



RF TEST REPORT



Report No.: RF_FCC_SL18113001-RAD-001_RFID_Rev1.0
Supersede Report No.: RF_FCC_SL18113001-RAD-001_RFID

Applicant	:	Radius Networks, Inc.
Product Name	:	RadPoint NFC Reader
Model No.	:	RNU-C01
Test Standard	:	FCC 15.225
Test Method	:	ANSI C63.10 2013
FCC ID	:	2ABYU-RNUC01
Dates of test	:	02/01/2019 - 03/05/2019
Issue Date	:	03/05/2019
Test Result	:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Equipment complied with the specification [X]		
Equipment did not comply with the specification []		

This Test Report is Issued Under the Authority of:	
	
Shuo Zhang	Chen Ge
Test Engineer	Engineer Reviewer
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only	

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, CA 95035



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Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



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Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	EMC, RF/Wireless, Telecom, Safety
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
RF_FCC_ SL18113001-RAD-001_RFID	None	Original	02/11/2019
RF_FCC_ SL18113001-RAD-001_RFID_Rev1.0	1.0	Update per TCB comments	03/05/2019

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Radius Networks, Inc.
Product: RadPoint NFC Reader
Model: RNU-C01

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	Radius Networks, Inc.
Applicant Address	:	3255 Grace St NW, Washington, DC 20007
Manufacturer Name	:	Radius Networks, Inc.
Manufacturer Address	:	3255 Grace St NW, Washington, DC 20007

4 Test site information

Lab performing tests	:	SIEMIC Laboratories
Lab Address	:	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	:	540430
IC Test Site No.	:	4842D-2
VCCI Test Site No.	:	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	RadPoint NFC Reader
Model No.	RNU-C01
Trade Name	Radius Networks, Inc.
Serial No.	N/A
Input Power	5V DC via USB
Date of EUT received	01/01/2019
Equipment Class/ Category	RFID
Port/Connectors	USB C
Remark	The RNU-C01 RadPoint Reader is high performance fully NFC compliant card reader that enables a connected host computer to read loyalty (VAS) data from Type 2 and Type 4 NFC Tags, Apple Wallet cards, and Google Pay cards.

6.2 Radio Description

Specifications for Radio:

Radio Type	RFID
Operating Frequency	13.56MHz
Modulation	ASK (13.56MHz)
Channel Spacing	None
Antenna Type	Loop
Antenna Connector Type	N/A

Channel List:

Type	Mode	Channel No.	Frequency (MHz)	Available (Y/N)
RFID	13.56MHz	1	13.56	Y

6.3 EUT test modes/configuration Description

Mode	Note
RF test	EUT is set to continuously transmit at 13.56MHz.
Note: None	

Test Item	Operating mode	Tested antenna port	Test frequencies
Antenna Requirement	N/A	-	13.56MHz
Conducted Emissions Voltage	Continuous Transmit	-	
Limit in the band of 13.553 – 13.567 MHz	Continuous Transmit	-	
Limit in the band of 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	Continuous Transmit	-	
Limit in the band of 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	Continuous Transmit	-	
Limit outside the band of 13.110 – 14.010 MHz	Continuous Transmit	-	
Frequency Stability	Continuous Transmit	-	
Occupied Bandwidth	Continuous Transmit	-	
Note: EUT uses a PCB trace antenna attached to the PCB board. Only radiated measurements were performed during the test.			

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	N17Q1	NXGNPAA0167300AA1C7600	Acer	To Power up the EUT
2	Laptop Power Supply	PA-1450-26	N/A	LITEON	N/A

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
USB to USB C	Laptop	USB	EUT	USB C	1	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Tera Term	The EUT continuously transmit

8 Test Summary

Test Item	Test standard		Test Method/Procedure	Pass / Fail
Antenna Requirement	FCC	15.203	ANSI C63.10 – 2013	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
AC Conducted Emissions	FCC	15.207(a)	ANSI C63.10:2013	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Limit in the band of 13.553 – 13.567 MHz	FCC	15.225(a)	FCC	ANSI C63.10 2013	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Limit in the band of 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	FCC	15.225(b)	FCC	ANSI C63.10 2013	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Limit in the band of 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	FCC	15.225(c)	FCC	ANSI C63.10 2013	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Limit outside the band of 13.110 – 14.010 MHz	FCC	15.225(d), 15.209	FCC	ANSI C63.10 2013	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Frequency Stability	FCC	15.225(e)	FCC	ANSI C63.10 2013	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Remark	<ol style="list-style-type: none"> All measurement uncertainties are not taken into consideration for all presented test result. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. 				

