EMC TEST REPORT

Applicant	Emerson White-Rodgers
FCC ID	2A4JN-RS01-SG
Product	Sensi Touch 2
Brand	Sensi
Model	RS01-SG; RS01-SGB3
Report No.	R2112A1150-E1V1
Issue Date	March 17, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2020)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	March 3, 2022
Rev.1	Update description in Page 8.	March 17, 2022
Note: This revised report (Report No. R2112A1150-E1V1) supersedes and replaces the previously issued report (Report No. R2112A1150-E1). Please discard or destroy the previously issued report and dispose of it accordingly.		

Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	FCC Part15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	FCC Part15.107, ANSI C63.4-2014	NA
Date of Testing: January 25, 2022~ January 29, 2022 Date of Sample Received: January 24, 2021			
Note: NA = Not Applicable. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
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2 General Description of Equipment under Test

2.1 Applicant and Manufacturer Information

Applicant	Emerson White-Rodgers
Applicant address	8100 West Florissant Ave St. Louis/United States of America
Manufacturer	Emerson White-Rodgers
Manufacturer address	8100 West Florissant Ave St. Louis/United States of America

2.2 General information

EUT Description		
Device Type	Movable Device	
Model	RS01-SG; RS01-SGB3	
Lab internal SN	R2112A1150/S01	
HW Version	0059-5376 verD	
SW Version	0170-1583v02_03	
Connecting I/O Port(s)	Please refer to the User's Manual.	
Antenna Type	PCB Antenna	
Frequency	Band	Frequency (MHz)
	900MHz	902.46 ~ 927.54
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. The main test model is RS01-SG in this report.		

Model Difference Table			
Model Number	**Description**	**Package**	**Channel**
RS01-SG	Remote Sensor	Sensor-1 pack	All Channels
RS01-SGB3	Remote Sensor	Sensor-3 pack	All Channels
Note: The customer declares that the models have the same PCB assembly, the only difference is Package.			

2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards
FCC Code CFR47 Part15B (2020)
ANSI C63.4 (2014)

2.4 Test Mode

Test Mode	
Mode 1	Battery + EUT + Receiver

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
15°C~35°C	30%~60%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.
The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.
Set the spectrum analyzer in the following:

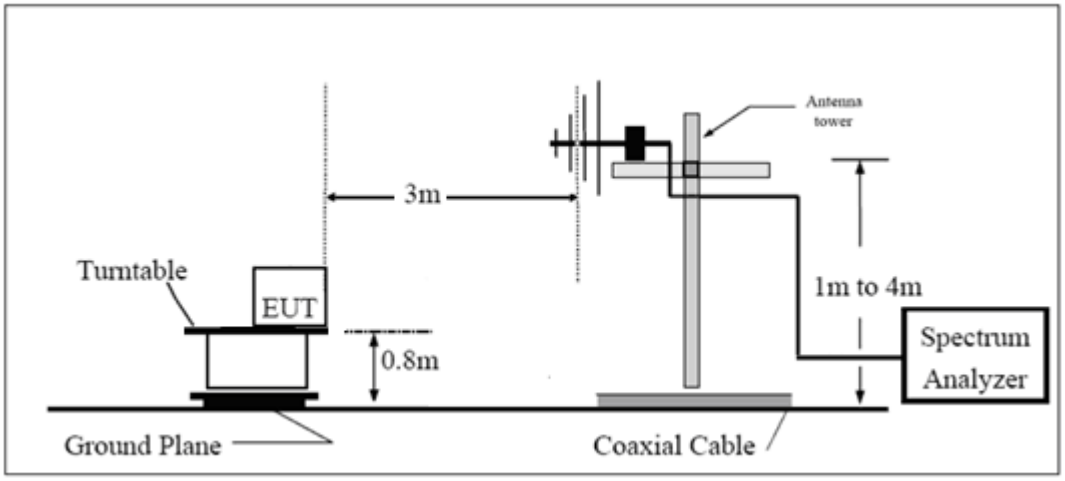
Below 1GHz:
RBW=100 kHz / VBW=300 kHz / Sweep=AUTO
Above 1GHz:

(a) PEAK Detector: RBW=1MHz / VBW=3MHz/ Sweep=AUTO
(b) AVERAGE Detector: RBW=1MHz / VBW=3MHz / Sweep=AUTO

