FCC Test Report

Report No.: AGC12134210302FE06

FCC ID	:	2AZA9-A201
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Bluetooth Receiver
BRAND NAME	:	esinkin
MODEL NAME	:	A201
APPLICANT	:	Shenzhen Yixunqi Technology Co., Ltd
DATE OF ISSUE	:	Apr. 07, 2021
STANDARD(S)	:	FCC Rules and Regulations Part 15 Subpart C Section 15.225
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 07, 2021	Valid	Initial Release

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1. VERIFICATION OF COMPLIANCE

Applicant	Shenzhen Yixunqi Technology Co., Ltd
Address	Room 416, Comprehensive Building No.4 beside Dengxinkeng Industrial Zone, Jihua Road, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China
Manufacturer	Shenzhen Yixunqi Technology Co., Ltd
Address	Room 416, Comprehensive Building No.4 beside Dengxinkeng Industrial Zone, Jihua Road, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China
Factory	Shenzhen Yixunqi Technology Co., Ltd
Address	Room 416, Comprehensive Building No.4 beside Dengxinkeng Industrial Zone, Jihua Road, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China
Product Designation	Bluetooth Receiver
Brand Name	esinkin
Test Model	A201
Date of test	Mar. 15, 2021 to Apr. 07, 2021
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-SRD/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC part 15.225.

Prepared By	Eddy Liu (Project Engineer)	Apr. 07, 2021
Reviewed By	Max Zhang (Reviewer)	Apr. 07, 2021
Approved By	Forrest Lei (Authorized Officer)	Apr. 07, 2021

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as a “Bluetooth Receiver”. It is designed by way of utilizing the ASK technology to achieve the system operation.
A major technical description of EUT is described as following

Operation Frequency	13.56MHz
Max field strength	48.64dBuV/m (Peak)
Modulation	ASK
Number of channels	1 Channel
Antenna Designation	Integral Antenna(Comply with requirements of the FCC part 15.203)
Antenna Gain	0dBi
Hardware Version	V1.5
Software Version	V1.0
Power Supply	DC 5V by adapter

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
13.110~14.010 MHz	01	13.56 MHz

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2.3. RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for **FCC ID: 2AZA9-A201** filing to comply with the FCC Part 15.247 requirements.

2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

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3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.1 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted, Uc = ±0.8 dB
- Uncertainty of RF power density, conducted, Uc = ±2.6 dB
- Uncertainty of spurious emissions, conducted, Uc = ±2.7 dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting(13.56MHz)

Note:
1. Only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.
4. For battery operated equipment, the equipment tests are performed using a new battery.
5. The test software is not applicable which can set the EUT into the individual test modes.

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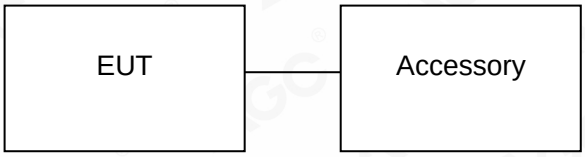
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF TESTED SYSTEM

Radiated Emission Configure:



5.2. EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Smart phone	Mate 40	1.65m unshielded	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.215(c)	20dB Spectrum Bandwidth	Compliant
15.225(e)	Frequency Stability	Compliant
15.225(a)(b)(c)	Field Strength of Fundamental Emissions	Compliant
15.225(d)&15.209	Radiated Emission	Compliant
15.207	AC Power Line Conducted Emissions	Compliant

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance (Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2021
LISN	R&S	ESH2-Z5	100086	Jul. 03, 2020	Jul. 02, 2021
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
2.4GHz Filter	EM Electronics	2400-2500MHz	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 09, 2019	Sep. 08, 2021
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 09, 2019	Sep. 08, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2020	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

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7.RADIATED EMISSION

3.1. TEST LIMIT

Rules and specifications	FCC CFR 47 Part 15 section 15.225			
Description	Compliance with the spectrum mask is tested with RBW set to 9kHz.			
Freq. of Emission (MHz)	Field Strength (μV/m) at 30m	Field Strength (dBμV/m) at 30m	Field Strength (dBμV/m) at 10m	Field Strength (dBμV/m) at 3m
1.705~13.110	30	29.5	48.58	69.5
13.110~13.410	106	40.5	59.58	80.5
13.410~13.553	334	50.5	69.58	90.5
13.553~13.567	15848	84.0	103.08	124.0
13.567~13.710	334	50.5	69.58	90.5
13.710~14.010	106	40.5	59.58	80.5
14.010~30.000	30	29.5	48.58	69.5

According to 15.35, on any frequency or frequencies below or equal to 1000 MHz, the limits Shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test.