9 Measurement Uncertainty

Emissions			
Test Item	Frequency Range	Description	Uncertainty
AC Conducted Emissions	150KHz – 30MHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2	±3.5dB
RF conducted measurement	150KHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2	±0.95dB
Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	±6dB
Radiated Spurious Emissions	1GHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	±6dB

10 Measurements, examination and derived results

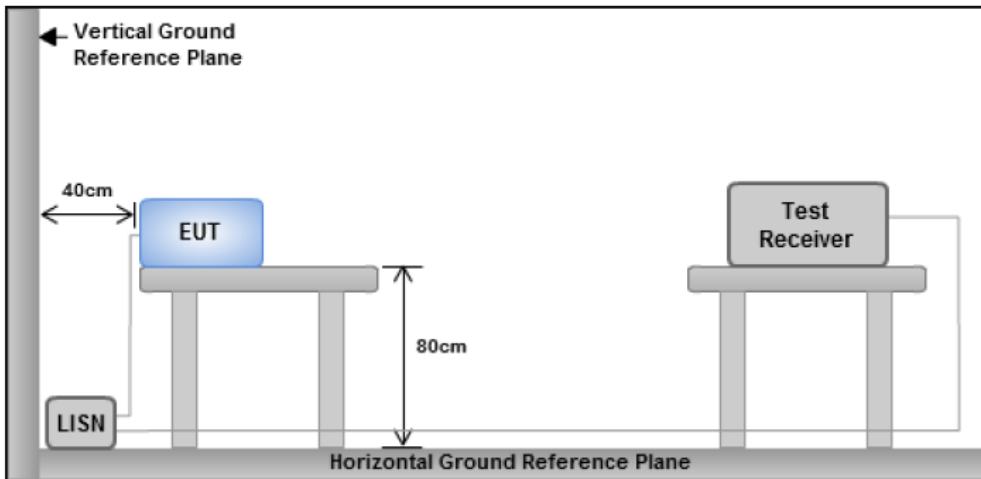
10.1 Antenna Requirement

Spec	Requirement	Applicable
§15.203	<p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.</p> <p>Antenna requirement must meet at least one of the following:</p> <p>a) Antenna must be permanently attached to the device. b) The antenna must use a unique type of connector to attach to the device. c) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device.</p>	<input checked="" type="checkbox"/>
Remark	The RFID antenna is integral to the PCB board permanently to the device which meets the requirement.	
Result	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	

10.2 Conducted Emissions

Conducted Emission Limit

Frequency ranges (MHz)	Limit (dBuV)	
	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

Spec	Item	Requirement	Applicable
FCC 15.207 RSS-GEN Section 8.8	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges.	<input checked="" type="checkbox"/>
Test Setup	 <p>Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes</p>		
Procedure	<ul style="list-style-type: none"> - The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment was powered separately from another main supply. 		
Remark	EUT was tested at 120VAC, 60Hz		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

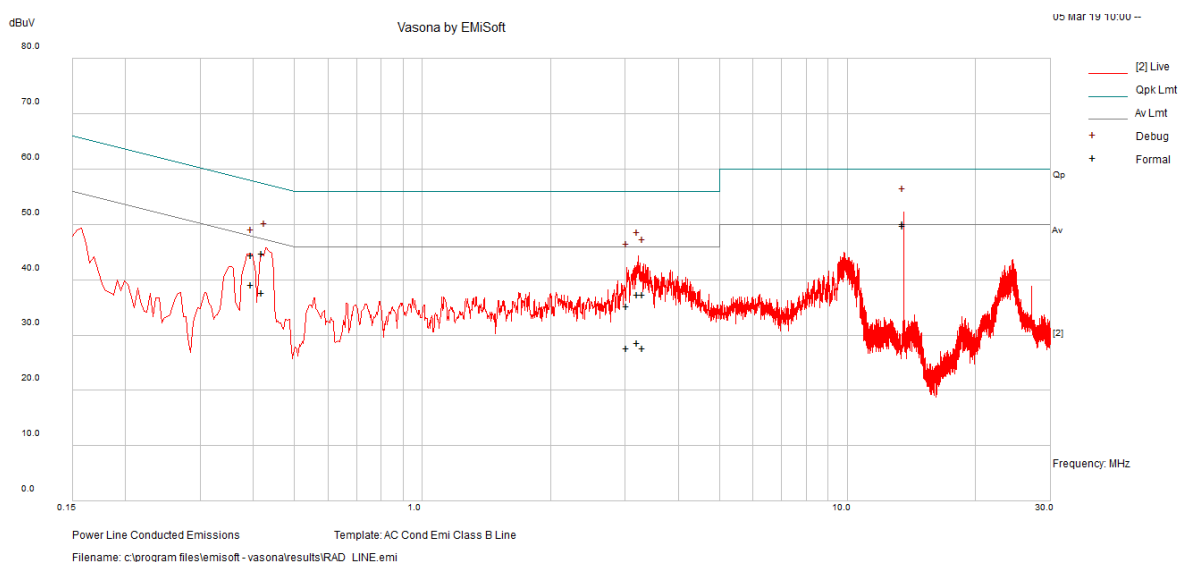
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Shuo Zhang at Conducted Emission test site.

