TEST REPORT

Report Number: 103770502MPK-003
Project Number: G103770502
August 14, 2020

Testing performed on the
Haws Electronic Water Cooler
Model(s) Tested: 1202SFH & 1212SFH
Model(s) Not Tested but declared equivalent by the client: 1201SFH & 1211SFH

FCC ID: 2AUAN-1200SFH
IC: 25359-1200SFH

to

FCC Part 15 Subpart C (15.225)
Industry Canada RSS-210 Issue 10

For

Haws Corporation

Test Performed by:	Test Authorized by:
Intertek	Haws Corporation
1365 Adams Court	1455 Kleppe Ln
Menlo Park, CA 94025 USA	Sparks, NV 89432 USA

Prepared by: _____ **Date:** August 14, 2020
Aaron Chang

Reviewed by: _____ **Date:** August 14, 2020
Krishna Vemuri

Report No. 103770502MPK-003	
Equipment Under Test:	Haws Electronic Water Cooler
Trade Name:	Haws Corporation
Model(s) Tested:	1202SFH & 1212SFH
Model(s) Not Tested but declared equivalent by the client:	1201SFH & 1211SFH
Applicant:	Haws Corporation
Contact:	Sam Hong
Address:	Haws Corporation 1455 Kleppe Ln Sparks, NV 89432
Country:	USA
Tel. Number:	(775) 772-9235
Email:	samh@hawsco.com
Applicable Regulation:	FCC Part 15 Subpart C (15.225) Industry Canada RSS-210 Issue 10
Date of Test:	August 4-6, 2020

We attest to the accuracy of this report:

Aaron Chang
Project Engineer

Krishna K Vemuri
EMC Manager

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1.0 Summary of Tests

TEST	REFERENCE FCC 15.225	REFERENCE RSS-210	RESULTS
Field Strength of Fundamental	15.225(a)	B.6	Complies
Radiated Emissions Outside the band	15.225(b), 15.225(c), 15.225(d), 15.209	B.6	Complies
Frequency Tolerance of the Carrier	15.225(e)	B.6	Complies
Line Conducted Emissions	15.207	RSS-GEN	Complies
Occupied Bandwidth	15.215	RSS-GEN	Complies
Antenna requirement	15.203	RSS-GEN	Complies[1]

[1] EUT utilizes an internal Antenna.

2.0 General Description

2.1 Product Description

Haws Corporation supplied the following description of the EUT:

The Equipment Under Test is a wall mounted, ADA, stainless steel electric water cooler with filtration, HI-LI, and bottle filler options. The 1202SFH and 1212SFH are hands free versions of 1202SF and 1212SF. The added sensors are Banner S18SP6FF50 and Q20PFF100Q7. The model can have either a front sensor or bottom sensor. With models with a Push Bar, it can have either a front sensor with Push Bar or bottom sensor with Push Bar.

Overview of the EUT

Model(s) Tested:	1202SFH, 1212SFH
Model(s) Not Tested but declared equivalent by the client:	1201SFH & 1211SFH
FCC Identifier	2AUAN-1200SFH
IC Identifier	25359-1200SFH
Operating Frequency	13.56MHz
Number of Channels	1
Type of Modulation	OOK
Operating Temperature	-20°C to +50°C
Antenna Type	Internal Loop Antenna
Applicant name & address	Haws Corporation 1455 Kleppe Ln Sparks, NV 89432 USA

EUT receive date: August 4, 2020
EUT receive condition: The EUT was received in good condition with no apparent damage. As declared by the Applicant it is identical to the production units.
Test start date: August 4, 2020
Test completion date: August 6, 2020

2.2 Related Submittal(s) Grants

None

2.3 Test Methodology

Both AC mains line-conducted and radiated emissions measurements were performed according to the procedures in ANSI C63.4. Radiated tests were performed at an antenna to EUT distance of 10 meters, unless stated otherwise in this test report. All other measurements were made in accordance with the procedures in part 2 of CFR 47 7, ANSI C63.10: 2013, ANSI C63.4-2014 & RSS-GEN Issue 5.

2.4 Test Facility

The radiated emission test site and conducted measurement facility used to collect the data is 10m semi-anechoic chamber located in Menlo Park, California. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada (Site # 2042L-1).

2.5 Measurement Uncertainty

Compliance with the limits was based on the results of the measurements and doesn't take into account the measurement uncertainty.

Estimated Measurement Uncertainty

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 1 GHz	1 GHz – 2.5 GHz	> 2.5 GHz
RF Power and Power Density – antenna conducted	-	0.7 dB	-
Unwanted emissions - antenna conducted	1.1 dB	1.3 dB	1.9 dB
Bandwidth – antenna conducted	-	30 Hz	-

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 30MHz	30 MHz – 1 GHz	1 GHz – 18 GHz
Radiated emissions	-	4.7	5.1 dB
AC mains conducted emissions	2.1 dB	-	-

3.0 System Test Configuration

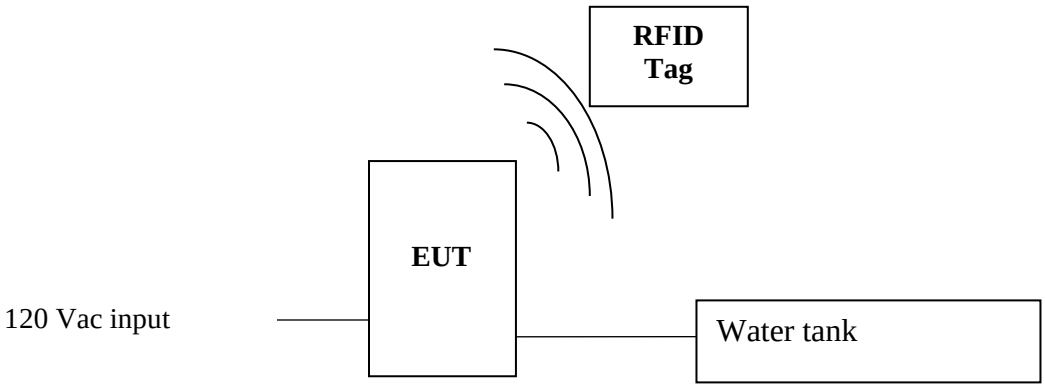
3.1 Support Equipment and description

Support Equipment		
Description	**Manufacturer**	**Model Number**
Water Tank	Not Listed	Not listed

3.2 Block Diagram of Test Setup

Equipment Under Test			
Description	**Manufacturer**	**Model**	**Serial Number**
Electric water cooler	Haws Corporation.	1202SFH	MPK2008050858-003
Electric water cooler	Haws Corporation.	1212SFH	MPK2008050858-001

3.2 Block Diagram of Test Setup (Continued)



S = Shielded **U** = Unshielded	**F** = With Ferrite **m** = Length in Meters

3.3 Justification

For radiated emission measurements the EUT was floor standing. The EUT was configured to continuously transmit and looking for tags. The highest clock frequency used in the EUT is less than 48MHz. The RFID radio is identical in all the models listed. Field strength and radiated emission were performed on both 1202SFH and 1212SFH models to show compliance.

During testing/evaluation, the front sensor was installed on the LO unit and the bottom sensor on the HI unit by the manufacturer. The sensors were Banner S18SP6FF50 and Q20PFF100Q7.

Per manufacturer:
- Model 1201SFH is the same as model 1202SFH. Model 1202SFH includes the addition of the HI unit.
- Model 1211SFH is the same as model 1212SFH. Model 1212SFH includes the addition of the HI unit.


Model: 1202SFH


Model: 1212SFH

3.4 Software Exercise Program

The EUT exercise program used during testing was provided by Haws Corporation.

3.5 Mode of Operation during test

The EUT was constantly broadcasting a 13.56 MHz signal while reading an RFID tag. Also, a water tank is hook up to provide the water at the water input line. The push button is pushed in during the test to keep the constant water stream from the dispenser.

3.6 Modifications required for Compliance

No Modifications were made e to bring the EUT into compliance.

3.7 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

4.0 Measurement Results

4.1 Field Strength of Fundamental and Radiated Emissions Outside the band

4.1.1 Requirements

FCC Rules 15.225, 15.209

a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (84 dBuV) at 30 meters.

b) 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.

c) 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.

d) 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.

§15.209 Radiated emission limits; general requirements.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

4.1.2 Procedure

Radiated Measurements Below 30 MHz

During the test the EUT is rotated and the measuring antenna angles are varied during the search for maximum signal level.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for below 30 MHz were performed at 10 meters. Data results below are corrected for distance at 10m. Limits were normalized to 10 meters.

Radiated Measurements Above 30 MHz

During the test the EUT is rotated and the measuring antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for above 30 MHz were made at 10 meters.

