

EMC TEST REPORT



Report No.: Q181227S004-FCC-E

Supersede Report No: N/A

Applicant	REMOTE SOLUTION.CO.,LTD	
Product Name	REMOTE CONTROL UNIT	
Model No.	RC96A	
Serial No.	RC96XBB (X stands for A~Z, BB stands for 00~99)	
Test Standard	FCC Part 15 Subpart B Class B, ANSI C63.4: 2014	
Test Date	January 09~22, 2019	
Issue Date	January 26, 2019	
Test Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Equipment complied with the specification		<input checked="" type="checkbox"/>
Equipment did not comply with the specification		<input type="checkbox"/>
Evans He	David Huang	
Evans He Test Engineer	David Huang Checked By	
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 (SHENZHEN-CHINA) LABORATORIES

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Laboratories 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.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
Q181227S004-FCC-E	NONE	Original	January 26, 2019

2. Customer information

Applicant Name	REMOTE SOLUTION.CO.,LTD
Applicant Add	326-14,APO-DAERO, NAM-MYEON, GIMCHEON CITY, GYEONGSANGBUK-DO,KOREA
Manufacturer	REMOTE SOLUTION.CO.,LTD
Manufacturer Add	326-14,APO-DAERO, NAM-MYEON, GIMCHEON CITY, GYEONGSANGBUK-DO,KOREA

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software of Radiated Emission	Radiated Emission Program-To Shenzhen v2.0
Test Software of Conducted Emission	EZ-EMC(ver.Icp-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	REMOTE CONTROL UNIT
Main Model:	RC96A
Serial Model:	RC96XBB (X stands for A~Z, BB stands for 00~99)
Antenna Gain:	BLE: -1.6dBi RF4CE: 0dBi
Antenna Type:	BLE: Chip antenna RF4CE: Pattern antenna
Equipment Category :	JAB
Type of Modulation:	BLE: GFSK RF4CE: O-QPSK
RF Operating Frequency (ies):	BLE: 2402-2480 MHz RF4CE: 2425-2475MHz
Number of Channels:	BLE: 40CH RF4CE: 11CH
Input Power:	Battery: Spec: DC 3V
Port:	Please refer to the user' s manual
Trade Name :	N/A
FCC ID:	TX4RC96A
Date EUT received:	January 08, 2019
Test Date(s):	January 09~22, 2019

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	N/A
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty

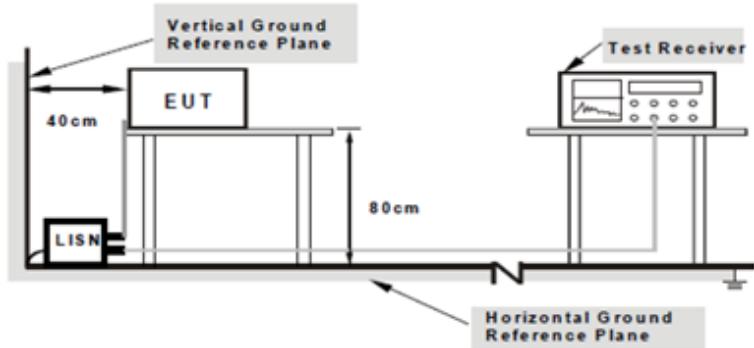
Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±3.11dB
Radiated Emission(30MHz~1GHz)	±5.12dB
Radiated Emission(1GHz~6GHz)	±5.34dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	--
Relative Humidity	--
Atmospheric Pressure	--
Test date :	--
Tested By :	--

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	<p>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 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency ranges (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>QP</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15 ~ 0.5</td> <td>66 – 56</td> <td>56 – 46</td> </tr> <tr> <td>0.5 ~ 5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5 ~ 30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency ranges (MHz)	Limit (dB μ V)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	<input type="checkbox"/>
Frequency ranges (MHz)	Limit (dB μ V)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															
Test Setup	 <p>The diagram illustrates the test setup. A 'Vertical Ground Reference Plane' is shown as a vertical line. A 'Horizontal Ground Reference Plane' is shown as a horizontal line. An 'EUT' (Equipment Under Test) is placed on a table. A 'LISN' (Line Impedance Stabilization Network) is connected between the EUT and the power source. A 'Test Receiver' is connected to the LISN. The distance between the LISN and the EUT is 40 cm. The distance between the LISN and the test receiver is 80 cm.</p> <p>Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</p>																
Procedure	<ol 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. The power supply for the EUT was fed through a 50Ω /50mH EUT LISN, connected to filtered mains. 																

