Engineering Test Report No. 2302027-02		
Report Date	November 16, 2023	
Manufacturer Name	Elkay Manufacturing Company	
Manufacturer Address	2222 Camden Ct. Oak Brook, IL 60523	
Model No.	Connected Enhanced EZH20 Bottle Filling Station and Cooler Model No.: LZSTL8WSSP-W1	
Date Received	October 30, 2023	
Test Dates	October 30, 2023 through November 2, 2023	
Specifications	FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.225 Innovation, Science, and Economic Development Canada, RSS-210 Innovation, Science, and Economic Development Canada, RSS-GEN	
Test Facility	Elite Electronic Engineering, Inc. 1516 Centre Circle, Downers Grove, IL 60515	FCC Reg. Number: 269750 IC Reg. Number: 2987A CAB Identifier: US0107
Signature	MARK E. LONGINOTTI	
Tested by	Mark E. Longinotti	
Signature	Raymond J Klouda	
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894	
PO Number	CC	

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.225 and Innovation, Science, and Economic Development Canada, RSS-210 and RSS-Gen test specification(s). The data presented in this test report pertains to the EUT on the test date(s) specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification. This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

Table of Contents

1. Report Revision History

Revision	Date	Description
–	16 NOV 2023	Initial Release of Engineering Test Report No. 2302027-02

2. Introduction

2.1. Scope of Tests

This document presents the results of a series of RF emissions tests that were performed on the Elkay Manufacturing Company Connected Enhanced EZH20 Bottle Filling Station and Cooler (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was manufactured and submitted for testing by Elkay Manufacturing Company located in Oak Brook, IL.

2.2. Purpose

The test series was performed to determine if the EUT meets the RF emission requirements of the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.225.

The test series was also performed to determine if the EUT meets the RF emission requirements of the Innovation, Scientific, and Economic Development Canada Radio Standards Specification RSS-Gen and Innovation, Scientific, and Economic Development Canada Radio Standards Specification RSS-210 for Transmitters.

Testing was performed in accordance with ANSI C63.10-2013.

2.3. Identification of the EUT

The EUT was identified as follows:

EUT Identification	
Product Description	Connected Enhanced EZH20 Bottle Filling Station and Cooler
Model/Part No.	LZSTL8WSSP-W1
S/N	4310213587
Band of Operation	13.56MHz
Software/Firmware Version	NFC_V2R1_05012018
Field Strength at Fundamental	37.9 dBuV/m at 30 meters
99% Bandwidth	515kHz
Size of EUT	39 ¾” x 36” x 19”

*- Antenna gain is supplied by the manufacturer and Elite is not responsible for the accuracy of the antenna gain.

The EUT listed above was used throughout the test series.

3. Power Input

The EUT obtained 115V 60Hz power via a 3-wire, 1-meter, unshielded power cord.

4. Grounding

The EUT was connected to ground through the third wire of its input power cord.

5. Support Equipment

No support equipment was used during the tests.

6. Interconnect Leads

No interconnect leads were used during the tests.

7. Modifications Made to the EUT

No modifications were made to the EUT during the testing.

8. Modes of Operation

The EMC tests were performed with the EUT operating in one or more of the test modes described below. See the specific test section for the applicable test modes.

8.1. NFC Transmit at 13.56MHz

This mode was achieved by applying 115V, 60Hz to the EUT. The EUT was programmed so that the NFC transmitter was transmitting at 13.56MHz.

9. Test Specifications

The tests were performed to selected portions of, and in accordance with the following test specifications:

- Federal Communications Commission “Code of Federal Regulations”, Title 47, Part 15, Subpart C, Section 15.225
- ANSI C63.10-2013, “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”
- RSS-210 Issue 10, December 2019, “License-Exempt Radio Apparatus: Category I Equipment”
- RSS-Gen Issue 5, March 2019, Amendment 1, Innovation, Science, and Economic Development Canada, “Spectrum Management and Telecommunications, Radio Standards Specification, General Requirements for Compliance of Radio Apparatus”

10. Test Plan

No test plan was provided. Instructions were provided by personnel from Elkay Manufacturing Company and used in conjunction with the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.225 and Innovation, Science, and Economic Development Canada, RSS-210, and ANSI C63.10-2013 specifications.

11. Deviation, Additions to, or Exclusions from Test Specifications

There were no deviations, additions to, or exclusions from the test specifications during this test series.

12. Laboratory Conditions

Ambient Parameters	Value
Temperature	22°C
Relative Humidity	23%
Atmospheric Pressure	1018mb

13. Summary

The following EMC tests were performed and the results are shown below:

Test Description	Requirements	Test Methods	S/N	Results
Transmitter Powerline Conducted Emissions Test (AC Mains)	FCC 15.225 RSS-Gen	ANSI C63.10: 2013	4310213587	Conforms
Radiated Emissions	FCC 15.225 ISED RSS-210 Annex B, Section B.6	ANSI C63.10: 2013	4310213587	Conforms
Occupied Bandwidth Measurements	ISED RSS-Gen	ANSI C63.10: 2013	4310213587	---
Frequency Tolerance / Frequency Stability	ISED RSS-210 Annex B, Section B.6	ANSI C63.10: 2013	4310213587	Conforms

14. Sample Calculations

For Powerline Conducted Emissions:

The resultant voltage level (VL) is a summation in decibels (dB) of the receiver meter reading (MTR) and the cable loss factor (CF).

Formula 1: VL (dBuV) = MTR (dBuV) + CF (dB).

For Radiated Emissions:

The resultant field strength (FS) is a summation in decibels (dB) of the receiver meter reading (MTR), the antenna correction factor (AF), and the cable loss factor (CF). If an external preamplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

Formula 1: FS (dBuV/m) = MTR (dBuV) + AF (dB/m) + CF (dB) + (- PA (dB)) + DC (dB)

To convert the Field Strength dBuV/m term to uV/m, the dBuV/m is first divided by 20. The Base 10 AntiLog is taken of this quotient. The result is the Field Strength value in uV/m terms.

Formula 2: FS (uV/m) = AntiLog [(FS (dBuV/m))/20]

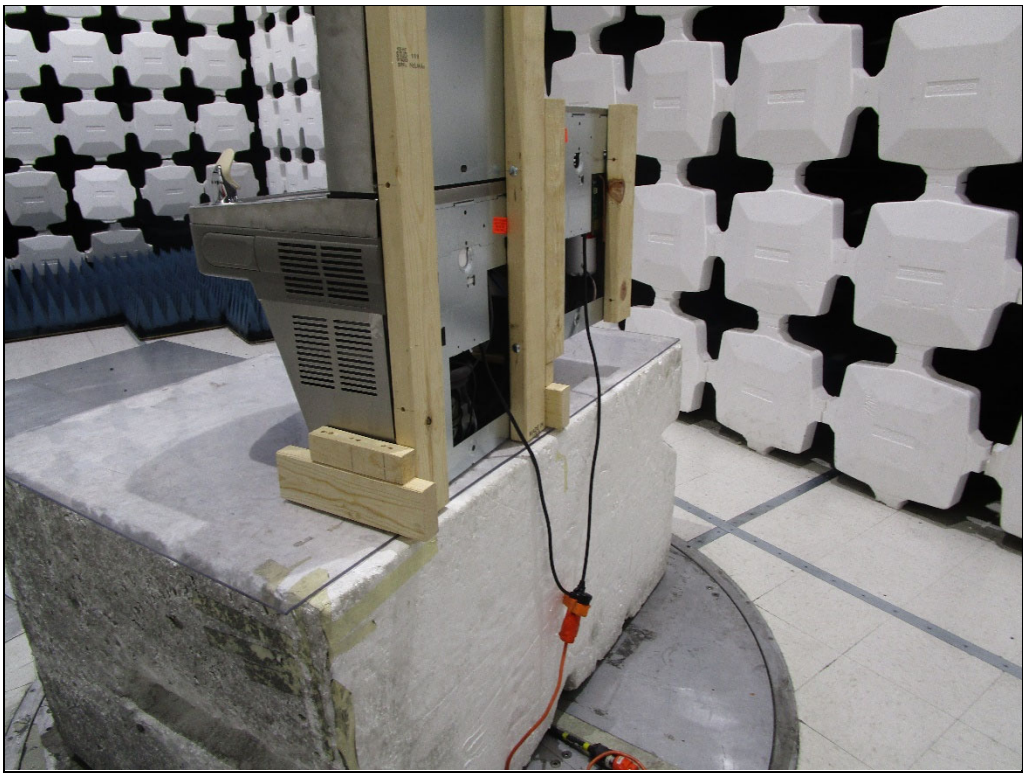
15. Statement of Conformity

The Elkay Manufacturing Company Connected Enhanced EZH20 Bottle Filling Station and Cooler, Model No. LZSTL8WSSP-W1, Serial No. 4310213587, did fully conform to the selected requirements of FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.225 and Innovation, Science, and Economic Development Canada, RSS-210, and RSS-Gen.