Radiated emission measurements were performed from 9kHz to 1 GHz.
Analyzer resolution is:

200Hz or greater for 9kHz to 150kHz
9 kHz or greater for 150kHz to 30 MHz
120 kHz or greater for 30MHz to 1000 MHz
For those frequencies quasi-peak detector applies

Data includes of the worst-case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follows:

FS = RA + AF + CF – AG – DCF

Where FS = Field Strength in dB (μV/m)

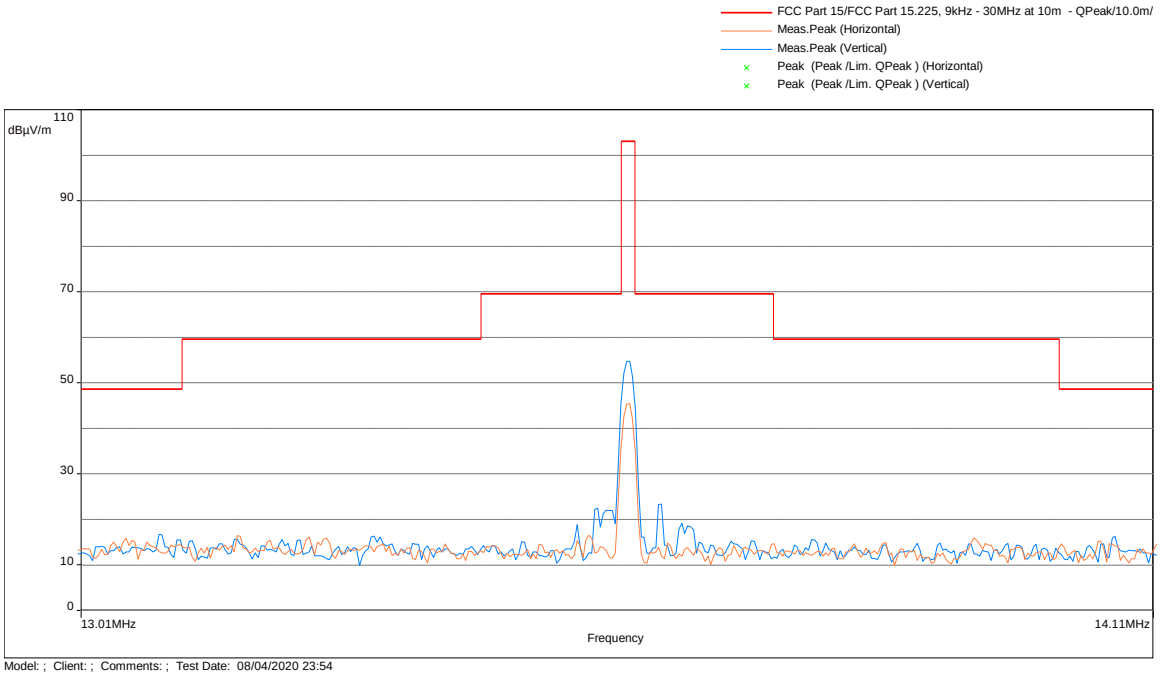
RA = Receiver Amplitude (including preamplifier) in dB (μV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB (1/m)
AG = Amplifier Gain in dB
DCF = Distance Correction Factor

Note: FS was measured with loop antenna below 30MHz

4.1.3 Test Results

The data below shows the significant emission frequencies, the limit and the margin of compliance.
Note: Measurements were performed at parallel and perpendicular orientation of loop antenna. The worst-case data was presented below.

Model: 1202SFH

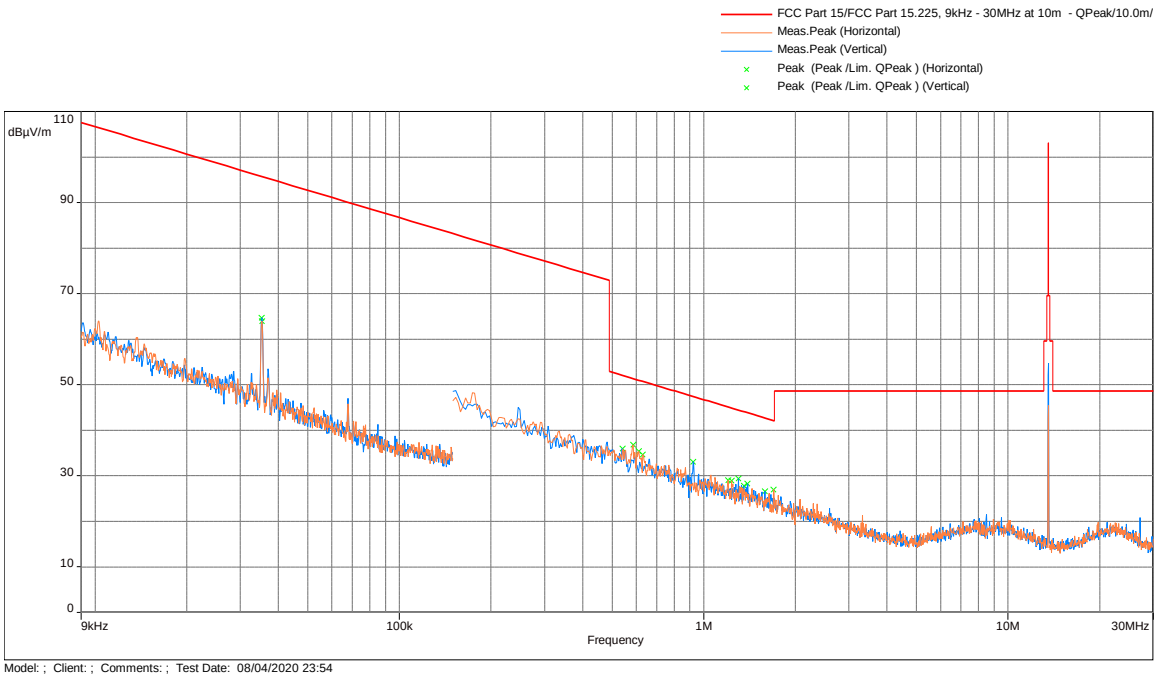


Frequency	Corrected Peak FS @10m	Limit @10m	Margin	RA@10m	Correction
(MHz)	dB(µV/m)	dB(µV/m)	dB	dB(uV)	dB
13.56	54.76	103.1	-48.34	52.1	2.66

Note: FS = RA + Correction
Correction = AF+CF–AG- distance correction factor
Distance correction factor=40*$\log_{10}$(limit distance/measured distance)

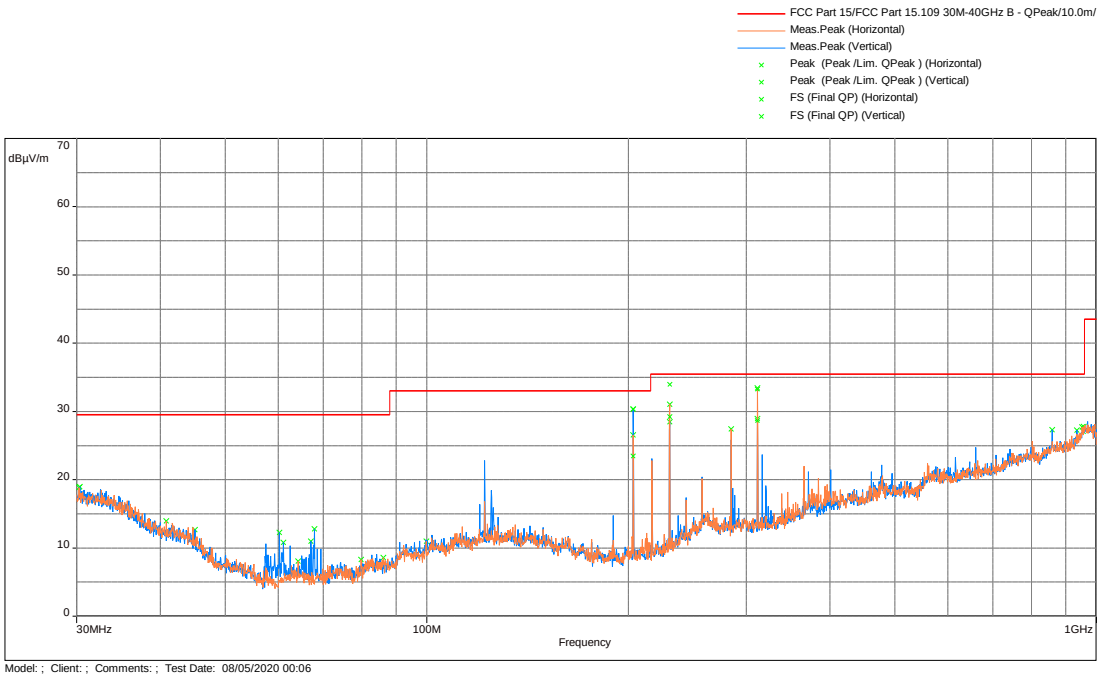
4.1.3 Test Result (Continued)

