



FCC Part 15.209

TEST REPORT

For

iKeyless, LLC dba Car Keys Express

12101 Sycamore Station Place Suite 140 Louisville, KY 40299

Report Type	Original Report
FCC Identity:	FCC ID: X32-ROKSBX1XX
Brand Name	ROKS Box
Product Name	ROKS Box v3
Model Name	ROKSBX-1XX
Report Number	RLK210305003-FRN
Report Date	2021/06/22
Reviewed By	Zeus Chen <i>Zeus Chen</i>
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Linkou Laboratory)

Revision History

Revision	Report Number	Issue Date	Description
1.0	RLK210305003-FRN	2021/06/22	Original Report

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Application	iKeyless, LLC dba Car Keys Express 12101 Sycamore Station Place Suite 140 Louisville, KY 40299
Manufacturer	AAEON TECHNOLOGY INC. 5F, No.135, Lane 235, Pao Chiao Rd Hsin-Tien Dist, New Taipei City, 231 Taiwan
Brand Name	ROKS Box
Product (Equipment)	ROKS Box v3
Model Name	ROKSBX-1XX
Frequency Range	125 kHz and 134 KHz
Number of Channels	125 kHz: 1 Channel. 134.2 kHz: 1 Channel.
Field strength (dBuV/m)	125 kHz: 46.20 dBuV/m 134.2 kHz: 46.11 dBuV/m
Modulation Type	FSK
Related Submittal(s)/Grant(s)	FCC Part 15.407 NII with FCC ID: X32-ROKSBX1XX FCC Part 15.247 DTS with FCC ID: X32-ROKSBX1XX
Received Date	Mar. 18, 2021
Date of Test	Apr. 09, 2021 - Apr. 22, 2021

Note: All measurement and test data in this report was gathered from production sample serial number: 210305003. Assigned by Bay Area Compliance Laboratories Corp. (Linkou Laboratory)

1.2 Operation Condition of EUT

Power Operation (Voltage Range)	☒ AC 120V/60Hz ☒ Adapter Model: MSA-C1000IC12.0-12W-US I/P: 100-240Vac, 0.5A O/P: 12Vdc, 1A ☐ By Power Cord
	☐ DC Type ☐ DC Power Supply ☐ Battery ☐ External from USB Cable ☐ External DC Adapter (Not For Sale)
	☐ Host System

1.3 Objective and Test Methodology

The Objective of this Test Report was to document the compliance of the iKeyless, LLC dba Car Keys Express Appliance (Model(s): ROKSBX-1XX) to the requirements of the following Standards:

- Part 2, Subpart J, Part 15 Subparts A and E of the Federal Communication Commission's rules.
- ANSI C63.10-2013 of the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

1.4 Measurement Uncertainty

Parameter	Expanded Measurement uncertainty
Occupied Channel Bandwidth	± 453.927 Hz
RF Conducted test with Spectrum	± 2.77 dB
AC Power Line Conducted Emission	± 2.66 dB
Radiated Below 1G	± 3.57 dB

The test results with statement of conformity, the decision rules are based on the specifications and standards. The test results will not take the measurement uncertainty into account.

1.5 Environmental Conditions and Test Date

Test Site	Test Date	Temperature (°C)	Relative Humidity (%)	Test Engineer
Conduction (Con-01)	Apr. 09, 2021	22.6	59	Brian Chang
Radiated (966A)	Apr. 19, 2021 – Apr. 22, 2021	17.5-18.7	60-62	Leo Cheng
Conducted (TH-02)	Apr. 15, 2021	22.8	55	Rui Jhan

1.6 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Linkou Laboratory) to collect test data is located on

☒ No.6, Wende 2Rd., Guishan Dist., Taoyuan City 33382, Taiwan (R.O.C.).

Bay Area Compliance Laboratories Corp. (Linkou Laboratory) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3546) by Mutual Recognition Agreement (MRA). The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database. The FCC Registration No.: 0027578244. Designation No.: TW3546. The Test Firm Registration No.: 181430.