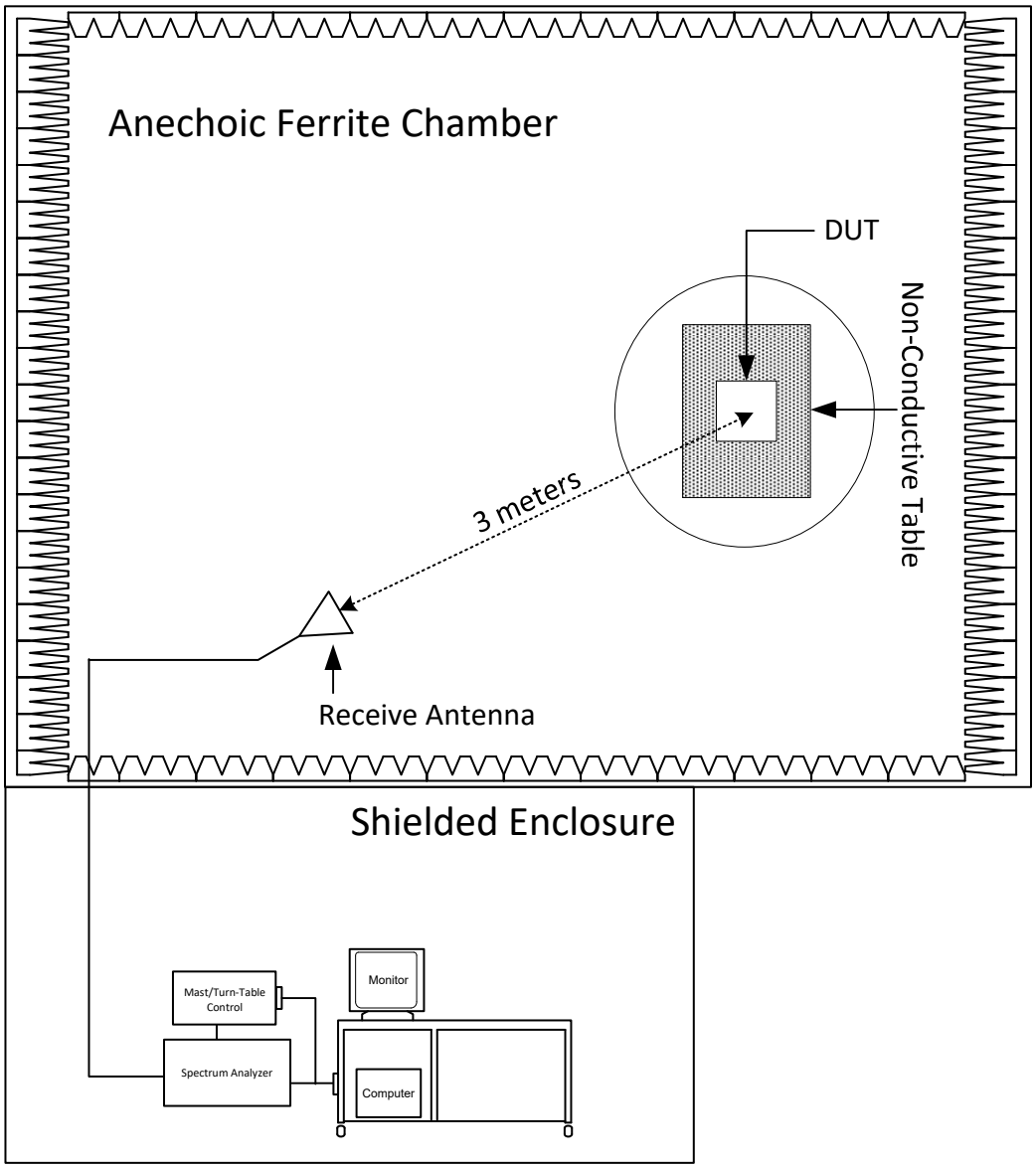
16. Certification

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.225 and Innovation, Science, and Economic Development Canada, RSS-210 test specifications. The data presented in this test report pertains to the EUT as provided by the customer on the test date specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

17. Photographs of EUT



18. Block Diagram of Test Setup



Radiated Measurements Test Setup

19. Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW10	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	3/10/2023	3/10/2024
CDZ3	LAB WORKSTATION	ELITE	LWS-10		WINDOWS 10	CNR	
CDZ5	LAB WORKSTATION	ELITE	LWS-10		WINDOWS 10	CNR	
EMCE02	TEMPERATURE CHAMBER	THERMOTRON	S-8	15461	-70C TO 150C	7/3/2023	7/3/2024
NLS0	24" ACTIVE LOOP ANTENNA	EMCO	6502	89979	10KHZ-30MHZ	4/4/2023	4/4/2025
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	11/17/2022	11/17/2024
PLF1	CISPR16 50UH LISN	ELITE	CISPR16/70A	001	.15-30MHz	4/7/2023	4/7/2024
PLF3	CISPR16 50UH LISN	ELITE	CISPR16/70A	003	.15-30MHz	4/7/2023	4/7/2024
RBJ0	EMI ANALYZER	ROHDE & SCHWARZ	ESW8	100986	2HZ-8GHZ	12/26/2022	12/26/2023
SPR0	AC/DC PROGRAMMABLE POWER SUPPLY	PREEN	AFV-P-600B	F117040006	0-310VAC/0-420VDC	CNR	
T1EJ	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	CD6790	DC-18GHZ	1/12/2022	1/12/2024
VBR8	CISPR EN FCC CE VOLTAGE.exe					N/A	
VBV2	CISPR EN FCC ICES RE.EXE	ELITE	CISPR EN FCC ICES RE.EXE	---	---	N/A	

N/A: Not Applicable I/O: Initial Only CNR: Calibration Not Required
NOTE 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

20. Transmitter Powerline Conducted Emissions Test (AC Mains)

Test Information	
Manufacturer	Elkay Manufacturing Company
Product	Connected Enhanced EZH20 Bottle Filling Station and Cooler
Model	LZSTL8WSSP-W1
Serial No	4310213587
Mode	NFC Transmit at 13.56MHz
Test Date	October 30, 2023

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Shielded Enclosure
Test site used	Room 23S
Note	None

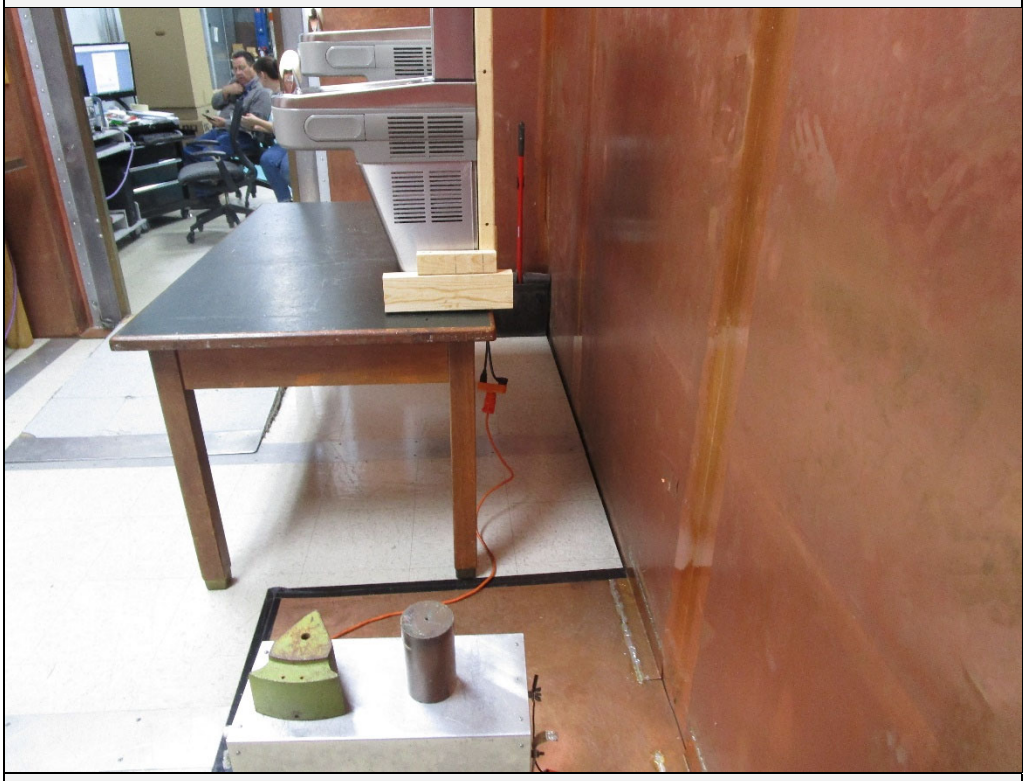
Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Conducted disturbance (mains port) (150 kHz – 30 MHz)	2.7

Requirements		
All radio frequency voltages on the power lines for any frequency or frequencies of an intentional radiator shall not exceed the limits in the following table:		
Frequency of Emission (MHz)	Conducted Limits (dBµV)	
	Quasi-peak	Average
0.15-05 0.5-5 5-30	66 to 56* 56 60	56-46* 46 50

*Decreases with the logarithm of the frequency

Procedures
The interference on each power lead of the EUT was measured by connecting the measuring equipment to the appropriate meter terminal of the Line Impedance Stabilization Network (LISN). The meter terminal of the LISN not under test was terminated with 50 ohms. 1) The EUT was operated in the NFC Transmit at 13.56MHz mode. 2) Measurements were first made on the 115V, 60Hz high line. 3) The frequency range from 150 kHz to 30 MHz was broken up into smaller frequency sub-bands. 4) Conducted emissions measurements were taken on the first frequency sub-band using a peak detector with a 9kHz resolution bandwidth. 5) The data thus obtained was then searched by the computer for the highest levels. Any emissions levels that were within 10dB of the average limit were then measured again using both a quasi-peak detector and an average detector. (If no peak readings were within 10dB of the average limit, quasi-peak and average readings were taken on the highest emissions levels measured during the peak detector scan.) 6) Steps (4) and (5) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits. 7) Steps (3) through (6) were repeated on the 115V, 60Hz neutral line.

Test Setup for Powerline Conducted Emissions (AC Mains)



Test Setup for Powerline Conducted Emissions (AC Mains)

FCC Part 15 Subpart C, Section 15.207
Conducted Emissions Test
Significant Emissions Data