***Radiated Spurious Emissions from 9 kHz to 30MHz,* Model: 1202SFH**



4.1.3 Test Result (Continued)

***Radiated Spurious Emissions from 30 MHz to 1000 MHz,* Model: 1202SFH**

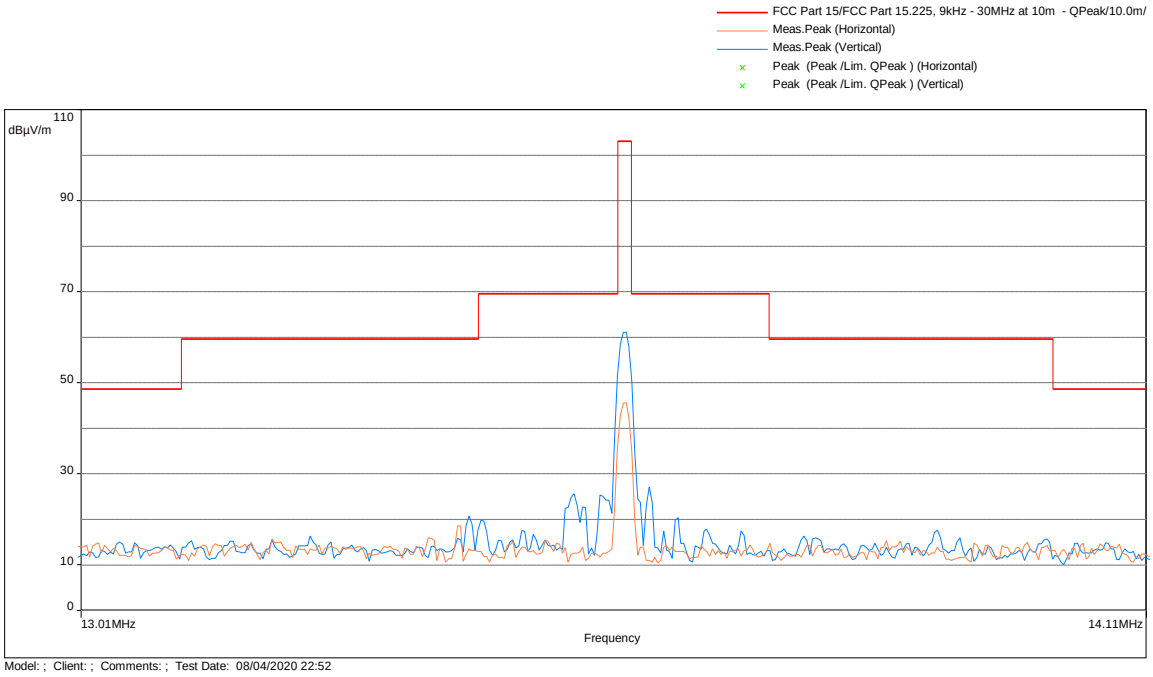


Frequency (MHz)	QP FS (dBµV/m) @10m	Lim. QPeak (dBµV/m) @10m	Margin (dB)	Height (m)	Angle (°)	Polarity	Correction (dB)
203.392	30.33	33	-2.67	13	3.9	Horizontal	47.92
230.510	33.93	35.5	-1.57	77.5	3.43	Horizontal	50.26
311.871	33.27	35.5	-2.23	31.5	3.37	Horizontal	46.18
203.395	23.47	33	-9.53	133.75	1.32	Vertical	41.06
230.513	29.24	35.5	-6.26	197	1.09	Vertical	45.58
311.869	28.66	35.5	-6.84	53.5	1	Vertical	41.58
Results: **Complies** by 1.57 dB							

Note: FS = RA + Correction
Correction = AF + CF – Preamp

4.1.3 Test Result (Continued)

Model: 1212SFH

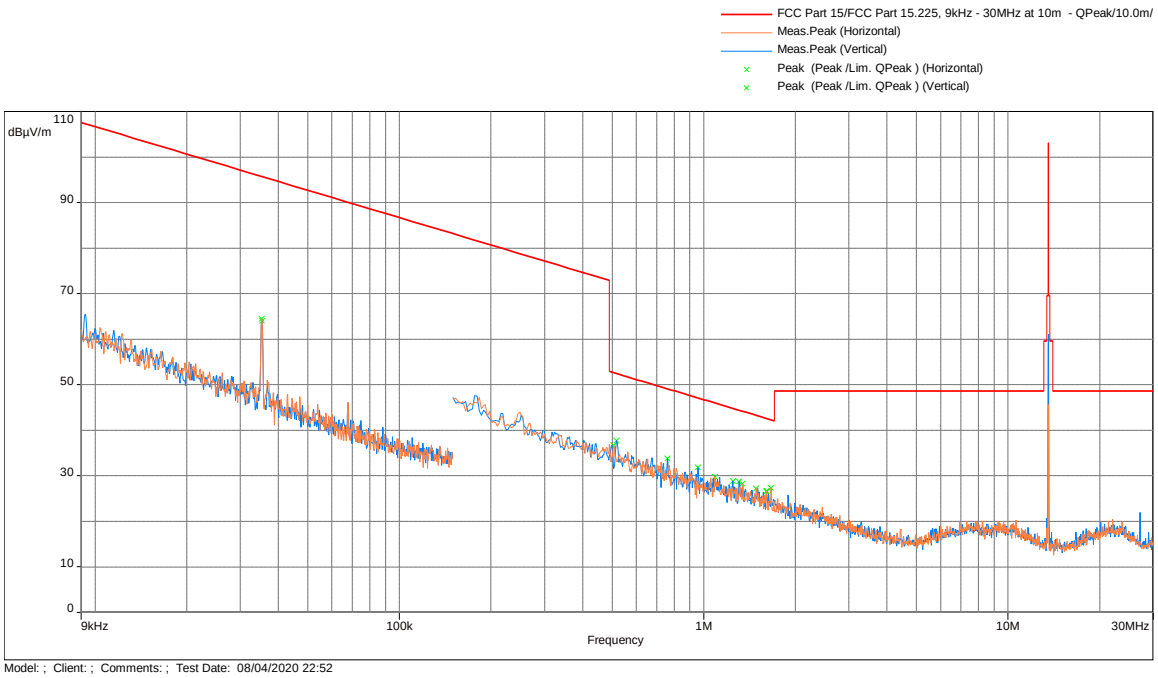


Frequency	Corrected Peak FS @10m	Limit @10m	Margin	RA@10m	Correction
(MHz)	dB(µV/m)	dB(µV/m)	dB	dB(uV)	dB
13.56	61.13	103.1	-41.97	58.47	2.66

Note: FS = RA + Correction
Correction = AF+CF–AG- distance correction factor
Distance correction factor=40*log$_{10}$(limit distance/measured distance)

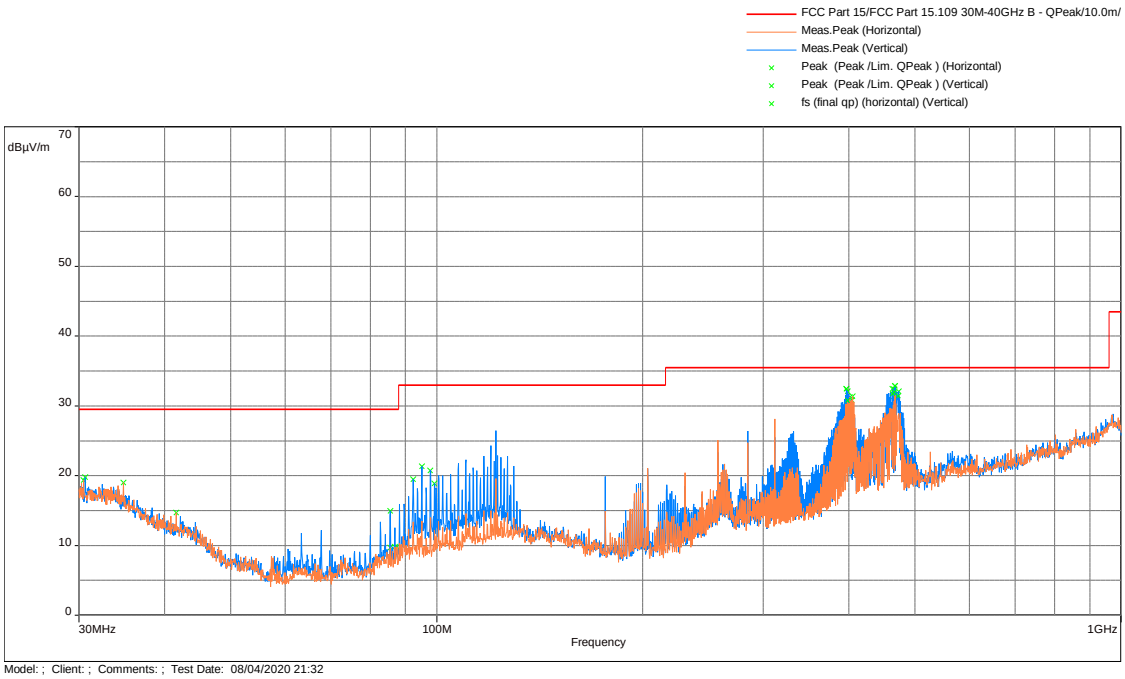
4.1.3 Test Result (Continued)