2 System Test Configuration

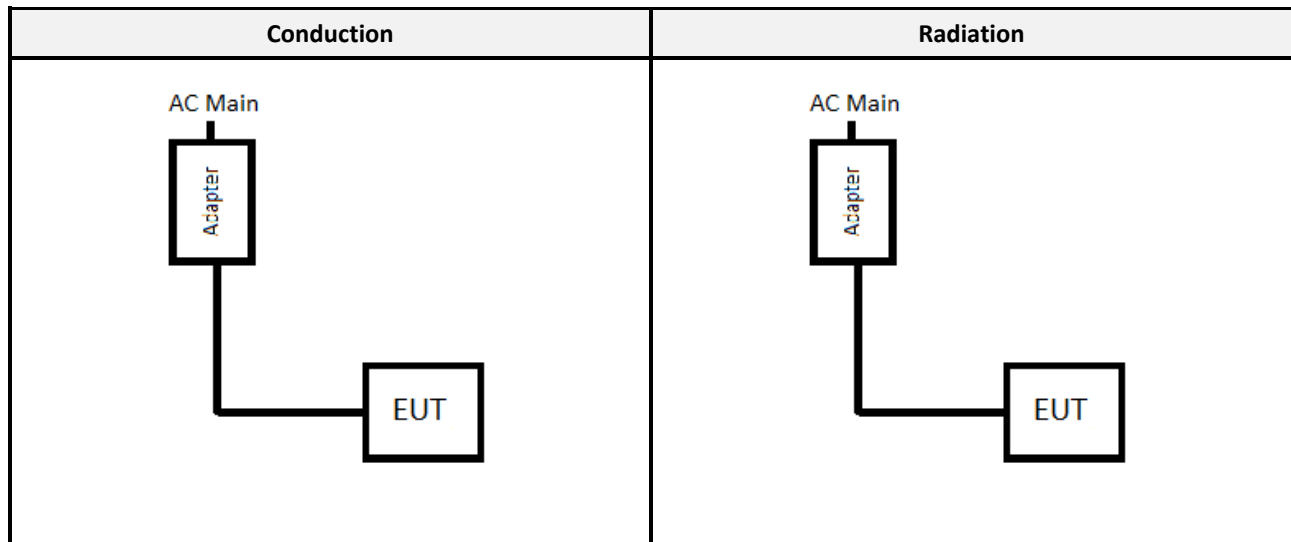
2.1 Test Channels and Description of Worst Test Configuration

The system was configured for testing in testing mode which was provided by manufacturer. No special accessory, No modification was made to the EUT and No special equipment used during test. And this device is the AP/STA and working in non-DFS Band.

2.2 Support Equipment List and External Cable List

No.	Description	Manufacturer	Model Number	Serial Number
A	Notebook	DELL	Latitude E6410	PP27LA001

2.3 Block Diagram of Test Setup



3 Summary of Test Results

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207	AC Line Conducted Emissions	Compliance
§15.205, §15.209	Spurious Emissions	Compliance

4 FCC §15.203 - Antenna Requirements

4.1 Applicable Standard

According to § 15.203, 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. 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 manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.

4.2 Antenna List and Details

Brand	Model	Antenna Type	Antenna Gain	Result
SINBON	A9706671	Coil	N/A	Compliance

The EUT have internal antennas arrangement and fulfill the requirement of this section.

5 FCC §15.207 - AC Line Conducted Emissions

5.1 Applicable Standard

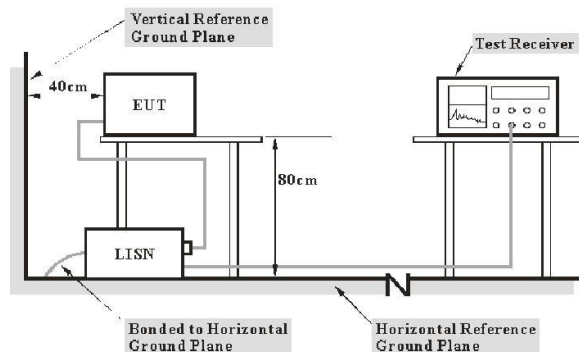
According to FCC §15.207,

For an intentional radiator 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). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 ^{Note 1}	56 to 46 ^{Note 2}
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency. Note 2: A linear average detector is required

