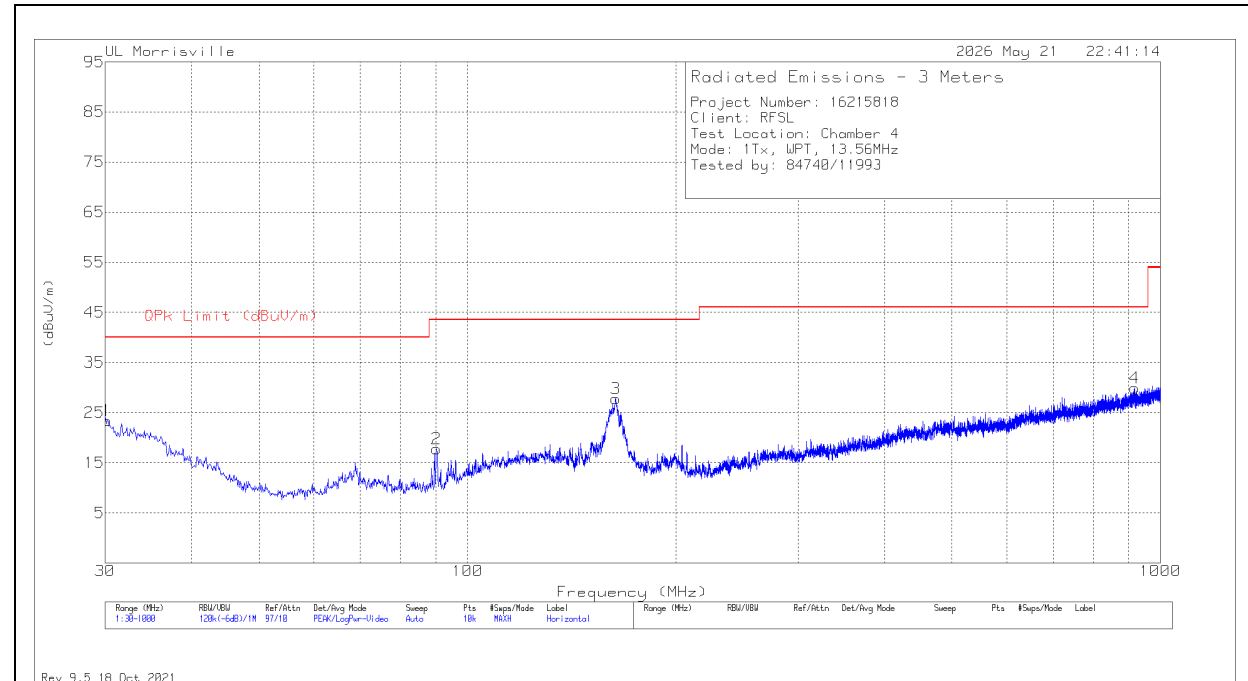
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ANT (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
5	.10684	36.18	Pk	10.8	0	-80	-33.02	27.03	47.03	-60.05	0-360	90 degs
1	.10698	37.97	Pk	10.8	0	-80	-31.23	27.02	47.02	-58.25	0-360	0 degs
9	.10741	37.37	Pk	10.8	0	-80	-31.83	26.98	46.98	-58.81	0-360	Flat
10	.16139	47.05	Pk	10.8	0	-80	-22.15	23.45	43.45	-45.6	0-360	Flat
2	.18256	47.23	Pk	10.8	0	-80	-21.97	22.38	42.38	-44.35	0-360	0 degs
6	.18774	45.86	Pk	10.8	0	-80	-23.34	22.13	42.13	-45.47	0-360	90 degs
7	.51108	35.9	Pk	10.8	.1	-40	6.8	33.43	-	-26.63	0-360	90 degs
11	.57432	36.59	Pk	10.8	.1	-40	7.49	32.42	-	-24.93	0-360	Flat
3	.58275	35	Pk	10.8	.1	-40	5.9	32.29	-	-26.39	0-360	0 degs
4	13.5596	17.76	Pk	9.2	.4	-40	-12.64	29.54	-	-42.18	0-360	0 degs
8	13.5596	17.37	Pk	9.2	.4	-40	-13.03	29.54	-	-42.57	0-360	90 degs
12	13.56382	9.67	Pk	9.2	.4	-40	-20.73	29.54	-	-50.27	0-360	Flat