***Radiated Spurious Emissions from 9 kHz to 30MHz,* Model: 1212SFH**



4.1.3 Test Result (Continued)

***Radiated Spurious Emissions from 30 MHz to 1000 MHz,* Model: 1212SFH**



Frequency (MHz)	QP FS (dBµV/m) @10m	Lim. QPeak (dBµV/m) @10m	Margin (dB)	Height (m)	Angle (°)	Polarity	Correction (dB)
396.912	32.46	35.5	-3.04	188	3.8	Vertical	42.73
398.336	30.76	35.5	-4.74	119.5	3.89	Vertical	40.93
463.070	31.73	35.5	-3.77	159.5	1	Vertical	40.54
465.786	31.99	35.5	-3.51	159.5	1	Vertical	40.72
467.235	32.87	35.5	-2.63	158.5	1	Vertical	41.6
472.742	31.4	35.5	-4.1	162.75	1	Vertical	40.01
Results: **Complies** by 2.63 dB							

Note: FS = RA + Correction
Correction = AF + CF – Preamp

4.1.4 Test Configuration Photographs

The following photographs show the testing configurations used.

Model: 1202SFH

4.1.5 Test Configuration Photographs (Continued)

Model: 1202SFH

Electromagnetic Radiated Disturbance Setup Photograph

4.1.5 Test Configuration Photographs (Continued)

Model: 1212SFH

4.1.5 Test Configuration Photographs (Continued)

Model: 1212SFH

4.2 Frequency Tolerance

4.2.1 Requirement

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. For battery operated equipment, the equipment tests shall be performed using a new battery.

4.2.2 Procedure

The RFID radio was placed in the temperature chamber. The frequency counter was connected to the transmitter output. For each temperature, the carrier frequency was recorded.

4.2.3 Test Results

Voltage (AC)	Temperature (C)	Measured Frequency (Hz)	Deviation from Reference (Hz)	Deviation (%)
120	50	13559551	96	0.00071
120	40	13559583	64	0.00047
120	30	13559679	32	0.00024
120	20	13559647	0	0.00000
120	10	13559647	0	0.00000
120	0	13559775	128	0.00094
120	-10	13559711	64	0.00047
120	-20	13559743	96	0.00071
Voltage (AC)	**Temperature (C)**	**Measured Frequency (Hz)**	**Deviation from Reference (Hz)**	**Deviation (%)**
102	20	13559639	8	0.00006
138	20	13559639	8	0.00006

Nominal Frequency @ 20C, 120VAC: 13559647 Hz

4.3 Occupied Bandwidth
FCC 15.215

4.3.1 Requirements

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

4.3.2 Procedure

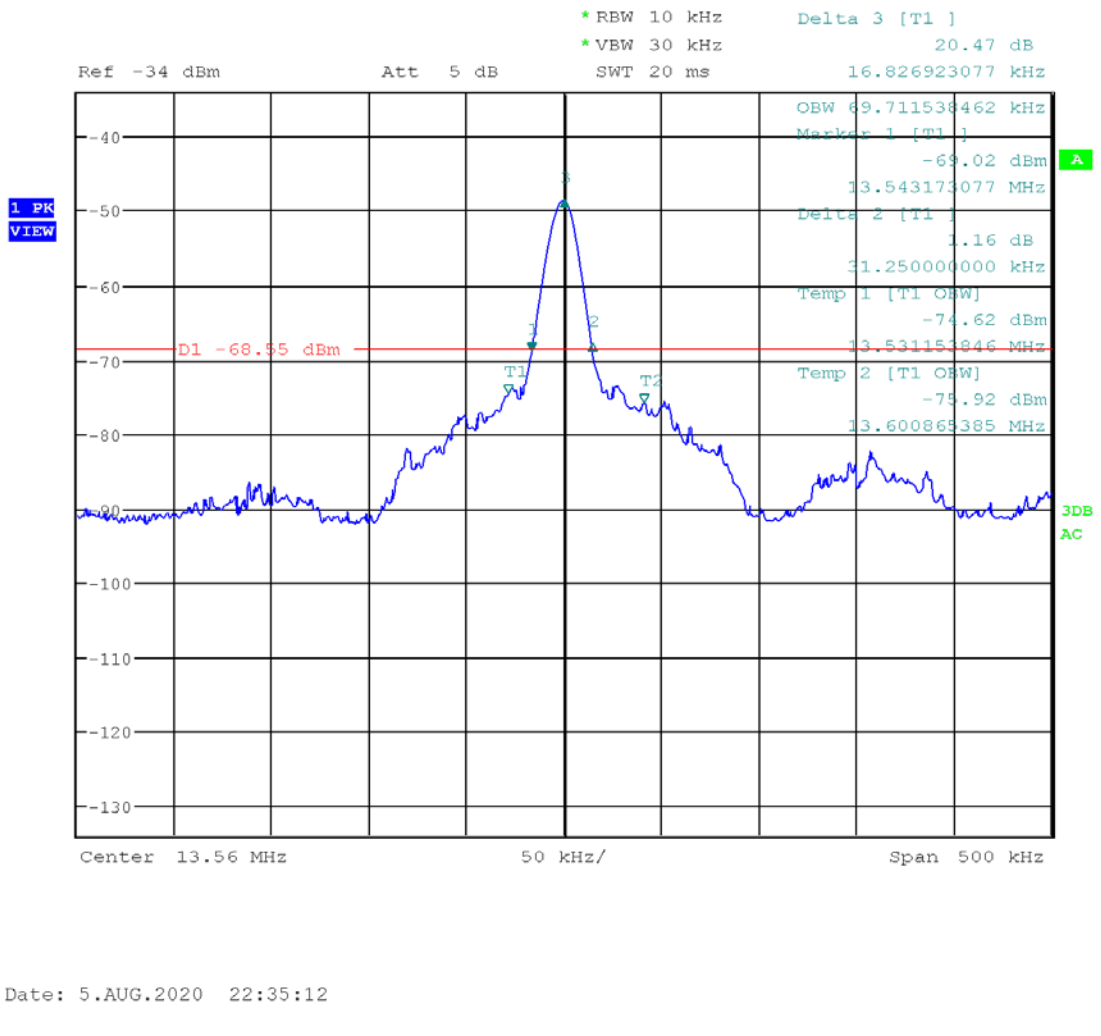
The EUT was setup to transmit in normal operating condition.

Measurements were made with the loop antenna in close proximity of the EUT. Following the procedures of ANSI 63.10, the 20dB bandwidth measurements were taken. The following plots show Occupied Bandwidth.

4.3.3 Test Results

Frequency (MHz)	20-dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
13.56	31.250	69.712

20-dB Channel Bandwidth & 99% Channel Bandwidth



4.4 AC Line Conducted Emission
FCC Rule 15.207

4.4.1 Requirement

Frequency Band MHz	15.207 Limit dB(μV)	
	Quasi-Peak	Average
0.15-0.50	66 to 56 *	56 to 46 *
0.50-5.00	56	46
5.00-30.00	60	50

*Note: *Decreases linearly with the logarithm of the frequency. At the transition frequency the lower limit applies.*

4.4.2 Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

EUT was placed in transmission mode then tested for conducted emissions per 15.207 to ensure the device complies with 15.207 outside the transmitter fundamental emissions band. After, the EUT antenna is removed from the EUT and only the fundamental emission band was measured to show that the fundamental emission band is in compliance with the 15.207 limits.

