MEASUREMENT REPORT

FCC PART 15.225 RFID 13.56MHz

FCC ID:	2AEDR-SPLUSPR-1
APPLICANT:	Accuride International Inc.

Application Type:	Certification
Product Name:	Senseon Plus System
Model No.:	SPLUSPR-1
Brand Name:	Senseon
FCC Classification:	Part 15 Low Power Communication Device Transmitter (DXX)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.225)
Test Procedure(s):	ANSI C63.10-2013
Test Date:	October 22, 2019 ~ April 12, 2020

Reviewed By: (Jame Yuan)

Approved By: (Robin Wu)

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1910RSU038-U1	Rev. 01	Initial Report	06-24-2020	Valid

CONTENTS

General Information

Applicant:	Accuride International Inc.
Applicant Address:	12311 Shoemaker Avenue Santa Fe Springs, California, United States
Manufacturer:	Accuride International Inc.
Manufacturer Address:	12311 Shoemaker Avenue Santa Fe Springs, California, United States
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
Test Device Serial No.:	2019042200001

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Designation No. CN1166) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.**

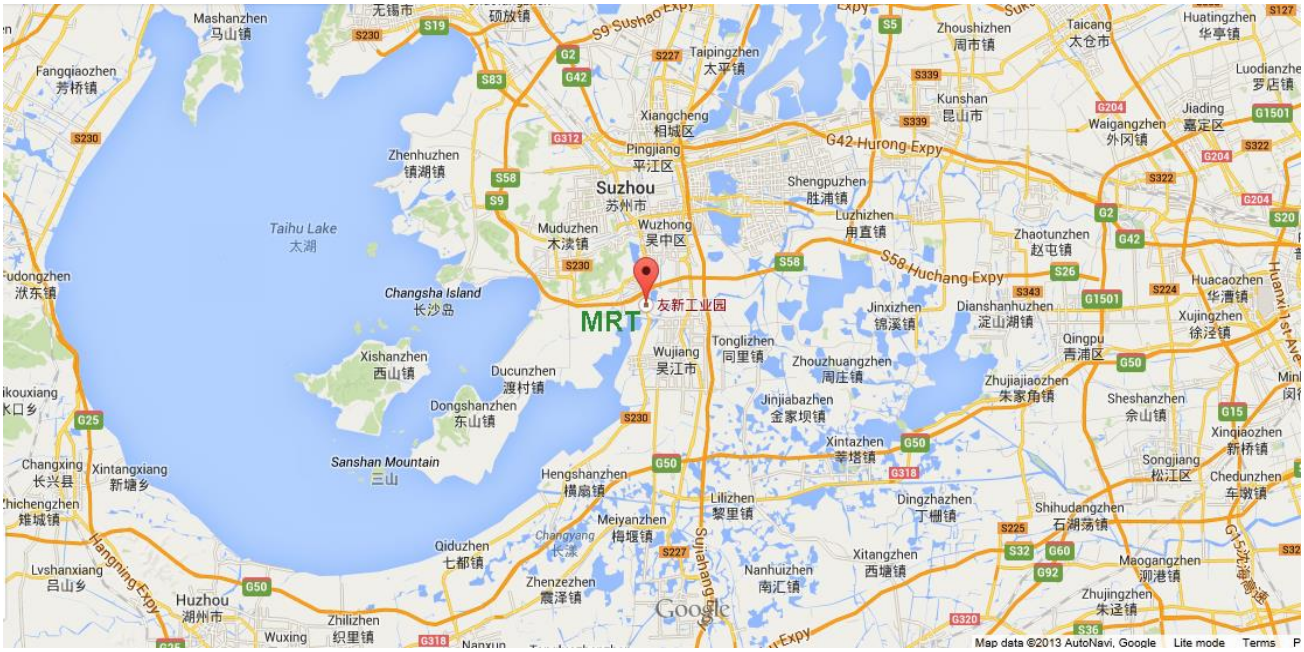
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	Senseon Plus System
Model No.:	SPLUSPR-1
Brand Name:	Senseon
RFID Specification:	13.56MHz
Type of Modulation:	ASK
Antenna Type:	PCB Antenna
Components	
AC/DC Adapter:	Manufacturer: Suzhou MEAN WELL Technology Co., Ltd. S/N: EBB4495111 Model No.: GST60A12 Input: 100-240VAC, 50/60Hz, 1.4A Output: 12V⎓5A, 60W MAX.
HUB:	Model No.: Senseon Plus Hub
Controller:	Model No.: Senseon Plus Controller
Lock:	Model No.: B10EL
Programmer:	Model No.: Senseon Plus Handheld Programmer
Reader:	Model No.: Senseon Plus Reader

Note: The final enclosure of each part will have the different color, and any other is same. We select blue enclosure of hub and black enclosure of the others to perform all the testing.