Pk - Peak detector

8.3. FCC TX SPURIOUS EMISSIONS FROM 30 TO 1000 MHz

8.3.1. CONFIG 1



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90628 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.194	27.86	Pk	26.7	-31.2	23.36	40	-16.64	0-360	100	H
5	31.746	31.24	Pk	25.7	-31.9	25.04	40	-14.96	0-360	100	V
6	89.655	42.45	Pk	13.9	-31.3	25.05	43.52	-18.47	0-360	100	V
2	90.14	35.55	Pk	14	-31.8	17.75	43.52	-25.77	0-360	200	H
7	163.278	44.89	Pk	18.1	-29.9	33.09	43.52	-10.43	0-360	100	V
3	163.569	39.74	Pk	18.1	-30	27.84	43.52	-15.68	0-360	100	H
8	274.343	36.23	Pk	19.4	-29.4	26.23	46.02	-19.79	0-360	200	V
9	911.633	26.9	Pk	28.3	-26.3	28.9	46.02	-17.12	0-360	100	V
4	918.326	26.97	Pk	28.4	-25.5	29.87	46.02	-16.15	0-360	300	H

Pk - Peak detector

9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	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

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.

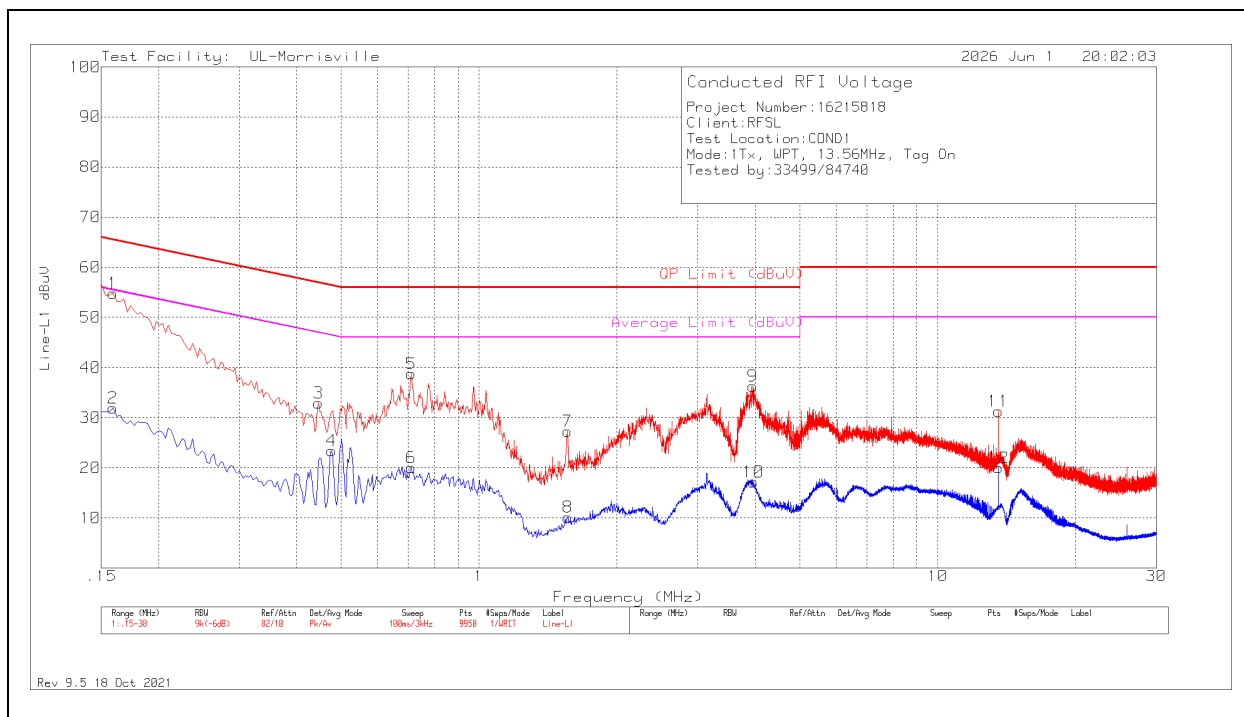
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