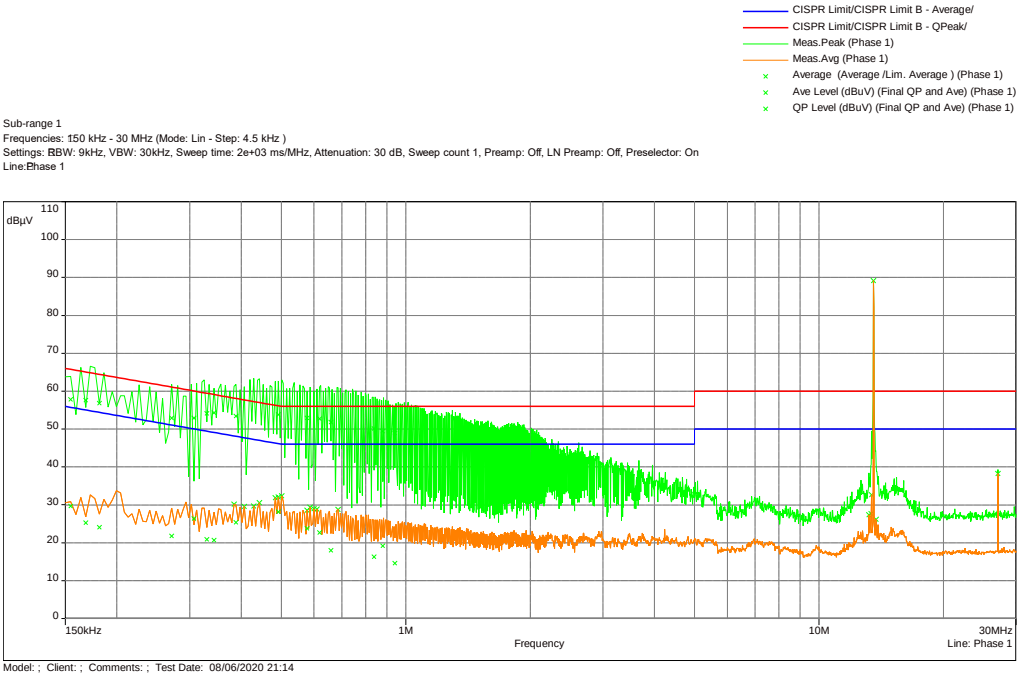
Equipment setup for conducted disturbance tests followed.

4.4.3 Test Result

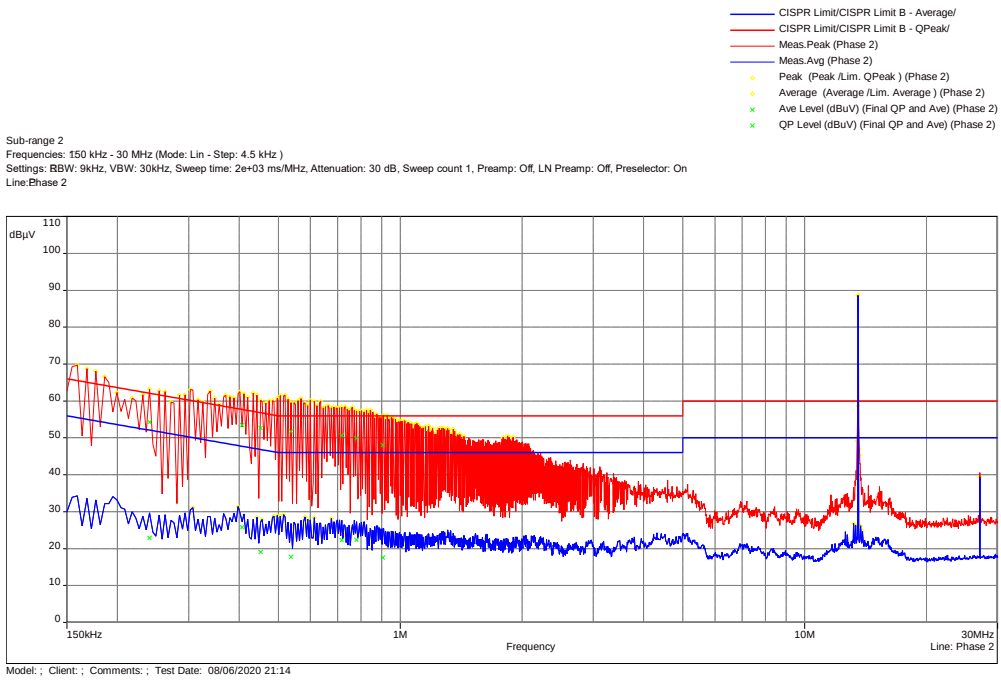
AC Line Conducted Emission with RFID Antenna

Model: 1202SFH

Line 1



Line 2



4.4.3 Test Result (Continued)

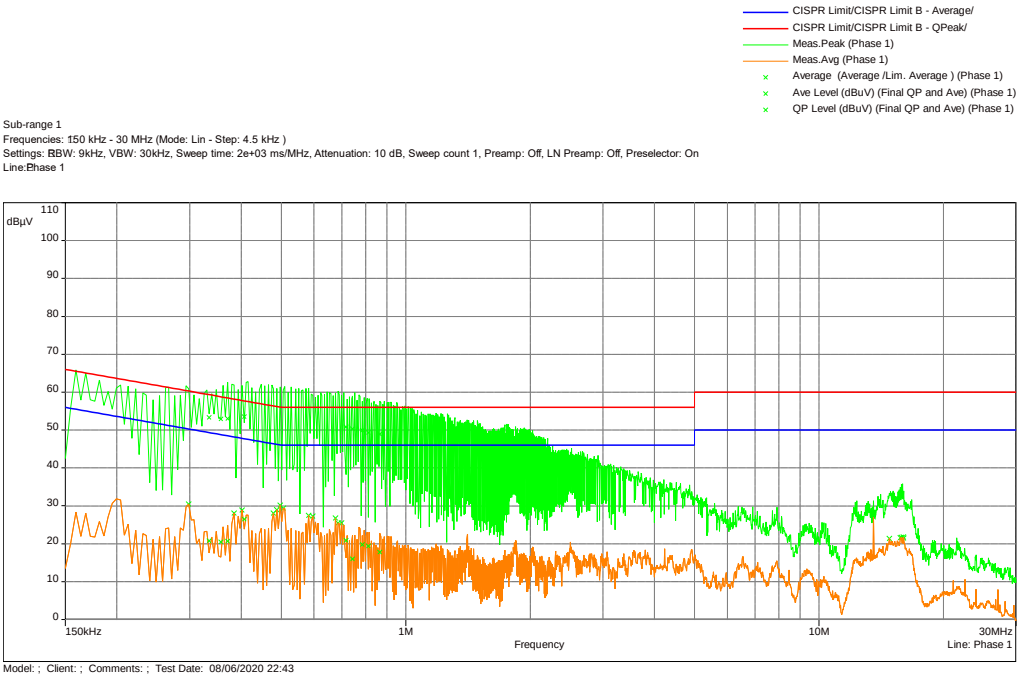
Frequency (MHz)	Ave Level (dBuV)	QP Level (dBuV)	Ave Limit (dBuV)	QP Limit (dBuV)	Ave Margin (dB)	QP Margin (dB)	Line	Correction (dB)
0.156	29.64	57.76	55.75	65.75	-26.12	-8.0	Phase 1	1.31
0.166	25.24	57.62	55.06	65.06	-29.82	-7.44	Phase 1	1.2
0.183	24.1	56.84	54.42	64.42	-30.32	-7.58	Phase 1	1.06
0.271	21.74	52.94	51.07	61.07	-29.33	-8.14	Phase 1	0.68
0.306	26.4	52.88	50.04	60.04	-23.64	-7.16	Phase 1	0.61
0.330	20.88	54.1	49.45	59.45	-28.57	-5.35	Phase 1	0.58
0.343	20.7	54.31	49.12	59.12	-28.42	-4.81	Phase 1	0.56
0.387	25.4	53.44	48.1	58.1	-22.69	-4.65	Phase 1	0.51
0.492	28.19	53.76	46.13	56.13	-17.94	-2.37	Phase 1	0.46
0.578	23.78	52.94	46	56	-22.22	-3.06	Phase 1	0.44
0.617	22.67	52.68	46	56	-23.33	-3.32	Phase 1	0.44
0.660	17.94	51.85	46	56	-28.06	-4.15	Phase 1	0.44
0.837	16.29	50.13	46	56	-29.71	-5.87	Phase 1	0.4
0.880	19.13	49.45	46	56	-26.87	-6.55	Phase 1	0.4
0.942	14.59	48.92	46	56	-31.41	-7.08	Phase 1	0.4
0.240	22.87	54.24	52.1	62.1	-29.23	-7.85	Phase 2	0.8
0.408	25.79	53.47	47.72	57.72	-21.93	-4.25	Phase 2	0.51
0.451	19.09	52.67	46.85	56.85	-27.76	-4.17	Phase 2	0.48
0.539	17.77	51.77	46	56	-28.23	-4.23	Phase 2	0.46
0.719	22.32	50.68	46	56	-23.68	-5.32	Phase 2	0.44
0.778	22.37	49.85	46	56	-23.63	-6.15	Phase 2	0.42
0.905	17.61	48.07	46	56	-28.39	-7.93	Phase 2	0.41