	<ol style="list-style-type: none"> 3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver. 7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	The EUT was powered by battery.
Result	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A

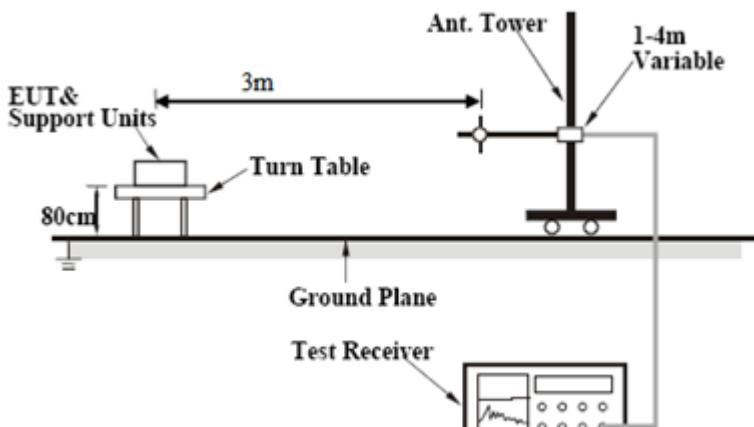
Test Data Yes N/A

Test Plot Yes (See below) N/A

6.2 Radiated Emissions

Temperature	24°C
Relative Humidity	55%
Atmospheric Pressure	1017mbar
Test date :	January 13, 2019
Tested By :	Evans He

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15. 109(d)	a)	<p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (μV/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 (μ V/m)	30 – 88	100	88 – 216	150	216 - 960	200	Above 960	500	<input checked="" type="checkbox"/>
Frequency range (MHz)	Field Strength (μ V/m)												
30 – 88	100												
88 – 216	150												
216 - 960	200												
Above 960	500												
Test Setup		 <p>The diagram illustrates the test setup. A 'Turn Table' is positioned on a 'Ground Plane'. An 'EUT & Support Units' is mounted on the turn table. A vertical 'Ant. Tower' is connected to the EUT. The distance between the EUT and the tower is 3m. The height of the EUT is 80cm. The height of the tower is adjustable, indicated as '1-4m Variable'. A 'Test Receiver' is connected to the tower to measure the emissions.</p>											
Procedure		<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarization (whichever gave the higher emission level) 											