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Shuo Zhang			
Test Date:	03/05/2019			
Remarks	USB, Live			

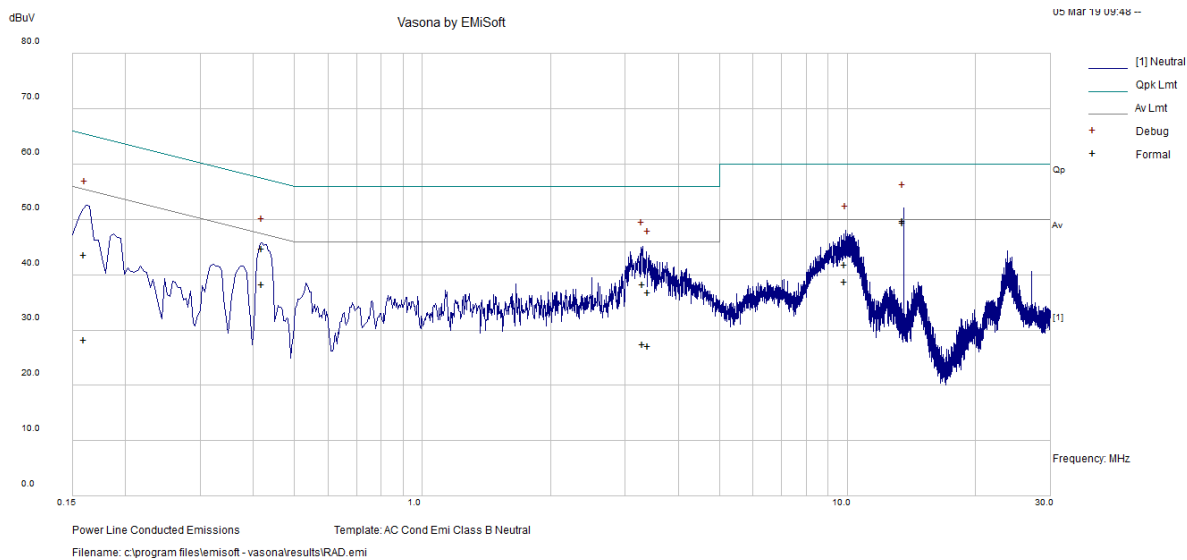


Live Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
13.56	41.01	8.83	0.33	50.16	Quasi Peak	Live	60	-9.84	Pass
0.42	37.42	7.31	0.04	44.77	Quasi Peak	Live	57.45	-12.68	Pass
3.22	29.3	7.95	0.07	37.32	Quasi Peak	Live	56	-18.68	Pass
3.31	29.34	7.96	0.07	37.37	Quasi Peak	Live	56	-18.63	Pass
0.40	37.13	7.3	0.04	44.48	Quasi Peak	Live	57.92	-13.45	Pass
3.04	27.32	7.93	0.07	35.33	Quasi Peak	Live	56	-20.67	Pass
13.56	40.7	8.83	0.33	49.86	Average	Live	50	-0.14	Pass
0.42	30.33	7.31	0.04	37.68	Average	Live	47.45	-9.76	Pass
3.22	20.66	7.95	0.07	28.69	Average	Live	46	-17.31	Pass
3.31	19.58	7.96	0.07	27.61	Average	Live	46	-18.39	Pass
0.40	31.86	7.3	0.04	39.2	Average	Live	47.92	-8.72	Pass
3.04	19.68	7.93	0.07	27.69	Average	Live	46	-18.31	Pass

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Shuo Zhang			
Test Date:	03/05/2019			
Remarks	USB, Neutral			



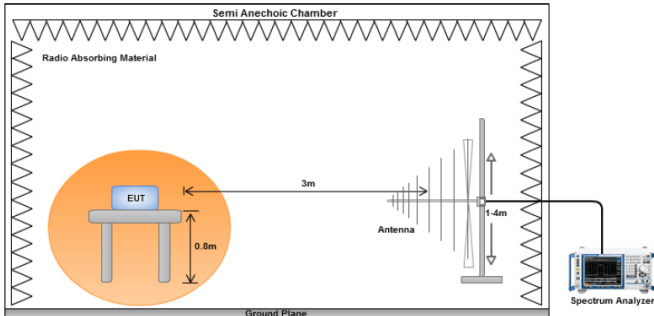
Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
13.56	40.66	8.83	0.33	49.82	Quasi Peak	Neutral	60	-10.18	Pass
3.31	30.24	7.96	0.07	38.27	Quasi Peak	Neutral	56	-17.73	Pass
0.42	37.43	7.31	0.03	44.77	Quasi Peak	Neutral	57.46	-12.69	Pass
9.91	33.32	8.3	0.25	41.87	Quasi Peak	Neutral	60	-18.13	Pass
3.40	28.76	7.97	0.07	36.79	Quasi Peak	Neutral	56	-19.21	Pass
0.16	36.49	7.13	0.04	43.66	Quasi Peak	Neutral	65.44	-21.78	Pass
13.56	40.29	8.83	0.33	49.45	Average	Neutral	50	-0.55	Pass
3.31	19.45	7.96	0.07	27.47	Average	Neutral	46	-18.53	Pass
0.42	30.97	7.31	0.03	38.31	Average	Neutral	47.46	-9.15	Pass
9.91	30.26	8.3	0.25	38.81	Average	Neutral	50	-11.19	Pass
3.40	19.2	7.97	0.07	27.23	Average	Neutral	46	-18.77	Pass
0.16	21.12	7.13	0.04	28.28	Average	Neutral	55.44	-27.15	Pass