5.2 EUT Setup and Test Procedure



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits. The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	Receiver RBW
150 kHz - 30 MHz	9 kHz

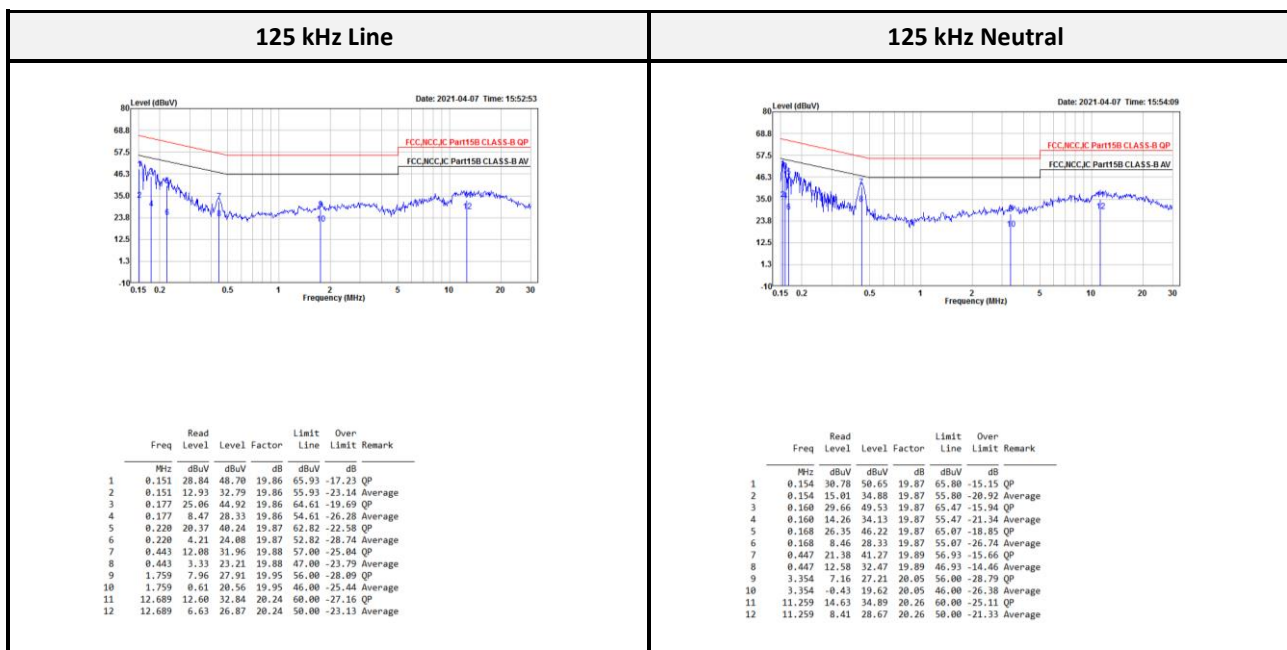
During the conducted emission test, the adapter was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

5.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
AC Line Conduction Room (Con-01)					
Two-Line V-Network	Rohde & Schwarz	ENV216	100010	2020/09/14	2021/09/13
Pulse Limiter	SCHWARZBECK	VSTD 9561-F	00432	2020/09/11	2021/09/10
ESR EMI Test Receiver	Rohde & Schwarz	ESR3	102430	2021/05/05	2022/05/04
RF Cable	EMCI	EMCCFD300-BM-BM-8000	180526	2020/08/18	2021/08/17
Software	Audix	e3 v9	E3LK-03	N.C.R	N.C.R

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

5.4 Test Result



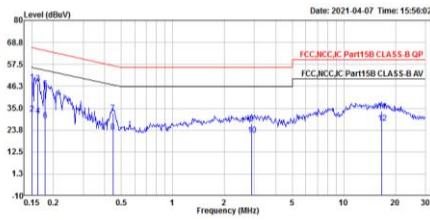
Note:

Level = Read Level + Factor.