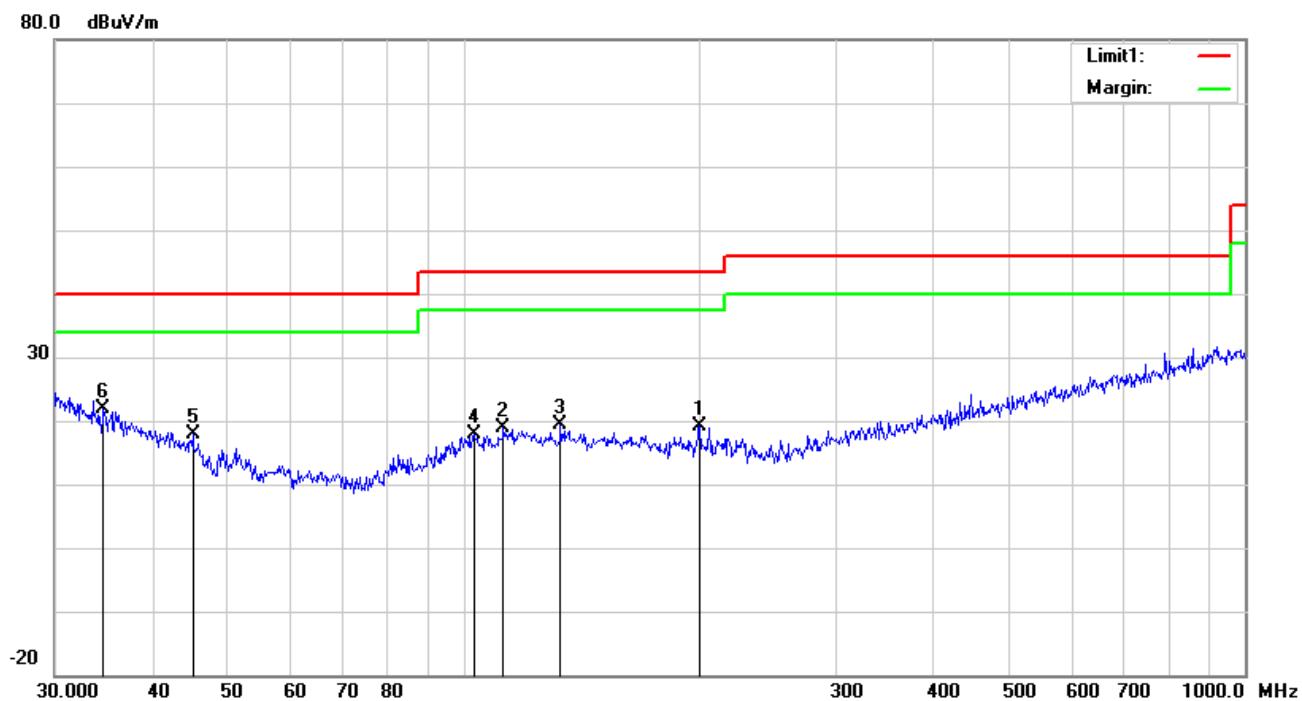
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.</p> <p>4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.</p> <p>The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz.</p> <ul style="list-style-type: none"> ■ 1 kHz (Duty cycle < 98%) <input type="checkbox"/> 10 Hz (Duty cycle > 98%) <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	We tested the infrared function with a frequency less than 108MHz
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test Mode : Normal Working Mode

