



Report Number: NBK14653036E.V1
Issue Date: 2023-09-15
Product Name: Wireless Charge Stand
Model Number: CBVS1

Electromagnetic Compatibility Test Report

For

HP Inc.



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Test Report Details

Tests Performed By: UL LLC
333 PFINGSTEN ROAD
NORTHBROOK, IL 60062, US

Tests Performed For: HP Inc.
1501 Page Mill Road
Palo Alto, CA 94304, US

Issue Date: 2023-09-15

Product Name: Wireless Charge Stand

Model Number Tested: CBVS1

Sample Serial Number: 62

Applicable Standards: 47 CFR PART 18 SUBPART C

Date Test Item Received: **2023-05-09**

Testing Start Date: **2023-05-09**

Date Testing Complete: **2023-05-09**

Overall Results: Compliant

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.

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Report Revision History

Revision Date	Revision Version	Description	Revised By	Revision Reviewed By
2023-09-15	V1	Initial Issue	Bm	Mk

1.0 TEST METHODOLOGY

The tests documented in this report were performed in accordance with MP-5:1986

1.1 Deviations from standard test methods

None

1.2 Device Modifications Necessary for Compliance

None

1.3 TEST RESULTS SUMMARY

Requirement – Test	Result (Compliant / Non-Compliant)
CONDUCTED EMISSIONS	Compliant
RADIATED EMISSIONS	Compliant

Approved & Released For
UL LLC. By: Michael Keeler



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2.0 DECISION RULES AND MEASUREMENT UNCERTAINTY

2.1 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

2.2 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).

2.3 Measurement Uncertainty

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

PARAMETER	U _{lab}	U _{Cispr}
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.4 dB	3.4 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz (60cm Loop)	2.52 db	3.3 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.66 dB	6.3 dB

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

2.4 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)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

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.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

3.0 GENERAL - Product Description

3.1 Equipment Description

The EUT (Equipment Under Test) is an Wireless Charging Base used for charging wireless headset.

3.2 Device Configuration During Test

3.2.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Charge Stand	HP Inc.	CBVS1	None
SIM	Wireless Headset	HP Inc.	Voyager Surround 85 UC	none
AE	Power Supply	Baseus	65W	none

Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test)

3.2.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	AC	N	N	AE Power Supply
2	USB C Cable	DC	N	Y	Cable is permanently attached to charging base with USB-C connector on the other side.

*Note:
 AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
 I/O = Signal Input or Output Port (Not Involved in Process Control)
 TP = Telecommunication Ports

3.2.3 EUT Highest Frequencies:

Frequency (MHz)	Description
13.56	Wireless Charging Frequency

3.2.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	120 Vac	-	-	60Hz	Single	AE Equipment Supply

3.2.5 Manufacturer’s Description of Model Differences

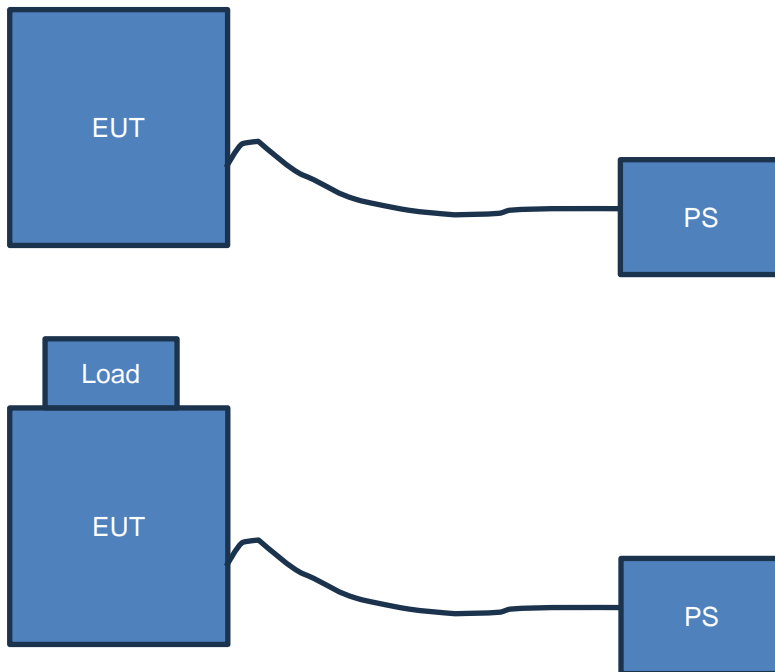
none

3.2.6 Software and Firmware

FW version of the charge stand: V213.91.0.3089

3.3 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



3.4 EUT Configurations

Configuration #	Description
1	Charger with load (headset).
2	Charger alone without load
3	EUT setup with RF output terminated into non radiating load.

3.5 EUT Operation Modes

Mode of Operation#	Description
1	Charging
2	Not charging, just powered alone.
3	Simulating Charge mode

3.6 Rationale for EUT Configurations

Configuration #	Description
1	Normal configuration when charger is in use.
2	Normal configuration when charger sits idle not used.
3	Simulate charge mode

3.7 Rationale for EUT Mode of Operation

Mode of Operation #	Description
1	Normal intended mode of operation when charging.
2	Normal operating mode when charger sits idle not used.
3	Simulate charge mode

4.0 APPLICABLE EMISSIONS LIMITS AND TEST RESULTS

4.1 Test Conditions and Results - MAINS TERMINAL - CONDUCTED EMISSIONS

Test Engineer	Bm06740	
Test Date	2023-05-09	
Laboratory Parameters	Required prior to the test	During the test
Ambient Temperature	-	23.3 °C
Humidity	-	47.8 %rH
Atmospheric Pressure	-	998.6 hPa
	Frequency range on each side of line	Measurement Point
Fully configured sample scanned over the following frequency range	150kHz to 30MHz	Mains
Limits – 47 CFR Part 18 Consumer		
Frequency (MHz)	Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Supplementary information: None		