9.1.1. CONFIG 1

LINE 1 RESULTS



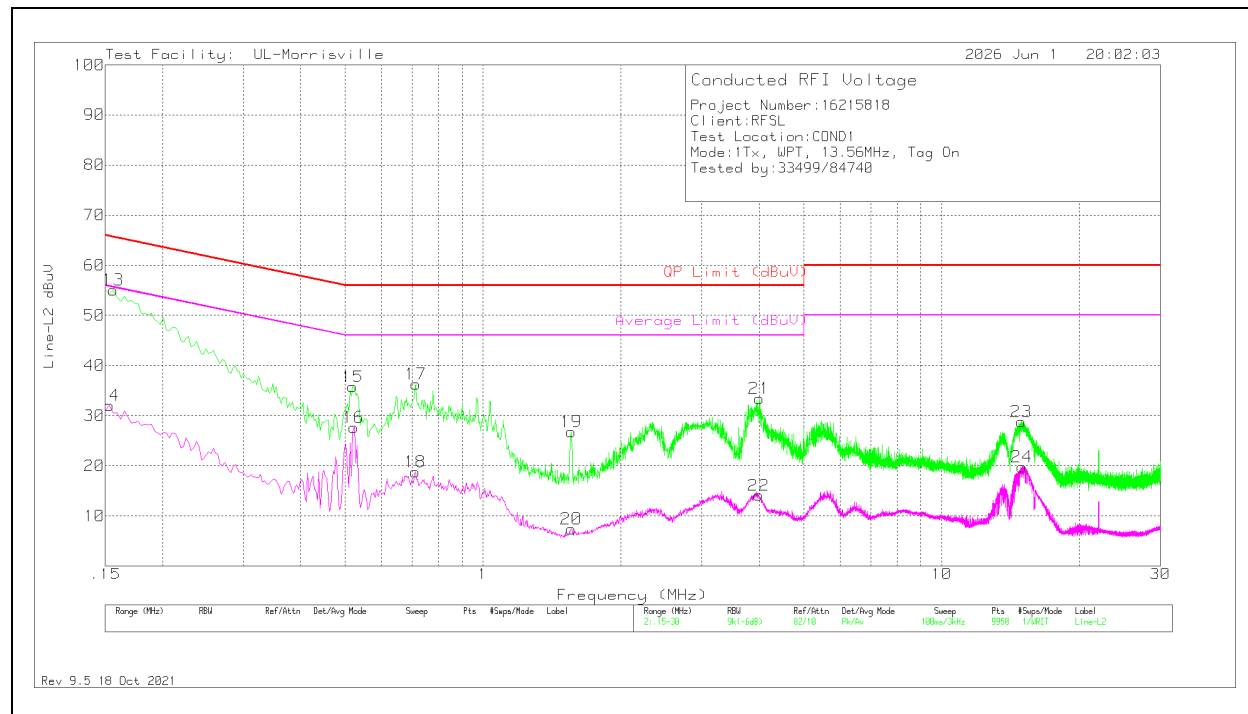
WORST EMISSIONS

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)
1	.159	44.85	Pk	.2	9.8	54.85	65.52	-10.67	-	-
2	.159	21.93	Av	.2	9.8	31.93	-	-	55.52	-23.59
3	.447	23.12	Pk	0	9.8	32.92	56.93	-24.01	-	-
4	.477	13.59	Av	0	9.8	23.39	-	-	46.39	-23
5	.711	28.94	Pk	0	9.8	38.74	56	-17.26	-	-
6	.711	10.21	Av	0	9.8	20.01	-	-	46	-25.99
7	1.56	17.44	Pk	0	9.8	27.24	56	-28.76	-	-
8	1.563	.37	Av	0	9.8	10.17	-	-	46	-35.83
9	3.948	26.38	Pk	0	9.9	36.28	56	-19.72	-	-
10	3.963	7.26	Av	0	9.9	17.16	-	-	46	-28.84
11	13.563	21.04	Pk	.1	10.1	31.24	60	-28.76	-	-
12	13.56	9.77	Av	.1	10.1	19.97	-	-	50	-30.03

Pk - Peak detector

Av - Average detection

LINE 2 RESULTS



WORST EMISSIONS

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	.156	45.08	Pk	.2	9.8	55.08	65.67	-10.59	-	-
14	.153	22.07	Av	.2	9.8	32.07	-	-	55.84	-23.77
15	.519	25.94	Pk	0	9.8	35.74	56	-20.26	-	-
16	.522	17.88	Av	0	9.8	27.68	-	-	46	-18.32
17	.714	26.48	Pk	0	9.8	36.28	56	-19.72	-	-
18	.711	8.98	Av	0	9.8	18.78	-	-	46	-27.22
19	1.557	16.94	Pk	0	9.8	26.74	56	-29.26	-	-
20	1.557	-2.42	Av	0	9.8	7.38	-	-	46	-38.62
21	4.008	23.56	Pk	0	9.9	33.46	56	-22.54	-	-
22	3.987	4.18	Av	0	9.9	14.08	-	-	46	-31.92
23	14.922	18.62	Pk	.1	10.1	28.82	60	-31.18	-	-
24	14.958	9.55	Av	.1	10.1	19.75	-	-	50	-30.25

Pk - Peak detector

Av - Average detection

10. SETUP PHOTOS

Refer to Setup Photo Exhibit R16215818-EP1 for setup diagrams and photos.

END OF TEST REPORT