Below 1GHz

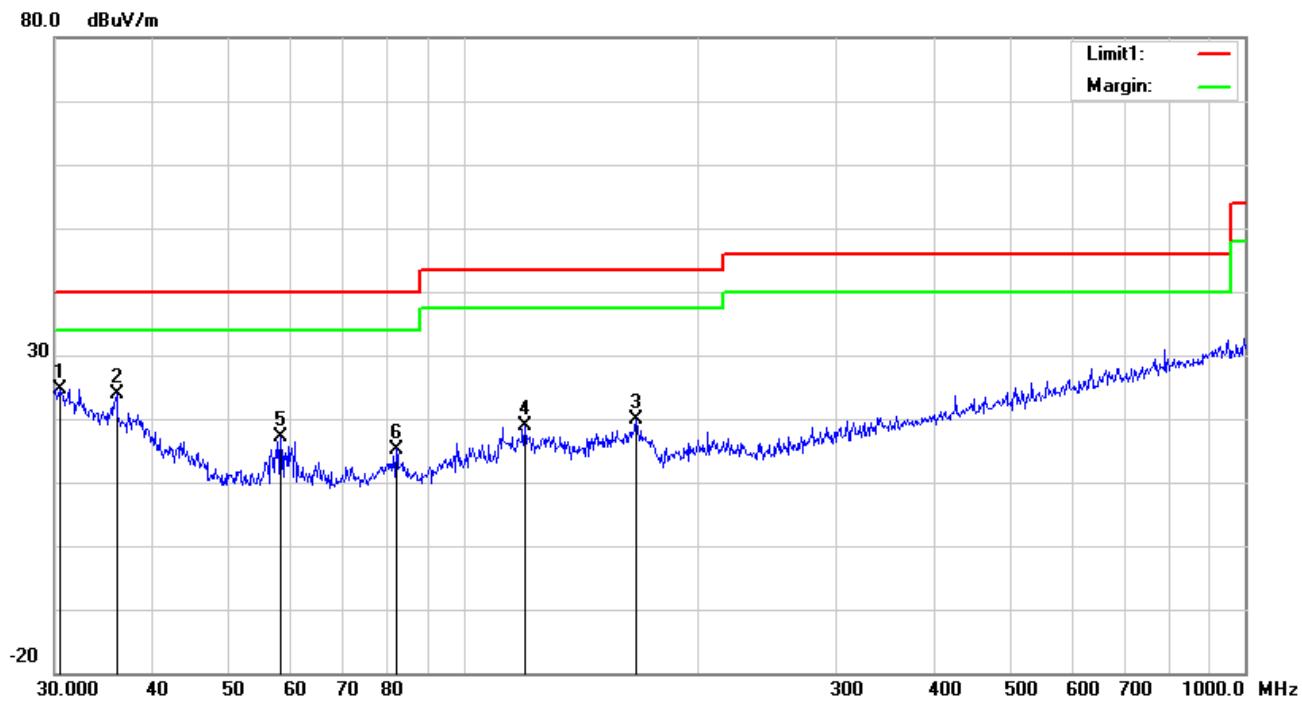


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	200.6881	27.83	12.09	22.38	1.54	19.08	43.50	-24.42	100	73
2	H	112.5244	27.43	12.59	22.35	1.17	18.84	43.50	-24.66	100	37
3	H	133.1511	27.60	13.05	22.39	1.22	19.48	43.50	-24.02	100	321
4	H	103.0800	28.10	10.94	22.33	1.14	17.85	43.50	-25.65	100	302
5	H	45.0583	28.80	10.57	22.29	0.75	17.83	40.00	-22.17	100	238
6	H	34.6385	25.54	17.83	22.25	0.75	21.87	40.00	-18.13	100	215

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	30.4238	25.29	21.07	22.28	0.63	24.71	40.00	-15.29	100	6
2	V	36.0007	28.66	16.82	22.26	0.77	23.99	40.00	-16.01	200	175
3	V	166.0680	28.67	12.11	22.26	1.37	19.89	43.50	-23.61	100	92
4	V	119.8556	26.24	13.87	22.36	1.16	18.91	43.50	-24.59	100	43
5	V	58.4074	31.26	7.48	22.41	0.76	17.09	40.00	-22.91	100	69
6	V	82.0706	28.91	7.68	22.40	1.06	15.25	40.00	-24.75	100	103