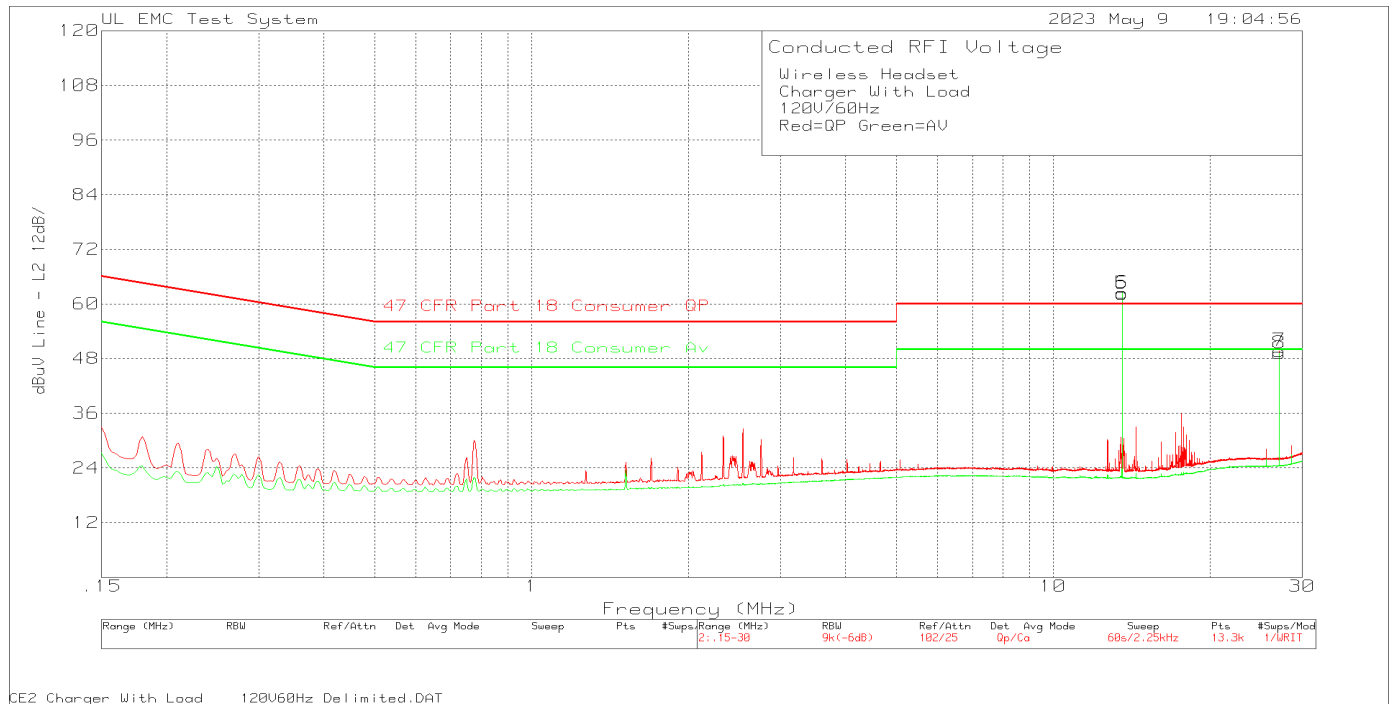
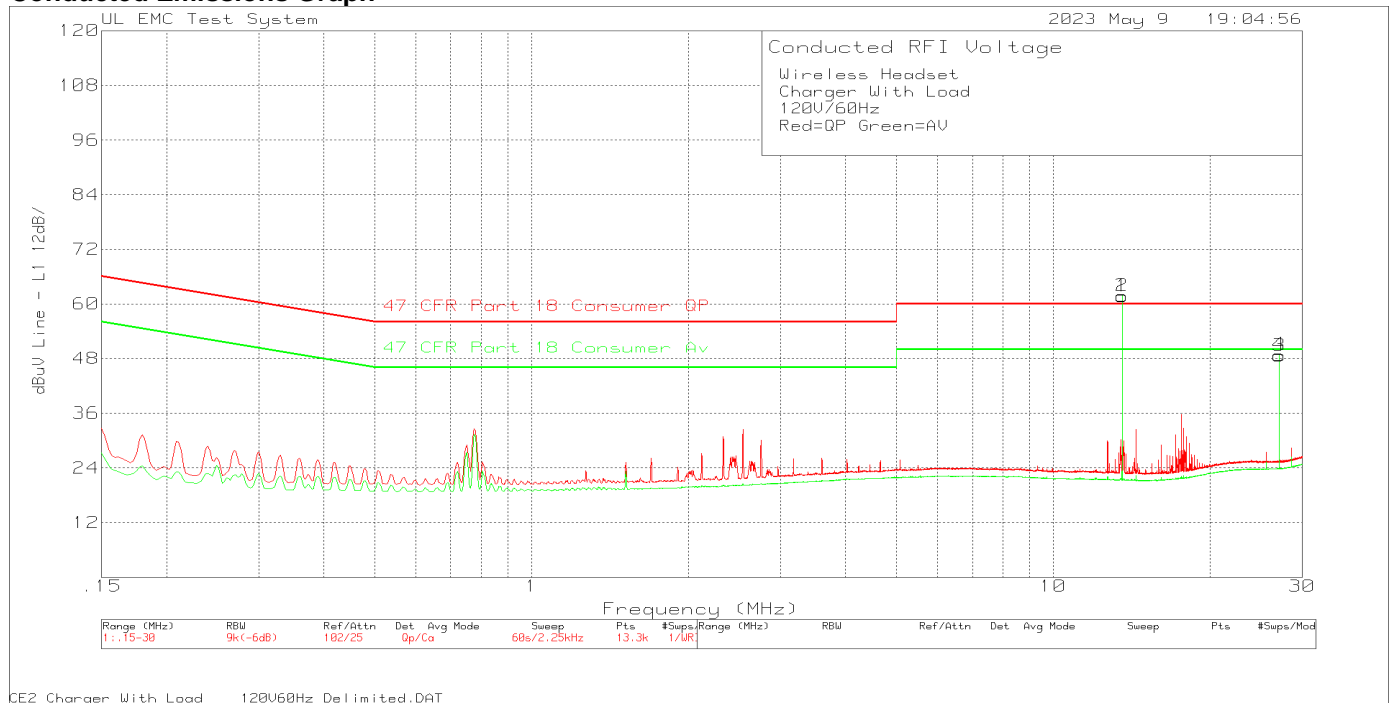
Conducted Emissions EUT Configuration Settings

Power Interface #	EUT Configurations #	EUT Mode of Operation#
1	1, 2	1, 2
Supplementary information: None		

Conducted Emissions Test Equipment

Test Equipment List					
Description	Manufacturer	Model	Global ID	Cal Date	Cal Due
Transient Limiter	Electro-Metrics	EM7600-2	19866	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESR	86711	2022-12-18	2023-12-31
High-Pass Filter	Solar Electronics	2803-150	53775	N/A	N/A
Attenuator	HP	8494G	240199	N/A	N/A
LISN - L1	Solar Electronics	8602-50-TS-50-N	19808	2022-12-06	2023-12-31
LISN - L2	Solar Electronics	8602-50-TS-50-N	19806	2022-12-06	2023-12-31
Barometric Pressure/ Humidity/ Temperature Datalogger	Extech Instruments	SD700	80227	2023-01-25	2024-01-31