The field strength of any emissions which appear outside of 13.110 ~14.010MHz band shall not exceed the general radiated emissions limits.

Frequencies (MHz)	Field Strength (μV/m)	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

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7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/1MHz for Peak, 1MHz/10Hz for Average

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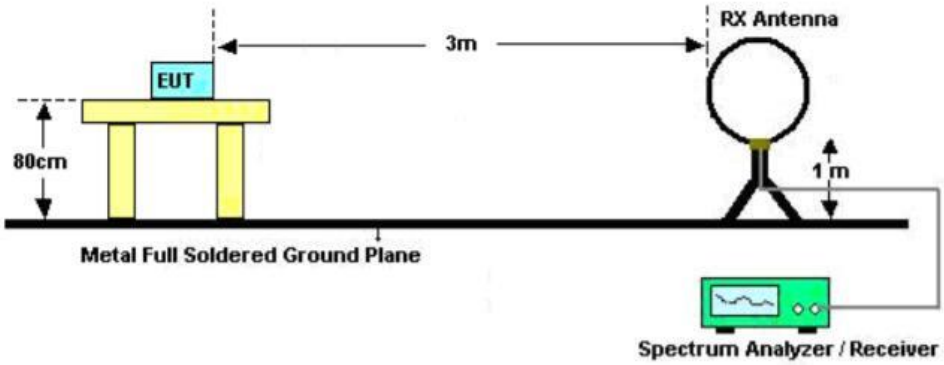
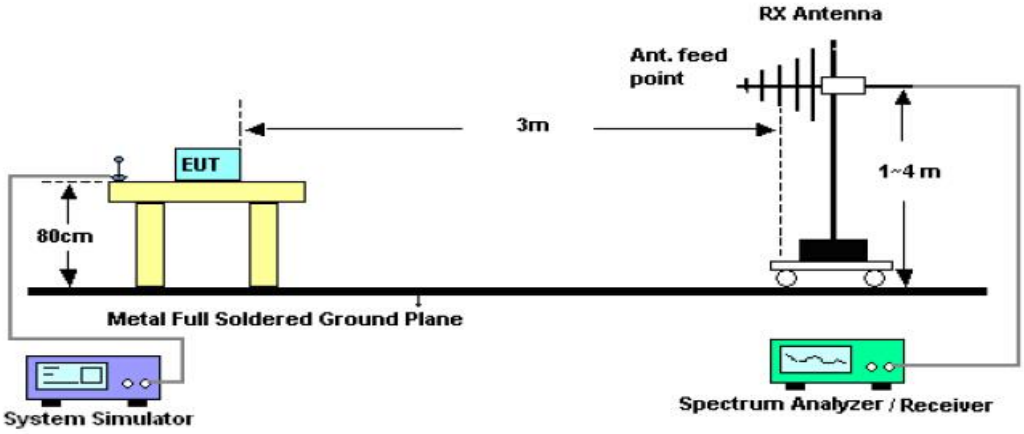
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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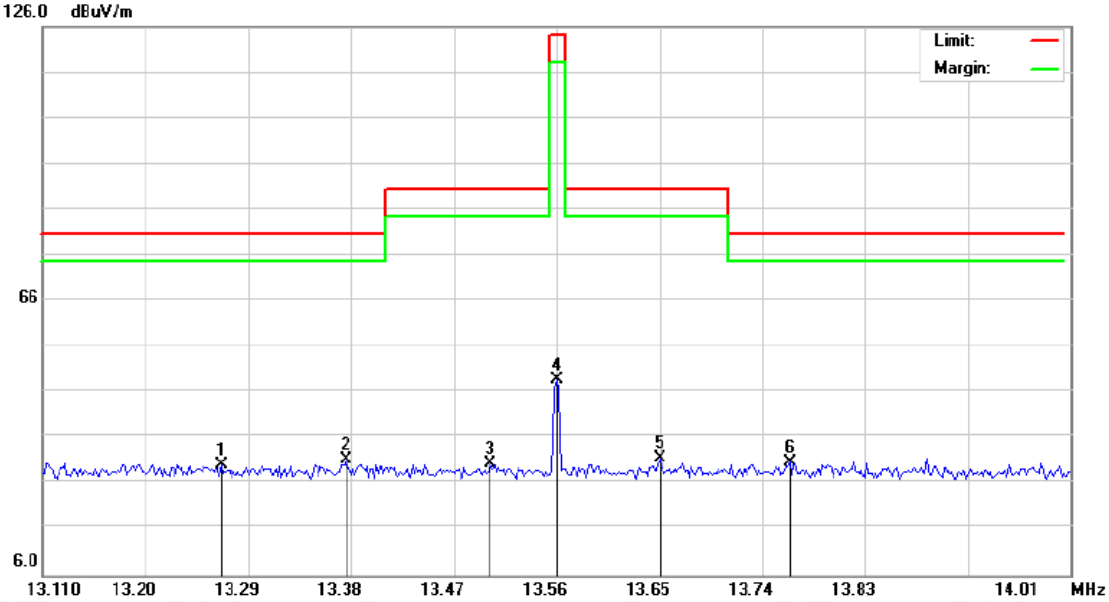
7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