10.3 Radiated Measurements

10.3.1 Radiated Measurements 30MHz to 1GHz

Requirement(s):

Spec	Requirement	Applicable										
47 CFR §15.225	<div>Operation within the band 13.110–14.010 MHz:</div> <div>(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.</div> <div>(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.</div> <div>(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.</div> <div>(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.</div> <table><thead><tr><th>Frequency range (MHz)</th><th>Field Strength (uV/m)</th></tr></thead><tbody><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></tbody></table>	Frequency range (MHz)	Field Strength (uV/m)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500	<input checked="" type="checkbox"/>
Frequency range (MHz)	Field Strength (uV/m)											
30 – 88	100											
88 – 216	150											
216 960	200											
Above 960	500											
Test Setup												
Procedure	<div>1. The EUT was switched on and allowed to warm up to its normal operating condition.</div> <div>2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:<div>a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.</div><div>b. The EUT was then rotated to the direction that gave the maximum emission.</div><div>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</div></div> <div>3. A Quasi-peak measurement was then made for that frequency point.</div> <div>4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</div>											
Test Date	02/01/2019	<div>Environmental conditions</div> <div>Temperature20.1°C</div> <div>Relative Humidity36%</div> <div>Atmospheric Pressure1026mbar</div>										
Remark	-											
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail											

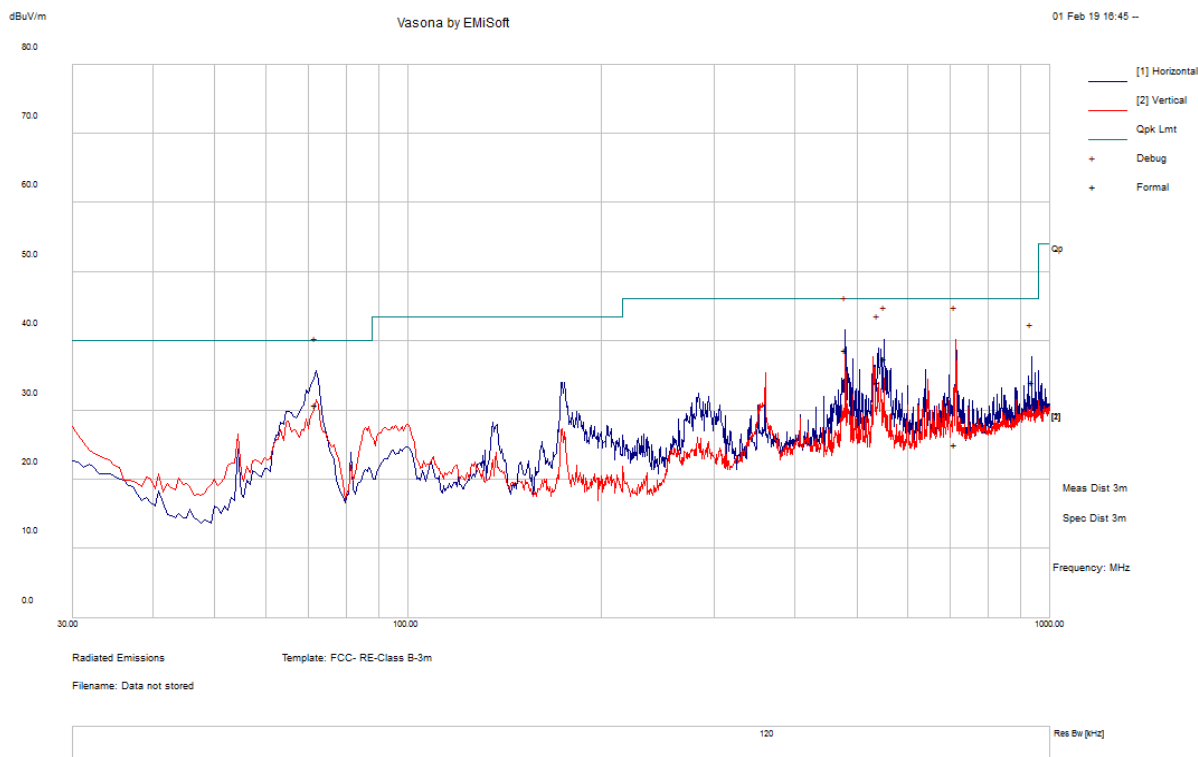
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Shuo Zhang at 10-meter chamber.