Results – 120 V, 60Hz, configuration mode 1, operating mode 1
Conducted Emissions Graph



Conducted Emissions Data Points

Wireless Headset
 Charger With Load
 120V/60Hz
 Red=QP Green=AV

Trace Markers

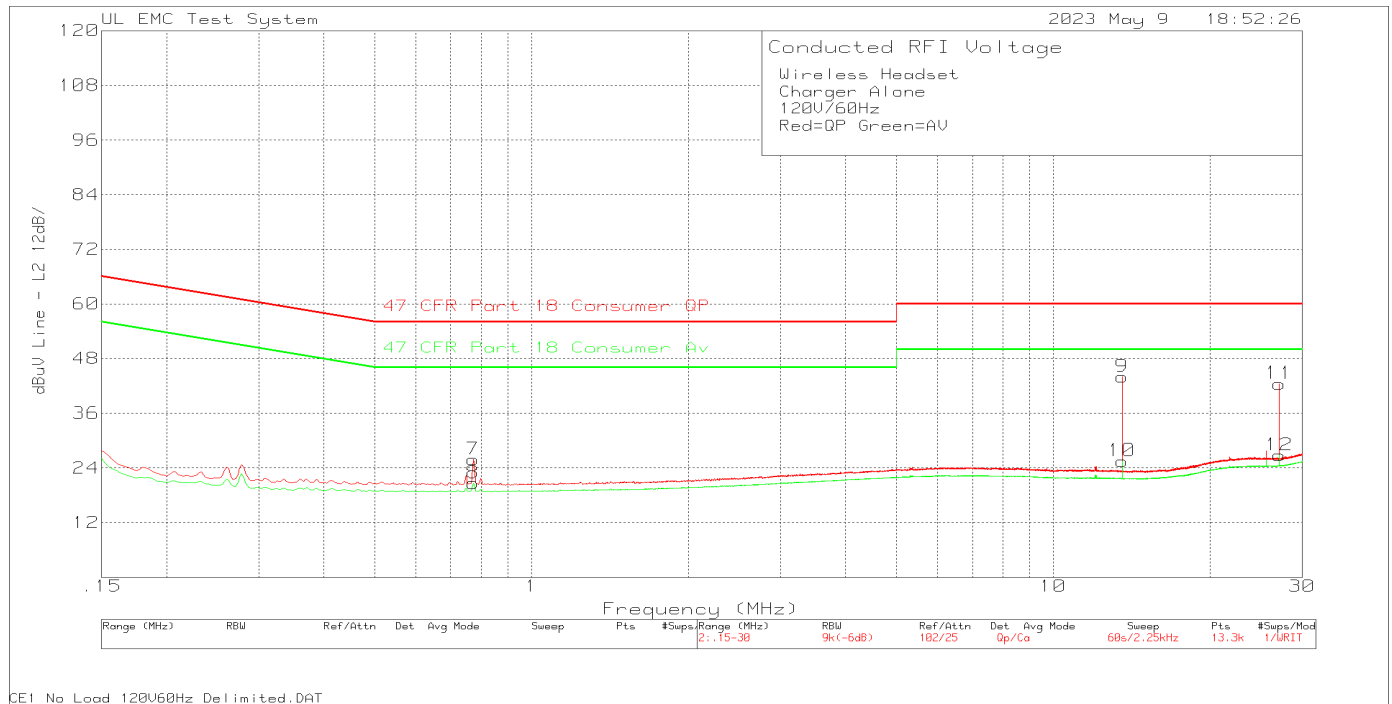
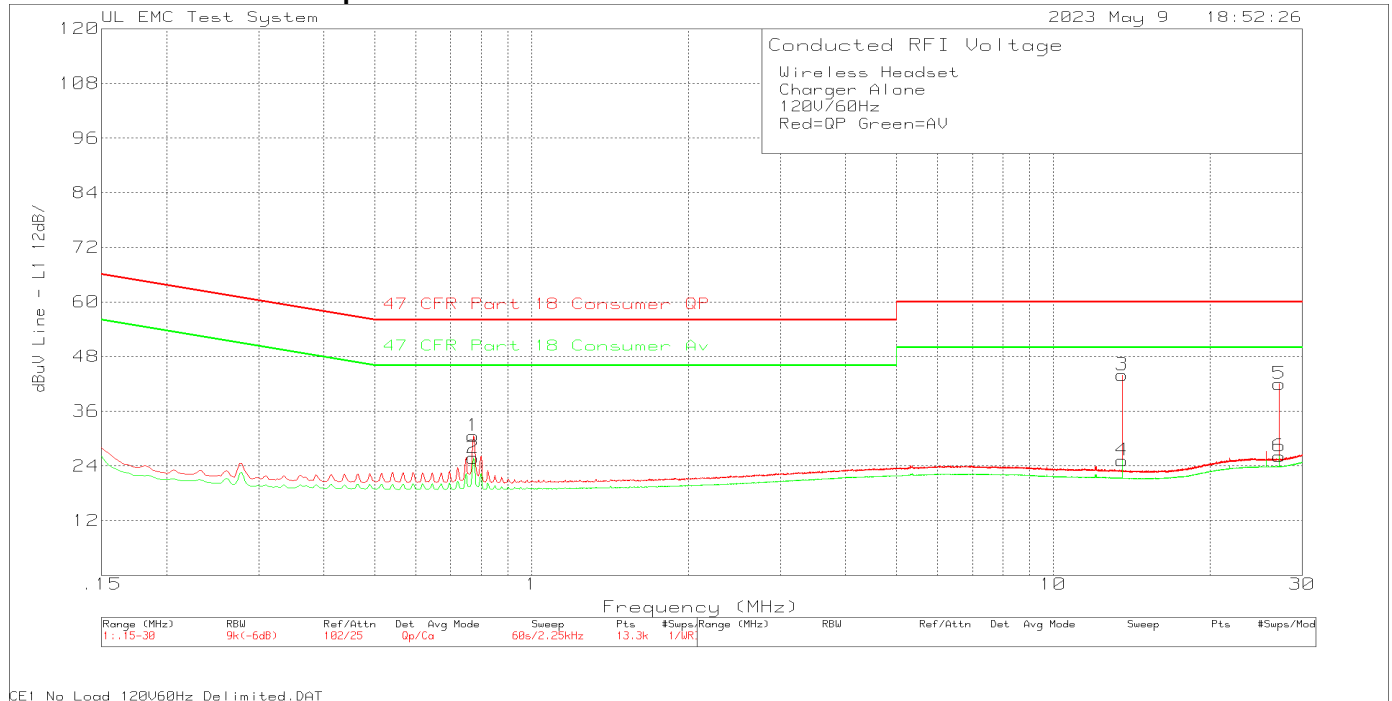
No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1	2
=====							
Line							
*1	13.56	50.29dBuV Qp	.1	11.3	61.69	60	-
					Margin (dB)	1.69	-
*2	13.56	50.38dBuV Ca	.1	11.3	61.78	-	50
					Margin (dB)	-	11.78
3	27.1208	36.4dBuV Qp	0	12.2	48.6	60	-
					Margin (dB)	-11.4	-
4	27.1208	36.6dBuV Ca	0	12.2	48.8	-	50
					Margin (dB)	-	-1.2
Neutral							
*5	13.56	50.56dBuV Qp	.1	11.6	62.26	60	-
					Margin (dB)	2.26	-
*6	13.56	50.71dBuV Ca	.1	11.6	62.41	-	50
					Margin (dB)	-	12.41
7	27.1208	36.93dBuV Qp	0	12.8	49.73	60	-
					Margin (dB)	-10.27	-
8	27.1208	36.4dBuV Ca	0	12.8	49.2	-	50
					Margin (dB)	-	-.8