Over Limit (Margin) = Level – Limit Line.

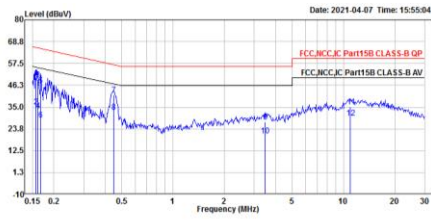
Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

134.2 kHz Line



	Freq	Read Level	Level Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB
1	0.150	28.48	48.34	19.86	66.00	-17.66 QP
2	0.150	12.40	32.26	19.86	56.00	-23.74 Average
3	0.162	27.75	47.61	19.86	65.34	-17.73 QP
4	0.162	11.13	30.99	19.86	55.34	-24.35 Average
5	0.179	25.28	45.14	19.86	64.54	-19.40 QP
6	0.179	8.95	28.81	19.86	54.54	-25.73 Average
7	0.447	12.44	32.32	19.88	56.93	-24.61 QP
8	0.447	3.05	22.93	19.88	46.93	-24.00 Average
9	2.883	7.00	27.01	20.01	56.00	-28.99 QP
10	2.883	1.07	21.08	20.01	46.00	-24.92 Average
11	16.637	13.14	33.44	20.30	60.00	-26.56 QP
12	16.637	7.13	27.43	20.30	50.00	-22.57 Average

134.2 kHz Neutral



	Freq	Read Level	Level Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB
1	0.157	30.35	50.22	19.87	65.60	-15.38 QP
2	0.157	15.25	35.12	19.87	55.60	-20.48 Average
3	0.161	29.31	49.18	19.87	65.40	-16.22 QP
4	0.161	13.13	33.00	19.87	55.40	-22.40 Average
5	0.168	26.28	46.15	19.87	65.07	-18.92 QP
6	0.168	8.38	28.25	19.87	55.07	-26.82 Average
7	0.450	21.44	41.33	19.89	56.87	-15.54 QP
8	0.450	12.53	32.42	19.89	46.87	-14.45 Average
9	3.463	7.31	27.37	20.06	56.00	-28.63 QP
10	3.463	0.11	20.17	20.06	46.00	-25.83 Average
11	10.994	15.07	35.33	20.26	60.00	-24.67 QP
12	10.994	9.26	29.52	20.26	50.00	-20.48 Average

Note:

Level = Read Level + Factor.

Over Limit (Margin) = Level – Limit Line.

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

6 FCC §15.209 and §15.205– Spurious Emissions

6.1 Applicable Standard

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	13.36-13.41	399.9-410	4.5-5.15
0.495-0.505	16.42-16.423	608-614	5.35-5.46
2.1735-2.1905	16.69475-16.69525	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

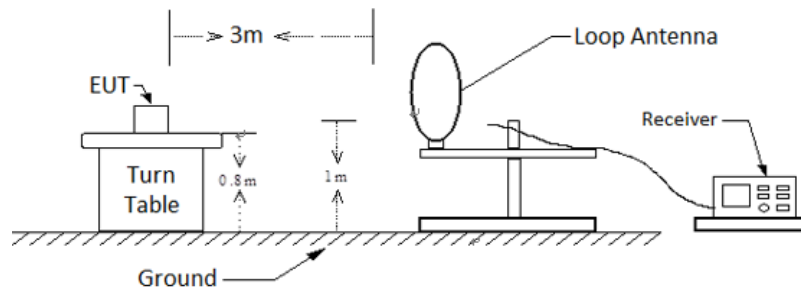
Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

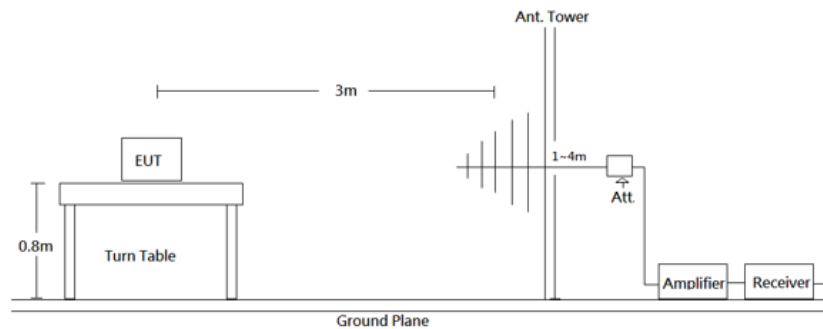
As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1MHz.