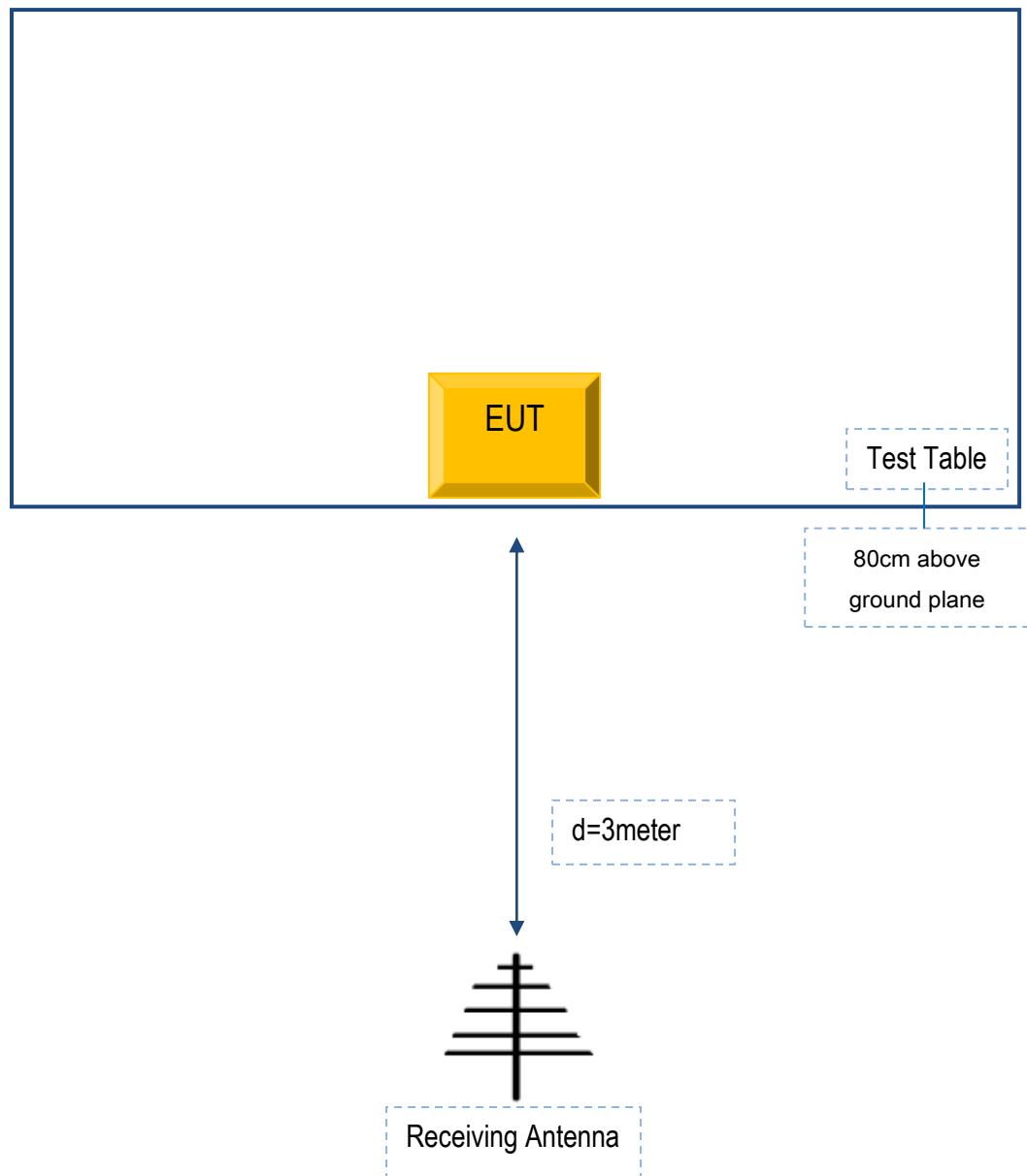
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due
AC Line Conducted Emissions				
EMI test receiver	ESCS30	8471241027	01/04/2019	01/03/2020
Artificial Mains Network	8127	8127713	01/04/2019	01/03/2020
ISN	ISN T800	34373	01/04/2019	01/03/2020
Radiated Emissions				
EMI test receiver	ESL6	1300.5001K06-100262-eQ	01/04/2019	01/03/2020
Active Antenna	AL-130	121031	02/08/2018	02/07/2019
3m Semi-anechoic Chamber	9m*6m*6m	N/A	10/18/2018	10/17/2019
Signal Amplifier	8447E	443008	01/25/2018	01/24/2019
MXA signal analyzer	N9020A	MY49100060	01/04/2019	01/03/2020
Horn Antenna	HAH-118	71259	01/26/2018	01/25/2019
Horn Antenna	HAH-118	71283	02/02/2018	02/01/2019
AMPLIFIER	EM01G26G	60613	01/25/2018	01/24/2019
AMPLIFIER	Emc012645	980077	01/04/2019	01/03/2020
Bilog Antenna (30MHz~6GHz)	JB6	A110712	02/08/2018	02/07/2019

Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

Annex B.i. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
-	-	-	-

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
-	-	-	-	-

Annex C. User Manual / Block Diagram / Schematics / Partlist

Please see the attachment

Annex D. DECLARATION OF SIMILARITY

REMOTE SOLUTION.CO.,LTD

To: 775 Montague Expressway Milpitas, CA 95035, USA

Declaration Letter

Dear Sir,

For our business issue and marketing requirement,

We declare that the model: RC96A, RC96XBB (X stands for A~Z, BB stands for 00~99) all models the same PCB and Appearance shape, accessories ,the Simple case, printing color difference is.

Thank you!

Sincerely,

Client's signature : BC, Kim



Client's name / title : Byung chul, Kim / Manager

Telephone: +82-10-5533-8113

Address : 92, Chogok-ri, Nammyun, Gimchun city, Kyungsangbukdo, Korea