2.2. Test Mode

Test Mode
Mode 1: Transmit by RFID

2.3. Device Capabilities

This device contains the following capabilities: RFID

2.4. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.5. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) was used in the measurement.

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.
The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.
Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.
An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013 at Clause 4.3.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meters semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.
For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.
Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antenna of the device is permanently attached.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATA

Conducted Emission - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2021/01/18
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2021/06/11
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2021/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2020/08/08
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Radiated Emission - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/01/18
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/04/03
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/29
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2020/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2020/08/01
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2020/12/29
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

Software	**Version**	**Function**
EMI Software	V3	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz~150kHz: 3.84dB 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 4.07dB Vertical: 30MHz~300MHz: 4.18dB
Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 3.75dB Vertical: 30MHz~300MHz: 3.86dB

7. TEST RESULT

7.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.225 (a), (b), (c)	In-Band Emission	15848uV/m @ 30m 13.553 ~ 13.567 MHz 334uV/m @ 30m 13.410 ~ 13.553 MHz 13.567 ~ 13.710 MHz 106uV/m @ 30m 13.110 ~ 13.410 MHz 13.710 ~ 14.010 MHz	Radiated	Pass	Section 7.2
15.225(d)	Out-Band Emission	Emissions outside of the specified band (13.110 ~ 14.010 MHz) must meet the radiated limits detailed in 15.209		Pass	Section 7.3
15.215 2.1049	20dB Bandwidth 99% Bandwidth	N/A		Pass	Section 7.4
15.225(e)	Frequency Stability Tolerance	±0.01% of operating frequency		Pass	Section 7.5
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.6

Notes:

1) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

7.2. In-band Emission

7.2.1.Test Limit

FCC Part 15.225 Limit		
Frequency (MHz)	Field Strength (uV/m)	Measured Distance (m)
13.553 - 13.567	15848	30
13.410 - 13.553 13.567 - 13.710	334	30
13.110 - 13.410 13.710 - 14.010	106	30
Note 1: The lower limit shall apply at the transition frequency. Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system. Note 3: E field strength (dBuV/m) = 20 log [E field strength (uV/m)]		

7.2.2.Test Procedure Used

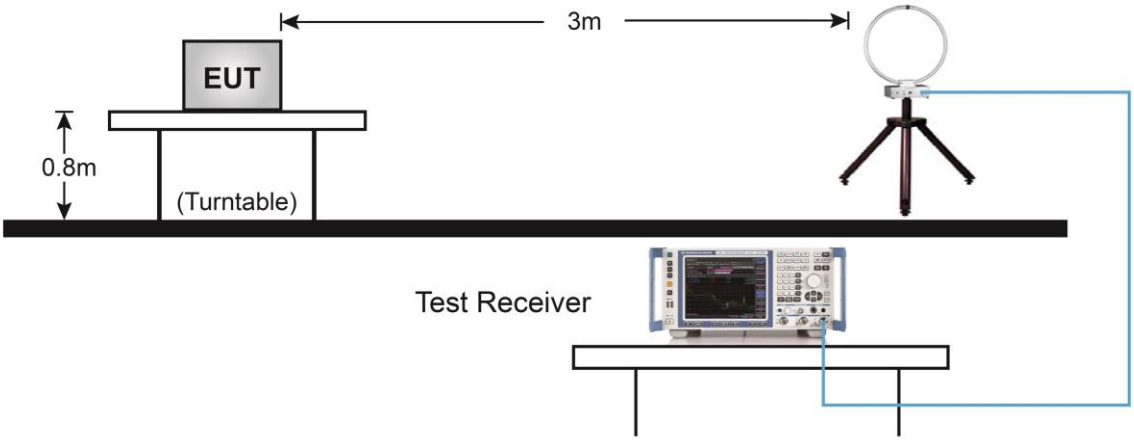
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all the interface cables were manipulated according to ANSI C63.4:2014 on radiated measurement. The EUT should be operate in transmission mode.

All measurements were performed using a loop antenna. The antenna was positioned in two orthogonal (face on and face off) and the highest emission level was recorded.