6.2 EUT Setup and Test Procedure

9 kHz to 30 MHz:



30 MHz to 1GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 Limits. The system was investigated from 30 MHz to 1 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	VBW	Duty cycle	Measurement Detector method
Below 150 kHz	200 Hz	1 kHz	-	QP
150 kHz-30 MHz	9 kHz	30 kHz	-	QP
30-1000 MHz	120 kHz	/	-	QP

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations. All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

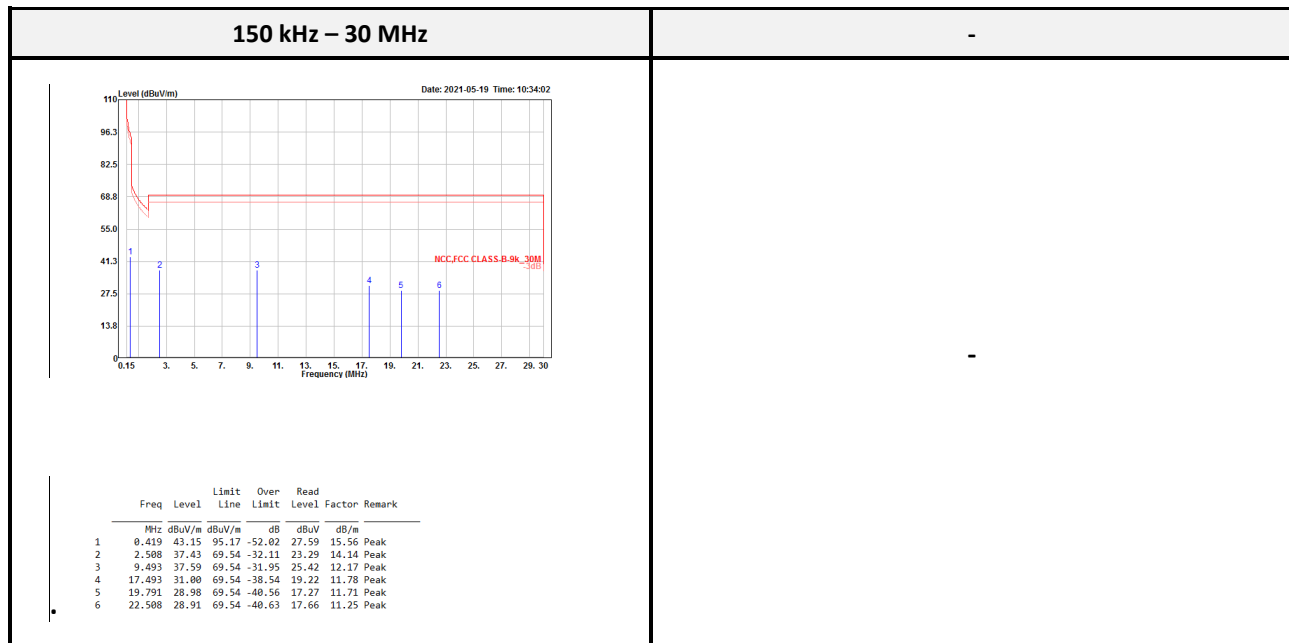
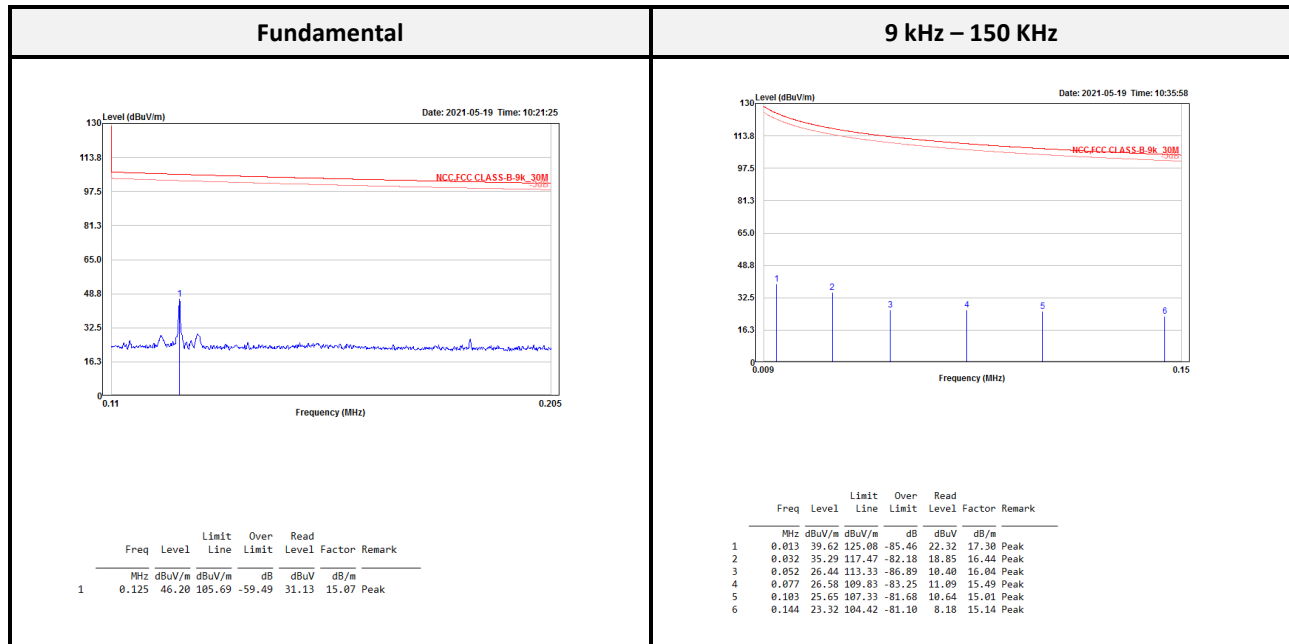
6.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Radiation 3M Room (966A)					
Active Loop	EMCO	6502	0001-3322	2021/03/16	2022/03/15
Bilog Antenna & 6 dB Attenuator	SUNOL SCIENCES & EMCI	JB3 & N-6-06	A111513 & AT-N0668	2021/03/30	2022/03/29