VBR8 09/15/2023

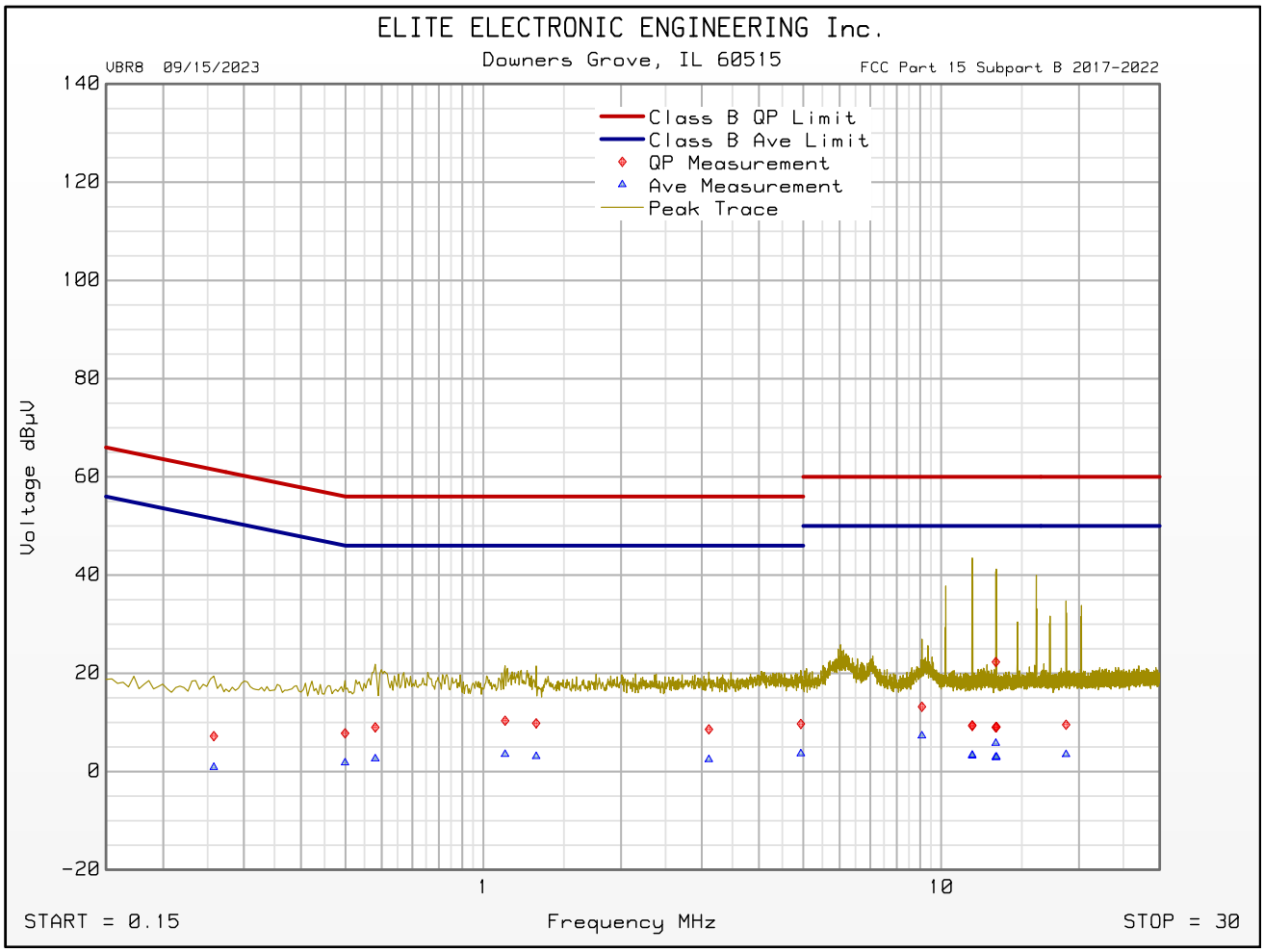
Manufacturer	:	Elkay
Model	:	LZSTL8WSSP-W1
DUT Revision	:	
Serial Number	:	4310213587
DUT Mode	:	NFC Tx @ 13.56MHz
Line Tested	:	120V, 60Hz High
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	15.207
Test Date	:	Oct 30, 2023 11:24:21 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.258	7.2	61.5		0.9	51.5	
0.499	7.8	56.0		1.8	46.0	
0.581	9.0	56.0		2.6	46.0	
1.116	10.3	56.0		3.5	46.0	
1.305	9.8	56.0		3.1	46.0	
3.110	8.6	56.0		2.5	46.0	
4.939	9.7	56.0		3.7	46.0	
9.077	13.2	60.0		7.3	50.0	
13.163	22.3	60.0		5.8	50.0	
18.738	9.5	60.0		3.5	50.0	

FCC Part 15 Subpart C, Section 15.207
Conducted Emissions Test
Cumulative Data

VBR8 09/15/2023

Manufacturer	:	Elkay
Model	:	LZSTL8WSSP-W1
DUT Revision	:	
Serial Number	:	4310213587
DUT Mode	:	NFC Tx @ 13.56MHz
Line Tested	:	120V, 60Hz High
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	15.207
Test Date	:	Oct 30, 2023 11:24:21 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart C, Section 15.207
Conducted Emissions Test
Significant Emissions Data

VBR8 09/15/2023

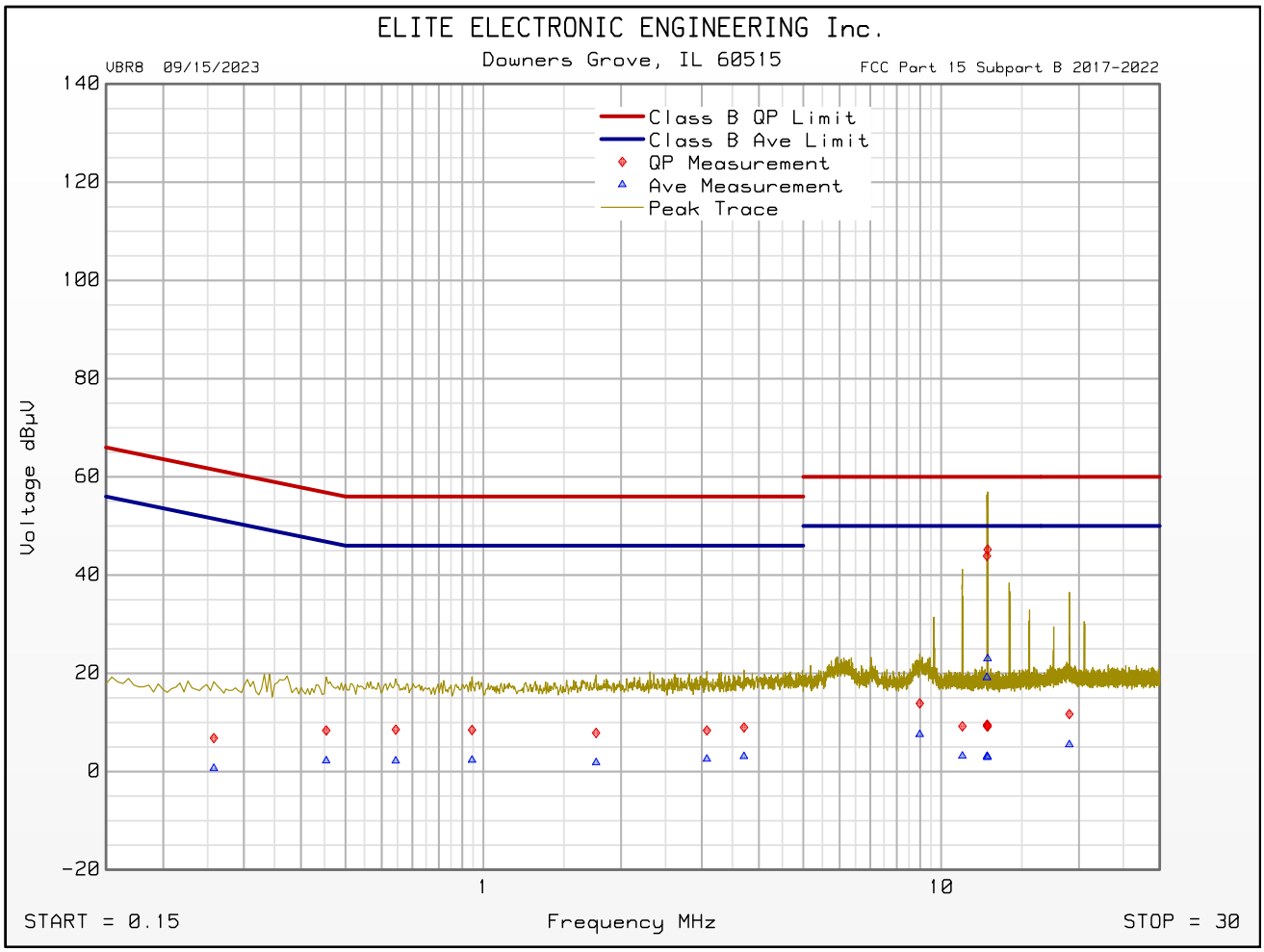
Manufacturer	:	Elkay
Model	:	LZSTL8WSSP-W1
DUT Revision	:	
Serial Number	:	4310213587
DUT Mode	:	NFC Tx @ 13.56MHz
Line Tested	:	120V, 60Hz Return
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	15.207
Test Date	:	Oct 30, 2023 11:17:29 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.258	6.8	61.5		0.7	51.5	
0.454	8.4	56.8		2.2	46.8	
0.644	8.5	56.0		2.2	46.0	
0.945	8.5	56.0		2.3	46.0	
1.764	7.9	56.0		1.9	46.0	
3.078	8.4	56.0		2.6	46.0	
3.710	9.0	56.0		3.1	46.0	
8.978	13.9	60.0		7.6	50.0	
12.628	45.2	60.0		23.0	50.0	
19.048	11.7	60.0		5.5	50.0	

FCC Part 15 Subpart C, Section 15.207
Conducted Emissions Test
Cumulative Data

VBR8 09/15/2023

Manufacturer	:	Elkay
Model	:	LZSTL8WSSP-W1
DUT Revision	:	
Serial Number	:	4310213587
DUT Mode	:	NFC Tx @ 13.56MHz
Line Tested	:	120V, 60Hz Return
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	M. Longinotti
Limit	:	15.207
Test Date	:	Oct 30, 2023 11:17:29 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

21. Radiated Emissions

Test Information	
Manufacturer	Elkay Manufacturing Company
Product	Connected Enhanced EZH20 Bottle Filling Station and Cooler
Model	LZSTL8WSSP-W1
Serial No	4310213587
Mode	NFC Transmit at 13.56MHz
Test Date	November 1, 2023 and November 2, 2023

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Semi-Anechoic Chamber
Test site used	Room 29
Notes	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2
Radiated disturbance (electric field strength on an open area test site or alternative test site) (18 GHz – 26.5 GHz)	3.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (26.5 GHz – 40 GHz)	3.4

Requirements
The EUT must comply with the requirements of FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.225: - The field strength of any The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters. - Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters. - Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters. -The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in 15.209. The EUT must comply with the requirements of RSS-210 Annex B, Section B.6:

Devices shall comply with the following requirements:

The field strength of any emission shall not exceed the following limits:

- 15.848 mV/m (84 dBµV/m) at 30 m, within the band 13.553-13.567 MHz
- 334 µV/m (50.5 dBµV/m) at 30 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MH
- 106 µV/m (40.5 dBµV/m) at 30 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz
- RSS-Gen general field strength limits for frequencies outside the band 13.110-14.010 MHz

Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Below 30MHz:

A preliminary radiated emissions test was performed to determine the emission characteristics of the EUT. For the preliminary test, a 24” active loop antenna was positioned at a 3-meter distance from the EUT. The frequency range from 9kHz to 30MHz was investigated using a peak detector function. The data was then processed by the computer to calculate equivalent field intensity.