7.2.3.Test Setup

9kHz ~ 30MHz Test Setup:



7.2.4.Test Result

Product	Senseon Plus System	Temperature	25℃
Test Engineer	Cloud Guo	Relative Humidity	54%
Test Site	AC1	Test Date	2019/10/22

In-Band Emission						
Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m) For 3m	Measure Level (dBuV/m) For 30m	Limit (dBuV/m)	Margin (dB)
Face On						
13.269	13.55	19.86	33.41	-6.59	40.51	-47.10
13.448	21.80	19.86	41.66	1.66	50.47	-48.81
13.560	38.40	19.87	58.27	18.27	84.00	-65.73
13.672	23.27	19.86	43.13	3.13	50.47	-47.34
13.777	22.90	19.88	42.78	2.78	40.51	-37.73
Face Off						
13.269	10.35	19.73	30.08	-9.92	40.51	-50.43
13.448	19.74	19.72	39.46	-0.54	50.47	-51.01
13.560	36.62	19.72	56.34	16.34	84.00	-67.66
13.672	21.80	19.71	41.51	1.51	50.47	-48.96
13.777	20.94	19.71	40.65	0.65	40.51	-39.86

Note 1: Measurements were tested at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear extrapolation factor (40 dB/decade) as specified in &15.31(f)(2).

Extrapolation Factor = 40*Log (3/30) = -40 dB

Note 2: All measurements were recorded using an EMI test receiver employing CISPR quasi-peak detector.

7.3. Out-band Emission

7.3.1.Test Limit

FCC Part 15.209 Limit		
Frequency (MHz)	Field Strength (uV/m)	Measured Distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

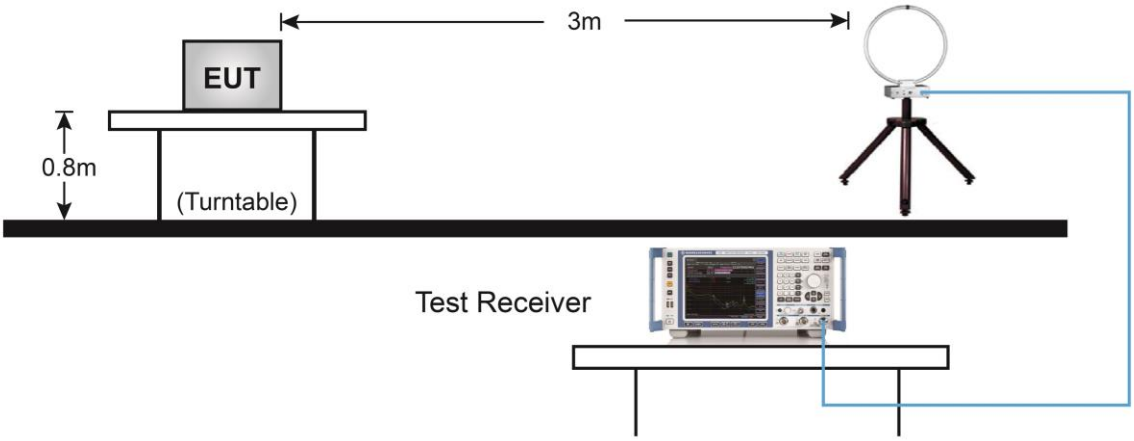
Note 3: E field strength (dBuV/m) = 20 log [E field strength (uV/m)]