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101434	2021/05/12	2022/05/11
Preamplifier	A.H. Systems	PAM-0118P	478	2021/05/12	2022/05/11
Microflex Cable (1m)	EMCI	EMC102-KM-KM-1000	180524	2020/08/06	2021/08/05
Microflex Cable (2m)	EMCI	EMC106-SM-SM-2000	180516	2020/08/06	2021/08/05
Microflex Cable (8m)	UTIFLEX	UFA210A-1-3149-300300	MFR 64639 232490-002	2020/08/06	2021/08/05
Turn Table	Chaintek	T-200-S-1	003501	N.C.R	N.C.R
Antenna Tower	Chaintek	MBD-400-1	003504	N.C.R	N.C.R
Controller	Chaintek	3000-1	003507	N.C.R	N.C.R
Software	Audix	e3 v9	E3LK-01	N.C.R	N.C.R

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

6.4 Test Result

● 125 kHz (Pre-scan with three orthogonal axis, and worse case as Z axis)



Note:

Result = Reading + Correct Factor.

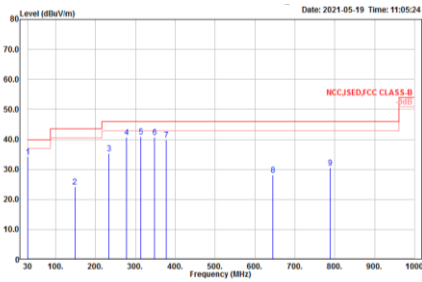
Margin = Result – Limit.