4.4.3 Test Result (Continued)

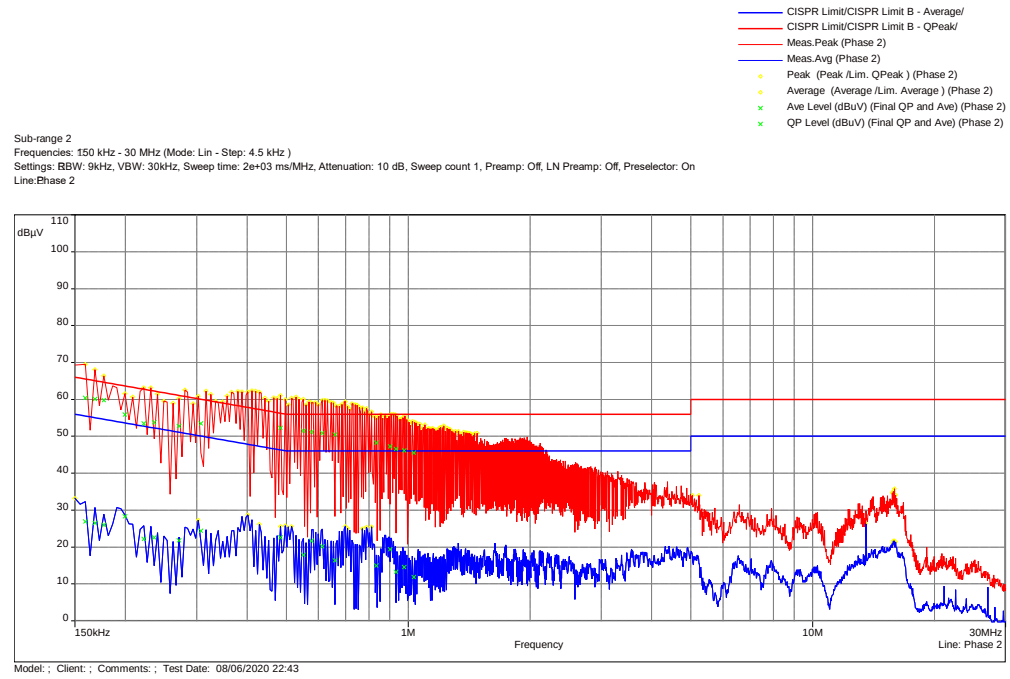
AC Line Conducted Emission with RFID Antenna Terminated with Load

Model: 1202SFH

Line 1



Line 2



4.4.3 Test Result (Continued)

Frequency (MHz)	Ave Level (dBuV) (dBµV)	QP Level (dBuV) (dBµV)	Ave Limit (dBuV)	QP Limit (dBuV)	Ave Margin (dB)	QP Margin (dB)	Line	Correction (dB)
0.160	26.87	60.34	55.52	65.52	-28.64	-5.17	Phase 2	1.32
0.169	26.51	60.09	55.06	65.06	-28.55	-4.97	Phase 2	1.23
0.177	25.98	59.79	54.63	64.63	-28.65	-4.84	Phase 2	1.15
0.200	28.32	55.82	53.63	63.63	-25.31	-7.81	Phase 2	0.99
0.222	22.19	53.45	52.74	62.74	-30.55	-9.29	Phase 2	0.87
0.236	22.52	53.75	52.25	62.25	-29.73	-8.51	Phase 2	0.82
0.272	21.76	52.79	51.07	61.07	-29.31	-8.28	Phase 2	0.7
0.308	24.38	53.48	50.04	60.04	-25.66	-6.56	Phase 2	0.63
0.335	20.75	53.28	49.34	59.34	-28.59	-6.05	Phase 1	0.57
0.359	20.51	52.87	48.8	58.8	-28.29	-5.93	Phase 1	0.54
0.371	20.62	53.05	48.49	58.49	-27.87	-5.44	Phase 1	0.53
0.405	26.49	53.52	47.72	57.72	-21.23	-4.2	Phase 1	0.5
0.482	22.53	52.2	46.29	56.29	-23.76	-4.08	Phase 2	0.46
0.549	17.85	51.46	46	56	-28.15	-4.54	Phase 2	0.46
0.579	21.7	51.1	46	56	-24.3	-4.9	Phase 2	0.45
0.613	20.18	50.85	46	56	-25.82	-5.15	Phase 2	0.45
0.659	16.35	50.48	46	56	-29.65	-5.52	Phase 2	0.45
0.719	20.87	50.77	46	56	-25.13	-5.23	Phase 1	0.44
0.746	16.02	50.28	46	56	-29.98	-5.72	Phase 1	0.43
0.785	19.76	49.94	46	56	-26.24	-6.06	Phase 1	0.41
0.811	19.4	49.33	46	56	-26.6	-6.67	Phase 1	0.4
0.832	14.97	48.23	46	56	-31.03	-7.77	Phase 2	0.41
0.865	17.75	48.87	46	56	-28.25	-7.13	Phase 1	0.4
0.904	19.35	47.24	46	56	-26.65	-8.76	Phase 2	0.41
0.935	13.24	46.56	46	56	-32.76	-9.44	Phase 2	0.4
0.979	14.57	46.12	46	56	-31.43	-9.88	Phase 2	0.39
1.034	11.84	45.5	46	56	-34.16	-10.5	Phase 2	0.39

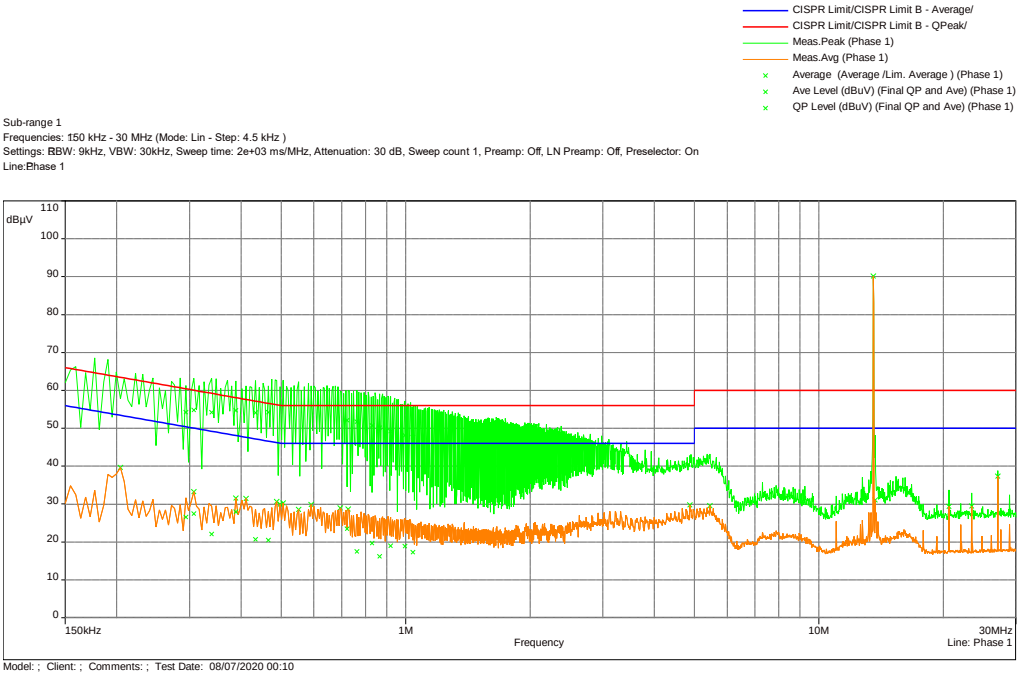
Results: **Complies** by 2.37 dB

4.4.3 Test Result (Continued)

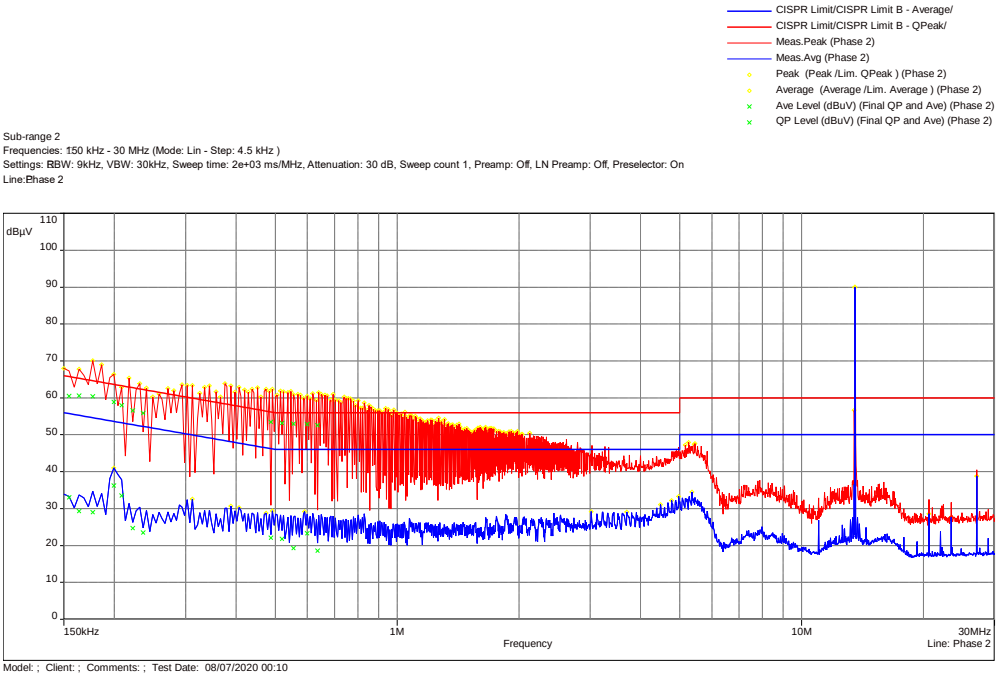
AC Line Conducted Emission with RFID Antenna