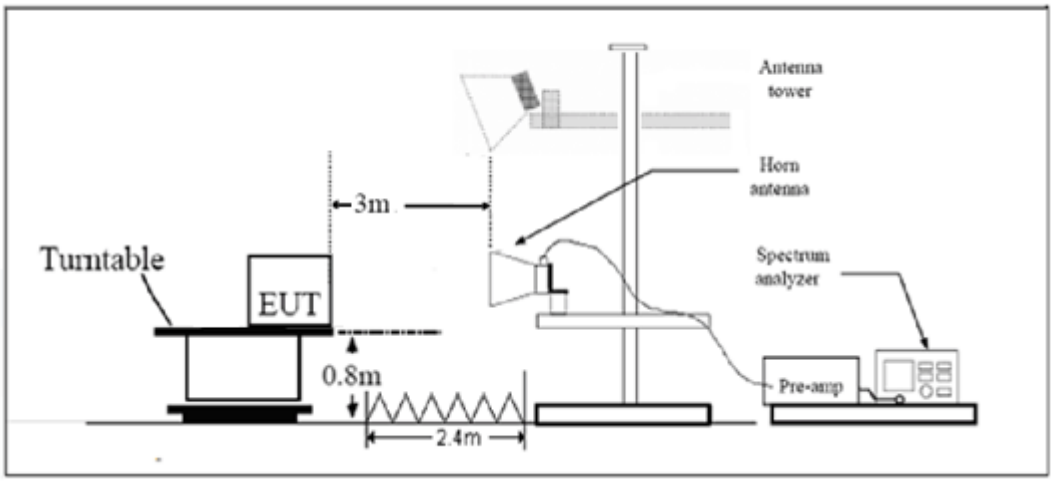
The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side: 2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits

Class B

Frequency (MHz)	Field Strength (dBμV/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

Measurement Uncertainty

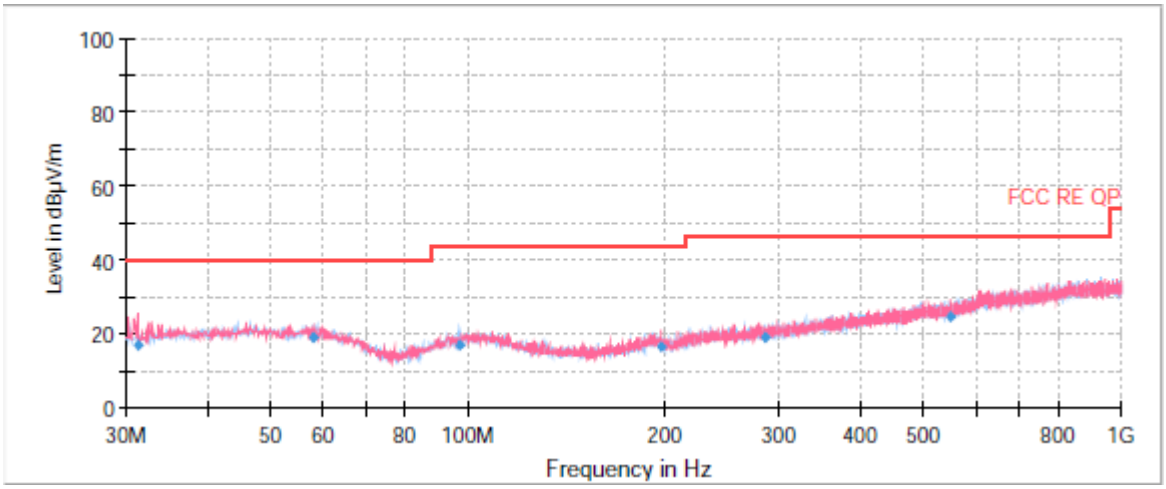
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96.

Frequency	Uncertainty
30MHz~200MHz	4.17 dB
200MHz~1000MHz	4.84 dB
1GHz~18GHz	4.35 dB

Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier.