LIMIT 1: 47 CFR Part 18 Consumer QP
 LIMIT 2: 47 CFR Part 18 Consumer Av

Qp - Quasi-Peak detector
 Ca - CISPR Average detection

* ISM frequency, not subject to limit.

Results – 120 V, 60 Hz configuration mode 2, operating mode 2
Conducted Emissions Graph



Conducted Emissions Data Points

Wireless Headset
 Charger Alone
 120V/60Hz
 Red=QP Green=AV

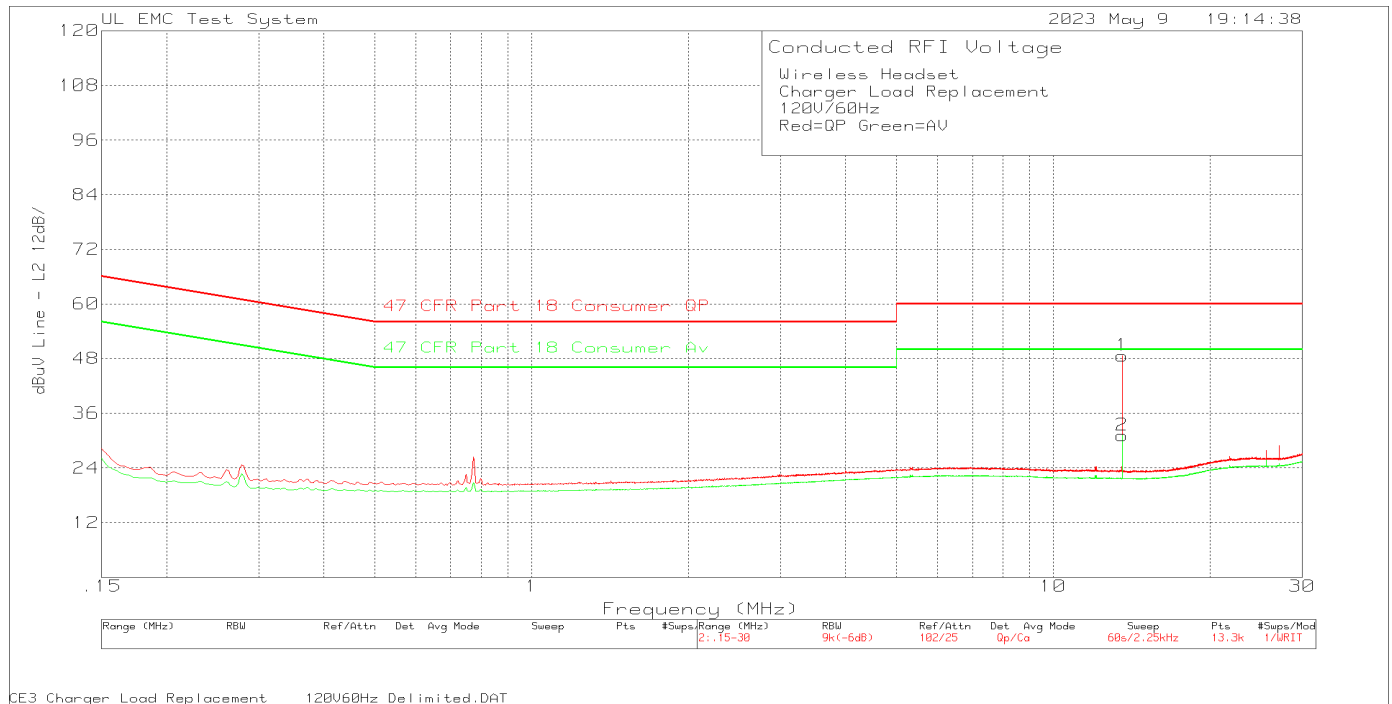
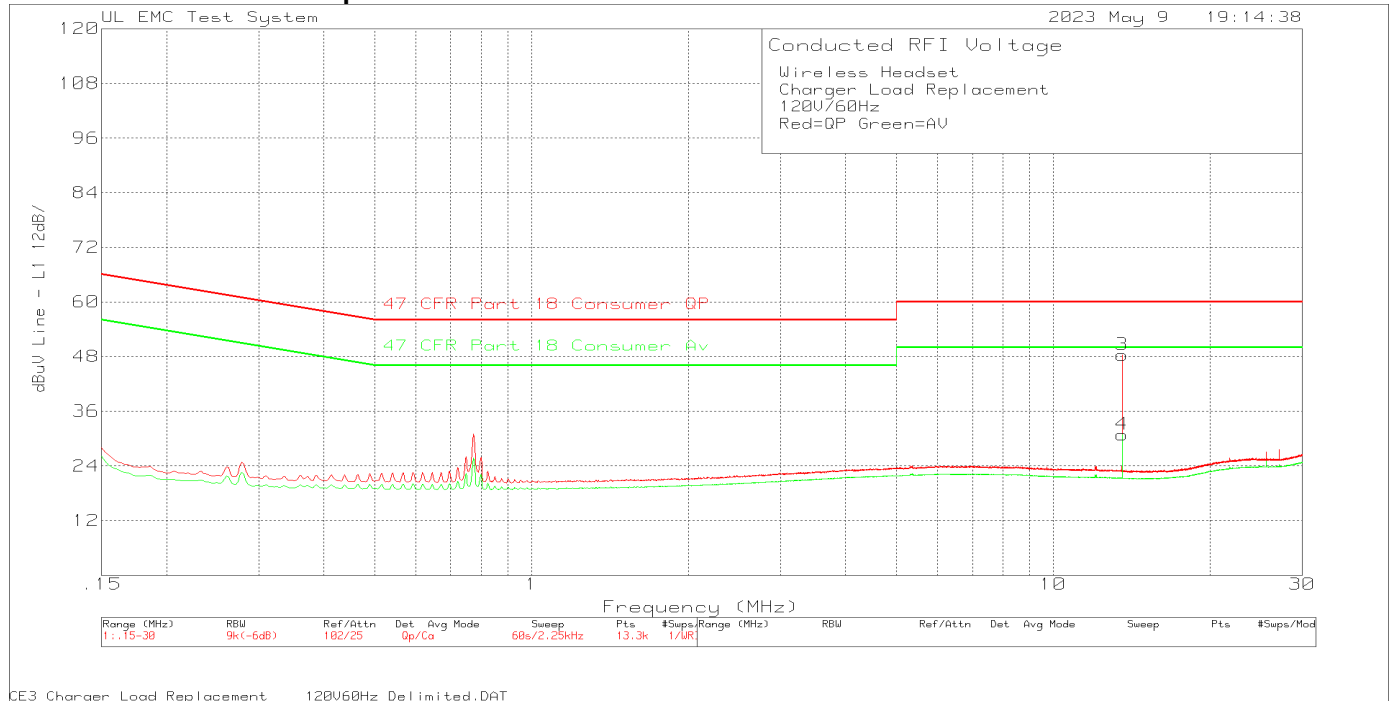
Trace Markers