7.3.2.Test Procedure Used

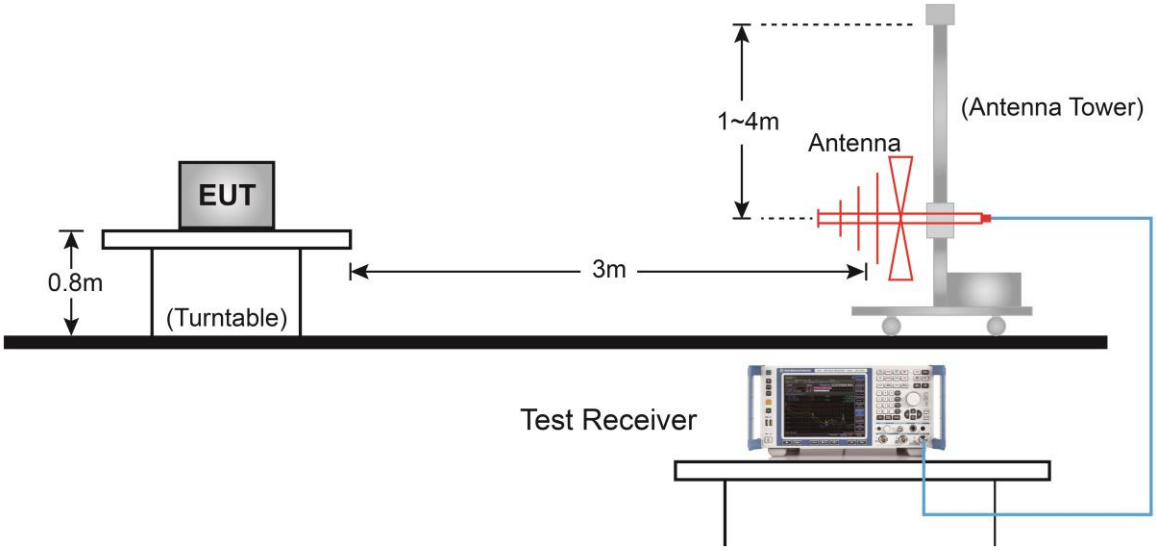
The EUT was tested from 9kHz up to the 1GHz excluding the band 13.110-14.010MHz. All measurements were recorded with a spectrum analyzer employing CISPR quasi-peak detector for emissions below 1GHz. All out-of-band emissions must not exceed the limits shown as stated per Section 15.209. A loop antenna was used for searching for emissions below 30MHz. Measurements below 30MHz were performed using a loop antenna. The antenna was positioned in two orthogonal (face on and face off). Measurements above 30MHz were performed using a bilog period antenna, and the highest emission level was recorded.

7.3.3.Test Setup

Below 30MHz Test Setup:



Above 30MHz Test Setup:



7.3.4.Test Result

Product	Senseon Plus System	Temperature	25℃
Test Engineer	Cloud Guo	Relative Humidity	54%
Test Site	AC1	Test Date	2019/10/22

Out-Band Emission Below 30MHz						
Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Face On						
27.12	7.90	19.41	27.31	69.54	-42.23	QP
Face Off						
27.12	7.54	19.41	26.95	69.54	-42.59	QP

Out-Band Emission Above 30MHz							
Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
63.950	18.69	11.99	30.68	40.000	-9.32	QP	Horizontal
79.480	26.20	9.38	35.58	40.000	-4.42	QP	Horizontal
87.230	17.95	9.40	27.35	40.000	-12.65	QP	Horizontal
94.505	24.36	9.76	34.12	43.500	-9.38	QP	Horizontal
127.970	15.10	12.68	27.78	43.500	-15.72	QP	Horizontal
135.245	21.65	13.17	34.82	43.500	-8.68	QP	Horizontal
47.460	19.05	13.60	32.65	40.000	-7.35	QP	Vertical
63.950	25.84	11.99	37.83	40.000	-2.17	QP	Vertical
79.480	26.84	9.38	36.22	40.000	-3.78	QP	Vertical
94.505	22.65	9.76	32.41	43.500	-11.09	QP	Vertical
108.085	15.65	10.94	26.59	43.500	-16.91	QP	Vertical
135.245	20.95	13.17	34.12	43.500	-9.38	QP	Vertical

Note 1: Measurements below 30MHz were tested at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear extrapolation factor (40 dB/decade) as specified in &15.31(f)(2).

Extrapolation Factor = 40*Log (30/3) = 40 dB

Note 2: All measurements were recorded using an EMI test receiver employing CISPR quasi-peak detector.

7.4. 20dB Bandwidth & 99% Bandwidth

7.4.1.Test Limit

N/A

7.4.2.Test Procedure Used

ANSI C63.10-2013 - Section 6.9.2 (20dB Bandwidth)

ANSI C63.10-2013 - Section 6.9.3 (99% Bandwidth)