Test specification:	Radiated Emissions			
Mains Power:	5V USB		Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Tested by:	Shuo Zhang			
Test Date:	02/01/2019			
Remarks:	N/A			

f=30MHz – 1000MHz plot and 3 meter distance

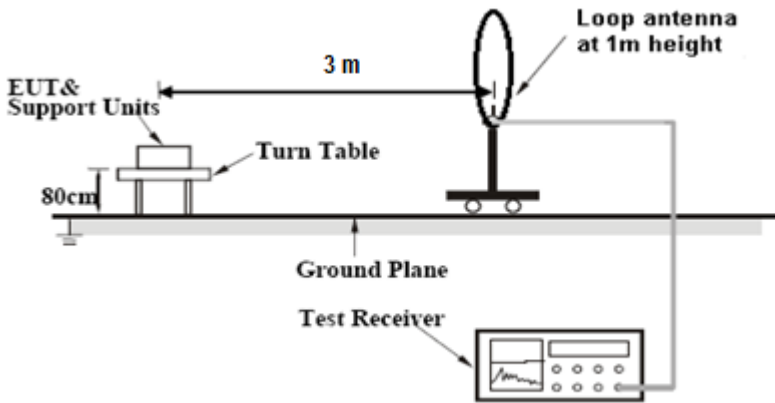


f=30MHz – 1000MHz Measurements

Frequency MHz	Raw dBμV/m	Cable Loss	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
71.80	47.16	11.59	-27.98	30.77	Quasi Max	H	350	356	40	-9.23	Pass
479.99	43.57	14.22	-19.06	38.73	Quasi Max	H	234	32	46	-7.27	Pass
712.03	25.78	15.19	-15.84	25.13	Quasi Max	V	110	221	46	-20.87	Pass
551.99	41.15	14.45	-18.03	37.57	Quasi Max	H	174	289	46	-8.43	Pass
540.01	38.33	14.49	-18.68	34.15	Quasi Max	H	169	88	46	-11.85	Pass
935.96	31.66	15.93	-13.43	34.16	Quasi Max	H	100	52	46	-11.84	Pass

10.3.2 Radiated Measurements below 30MHz

Requirement(s):

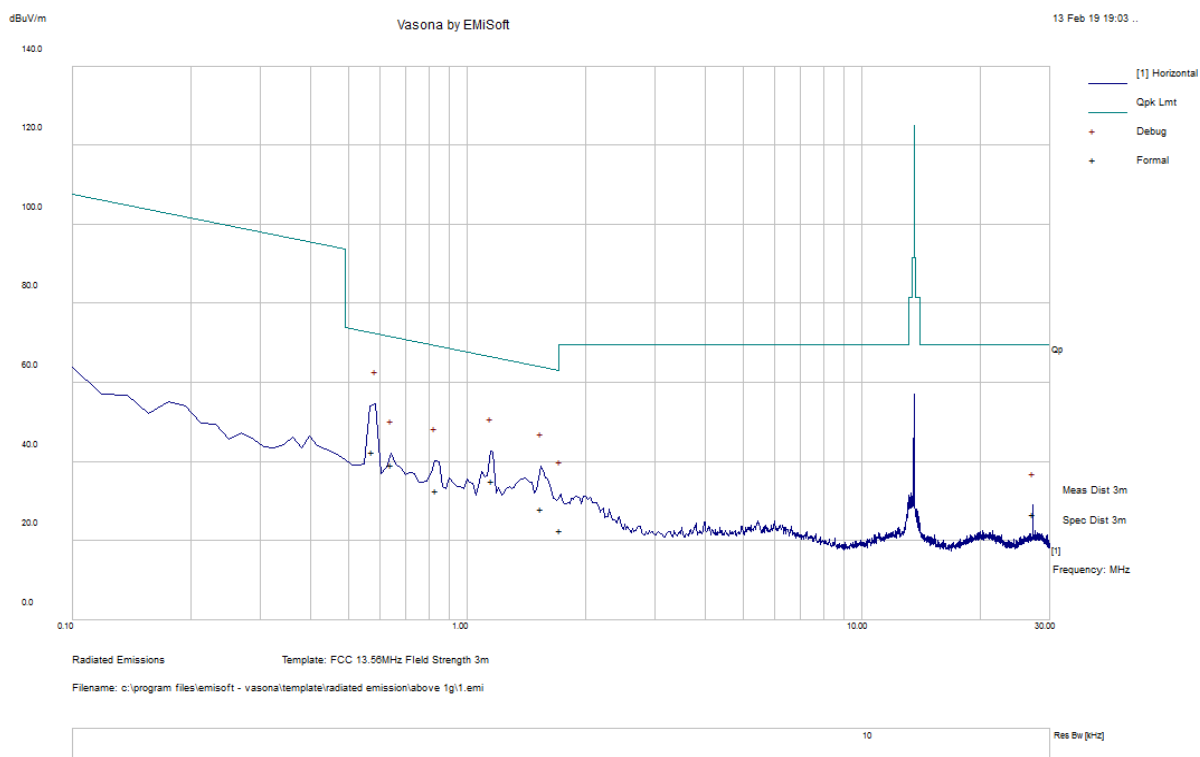
Spec	Requirement	Applicable
47 CFR §15.225	<p>Operation within the band 13.110–14.010 MHz</p> <p>(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.</p> <p>(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.</p> <p>(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.</p> <p>(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.</p>	<input checked="" type="checkbox"/>
Test Setup		
Procedure	<p>For < 30MHz, Radiated emissions were measured according to ANSI C63.10. The EUT was set to transmit at the highest output power.</p> <p>The EUT was set 3 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 kHz.</p> <p>The limit is converted from microvolt/meter to decibel microvolt/meter.</p>	
Test Date	02/14/2019	Environmental conditions
		<p>Temperature 22°C</p> <p>Relative Humidity 40%</p> <p>Atmospheric Pressure 1026mbar</p>
Remark	-	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Shuo Zhang at 10-meter chamber.