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

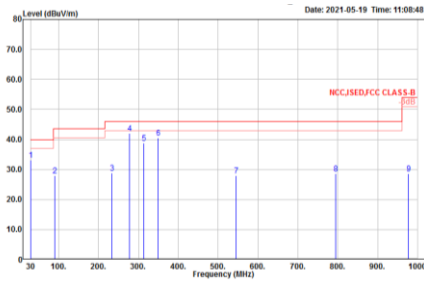
Non-Restricted bands signal was less than fundamental 20 dB or more, that don't need get average result.

30 MHz – 1GHz Horizontal



	Freq	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	30.000	34.29	40.00	-5.71	42.64	-8.35	Peak
2	148.340	24.24	43.50	-19.26	44.18	-19.94	Peak
3	234.670	35.35	46.00	-10.65	56.95	-21.60	Peak
4	278.360	40.67	46.00	-5.33	60.66	-19.99	QP
5	314.210	40.90	46.00	-5.10	60.40	-19.50	QP
6	348.160	40.75	46.00	-5.25	59.40	-18.65	QP
7	377.200	39.86	46.00	-6.14	57.88	-18.02	Peak
8	644.010	28.21	46.00	-17.79	41.01	-12.82	Peak
9	788.540	30.49	46.00	-15.51	41.35	-10.86	Peak

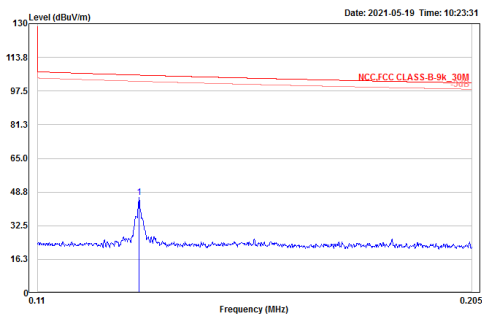
30 MHz – 1GHz Vertical



	Freq	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	30.000	33.11	40.00	-6.89	41.46	-8.35	Peak
2	91.110	27.96	43.50	-15.54	52.29	-24.33	Peak
3	234.670	28.78	46.00	-17.22	50.38	-21.60	Peak
4	278.320	42.00	46.00	-3.91	62.00	-19.99	Peak
5	314.210	38.76	46.00	-7.24	58.26	-19.50	Peak
6	349.130	40.55	46.00	-5.45	59.17	-18.62	Peak
7	545.070	27.92	46.00	-18.08	42.54	-14.62	Peak
8	784.360	28.56	46.00	-17.44	39.35	-10.79	Peak
9	976.720	28.61	54.00	-25.39	37.18	-8.49	Peak

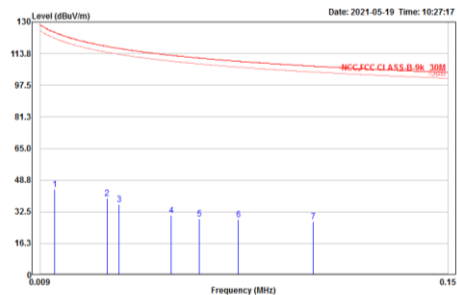
● 134.2 kHz (Pre-scan with three orthogonal axis, and worse case as Z axis)

Fundamental



	Freq	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	0.132	46.11	105.18	-59.07	31.01	15.10	Peak

9 kHz – 150 KHz



	Freq	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	0.014	44.21	124.72	-80.51	26.94	17.27	Peak
2	0.032	39.53	117.47	-77.94	23.09	16.44	Peak
3	0.036	36.17	116.39	-80.22	19.82	16.35	Peak
4	0.054	30.65	112.91	-82.26	14.66	15.99	Peak
5	0.064	28.93	111.40	-82.55	13.15	15.78	Peak
6	0.078	28.41	109.82	-81.41	12.93	15.48	Peak
7	0.103	27.55	107.32	-79.77	12.54	15.01	Peak

Note:

Result = Reading + Correct Factor.