7.4.3.Test Setting

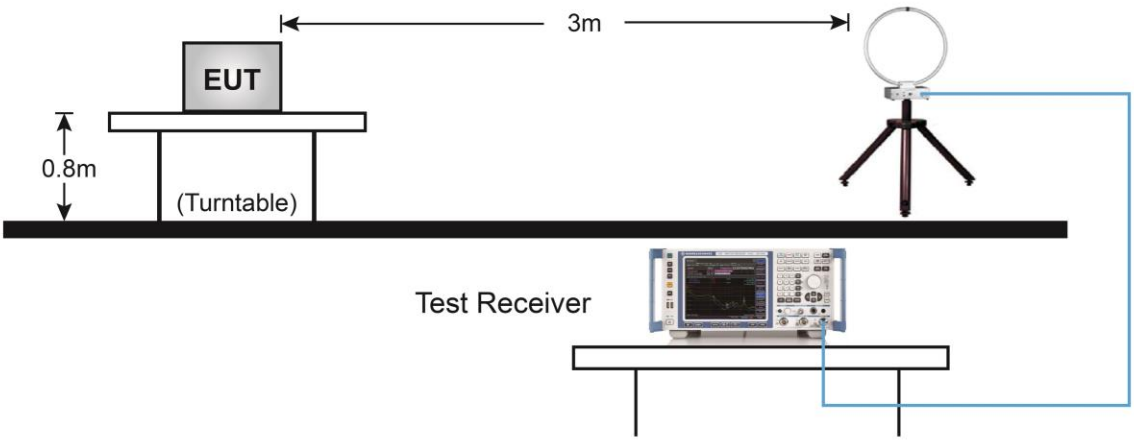
For 20dB Bandwidth

1. Set RBW ≥ 1% to 5% of the 20dB bandwidth
2. VBW ≥ 3 × RBW
3. Detector = Peak
4. Trace mode = Max hold
5. Sweep = Auto couple
6. Allow the trace to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

For 99% bandwidth

1. Span = 1.5 times to 5 times the OBW
2. Set RBW = 1% to 5% the OBW
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize

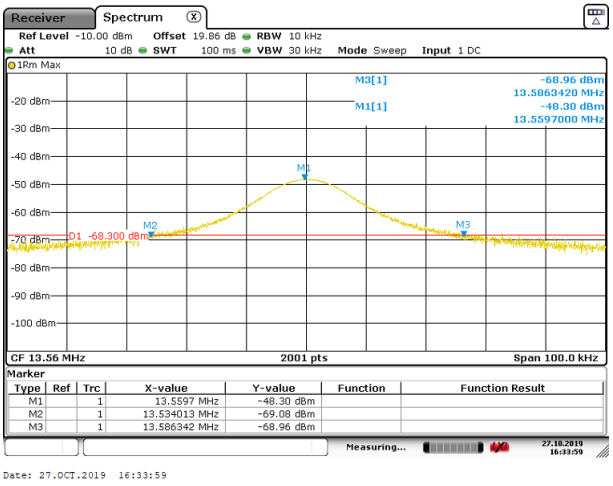
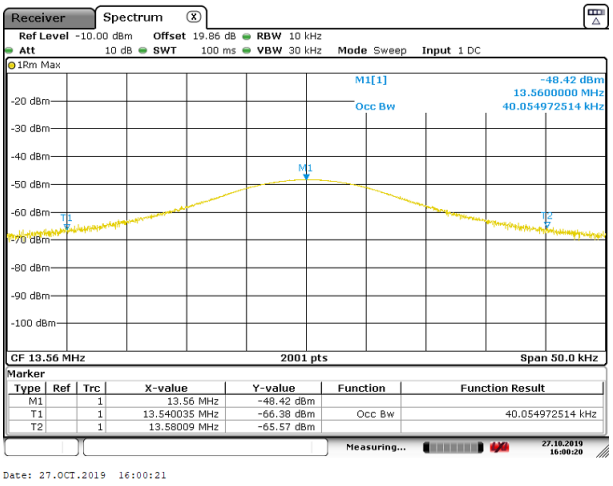
7.4.4.Test Setup



7.4.5.Test Result

Product	Senseon Plus System	Temperature	25℃
Test Engineer	Cloud Guo	Relative Humidity	54%
Test Site	AC1	Test Date	2019/10/27

Frequency (MHz)	20dB Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
13.56	52.329	40.055

20dB Bandwidth	99% Occupied Bandwidth
	

Note: Because the measured signal is CW or CW-like adjusting the RBW per ANSI C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW, so the RBW was set higher than 5% of the measured bandwidth.

7.5. Frequency Tolerence

7.5.1.Test Limit

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.