No.	Test Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading	Limit:1	2
=====							
Line							
1	.7733	20.02dBuV Qp	0	10.6	30.62	56	-
					Margin (dB)	-25.38	-
2	.7733	15.18dBuV Ca	0	10.6	25.78	-	46
					Margin (dB)	-	-20.22
3	13.56	32.57dBuV Qp	.1	11.3	43.97	60	-
					Margin (dB)	-16.03	-
4	13.56	13.8dBuV Ca	.1	11.3	25.2	-	50
					Margin (dB)	-	-24.8
5	27.1208	29.8dBuV Qp	0	12.2	42	60	-
					Margin (dB)	-18	-
6	27.1208	13.95dBuV Ca	0	12.2	26.15	-	50
					Margin (dB)	-	-23.85
Neutral							
7	.7733	15.33dBuV Qp	0	10.5	25.83	56	-
					Margin (dB)	-30.17	-
8	.7733	10.15dBuV Ca	0	10.5	20.65	-	46
					Margin (dB)	-	-25.35
9	13.56	32.36dBuV Qp	.1	11.6	44.06	60	-
					Margin (dB)	-15.94	-
10	13.56	13.81dBuV Ca	.1	11.6	25.51	-	50
					Margin (dB)	-	-24.49
11	27.1208	29.69dBuV Qp	0	12.8	42.49	60	-
					Margin (dB)	-17.51	-
12	27.1208	13.94dBuV Ca	0	12.8	26.74	-	50
					Margin (dB)	-	-23.26

LIMIT 1: 47 CFR Part 18 Consumer QP
 LIMIT 2: 47 CFR Part 18 Consumer Av

Qp - Quasi-Peak detector
 Ca - CISPR Average detection

Results – 120 V, 60 Hz non radiating antenna, configuration 3
Conducted Emissions Graph



Conducted Emissions Data Points

Wireless Headset
 Charger Load Replacement
 120V/60Hz
 Red=QP Green=AV

Trace Markers

Test No.	Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading dBuV	Limit:1	2
=====							
Line 1							
3	13.56	36.96dBuV Qp	.1	11.3	48.36	60	-
					Margin (dB)	-11.64	-
4	13.56	19.44dBuV Ca	.1	11.3	30.84	-	50
					Margin (dB)	-	-19.16
Neutral							
1	13.56	36.92dBuV Qp	.1	11.6	48.62	60	-
					Margin (dB)	-11.38	-
2	13.56	19.44dBuV Ca	.1	11.6	31.14	-	50
					Margin (dB)	-	-18.86

LIMIT 1: 47 CFR Part 18 Consumer QP
 LIMIT 2: 47 CFR Part 18 Consumer AV

Qp - Quasi-Peak detector
 Ca - CISPR Average detection

4.2 Test Conditions and Results - RADIATED EMISSIONS

Test Engineer	Bm06740	
Test Date	2023-05-09	
Laboratory Parameters	Required prior to the test	During the test
Ambient Temperature	-	24.3 °C
Humidity	-	40 %rH
Atmospheric Pressure	-	998.3 hPa
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	300kHz – 30MHz	3 meter
	30MHz – 1GHz	10 meter
Limits – 47 CFR Part 18 Consumer under 500W		
Frequency (MHz)	Limit (dBµV/m)	
Limits	At 300 meter distance	At 3 meter distance
0.3 – 1,000	27.96	67.96
Supplementary information: Lowest frequency used is 365kHz therefore radiated emissions scans start at 300kHz.		