The final emission tests were then manually performed over the frequency range of 9kHz to 30MHz using a 24” active loop antenna as the pick-up device. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 200Hz on the spectrum analyzer was used below 150kHz and a peak detector with a resolution bandwidth of 9kHz on the spectrum analyzer was used above 150kHz.

To ensure that maximum or worst case, emission levels were measured, the following steps were taken:

1) The active loop antenna was placed 3 meters away from the EUT with the plane of the loop antenna perpendicular to the ground.
2) The height of the loop antenna was set to 1 meter above the ground with the face of the loop antenna facing the site axis.
3) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
4) The height of the loop antenna was set to 1 meter above the ground with the face of the loop antenna orthogonal to the site axis.
5) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
6) The height of the loop antenna was set to 1 meter above the ground with the face of the loop antenna in the horizontal polarization.
7) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
8) The measured field strength at 3 meters test distance was extrapolated out to the specified distance using the 40dB/decade extrapolation factor as stated in 15.31(f)(2).

Above 30MHz:

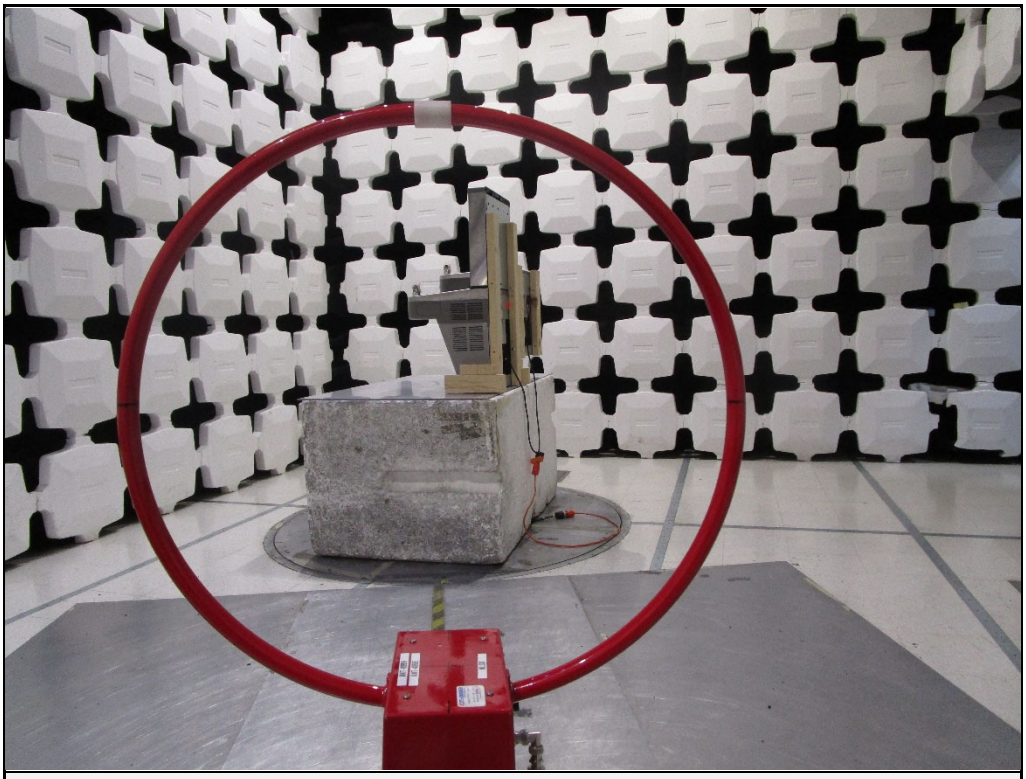
A preliminary radiated emissions test was performed to determine the emission characteristics of the EUT.

For the preliminary test, a broadband measuring antenna was positioned at a 3-meter distance from the EUT. The entire frequency range from 30MHz to 1GHz was investigated using a peak detector function. The data was then processed by the computer to calculate equivalent field intensity.

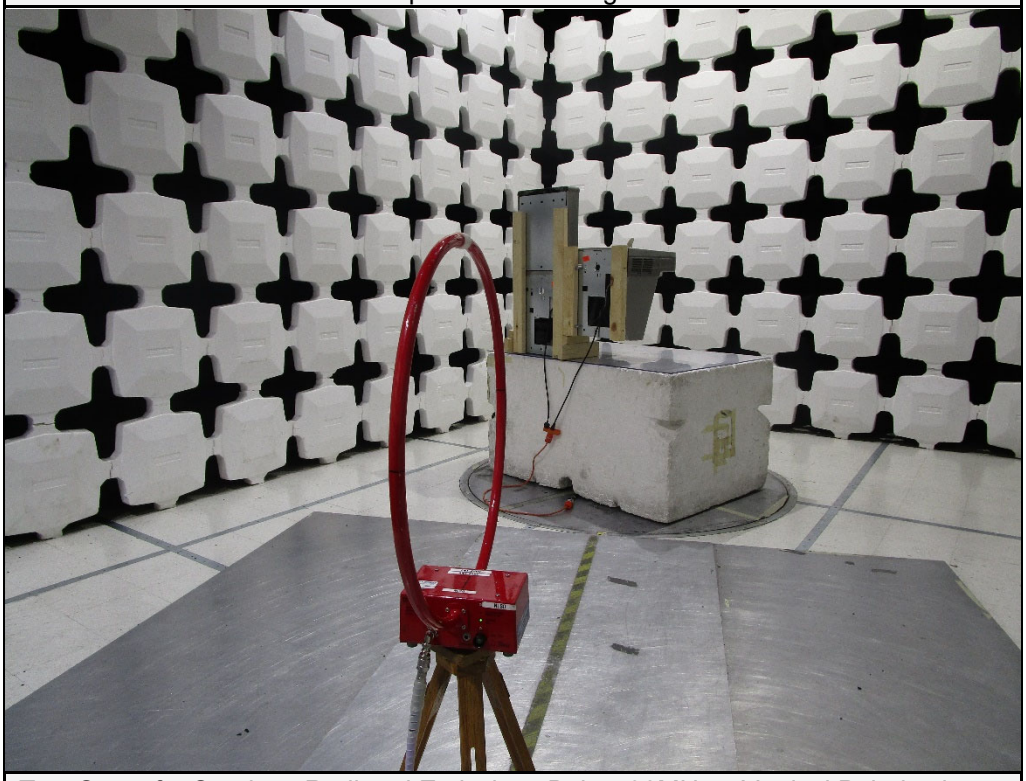
The final emission tests were then manually performed over the frequency range of 30MHz to 1GHz using a bi-log antenna as the pick-up device. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.

To ensure that maximum or worst case, emission levels were measured, the following steps were taken:

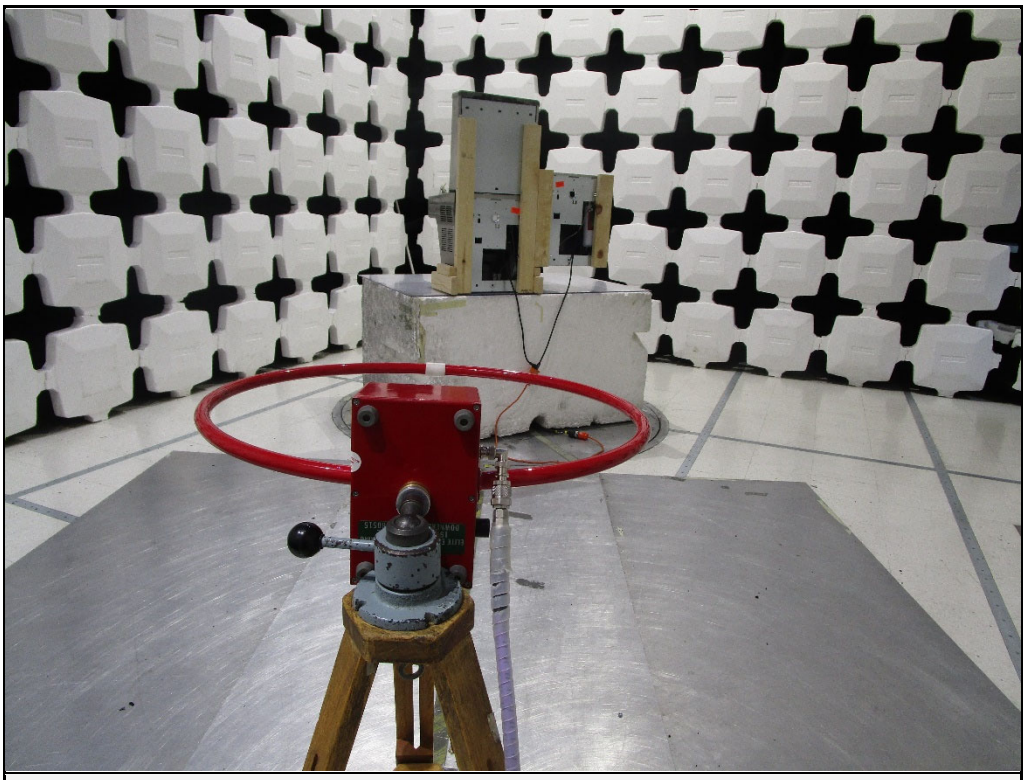
1) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
2) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
3) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.