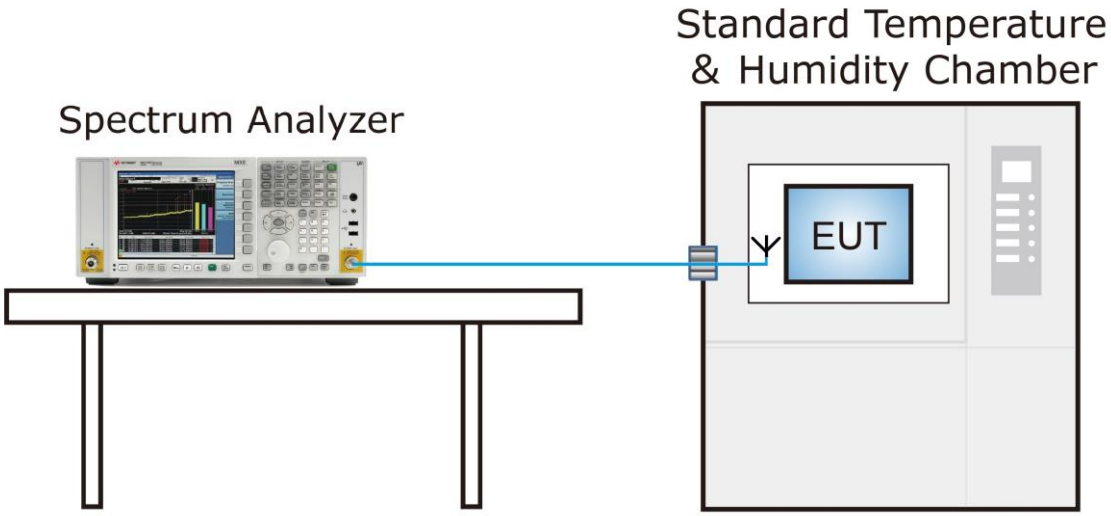
7.5.2.Test Procedure Used

ANSI C63.10-2013 - Section 6.8

7.5.3.Test Setting

1. Supply the EUT with a nominal ac voltage.
2. A measuring antenna was connected to spectrum analyzer, and placing it near the EUT.
3. Adjust the location of the measurement antenna obtain a suitable signal level.
4. Turn the EUT off and place it inside the environmental temperature chamber.
5. Set the temperature control on the chamber to the highest.
6. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.
7. Measure the center frequency.
8. Switch off the EUT.
9. Lower the chamber temperature by not more that 10℃, and allow the temperature inside the chamber to stabilize.
10. Repeat step 6 through step 9 down to the lowest specified temperature.
11. Repeat measure the center frequency at 85% and 115% of the nominal supply voltage and a temperature of 20℃.

7.5.4.Test Setup



7.5.5.Test Result

Product	Senseon Plus System	Temperature	25℃
Test Engineer	David Lv	Relative Humidity	54%
Test Site	TR3	Test Date	2019/10/27

Test Frequency (MHz)	Voltage (V_{AC})	Temperature (℃)	Measure Frequency (MHz)	Frequency Tolerance (%)	Limit (%)	Result
13.56	120	-20	13.560075	0.000553	±0.01	Pass
		-10	13.560100	0.000737	±0.01	Pass
		0	13.559700	-0.002212	±0.01	Pass
		+10	13.560350	0.002581	±0.01	Pass
		+20 (Ref)	13.560000	0.000000	±0.01	Pass
		+30	13.559275	-0.005347	±0.01	Pass
		+40	13.559275	-0.005347	±0.01	Pass
		+50	13.559975	-0.000184	±0.01	Pass
	102	+20	13.559900	-0.000737	±0.01	Pass
	138	+20	13.559950	-0.000369	±0.01	Pass

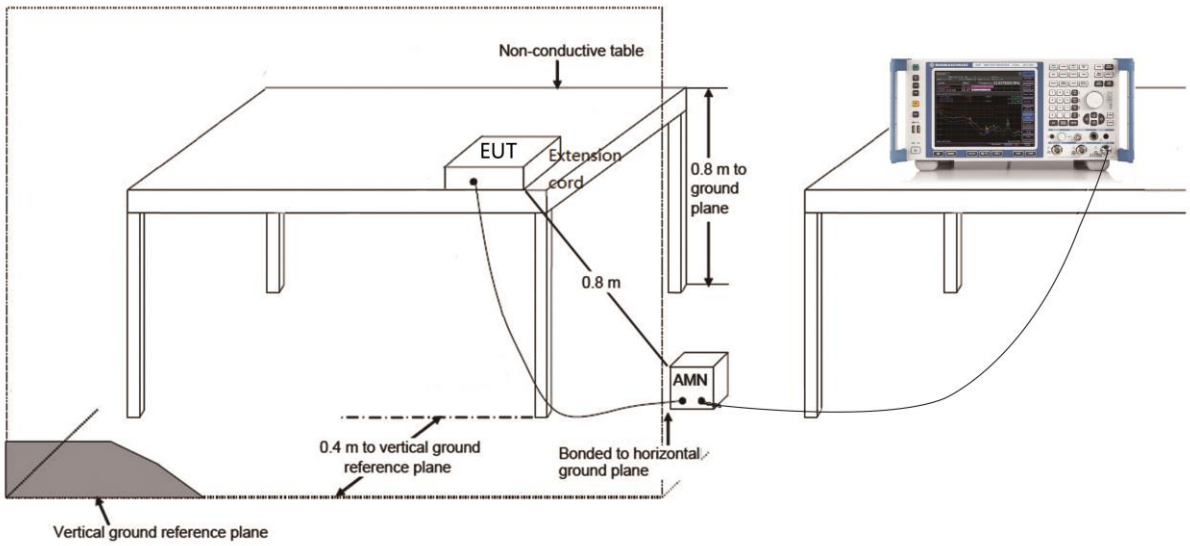
Note: Frequency Tolerance (%) = {[Measure Frequency (MHz) - Test Frequency (MHz)] / Test Frequency (MHz)} * 100%.