Radiated Emissions EUT Configuration Settings

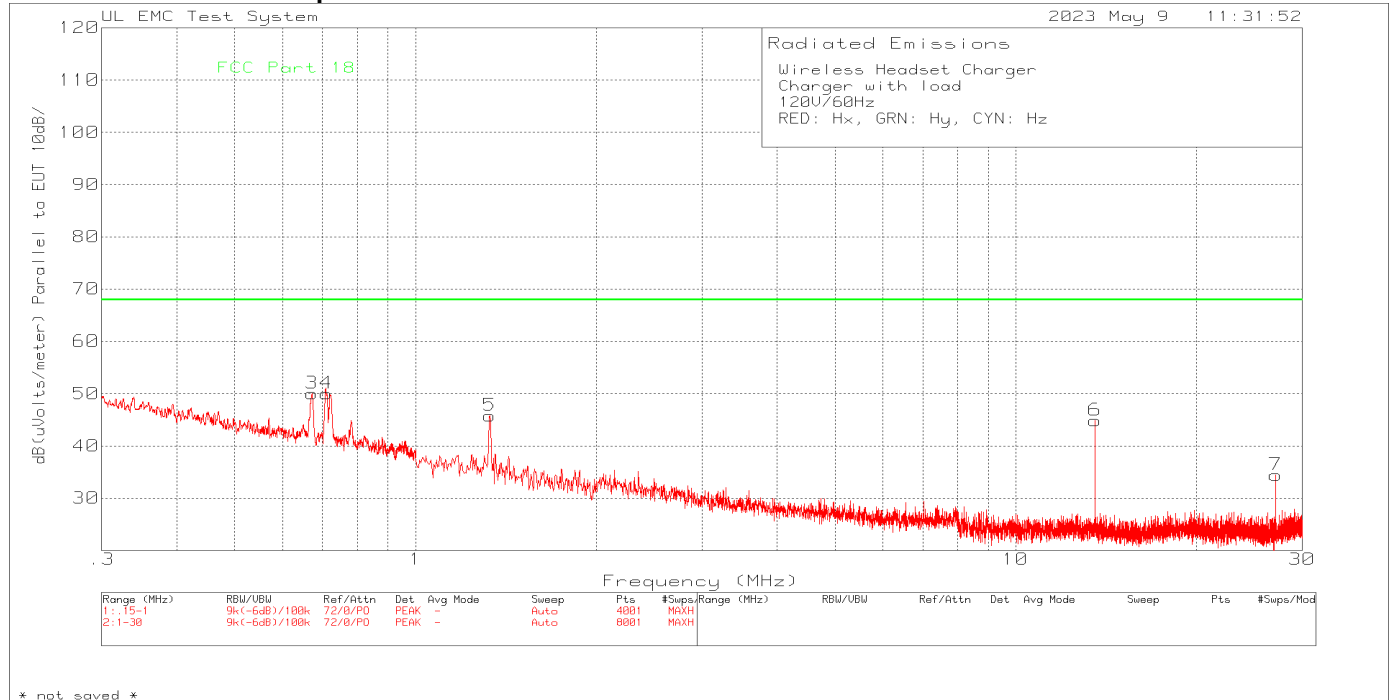
Power Interface #	EUT Configurations #	EUT Mode of Operation#
1	1, 2	1, 2
Supplementary information: None		

Radiated Emissions Test Equipment

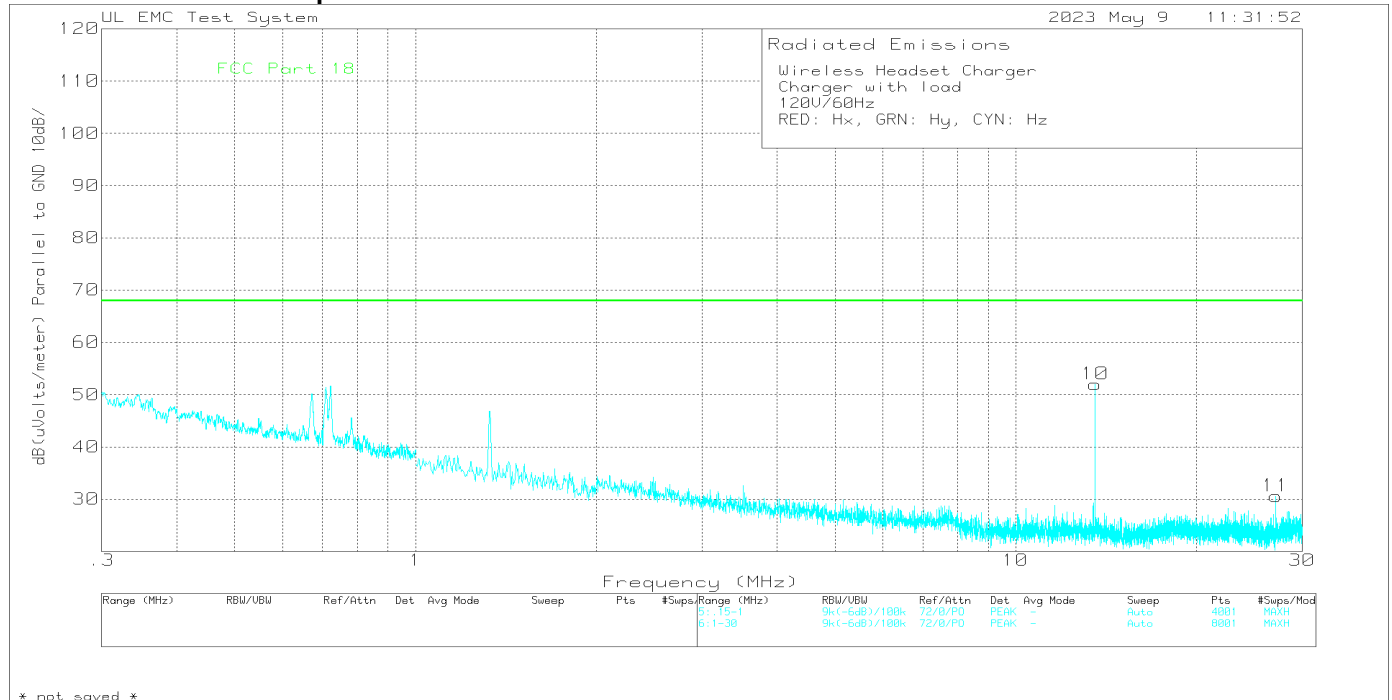
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESCI	54598	2022-12-08	2023-12-31
Passive Loop Antenna	EMCO	EM-6872	232146	2022-09-29	2023-09-30
Hybrid Antenna	SunAR RF Motion	JB1-UN	202902	2023-02-03	2024-02-29
Barometric Pressure/ Humidity/ Temperature Datalogger	Extech Instruments	SD700	80491	2022-12-15	2023-12-31