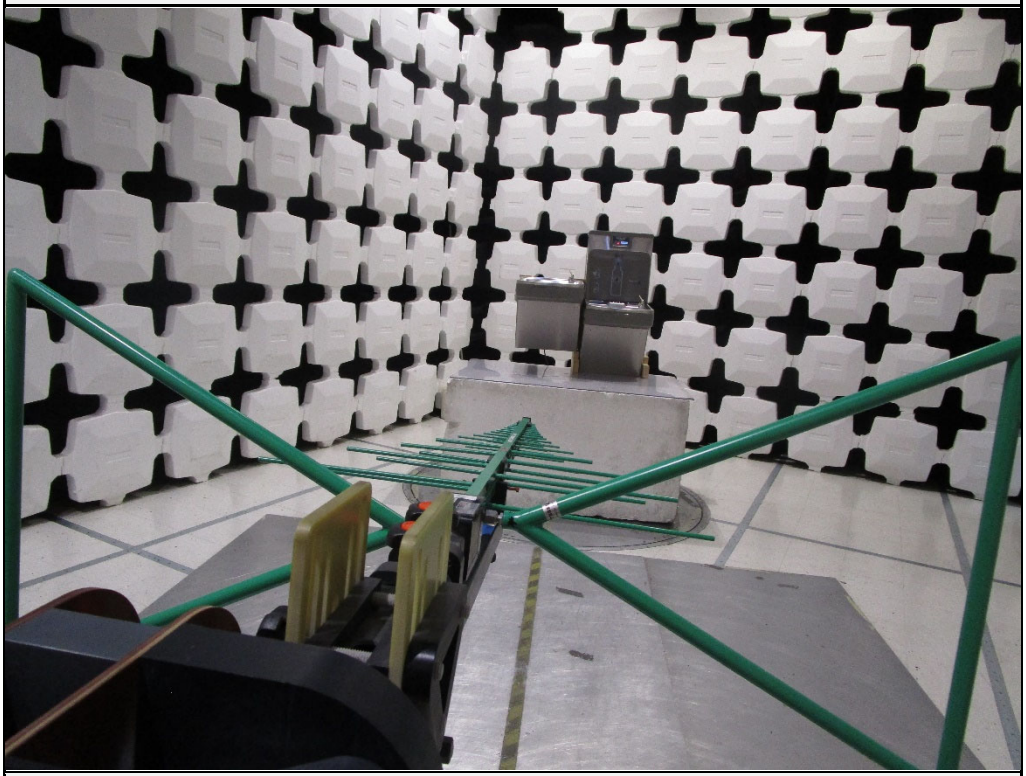
Test Setup for Spurious Radiated Emissions Below 30MHz – Vertical Polarization
Face of the Loop Antenna Facing the Site Axis



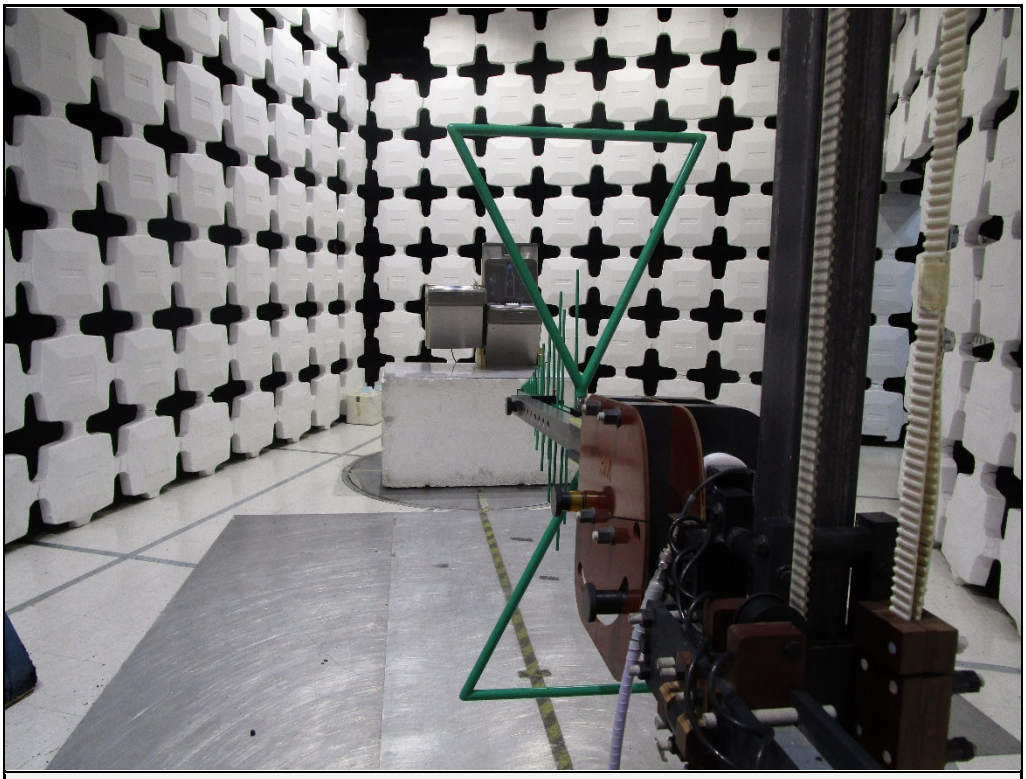
Test Setup for Spurious Radiated Emissions Below 30MHz – Vertical Polarization
Face of the Loop Antenna Orthogonal to the Site Axis



Test Setup for Spurious Radiated Emissions Below 30MHz – Horizontal Polarization



Test Setup for Spurious Radiated Emissions, 30MHz to 1 GHz – Horizontal Polarization



Test Setup for Spurious Radiated Emissions, 30MHz to 1 GHz – Vertical Polarization

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	FCC 15.225(a) radiated emissions
Date Tested	November 1, 2023 and November 2, 2023
Notes	Test distance = 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Dist. Corr. (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Specified Test Distance (meters)	Margin (dB)
13.560	H	44.7		0.2	10.1	0.0	-40.0	15.0	5.6	15848.0	30.0	-69.0
13.560	V	67.6		0.2	10.1	0.0	-40.0	37.9	78.7	15848.0	30.0	-46.1
27.120	H	11.9	Ambient	0.3	8.3	0.0	-40.0	-19.5	0.1	30.0	30.0	-49.1
27.120	V	14.7		0.3	8.3	0.0	-40.0	-16.7	0.1	30.0	30.0	-46.3
40.680	H	5.4	Ambient	0.3	18.6	0.0	0.0	24.3	16.4	100.0	3.0	-15.7
40.680	V	9.3		0.3	18.6	0.0	0.0	28.2	25.7	100.0	3.0	-11.8
54.240	H	5.6	Ambient	0.4	13.1	0.0	0.0	19.1	9.0	100.0	3.0	-20.9
54.240	V	5.3	Ambient	0.4	13.1	0.0	0.0	18.8	8.7	100.0	3.0	-21.2
67.800	H	15.8		0.4	12.3	0.0	0.0	28.5	26.6	100.0	3.0	-11.5
67.800	V	17.0		0.4	12.3	0.0	0.0	29.7	30.6	100.0	3.0	-10.3
81.360	H	4.3	Ambient	0.5	13.1	0.0	0.0	17.9	7.9	100.0	3.0	-22.1
81.360	V	5.1	Ambient	0.5	13.1	0.0	0.0	18.7	8.6	100.0	3.0	-21.3
94.920	H	9.4	Ambient	0.5	15.9	0.0	0.0	25.8	19.6	150.0	3.0	-17.7
94.920	V	9.4	Ambient	0.5	15.9	0.0	0.0	25.8	19.6	150.0	3.0	-17.7
108.480	H	5.0	Ambient	0.5	18.0	0.0	0.0	23.5	14.9	150.0	3.0	-20.0
108.480	V	3.7	Ambient	0.5	18.0	0.0	0.0	22.2	12.9	150.0	3.0	-21.3
122.040	H	4.1	Ambient	0.6	18.3	0.0	0.0	23.0	14.1	150.0	3.0	-20.6
122.040	V	3.7	Ambient	0.6	18.3	0.0	0.0	22.6	13.4	150.0	3.0	-21.0
135.600	H	8.7	Ambient	0.6	17.5	0.0	0.0	26.8	22.0	150.0	3.0	-16.7
135.600	V	9.3	Ambient	0.6	17.5	0.0	0.0	27.4	23.6	150.0	3.0	-16.1

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	RSS-210 Annex B, Section B.6, radiated emissions of fundamental
Date Tested	November 1, 2023 and November 2, 2023
Notes	Test distance = 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Dist. Corr. (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Specified Test Distance (meters)	Margin (dB)
13.560	H	44.7		0.2	10.1	0.0	-40.0	15.0	5.6	15848.0	30.0	-69.0
13.560	V	67.6		0.2	10.1	0.0	-40.0	37.9	78.7	15848.0	30.0	-46.1

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	RSS-210 Annex B, Section B.6, spurious radiated emissions below 30MHz
Date Tested	November 1, 2023 and November 2, 2023
Notes	Test distance = 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dBS/m)	Pre Amp (dB)	Dist. Corr. (dB)	Total (dBuA/m)	Total (uA/m)	Limit (uA/m)	Specified Test Distance (meters)	Margin (dB)
27.1	H	11.9	Ambient	0.4	-43.2	0.0	-40.0	-71.0	0.0003	0.0800	30.0	-49.0
27.1	V	14.7		0.4	-43.2	0.0	-40.0	-68.2	0.0004	0.0800	30.0	-46.2

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	RSS-210 Annex B, Section B.6, spurious radiated emissions above 30MHz
Date Tested	November 1, 2023 and November 2, 2023
Notes	Test distance = 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Dist. Corr. (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Specified Test Distance (meters)	Margin (dB)
40.680	H	5.4	Ambient	0.3	18.6	0.0	0.0	24.3	16.4	100.0	3.0	-15.7
40.680	V	9.3		0.3	18.6	0.0	0.0	28.2	25.7	100.0	3.0	-11.8
54.240	H	5.6	Ambient	0.4	13.1	0.0	0.0	19.1	9.0	100.0	3.0	-20.9
54.240	V	5.3	Ambient	0.4	13.1	0.0	0.0	18.8	8.7	100.0	3.0	-21.2
67.800	H	15.8		0.4	12.3	0.0	0.0	28.5	26.6	100.0	3.0	-11.5
67.800	V	17.0		0.4	12.3	0.0	0.0	29.7	30.6	100.0	3.0	-10.3
81.360	H	4.3	Ambient	0.5	13.1	0.0	0.0	17.9	7.9	100.0	3.0	-22.1
81.360	V	5.1	Ambient	0.5	13.1	0.0	0.0	18.7	8.6	100.0	3.0	-21.3
94.920	H	9.4	Ambient	0.5	15.9	0.0	0.0	25.8	19.6	150.0	3.0	-17.7
94.920	V	9.4	Ambient	0.5	15.9	0.0	0.0	25.8	19.6	150.0	3.0	-17.7
108.480	H	5.0	Ambient	0.5	18.0	0.0	0.0	23.5	14.9	150.0	3.0	-20.0
108.480	V	3.7	Ambient	0.5	18.0	0.0	0.0	22.2	12.9	150.0	3.0	-21.3
122.040	H	4.1	Ambient	0.6	18.3	0.0	0.0	23.0	14.1	150.0	3.0	-20.6
122.040	V	3.7	Ambient	0.6	18.3	0.0	0.0	22.6	13.4	150.0	3.0	-21.0
135.600	H	8.7	Ambient	0.6	17.5	0.0	0.0	26.8	22.0	150.0	3.0	-16.7
135.600	V	9.3	Ambient	0.6	17.5	0.0	0.0	27.4	23.6	150.0	3.0	-16.1