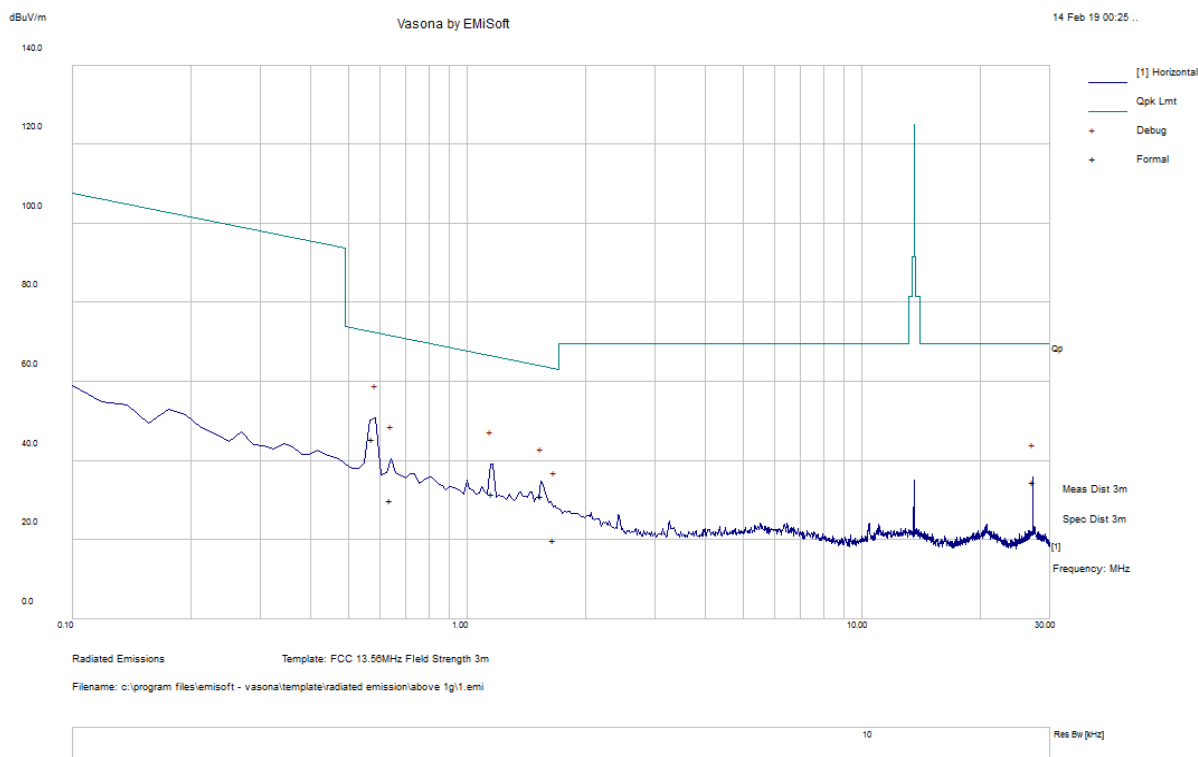
Test specification:	Radiated Spurious Emissions			
Mains Power:	5V USB		Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Tested by:	Shuo Zhang			
Test Date:	02/14/2019			
Remarks:	f= 100kHz – 30MHz plot, and loop antenna at 0 degree			



Quasi Max Measurement

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol (0/90)	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
0.58	24.79	0.45	17.21	42.45	Quasi Max	0	100	229	72.38	-29.93	Pass
1.16	22.99	0.53	11.67	35.18	Quasi Max	0	100	30	66.35	-31.17	Pass
1.54	18.06	0.56	9.47	28.09	Quasi Max	0	100	220	63.83	-35.74	Pass
0.84	18.01	0.49	14.2	32.7	Quasi Max	0	100	209	69.17	-36.47	Pass
0.64	22.56	0.46	16.36	39.38	Quasi Max	0	100	290	71.44	-32.06	Pass
1.73	13.66	0.57	8.62	22.85	Quasi Max	0	100	214	69.54	-46.69	Pass