Model: 1212SFH

Line 1



Line 2



4.4.3 Test Result (Continued)

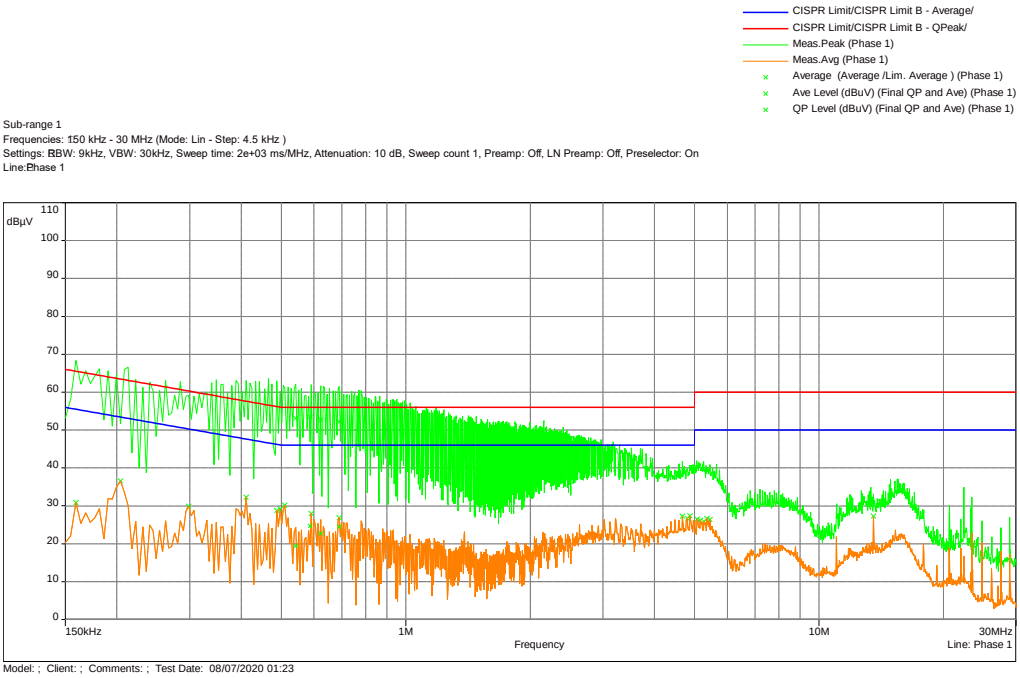
Frequency (MHz)	Ave Level (dBuV) (dBµV)	QP Level (dBuV) (dBµV)	Ave Limit (dBuV)	QP Limit (dBuV)	Ave Margin (dB)	QP Margin (dB)	Line	Correction (dB)
0.293	26.52	54.2	50.41	60.41	-23.89	-6.21	Phase 1	0.64
0.307	27.47	54.77	50.04	60.04	-22.57	-5.27	Phase 1	0.61
0.338	22.09	54.22	49.23	59.23	-27.13	-5	Phase 1	0.57
0.390	27.91	54.73	48.1	58.1	-20.19	-3.37	Phase 1	0.51
0.435	20.65	54.12	47.19	57.19	-26.53	-3.06	Phase 1	0.48
0.465	20.47	54.2	46.6	56.6	-26.14	-2.4	Phase 1	0.47
0.724	23.51	52.13	46	56	-22.49	-3.87	Phase 1	0.44
0.762	17.48	51.68	46	56	-28.52	-4.32	Phase 1	0.42
0.829	19.63	50.67	46	56	-26.37	-5.33	Phase 1	0.4
0.863	16.17	50.08	46	56	-29.83	-5.92	Phase 1	0.4
0.917	18.96	49.26	46	56	-27.04	-6.74	Phase 1	0.4
0.994	18.87	48.09	46	56	-27.13	-7.91	Phase 1	0.39
1.042	17.26	47.63	46	56	-28.74	-8.37	Phase 1	0.39
0.156	32.99	60.49	55.75	65.75	-22.76	-5.27	Phase 2	1.36
0.163	29.32	60.59	55.28	65.28	-25.97	-4.7	Phase 2	1.28
0.175	28.98	60.39	54.63	64.63	-25.65	-4.23	Phase 2	1.17
0.199	36.17	58.9	53.63	63.63	-17.46	-4.73	Phase 2	0.99
0.207	33.46	57.97	53.26	63.26	-19.8	-5.29	Phase 2	0.94
0.224	24.72	56.59	52.74	62.74	-28.02	-6.15	Phase 2	0.86
0.235	23.51	55.87	52.25	62.25	-28.74	-6.39	Phase 2	0.82
0.487	22.06	53.43	46.21	56.21	-24.15	-2.78	Phase 2	0.46
0.520	21.73	53.11	46	56	-24.27	-2.89	Phase 2	0.45
0.556	19.25	52.94	46	56	-26.75	-3.06	Phase 2	0.46
0.601	23.26	52.87	46	56	-22.74	-3.13	Phase 2	0.45
0.635	18.52	52.55	46	56	-27.48	-3.45	Phase 2	0.45

4.4.3 Test Result (Continued)

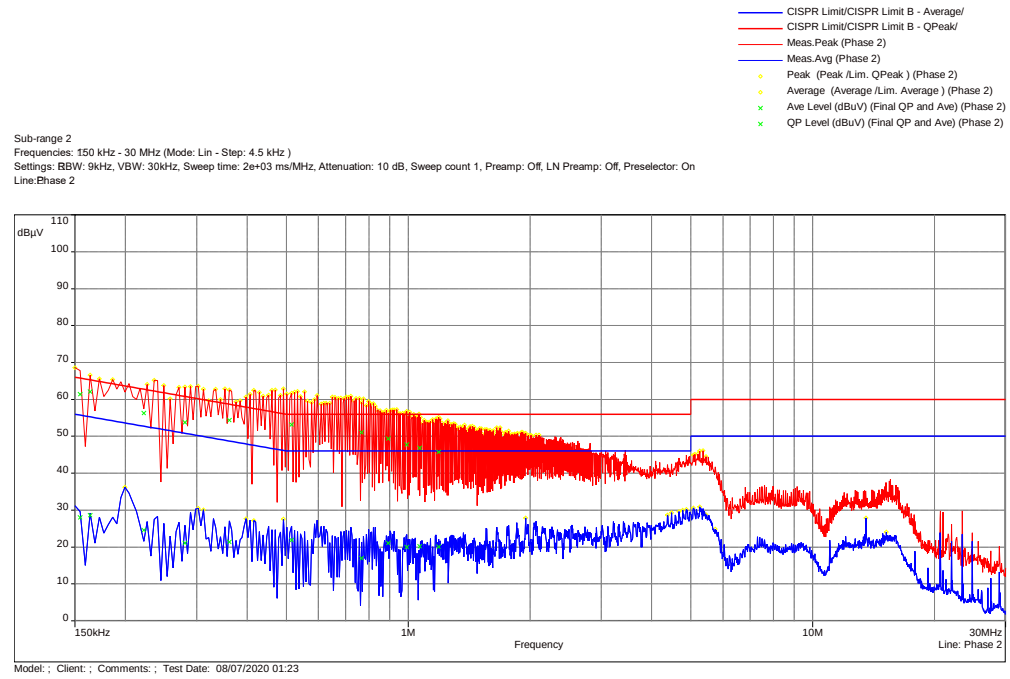
AC Line Conducted Emission with RFID Antenna Terminated with Load