22. Occupied Bandwidth Measurements

Test Information	
Manufacturer	Elkay Manufacturing Company
Product	Connected Enhanced EZH20 Bottle Filling Station and Cooler
Model	LZSTL8WSSP-W1
Serial No	4310213587
Mode	NFC Transmit at 13.56MHz
Test Date	

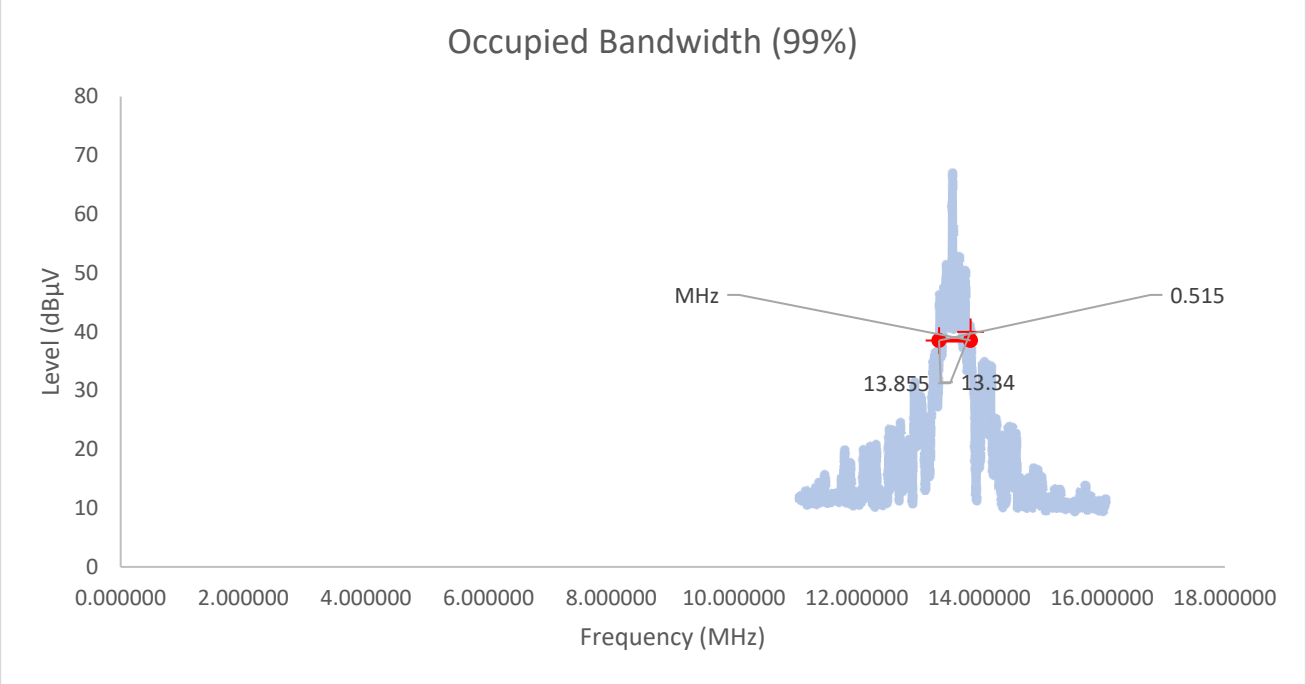
Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Semi-Anechoic Chamber
Test site used	Room 29
Notes	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2
Radiated disturbance (electric field strength on an open area test site or alternative test site) (18 GHz – 26.5 GHz)	3.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (26.5 GHz – 40 GHz)	3.4

Requirements
RSS-Gen: Per RSS-Gen, Section 6.7, the occupied bandwidth (99% bandwidth) shall be reported for all equipment.

Procedures
The EUT was placed on an 80cm high non-conductive stand. The unit was set to transmit continuously. With an antenna positioned nearby, occupied bandwidth emissions were displayed on the spectrum analyzer. The resolution bandwidth was set to 10kHz and span was set to 5MHz. A screen capture was taken of the frequency spectrum near the carrier using a screen dump function on the spectrum analyzer.

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Parameters	99% Bandwidth = 515kHz
Date Tested	November 2, 2023
Notes	



23. Frequency Tolerance / Frequency Stability

Test Information	
Manufacturer	Elkay Manufacturing Company
Product	Connected Enhanced EZH20 Bottle Filling Station and Cooler
Model	LZSTL8WSSP-W1
Serial No	4310213587
Mode	NFC Transmit at 13.56MHz
Test Date	October 30, 2023 and October 31, 2023

Test Setup Details	
Setup Format	N/A
Height of Support	N/A
Type of Test Site	Temperature Chamber
Test site used	N/A
Notes	None

Requirements

FCC 15.225(e):
The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

RSS-210 Annex B, Section B.6:
The carrier frequency stability shall not exceed ±100 ppm.

RSS-Gen Section 6.11:

For license-exempt devices, the following conditions apply:

at the temperatures of -20°C (-4°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer’s rated supply voltage
at the temperature of +20°C (+68°F) and at ±15% of the manufacturer's rated supply voltage

Procedures

The procedures described in ANSI C63.10-2013 were followed.

The EUT was placed inside an environmental temperature chamber. Power to the EUT was provided by a programmable AC power supply. A near-field probe was placed next to the transmit antenna of the NFC transmitter.

a) The EUT was turned off.
b) The temperature control of the chamber was set to +50C. The temperature inside the chamber was allowed to stabilize.
c) While maintaining a constant temperature inside the test chamber, the EUT was turned on and the transmit frequency was recorded at startup, at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized.
d) The EUT was turned off.
e) The temperature inside the temperature chamber was lowered by 10C. The temperature inside the

chamber was allowed to stabilize.

f) While maintaining a constant temperature inside the test chamber, the EUT was turned on and the transmit frequency at startup, at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized.
g) The EUT was turned off.
h) Steps (e) through (g) were repeated at 10C increments down to -20C.
i) The EUT was turned off.
j) The temperature inside the temperature chamber was set to +20C. The temperature inside the chamber was allowed to stabilize.
k) The EUT was turned on and the transmit frequency was measured.
l) The input voltage to the EUT was reduced to 85% of nominal voltage and the transmit frequency was measured.
m) The input voltage to the EUT was increased to 115% of nominal voltage and the transmit frequency was measured.

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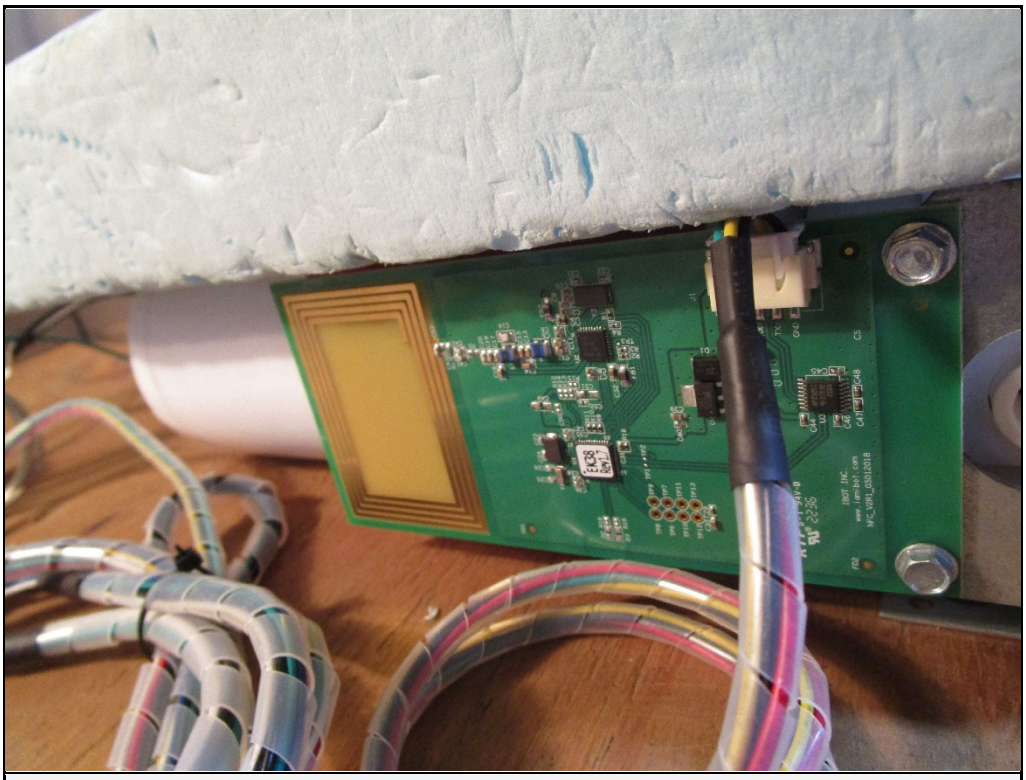
Test Setup for Frequency Tolerance / Frequency Stability Tests

Test Setup for Frequency Tolerance / Frequency Stability Tests



Test Setup for Frequency Tolerance / Frequency Stability Tests

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	FCC 15.225 (e), Frequency Tolerance vs. Temperature
Date Tested	October 30, 2023 and October 31, 2023
Notes	