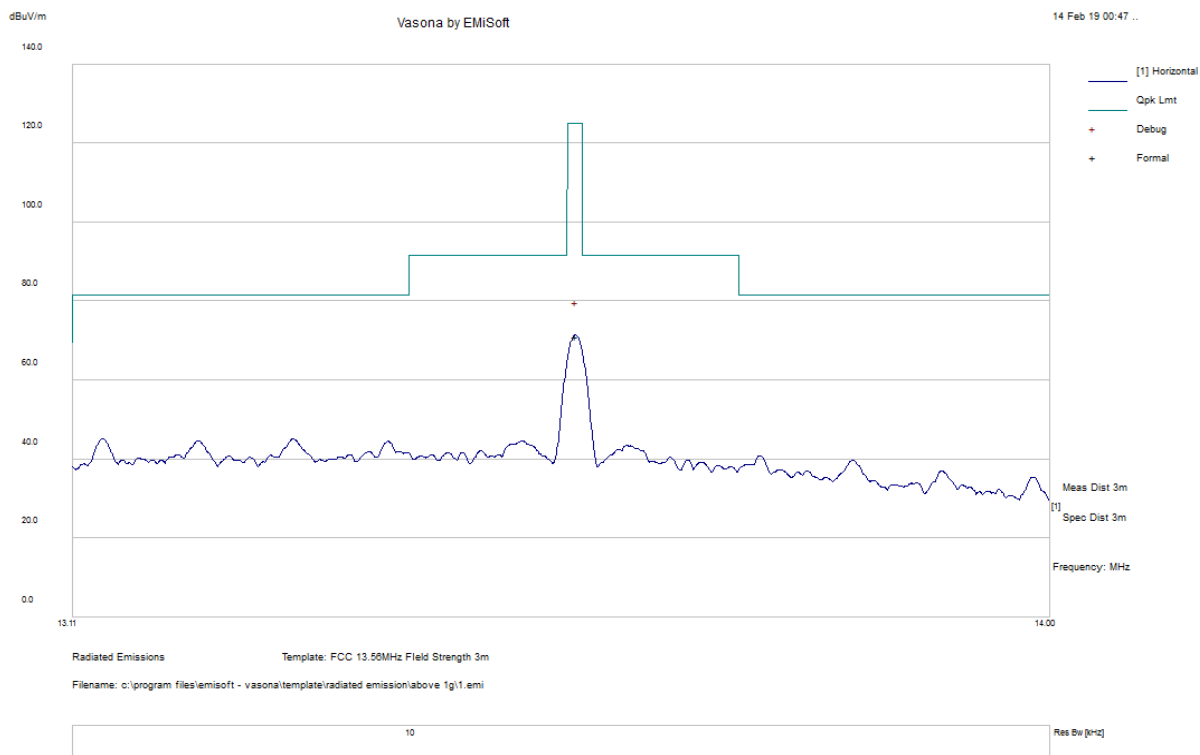
Test specification:	Radiated Spurious Emissions			
Mains Power:	5V USB		Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Tested by:	Shuo Zhang			
Test Date:	02/14/2019			
Remarks:	f= 100kHz – 30MHz plot, and loop antenna at 90 degree			



Quasi Max Measurement

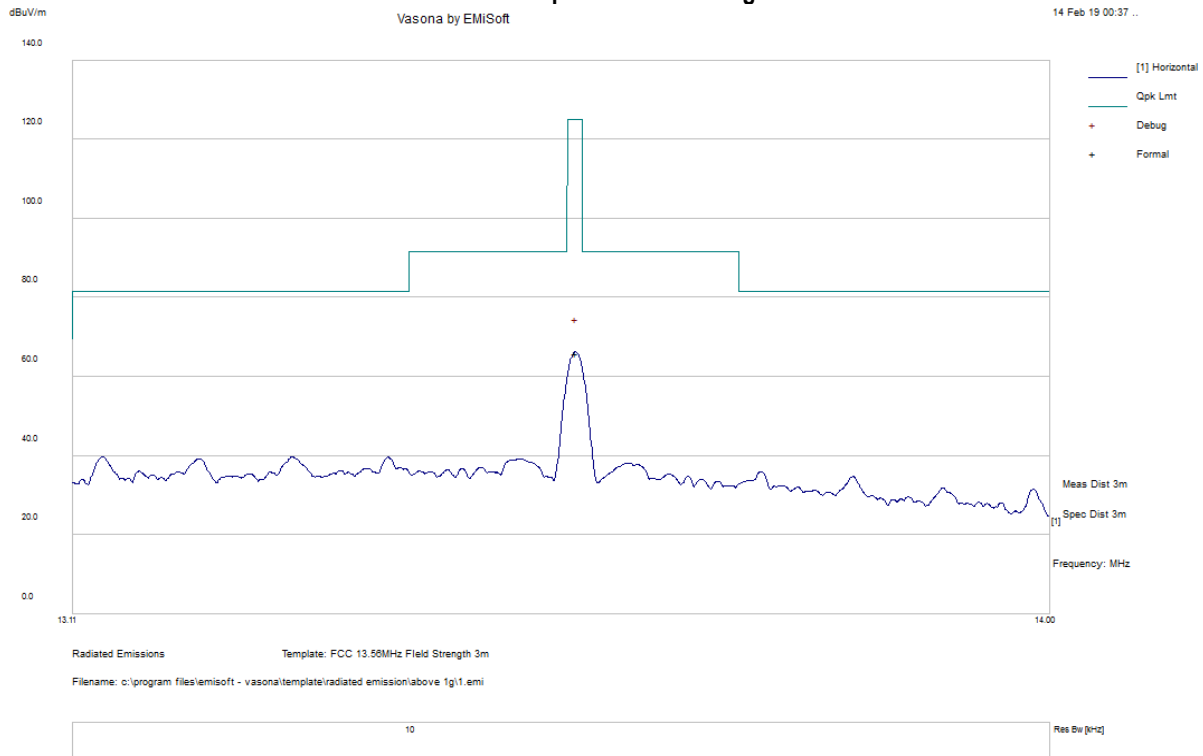
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol (0/90)	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
0.58	27.78	0.45	17.2	45.44	Quasi Max	90	100	258	72.38	-26.94	Pass
1.16	19.48	0.53	11.65	31.65	Quasi Max	90	100	296	66.32	-34.67	Pass
1.54	21.15	0.56	9.48	31.19	Quasi Max	90	100	233	63.84	-32.65	Pass
0.64	13.27	0.46	16.41	30.14	Quasi Max	90	100	106	71.5	-41.36	Pass
27.12	32.73	1.07	0.87	34.67	Quasi Max	90	100	11	69.54	-34.87	Pass
1.66	10.65	0.57	8.91	20.13	Quasi Max	90	100	122	63.2	-43.08	Pass