RADIATED EMISSIONS 300kHz TO 30MHz configuration mode 1, operating mode 1

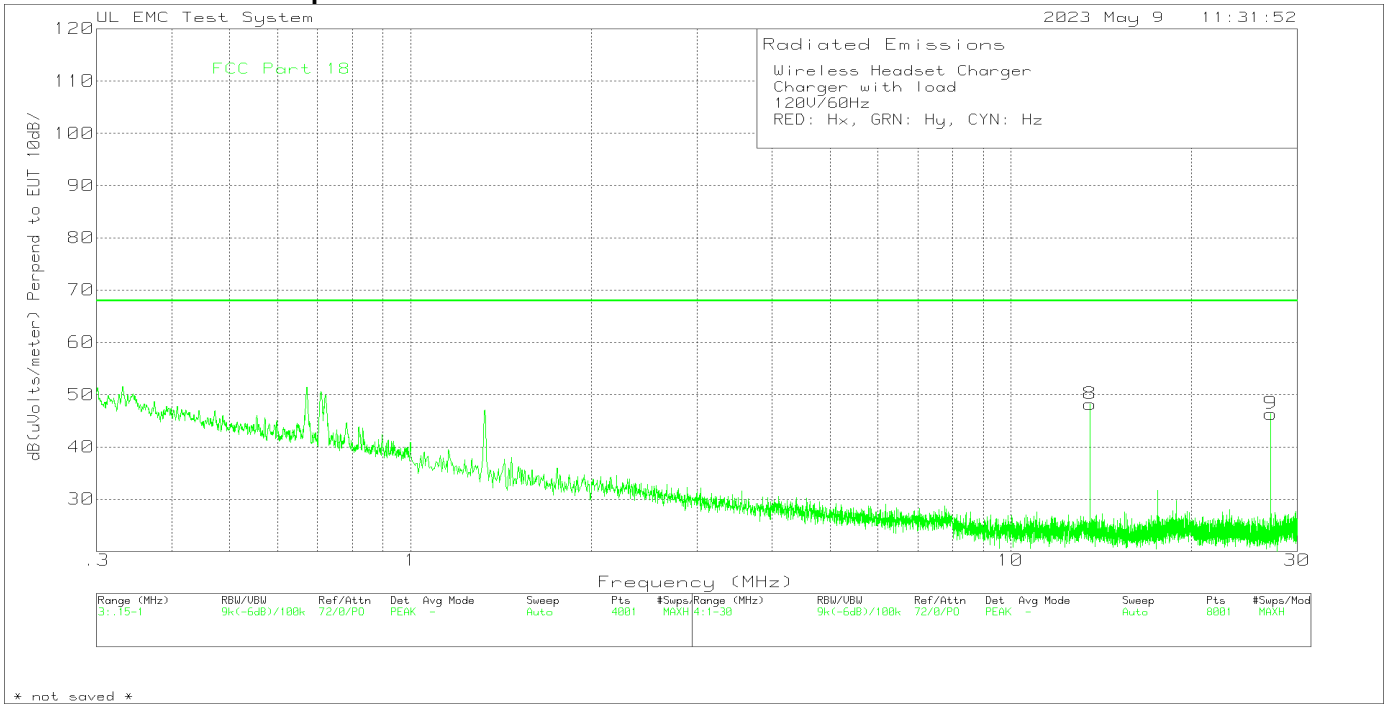
Radiated Emissions Graph X-Axis



Radiated Emissions Graph Y-Axis



Radiated Emissions Graph Z-Axis



Radiated Emissions Data Points

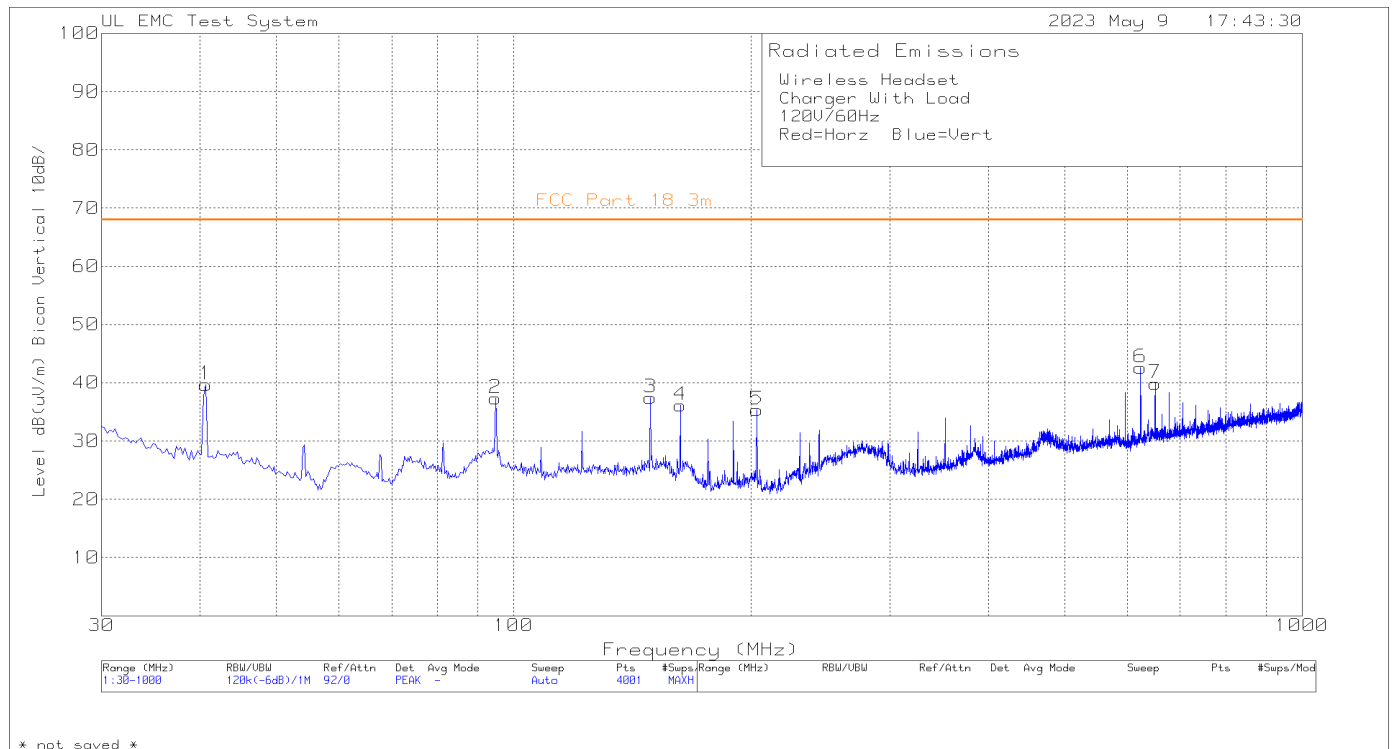
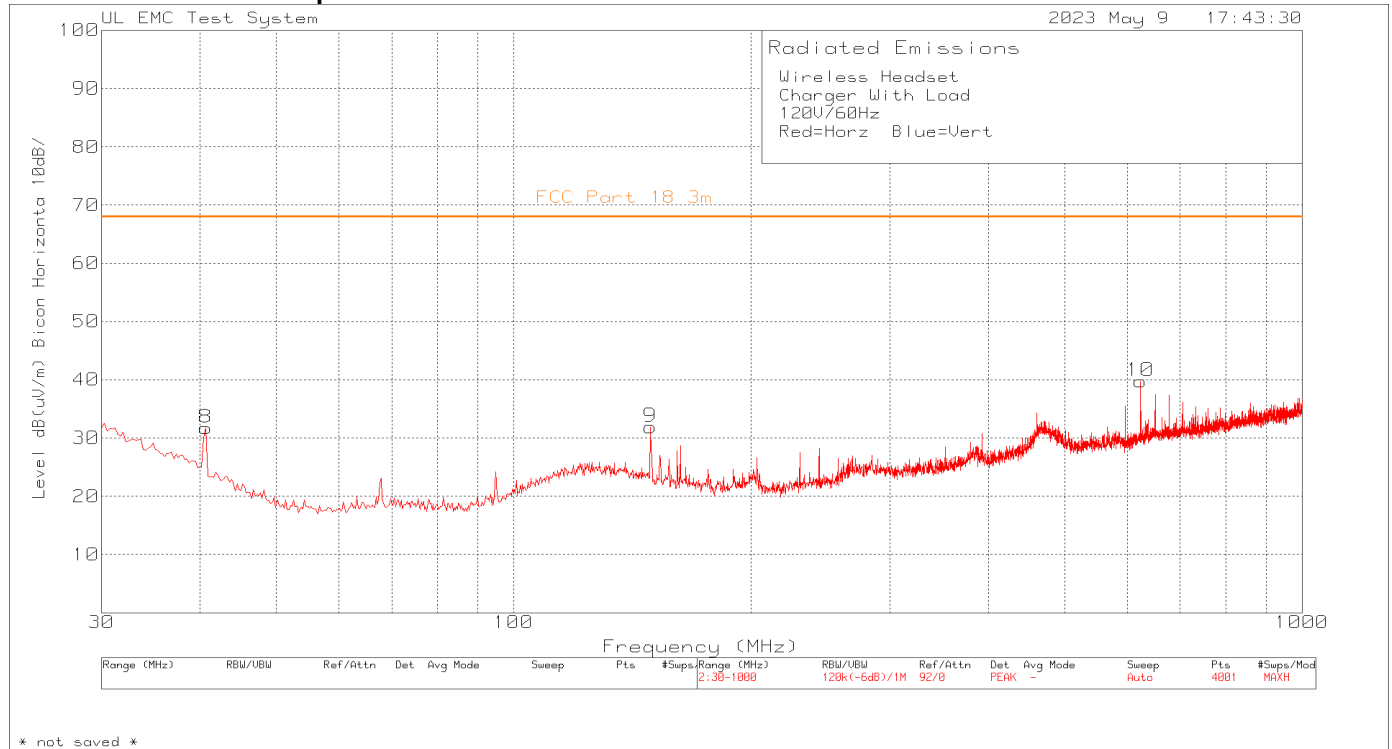
Wireless Headset Charger
 Charger with load
 120V/60Hz
 RED: Hx, GRN: Hy, CYN: Hz