Temperature °C	Input Power VAC	Time of Measurement	Nominal Frequency Hz	Measured Frequency Hz	Frequency Variation in %			Pass/Fail
					Lower Limit %	Measured Variation %	Upper Limit %	
+50	115	Startup	13,560,000.0	13,560,040.0	-0.0100	0.0003	0.0100	Pass
+50	115	2 minutes	13,560,000.0	13,560,040.0	-0.0100	0.0003	0.0100	Pass
+50	115	5 minutes	13,560,000.0	13,560,040.0	-0.0100	0.0003	0.0100	Pass
+50	115	10 minutes	13,560,000.0	13,560,040.0	-0.0100	0.0003	0.0100	Pass
+40	115	Startup	13,560,000.0	13,560,070.0	-0.0100	0.0005	0.0100	Pass
+40	115	2 minutes	13,560,000.0	13,560,070.0	-0.0100	0.0005	0.0100	Pass
+40	115	5 minutes	13,560,000.0	13,560,070.0	-0.0100	0.0005	0.0100	Pass
+40	115	10 minutes	13,560,000.0	13,560,100.0	-0.0100	0.0007	0.0100	Pass
+30	115	Startup	13,560,000.0	13,560,100.0	-0.0100	0.0007	0.0100	Pass
+30	115	2 minutes	13,560,000.0	13,560,100.0	-0.0100	0.0007	0.0100	Pass
+30	115	5 minutes	13,560,000.0	13,560,100.0	-0.0100	0.0007	0.0100	Pass
+30	115	10 minutes	13,560,000.0	13,560,100.0	-0.0100	0.0007	0.0100	Pass
+20	115	Startup	13,560,000.0	13,560,140.0	-0.0100	0.0010	0.0100	Pass
+20	115	2 minutes	13,560,000.0	13,560,130.0	-0.0100	0.0010	0.0100	Pass
+20	115	5 minutes	13,560,000.0	13,560,120.0	-0.0100	0.0009	0.0100	Pass
+20	115	10 minutes	13,560,000.0	13,560,130.0	-0.0100	0.0010	0.0100	Pass
+10	115	Startup	13,560,000.0	13,560,170.0	-0.0100	0.0013	0.0100	Pass
+10	115	2 minutes	13,560,000.0	13,560,170.0	-0.0100	0.0013	0.0100	Pass
+10	115	5 minutes	13,560,000.0	13,560,140.0	-0.0100	0.0010	0.0100	Pass
+10	115	10 minutes	13,560,000.0	13,560,170.0	-0.0100	0.0013	0.0100	Pass
0	115	Startup	13,560,000.0	13,560,180.0	-0.0100	0.0013	0.0100	Pass
0	115	2 minutes	13,560,000.0	13,560,200.0	-0.0100	0.0015	0.0100	Pass
0	115	5 minutes	13,560,000.0	13,560,180.0	-0.0100	0.0013	0.0100	Pass
0	115	10 minutes	13,560,000.0	13,560,180.0	-0.0100	0.0013	0.0100	Pass
-10	115	Startup	13,560,000.0	13,560,170.0	-0.0100	0.0013	0.0100	Pass
-10	115	2 minutes	13,560,000.0	13,560,170.0	-0.0100	0.0013	0.0100	Pass
-10	115	5 minutes	13,560,000.0	13,560,170.0	-0.0100	0.0013	0.0100	Pass
-10	115	10 minutes	13,560,000.0	13,560,170.0	-0.0100	0.0013	0.0100	Pass
-20	115	Startup	13,560,000.0	13,560,130.0	-0.0100	0.0010	0.0100	Pass
-20	115	2 minutes	13,560,000.0	13,560,130.0	-0.0100	0.0010	0.0100	Pass
-20	115	5 minutes	13,560,000.0	13,560,140.0	-0.0100	0.0010	0.0100	Pass
-20	115	10 minutes	13,560,000.0	13,560,140.0	-0.0100	0.0010	0.0100	Pass

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	FCC 15.225 (e), Frequency Tolerance vs. Supply Voltage
Date Tested	October 30, 2023 and October 31, 2023
Notes	

Temperature °C	Input Power VAC	% of Nominal Voltage	Nominal Frequency Hz	Measured Frequency Hz	Frequency Variation in %			Pass/Fail
					Lower Limit %	Measured Variation %	Upper Limit %	
+20	115.00	---	13560000.0000	13560140	-0.01	0.0010324	0.01	Pass
+20	97.75	85%	13560000.0000	13560130	-0.01	0.0009587	0.01	Pass
+20	132.25	115%	13560000.0000	13560130	-0.01	0.0009587	0.01	Pass

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	RSS-210, Annex B, Section B.6(b) Frequency Stability vs. Temperature
Date Tested	October 30, 2023 and October 31, 2023
Notes	

Temperature °C	Input Power VAC	Time of Measurement	Nominal Frequency Hz	Measured Frequency Hz	Frequency Variation in ppm			Pass/Fail
					Lower Limit ppm	Measured Variation ppm	Upper Limit ppm	
+50	115	Startup	13,560,000.0	13,560,040.0	-100.0000	2.9499	100.0000	Pass
+50	115	2 minutes	13,560,000.0	13,560,040.0	-100.0000	2.9499	100.0000	Pass
+50	115	5 minutes	13,560,000.0	13,560,040.0	-100.0000	2.9499	100.0000	Pass
+50	115	10 minutes	13,560,000.0	13,560,040.0	-100.0000	2.9499	100.0000	Pass
+20	115	Startup	13,560,000.0	13,560,140.0	-100.0000	10.3245	100.0000	Pass
+20	115	2 minutes	13,560,000.0	13,560,130.0	-100.0000	9.5870	100.0000	Pass
+20	115	5 minutes	13,560,000.0	13,560,120.0	-100.0000	8.8496	100.0000	Pass
+20	115	10 minutes	13,560,000.0	13,560,130.0	-100.0000	9.5870	100.0000	Pass
-20	115	Startup	13,560,000.0	13,560,130.0	-100.0000	9.5870	100.0000	Pass
-20	115	2 minutes	13,560,000.0	13,560,130.0	-100.0000	9.5870	100.0000	Pass
-20	115	5 minutes	13,560,000.0	13,560,140.0	-100.0000	10.3245	100.0000	Pass
-20	115	10 minutes	13,560,000.0	13,560,140.0	-100.0000	10.3245	100.0000	Pass

Test Details	
Manufacturer	Elkay Manufacturing Company
Model	LZSTL8WSSP-W1
S/N	4310213587
Mode	NFC Transmit
Carrier Frequency	13.56MHz
Requirements	RSS-210, Annex B, Section B.6(b) Frequency Stability vs. Supply Voltage
Date Tested	October 30, 2023 and October 31, 2023
Notes	

Temperature °C	Input Power VAC	% of Nominal Voltage	Nominal Frequency Hz	Measured Frequency Hz	Frequency Variation in ppm			Pass/Fail
					Lower Limit ppm	Measured Variation ppm	Upper Limit ppm	
+20	115.00	---	13560000.0000	13560140	-100	10.32448378	100	Pass
+20	97.75	-15%	13560000.0000	13560130	-100	9.587020649	100	Pass
+20	132.25	+15%	13560000.0000	13560130	-100	9.587020649	100	Pass

24. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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ELECTRICAL

Valid To: June 30, 2025 Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility and other electrical tests:

Test Technology:	Test Method(s)[1]:
Transient Immunity *(Max Voltage 60V/Max current 100A)*	ISO 7637-2 (including emissions); ISO 7637-3; ISO 16750-2:2012, Sections 4.6.3 and 4.6.4; CS-11979, Section 6.4; CS.00054, Section 5.9; EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222); GMW 3097, Section 3.5; SAE J1113-11; SAE J1113-12; ECE Regulation 10.06 Annex 10
Electrostatic Discharge (ESD) *(Up to +/-25kV)*	ISO 10605 (2001, 2008); CS-11979 Section 7.0; CS.00054, Section 5.10; EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13; GMW 3097 Section 3.6
Conducted Emissions	CISPR 25 (2002, 2008), Sections 6.2 and 6.3; CISPR 25 (2016), Sections 6.3 and 6.4; CS-11979, Section 5.1; CS.00054, Sections 5.6.1 and 5.6.2; GMW 3097, Section 3.3.2; EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421, CE 430, CE440)

Test Technology:	Test Method(s)[1]:
Radiated Emissions Anechoic *(Up to 6GHz)*	CISPR 25 (2002, 2008), Section 6.4; CISPR 25 (2016), Section 6.5; CS-11979, Section 5.3; CS.00054, Section 5.6.3; GMW 3097, Section 3.3.1; EMC-CS-2009.1 (RE 310); FMC1278 (RE310, RE320);
Vehicle Radiated Emissions	CISPR 12; CISPR 36; ICES-002; ECE Regulation 10.06 Annex 5
Bulk Current Injection (BCI) *(1 to 400MHz 500mA)*	ISO 11452-4; CS-11979, Section 6.1; CS.00054, Section 5.8.1; GMW 3097, Section 3.4.1; SAE J1113-4; EMC-CS-2009.1 (RI112); FMC1278 (RI112); ECE Regulation 10.06 Annex 9
Radiated Immunity Anechoic *(Up to 6GHz and 200V/m)* *(Including Radar Pulse 600V/m)*	ISO 11452-2; CS-11979, Section 6.2; CS.00054, Section 5.8.2; GMW 3097, Section 3.4.2; EMC-CS-2009.1 (RI114); FMC1278 (RI114); SAE J1113-21; ECE Regulation 10.06 Annex 9
Radiated Immunity Magnetic Field	ISO 11452-8; FMC 1278 (RI140)
Radiated Immunity Reverb *(360MHz to 6GHz and 100V/m)*	ISO/IEC 61000-4-21; GMW 3097, Section 3.4.3; EMC-CS-2009.1 (RI114); FMC1278 (RI114); ISO 11452-11
Radiated Immunity *(Portable Transmitters)* *(Up to 6GHz and 20W)*	ISO 11452-9; EMC-CS-2009.1 (RI115); FMC1278 (RI115); GMW 3097, Sec 3.4.4
Vehicle Radiated Immunity (ALSE)	ISO 11451-2; ECE Regulation 10.06 Annex 6
Vehicle Product Specific EMC Standards	EN 14982; EN ISO 13309; ISO 13766; EN 50498; EC Regulation No. 2015/208; EN 55012
Electrical Loads	ISO 16750-2
Stripline	ISO 11452-5
Transverse Electromagnetic (TEM) Cell	ISO 11452-3