Loop antenna at 0 degree



Frequency (MHz)	Amplitude (dBμV/m)
13.5645	71.16

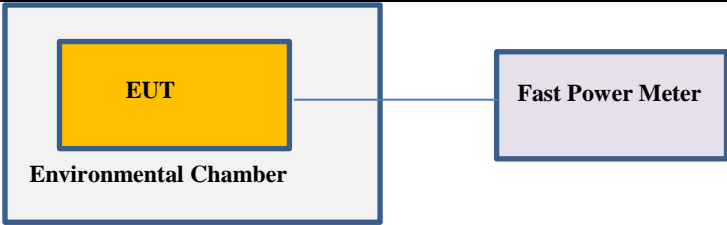
Loop antenna at 90 degree



Frequency (MHz)	Amplitude (dBuV/m)
13.561	65.99

10.4 Frequency Stability

Requirement(s):

Spec	Requirement	Applicable									
47 CFR §15.225 e)	Limit: $\pm 0.01\%$ of 13.56 MHz = 1356 Hz	<input checked="" type="checkbox"/>									
Test Setup	 <ol style="list-style-type: none"> The EUT was set up inside an environmental chamber. The EUT was placed in the centre of the environmental. 										
Procedure	Frequency Stability was measured according to 47 CFR §2.1055. Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz. A voltmeter was used to monitor when varying the voltage.										
Test Date	02/14/2019	<table border="1"> <tr> <td>Environmental conditions</td> <td>Temperature</td> <td>20°C</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>41%</td> </tr> <tr> <td></td> <td>Atmospheric Pressure</td> <td>1026mbar</td> </tr> </table>	Environmental conditions	Temperature	20°C		Relative Humidity	41%		Atmospheric Pressure	1026mbar
Environmental conditions	Temperature	20°C									
	Relative Humidity	41%									
	Atmospheric Pressure	1026mbar									
Remark	None										
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail										

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Shuo Zhang at RF test site.

Test Result for 13.56MHz Radio

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20°C to $+50^{\circ}\text{C}$ at normal supply voltage.

Reference Frequency: 13.56MHz

Temperature ($^{\circ}\text{C}$)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
65	13.56073	730	<0.01	Pass
60	13.56073	730	<0.01	Pass
50	13.56073	730	<0.01	Pass
40	13.56073	730	<0.01	Pass
30	13.56074	740	<0.01	Pass
20	13.56074	740	<0.01	Pass
10	13.56074	740	<0.01	Pass
0	13.55967	-330	<0.01	Pass
-10	13.55967	-330	<0.01	Pass
-20	13.55967	-330	<0.01	Pass

Frequency Stability versus Input Voltage: The Frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$, the frequency of the transmitter was measured at 85% and at 115% of the rated power supply voltage at a 20°C environmental temperature.

















Carrier Frequency: 13.56MHz







Measured Voltage $\pm 15\%$ of nominal (DC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Deviation (Limit: 0.01%)	Pass/Fail
5.75	13.56075	750	<0.01	Pass
4.25	13.56075	750	<0.01	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
Spectrum Analyzer	N9010A	10SL0219	05/13/2018	1 Year	05/13/2019	<input checked="" type="checkbox"/>
Bi-Log antenna (30MHz~1GHz)	JB1	A030702	03/09/2018	1 Year	03/09/2019	<input checked="" type="checkbox"/>
Horn Antenna (1GHz~18GHz)	3115	100059	11/09/2018	1 Year	11/09/2019	<input checked="" type="checkbox"/>
Horn Antenna (18GHz~40GHz)	PA-840	181251	06/23/2018	1 Year	06/23/2019	<input checked="" type="checkbox"/>
Preamplifier (100KHz-7GHz)	LPA-6-30	11170602	03/09/2018	1 Year	03/09/2019	<input checked="" type="checkbox"/>
Preamplifier (0.01-50 GHz)	RAMP00M50GA	17032300047	02/19/2018	1 Year	02/19/2019	<input checked="" type="checkbox"/>
ETS-Lingren Loop Antenna	6512	00049120	08/20/2018	1 Year	08/20/2019	<input checked="" type="checkbox"/>

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1 , A2 , A3 , A4 , B1 , B2 , B3 , B4 ,
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)	 	Phase I , Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurements
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2