7.6. AC Conducted Emissions Measurement

7.6.1.Test Limit

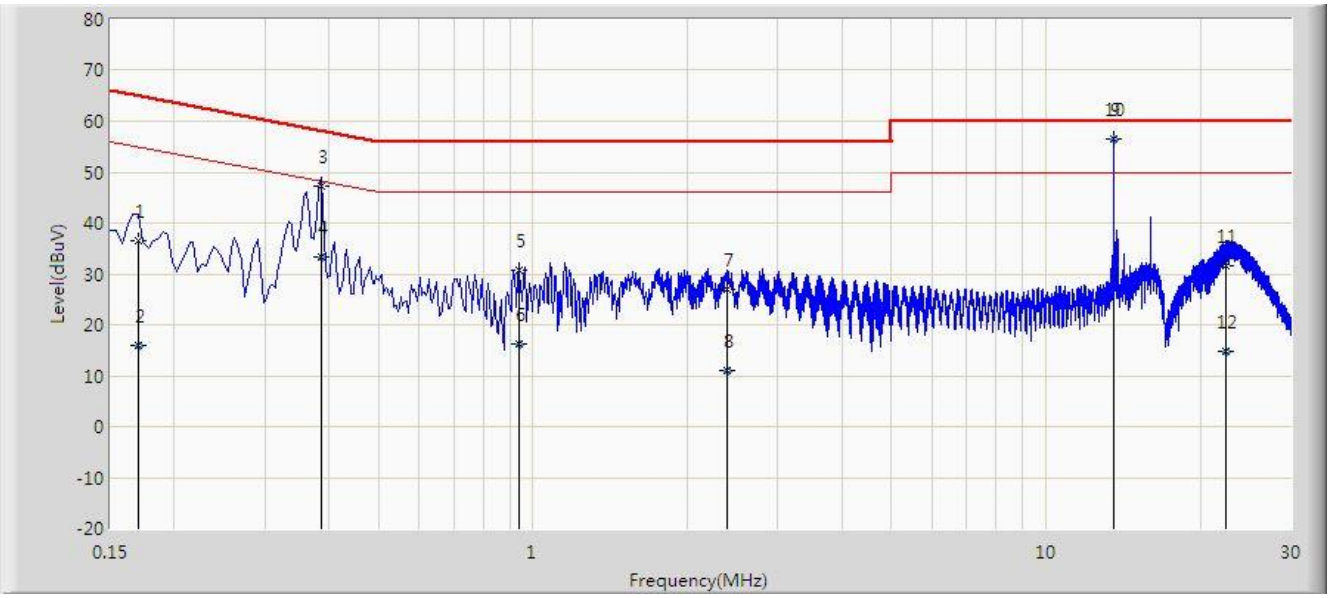
FCC Part 15.207 Limit		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.		

7.6.2.Test Setup



7.6.3.Test Result

Site: SR2	Time: 2020/04/12 - 14:37
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Senseon Plus System	Power: AC 120V/60Hz
Test Mode 1	