Test Technology:	Test Method(s)[1]:
Emissions	
Radiated and Conducted (3m Semi-anechoic chamber, up to 40 GHz)	47 CFR, FCC Part 15 B (using ANSI C63.4:2014); 47 CFR, FCC Part 18 (using FCC MP-5:1986); ICES-001; ICES-003; ICES-005; IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004); IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010); KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008); CISPR 11; EN 55011; KS C 9811; CNS 13803 (1997, 2003); CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1; CISPR 16-2-1 (2008); CISPR 16-2-1; KS C 9814-1; KN 14-1; IEC/CISPR 22 (1997); EN 55022 (1998) + A1(2000); EN 55022 (1998) + A1(2000) + A2(2003); EN 55022 (2006); IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2004); AS/NZS CISPR 22, 3rd Edition (2006); KN 22 (up to 6 GHz); CNS 13438 (up to 6 GHz); VCCI V-3 (up to 6 GHz); CISPR 32; EN 55032; KS C 9832; KN 32; ECE Regulation 10.06 Annex 7 (Broadband); ECE Regulation 10.06 Annex 8 (Narrowband); ECE Regulation 10.06 Annex 14 (Conducted)
Cellular Radiated Spurious Emissions	ETSI TS 151 010-1 GSM; 3GPP TS 51.010-1, Sec 12; ETSI TS 134 124 UMTS; 3GPP TS 34.124; ETSI TS 136 124 LTE; E-UTRA; 3GPP TS 36.124
Current Harmonics	IEC 61000-3-2; IEC 61000-3-12; EN 61000-3-2; KN 61000-3-2; KS C 9610-3-2; ECE Regulation 10.06 Annex 11
Flicker and Fluctuations	IEC 61000-3-3; IEC 61000-3-11; EN 61000-3-3; KN 61000-3-3; KS C 9610-3-3; ECE Regulation 10.06 Annex 12
Immunity	
Electrostatic Discharge	IEC 61000-4-2, Ed. 1.2 (2001); IEC 61000-4-2 (1995) + A1(1998) + A2(2000); EN 61000-4-2 (1995); EN 61000-4-2 (2009-05); KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2; KS C 9610-4-2; IEEE C37.90.3 2001
Radiated Immunity	IEC 61000-4-3 (1995) + A1(1998) + A2(2000); IEC 61000-4-3, Ed. 3.0 (2006-02); IEC 61000-4-3, Ed. 3.2 (2010); KN 61000-4-3 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3; KS C 9610-4-3; IEEE C37.90.2 2004

Test Technology:	Test Method(s)[1]:
Immunity (cont'd)	
Electrical Fast Transient/Burst	IEC 61000-4-4, Ed. 2.0 (2004-07); IEC 61000-4-4, Ed. 2.1 (2011); IEC 61000-4-4 (1995) + A1(2000) + A2(2001); KN 61000-4-4 (2008-5); RRL Notice No. 2008-5 (May 20, 2008); IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4; KS C 9610-4-4; ECE Regulation 10.06 Annex 15
Surge	IEC 61000-4-5 (1995) + A1(2000); IEC 61000-4-5, Ed 1.1 (2005-11); EN 61000-4-5 (1995) + A1(2001); KN 61000-4-5 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5; KS C 9610-4-5; IEEE C37.90.1 2012; IEEE STD C62.41.2 2002; ECE Regulation 10.06 Annex 16
Conducted Immunity	IEC 61000-4-6 (1996) + A1(2000); IEC 61000-4-6, Ed 2.0 (2006-05); IEC 61000-4-6 Ed. 3.0 (2008); KN 61000-4-6 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6; EN 61000-4-6; KN 61000-4-6; KS C 9610-4-6
Power Frequency Magnetic Field Immunity (*Down to 3 A/m*)	IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009); EN 61000-4-8 (1994) + A1(2000); KN 61000-4-8 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8; KS C 9610-4-8
Voltage Dips, Short Interrupts, and Line Voltage Variations	IEC 61000-4-11, Ed. 2 (2004-03); KN 61000-4-11 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11; KS C 9610-4-11
Ring Wave	IEC 61000-4-12, Ed. 2 (2006-09); EN 61000-4-12:2006; IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12; IEEE STD C62.41.2 2002

Test Technology:	Test Method(s)[1]:
Generic and Product Specific EMC Standards	IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1; KS C 9610-6-1; IEC/EN 61000-6-2; AS/NZS 61000-6-2; KN 61000-6-2; KS C 9610-6-2; IEC/EN 61000-6-3; AS/NZS 61000-6-3; KN 61000-6-3; KS C 9610-6-3; IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4; KS C 9610-6-4; EN 50130-4; EN 61326-1; EN 50121-3-2; EN 12895; EN 50270; EN 50491-1; EN 50491-2; EN 50491-3; EN 55015; EN 60730-1; EN 60945; IEC 60533; EN 61326-2-6; EN 61800-3; IEC/CISPR 14-2; EN 55014-2; AS/NZS CISPR 14.2; KN 14-2; KS C 9814-2; IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24; IEC/CISPR 35; AS/NZS CISPR 35; EN 55035; KN 35; KS C 9835; IEC 60601-1-2; JIS T0601-1-2
TxRx EMC Requirements	EN 301 489-1; EN 301 489-3; EN 301 489-9; EN 301 489-17; EN 301 489-19; EN 301 489-20
European Radio Test Standards	ETSI EN 300 086-1; ETSI EN 300 086-2; ETSI EN 300 113-1; ETSI EN 300 113-2; ETSI EN 300 220-1; ETSI EN 300 220-2; ETSI EN 300 220-3-1; ETSI EN 300 220-3-2; ETSI EN 300 330-1; ETSI EN 300 330-2; ETSI EN 300 440-1; ETSI EN 300 440-2; ETSI EN 300 422-1; ETSI EN 300 422-2; ETSI EN 300 328; ETSI EN 301 893; ETSI EN 301 511; ETSI EN 301 908-1; ETSI EN 908-2; ETSI EN 908-13; ETSI EN 303 413; ETSI EN 302 502; EN 303 340; EN 303 345-2; EN 303 345-3; EN 303 345-4
Canadian Radio Tests	RSS-102 measurement (RF Exposure Evaluation); RSS-102 measurement (Nerve Stimulation); SPR-002; RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-139; RSS-140; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196; RSS-197; RSS-199; RSS-210; RSS-211; RSS-213; RSS-215; RSS-216; RSS-220; RSS-222; RSS-236; RSS-238; RSS-243; RSS-244; RSS-247; RSS-248; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310; RSS-GEN
Mexico Radio Tests	IFT-008-2015; NOM-208-SCFI-2016
Japan Radio Tests	Radio Law No. 131, Ordinance of MPT No. 37, 1981, MIC Notification No. 88:2004, Table No. 22-11; ARIB STD-T66, Regulation 18
Taiwan Radio Tests	LP-0002 (July 15, 2020)

Test Technology:	Test Method(s)[1]:
Australia/New Zealand Radio Tests	AS/NZS 4268; Radiocommunications (Short Range Devices) Standard (2014)
Hong Kong Radio Tests	HKCA 1039 Issue 6; HKCA 1042; HKCA 1033 Issue 7; HKCA 1061; HKCA 1008; HKCA 1043; HKCA 1057; HKCA 1073
Korean Radio Test Standards	KN 301 489-1; KN 301 489-3; KN 301 489-9; KN 301 489-17; KN 301 489-52; KS X 3124; KS X 3125; KS X 3130; KS X 3126; KS X 3129
Vietnam Radio Test Standards	QCVN 47:2015/BTTTT; QCVN 54:2020/BTTTT; QCVN 55:2011/BTTTT; QCVN 65:2013/BTTTT; QCVN 73:2013/BTTTT; QCVN 74:2020/BTTTT; QCVN 112:2017/BTTTT; QCVN 117:2020//BTTTT
Vietnam EMC Test Standards	QCVN 18:2014/BTTTT; QCVN 86:2019/BTTTT; QCVN 96:2015/BTTTT; QCVN 118:2018/BTTTT
Unlicensed Radio Frequency Devices *(3 Meter Semi-Anechoic Room)*	47 CFR FCC Part 15C, 15D, 15E, 15F, 15G, 15H (using ANSI C63.10:2013, ANSI C63.17:2013 and FCC KDB 905462 D02 (v02))
Licensed Radio Service Equipment	47 CFR FCC Parts 20, 22, 24, 25, 27, 30, 73, 74, 80, 87, 90, 95, 96, 97, 101 (using ANSI/TIA-603-E, TIA-102.CAAA-E, ANSI C63.26:2015)
OTA (Over the Air) Performance GSM, GPRS, EGPRS UMTS (W-CDMA) LTE including CAT M1 A-GPS for UMTS/GSM LTS A-GPS, A-GLONASS, SIB8/SIB16 Large Device/Laptop/Tablet Testing Integrated Device Testing WiFi 802.11 a/b/g/n/a	CTIA Test Plan for Wireless Device Over-the-Air Performance (Method for Measurement for Radiated Power and Receiver Performance) V3.8.2; CTIA Test Plan for RF Performance Evaluation of WiFi Mobile Converged Devices V2.1.0

Test Technology:	Test Method(s)[1]:
Electrical Measurements and Simulation	
AC Voltage / Current (1mV to 5kV) 60 Hz (0.1V to 250V) up to 500 MHz (1μA to 150A) 60 Hz	FAA AC 150/5345-10H; FAA AC 150/5345-43J; FAA AC 150/5345-44K; FAA AC 150/5345-46E; FAA AC 150/5345-47C;
DC Voltage / Current (1mV to 15 kV) / (1μA to 10A)	FAA EB 67D
Power Factor / Efficiency / Crest Factor (Power to 30kW)	
Resistance (1mΩ to 4000MΩ)	
Surge (Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)	

On the following products and materials:
Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors

[1] When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA *R101 - General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Unintentional Radiators Part 15B	ANSI C63.4:2014	40000
Industrial, Scientific, and Medical Equipment Part 18	FCC MP-5 (February 1986)	40000
Intentional Radiators Part 15C	ANSI C63.10:2013	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Unlicensed Personal Communication Systems Devices Part 15D	ANSI C63.17:2013	40000
U-NII without DFS Intentional Radiators Part 15E	ANSI C63.10:2013	40000
U-NII with DFS Intentional Radiators Part 15E	FCC KDB 905462 D02 (v02)	40000
UWB Intentional Radiators Part 15F	ANSI C63.10:2013	40000
BPL Intentional Radiators Part 15G	ANSI C63.10:2013	40000
White Space Device Intentional Radiators Part 15H	ANSI C63.10:2013	40000
Commercial Mobile Services (FCC Licensed Radio Service Equipment) Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
General Mobile Radio Services (FCC Licensed Radio Service Equipment) Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97, and 101 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment) Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Maritime and Aviation Radio Services Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	40000
Microwave and Millimeter Bands Radio Services Parts 25, 30, 74, 90 (above 3 GHz), 97 (above 3 GHz), and 101	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Broadcast Radio Services		
Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Signal Boosters		
Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters) Section 90.219	ANSI C63.26:2015	40000

[2] Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (https://apps.fcc.gov/oetcf/eas/) for a listing of FCC approved laboratories.

Accredited Laboratory

A2LA has accredited

ELITE ELECTRONIC ENGINEERING INC.

Downers Grove, IL

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 15th day of August 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1786.01
Valid to June 30, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.