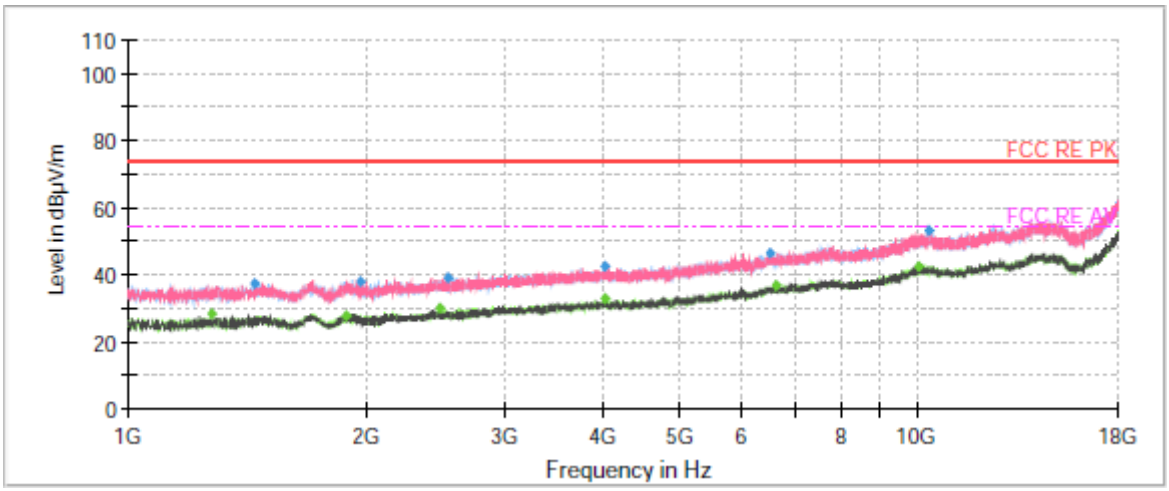
The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.



Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
31.21	16.90	40.00	23.10	1000.00	105.0	V	237.00	12
58.01	18.81	40.00	21.19	1000.00	105.0	H	326.00	14
97.54	16.68	43.50	26.82	1000.00	125.0	H	16.00	13
197.93	16.20	43.50	27.30	1000.00	100.0	V	231.00	12
285.96	19.09	46.00	26.91	1000.00	113.0	H	2.00	15
548.71	24.68	46.00	21.32	1000.00	100.0	V	164.00	20

Remark: 1. Correction Factor = Antenna factor + Insertion loss(cable loss+amplifier gain)
2. Margin = Limit – Quasi-Peak



Radiated Emission from 1GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1273.70	---	27.93	54.00	26.07	500.00	200.0	H	25.00	-18
1443.13	37.50	---	74.00	36.50	500.00	100.0	H	48.00	-17
1889.67	---	27.77	54.00	26.23	500.00	100.0	H	175.00	-15
1965.60	37.60	---	74.00	36.40	500.00	200.0	V	3.00	-15
2485.80	---	29.64	54.00	24.36	500.00	100.0	V	241.00	-14
2548.70	38.88	---	74.00	35.12	500.00	100.0	V	100.00	-14
4017.50	42.05	---	74.00	31.95	500.00	100.0	V	199.00	-11
4018.63	---	32.70	54.00	21.30	500.00	100.0	H	119.00	-11
6512.53	46.51	---	74.00	27.49	500.00	200.0	V	25.00	-4
6622.47	---	36.70	54.00	17.30	500.00	200.0	H	0.00	-4
10054.20	---	42.55	54.00	11.45	500.00	200.0	H	271.00	-1
10350.57	52.85	---	74.00	21.15	500.00	200.0	V	9.00	0

3.2 Conducted Emission

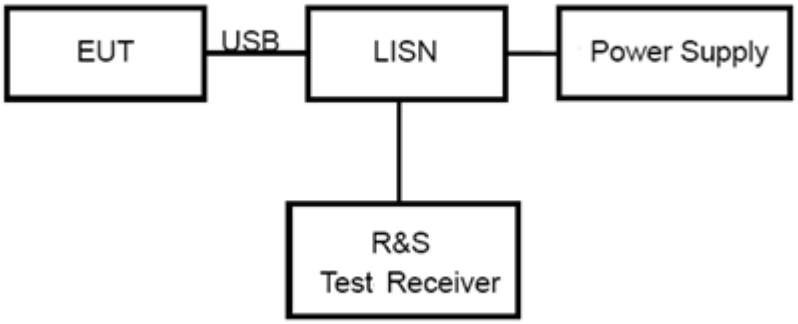
Ambient condition

Temperature	Relative humidity	Pressure
15°C~35°C	30%~60%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U= 2.57 dB.

Test Results

The equipment doesn't connected to public network, therefore this requirement do not apply.

4 Main Test Instruments

Name of Equipment	Manufacturer	Type/Model	Serial Number	Calibration Date	Expiration Time
EMI Test Receiver	R&S	ESCI7	100936	2021-12-12	2022-12-11
Signal Analyzer	R&S	FSV30	103591	2021-05-15	2022-05-14
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	9163	391	2020-05-05	2023-05-04
Horn Antenna	R&S	HF907	102723	2021-07-26	2024-07-25
Software	R&S	EMC32	9.26.01	/	/

********END OF REPORT ********

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.