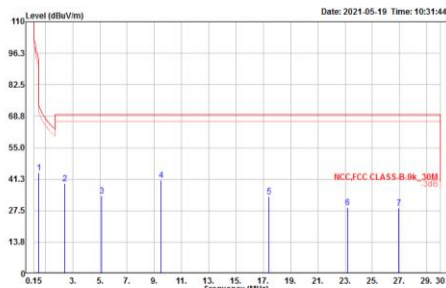
Margin = Result – Limit.

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

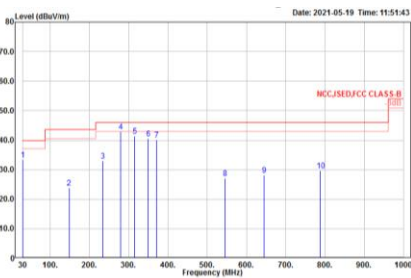
Non-Restricted bands signal was less than fundamental 20 dB or more, that don't need get average result.

150 kHz – 30 MHz



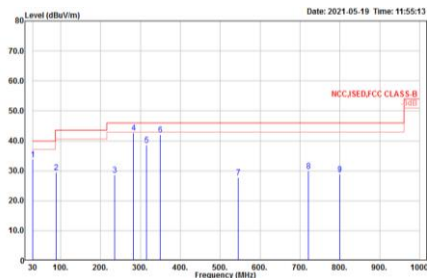
	Freq	Level	Limit	Over	Read	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m
1	0.588	44.18	73.48	-29.30	28.67	15.51 Peak
2	2.419	39.48	69.54	-30.06	25.34	14.14 Peak
3	5.185	34.12	69.54	-35.42	22.15	11.97 Peak
4	9.493	40.84	69.54	-28.70	28.67	12.17 Peak
5	17.483	33.77	69.54	-35.77	21.99	11.78 Peak
6	23.164	28.97	69.54	-40.57	17.86	11.11 Peak
7	26.925	28.52	69.54	-41.02	18.13	10.39 Peak

30 MHz – 1GHz Horizontal



	Freq	Level	Limit	Over	Read	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m
1	30.000	33.40	40.00	-6.60	41.75	-8.35 Peak
2	148.340	23.87	43.50	-19.63	43.81	-19.94 Peak
3	234.670	33.05	46.00	-12.95	54.05	-21.60 Peak
4	279.290	42.96	46.00	-3.04	62.95	-19.99 Peak
5	316.150	41.34	46.00	-4.66	60.80	-19.46 QP
6	349.130	40.49	46.00	-5.51	59.11	-18.62 QP
7	371.640	40.09	46.00	-5.91	58.25	-18.16 Peak
8	545.070	27.17	46.00	-18.83	41.79	-14.62 Peak
9	644.010	28.16	46.00	-17.84	40.98	-12.82 Peak
10	788.540	29.71	46.00	-16.29	40.57	-10.86 Peak

30 MHz – 1GHz Vertical



	Freq	Level	Limit	Over	Read	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m
1	30.000	33.84	40.00	-6.16	42.19	-8.35 Peak
2	89.170	29.47	43.50	-14.03	54.05	-24.58 Peak
3	235.640	28.67	46.00	-17.33	50.23	-21.56 Peak
4	282.200	42.69	46.00	-3.31	62.66	-19.97 Peak
5	315.180	38.50	46.00	-7.50	57.98	-19.48 Peak
6	349.130	42.13	46.00	-3.87	60.75	-18.62 Peak
7	545.070	27.74	46.00	-18.26	42.36	-14.62 Peak
8	721.610	29.84	46.00	-16.16	41.70	-11.86 Peak
9	800.180	28.88	46.00	-17.12	39.60	-10.72 Peak

Note:

Result = Reading + Correct Factor.

Margin = Result – Limit.

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Non-Restricted bands signal was less than fundamental 20 dB or more, that don't need get average result.

----- END OF REPORT -----