Model: 1212SFH

Line 1



Line 2



4.4.3 Test Result (Continued)

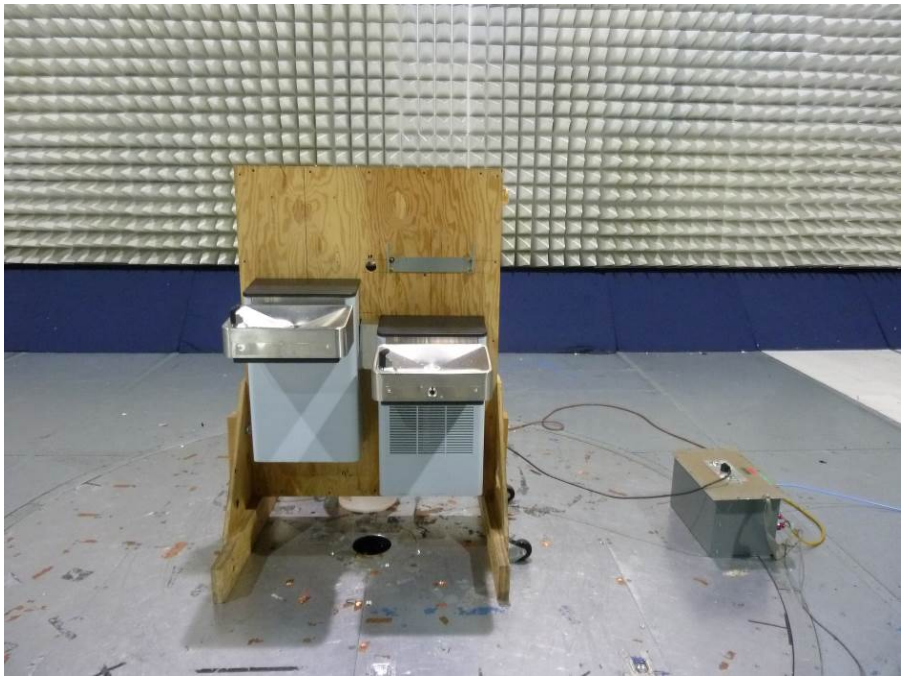
Frequency (MHz)	Ave Level (dBuV) (dBµV)	QP Level (dBuV) (dBµV)	Ave Limit (dBuV)	QP Limit (dBuV)	Ave Margin (dB)	QP Margin (dB)	Line	Correction (dB)
0.156	27.95	61.39	55.75	65.75	-27.81	-4.37	Phase 2	1.36
0.164	28.59	62.06	55.28	65.28	-26.7	-3.22	Phase 2	1.27
0.222	24.56	56.27	52.74	62.74	-28.19	-6.47	Phase 2	0.87
0.280	21.04	53.77	50.8	60.8	-29.76	-7.03	Phase 2	0.68
0.360	21.36	54.32	48.69	58.69	-27.34	-4.37	Phase 2	0.56
0.514	21.91	53.19	46	56	-24.09	-2.81	Phase 2	0.45
0.541	19.39	53.13	46	56	-26.61	-2.87	Phase 1	0.45
0.584	24.62	53.37	46	56	-21.38	-2.63	Phase 1	0.44
0.625	22.63	52.69	46	56	-23.37	-3.31	Phase 1	0.44
0.688	24.43	52.22	46	56	-21.57	-3.78	Phase 1	0.44
0.764	16.92	51.03	46	56	-29.08	-4.97	Phase 2	0.42
0.892	21.08	49.38	46	56	-24.92	-6.62	Phase 2	0.41
0.992	19.97	47.74	46	56	-26.03	-8.26	Phase 2	0.39
1.070	20.15	46.84	46	56	-25.85	-9.16	Phase 2	0.39
1.189	20.06	45.75	46	56	-25.94	-10.25	Phase 2	0.38

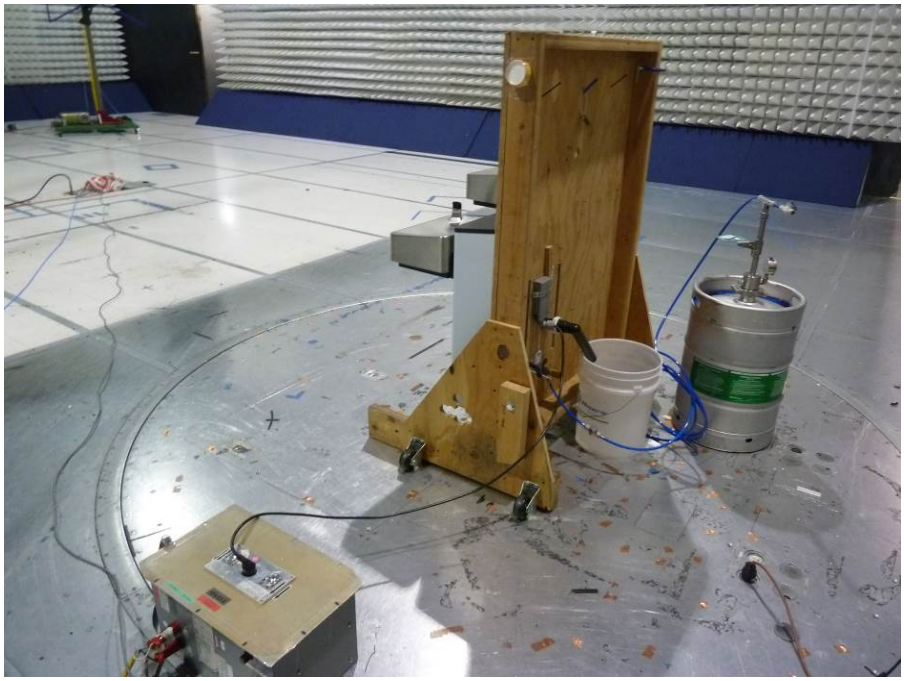
Results: **Complies** by 2.4 dB

4.4.4 Test Configuration Photographs

The following photographs show the testing configurations used.

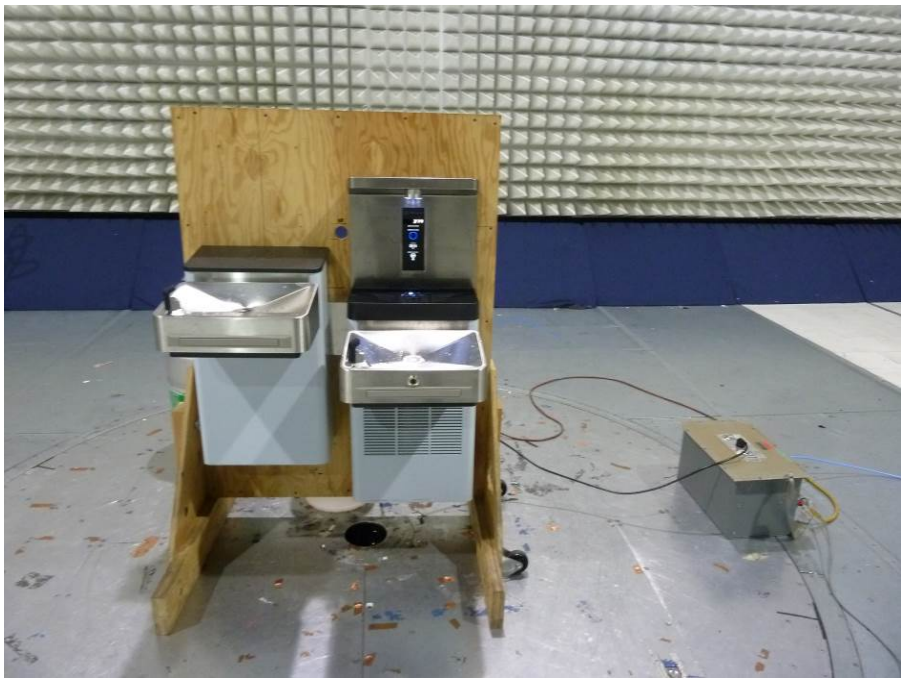
Model: 1202SFH





4.4.4 Test Configuration Photographs (Continued)

Model: 1212SFH



5.0 List of test equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Asset No.	Calibration Interval	Cal Due
BI-Log Antenna	Antenna Research	LPB-2513	ITS 00355	12	04/28/21
Pre-Amplifier	Sonoma Instrument	310N	ITS 01493	12	02/07/21
EMI Receiver	Rohde and Schwarz	ESU40	ITS 01375	12	06/16/21
LISN	FCC	FCC-LISN-50-50-M-H	ITS 00551	12	11/13/20
RF Cable	TRU Corporation	TRU CORE 300	ITS 01330	12	06/11/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 00465	12	06/11/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01470	12	06/11/21
Loop Sensor	Solar Electronics	7334-1	ITS 001608	12	10/22/20
Environmental Test Chamber	ESPEC	BTX-475	ITS 01436	12	10/09/20
Ant-Passive Loop	EMCO	6512	ITS 01598	12	10/22/20
10m Semi-anechoic chamber	Panashield	10m Chamber	ITS 00984	36	9/11/21

Software used for emission compliance testing utilized the following:

Name	Manufacturer	Version	Template/Profile
BAT-EMC	Nexio	3.17.0.10	Haws 8-4-2020.bpp

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewer Initials	Date	Change
1.0 / G103770502	AC	KV	August 14, 2020	Original document

END OF REPORT