Trace Markers

Test No.	Frequency (MHz)	Meter Reading	Transducer Factor (dB)	Gain/Loss Factor (dB)	Corrected Reading (uVolts/meter)	Limit:1 (dB)
=====						
Parallel to EUT - X-Axis						
3	.6722	.1dBuV Pk	49.8	.1	50	67.96
		Azimuth:0-360			Margin (dB)	-17.96
4	.7106	.52dBuV Pk	49.4	.1	50.02	67.96
		Azimuth:0-360			Margin (dB)	-17.94
5	1.3299	.61dBuV Pk	45.1	.1	45.81	67.96
		Azimuth:0-360			Margin (dB)	-22.15
6	13.5606	10.33dBuV Pk	34.1	.4	44.83	67.96
		Azimuth:0-360			Margin (dB)	-23.13
7	27.1218	.41dBuV Pk	33.4	.6	34.41	67.96
		Azimuth:0-360			Margin (dB)	-33.55
Perpendicular to EUT - Y-Axis						
8	13.5606	13.72dBuV Pk	34.1	.4	48.22	67.96
		Azimuth:0-360			Margin (dB)	-19.74
9	27.1218	12.31dBuV Pk	33.4	.6	46.31	67.96
		Azimuth:0-360			Margin (dB)	-21.65
Parallel to Ground - Z-Axis						
10	13.5606	17.47dBuV Pk	34.1	.4	51.97	67.96
		Azimuth:0-360			Margin (dB)	-15.99
11	27.1218	-3.41dBuV Pk	33.4	.6	30.59	67.96
		Azimuth:0-360			Margin (dB)	-37.37

LIMIT 1: FCC Part 18
 Pk - Peak detector

RADIATED EMISSIONS 30MHz-1GHz configuration mode 1, operating mode 1
Radiated Emissions Graph



Radiated Emissions Data Points

Wireless Headset												
Charger With Load												
120V/60Hz												
Red=Horz Blue=Vert												
Trace MArkers												
Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Antenna Factor dB/m	Path Factor dB	10m to 3m Factor dB	Level dBuV/m	FCC Part 18 3m dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	40.67	52.29	Pk	19.5	-42.6	10.5	39.69	67.96	-28.27	0-360	97	V
2	94.7475	54.33	Pk	14.6	-42.1	10.5	37.33	67.96	-30.63	0-360	197	V
3	149.0675	49.96	Pk	18.6	-41.6	10.5	37.46	67.96	-30.5	0-360	97	V
4	162.6475	49.12	Pk	17.9	-41.4	10.5	36.12	67.96	-31.84	0-360	97	V
5	203.3875	48.2	Pk	18	-41.3	10.5	35.4	67.96	-32.56	0-360	97	V
6	623.8825	46.79	Pk	25.2	-39.9	10.5	42.59	67.96	-25.37	0-360	297	V
7	651.0425	43.3	Pk	25.8	-39.7	10.5	39.9	67.96	-28.06	0-360	197	V
8	40.67	44.34	Pk	19.5	-42.6	10.5	31.74	67.96	-36.22	0-360	399	H
9	149.0675	44.42	Pk	18.6	-41.6	10.5	31.92	67.96	-36.04	0-360	399	H
Pk - Peak detector												