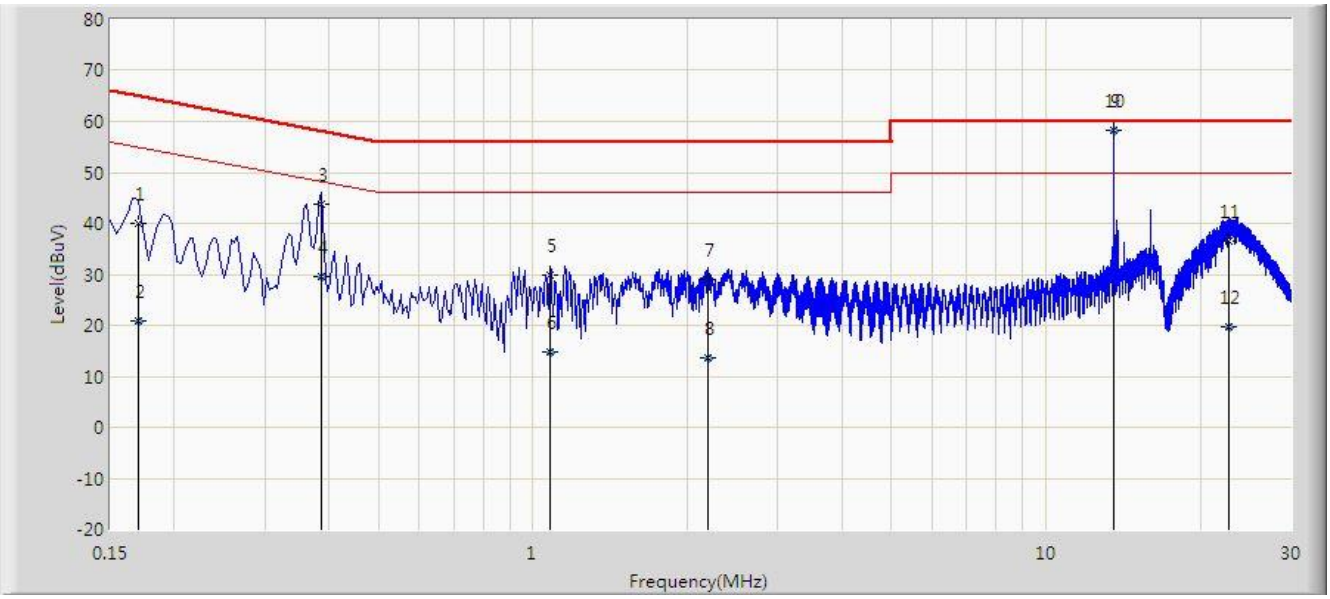
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.170	36.585	26.934	-28.375	64.960	9.652	QP
2			0.170	15.841	6.189	-39.120	54.960	9.652	AV
3			0.386	47.238	37.525	-10.912	58.149	9.712	QP
4			0.386	33.254	23.542	-14.895	48.149	9.712	AV
5			0.938	30.666	20.854	-25.334	56.000	9.812	QP
6			0.938	16.258	6.446	-29.742	46.000	9.812	AV
7			2.382	26.849	17.003	-29.151	56.000	9.846	QP
8			2.382	11.046	1.201	-34.954	46.000	9.846	AV
9			13.562	56.578	46.271	N/A	N/A	10.308	QP
10		*	13.562	56.510	46.202	N/A	N/A	10.308	AV
11			22.442	31.604	21.240	-28.396	60.000	10.364	QP
12			22.442	14.638	4.274	-35.362	50.000	10.364	AV

Note 1: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Note 2: 13.562MHz is the fundamental frequency of the EUT.

Site: SR2	Time: 2020/04/12 - 14:51
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Senseon Plus System	Power: AC 120V/60Hz
Test Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.170	40.122	30.510	-24.839	64.960	9.612	QP
2			0.170	20.937	11.325	-34.024	54.960	9.612	AV
3			0.386	43.628	33.993	-14.521	58.149	9.635	QP
4			0.386	29.677	20.042	-18.473	48.149	9.635	AV
5			1.082	29.984	20.275	-26.016	56.000	9.710	QP
6			1.082	14.866	5.156	-31.134	46.000	9.710	AV
7			2.186	28.886	19.105	-27.114	56.000	9.781	QP
8			2.186	13.583	3.803	-32.417	46.000	9.781	AV
9			13.558	58.281	48.103	N/A	N/A	10.178	QP
10		*	13.558	58.206	48.028	N/A	N/A	10.178	AV
11			22.770	36.528	26.169	-23.472	60.000	10.360	QP
12			22.770	19.843	9.483	-30.157	50.000	10.360	AV

Note 1: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Note 2: 13.558MHz is the fundamental frequency of the EUT.

8. CONCLUSION

The data collected relate only the item(s) tested and show that the device is in complied with Part 15C of the FCC Rules.

The End

Appendix A - Test Setup Photograph

Refer to “1910RSU038-UT” file.

Appendix B - EUT Photograph

Refer to “1910RSU038-UE” file.