EUT:	Bluetooth Receiver	Model Name	A201
Temperature:	21.8℃	Relative Humidtity:	58%
Pressure:	1010hPa	Test Voltage :	Normal Voltage
Test Mode :	Mode 1	Polarization :	Face



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		13.2660	5.42	24.62	30.04	80.50	-50.46	peak
2	*	13.3755	6.67	24.63	31.30	80.50	-49.20	peak
3		13.5015	5.73	24.64	30.37	90.50	-60.13	peak
4		13.5600	24.00	24.64	48.64	124.0	-75.36	peak
5		13.6500	6.90	24.65	31.55	90.50	-58.95	peak
6		13.7639	5.97	24.65	30.62	80.50	-49.88	peak

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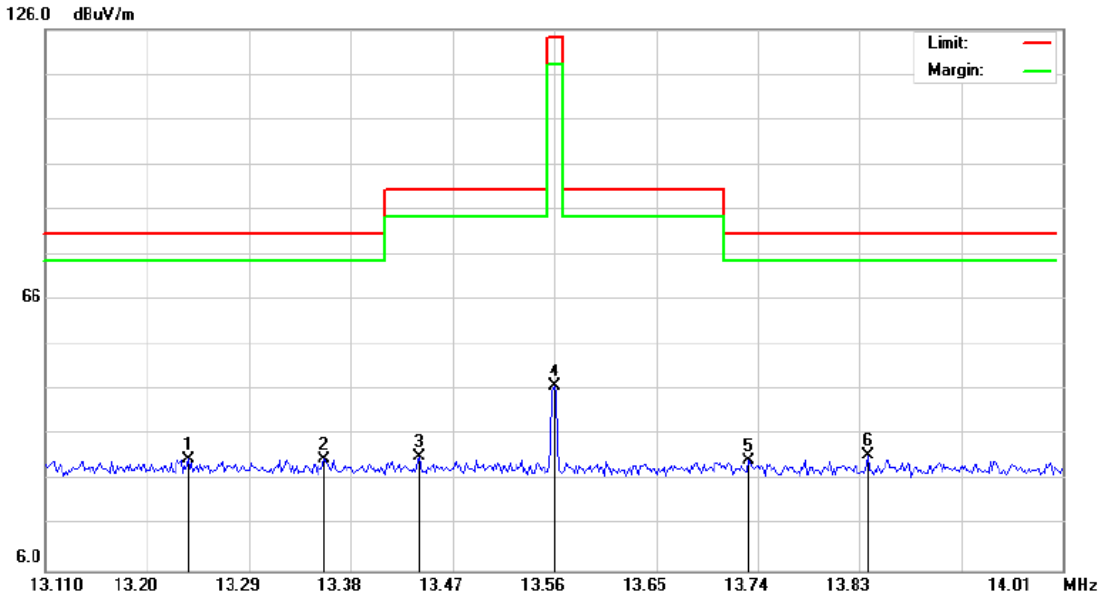
EUT：	Bluetooth Receiver	Model Name	A201
Temperature：	21.8℃	Relative Humidtity：	58%
Pressure：	1010 hPa	Test Voltage ：	Normal Voltage
Test Mode ：	Mode 1	Polarization :	Side



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		13.2360	6.23	24.62	30.85	80.50	-49.65	peak
2		13.3559	6.19	24.62	30.81	80.50	-49.69	peak
3		13.4399	6.87	24.63	31.50	90.50	-59.00	peak
4		13.5600	22.36	24.64	47.00	124.0	-77.00	peak
5		13.7324	5.86	24.65	30.51	80.50	-49.99	peak
6	*	13.8375	6.88	24.66	31.54	80.50	-48.96	peak

Note: Other emissions from 9kHz to 30MHz are attenuated 20dB below the limits, so it does not recorded in the report.

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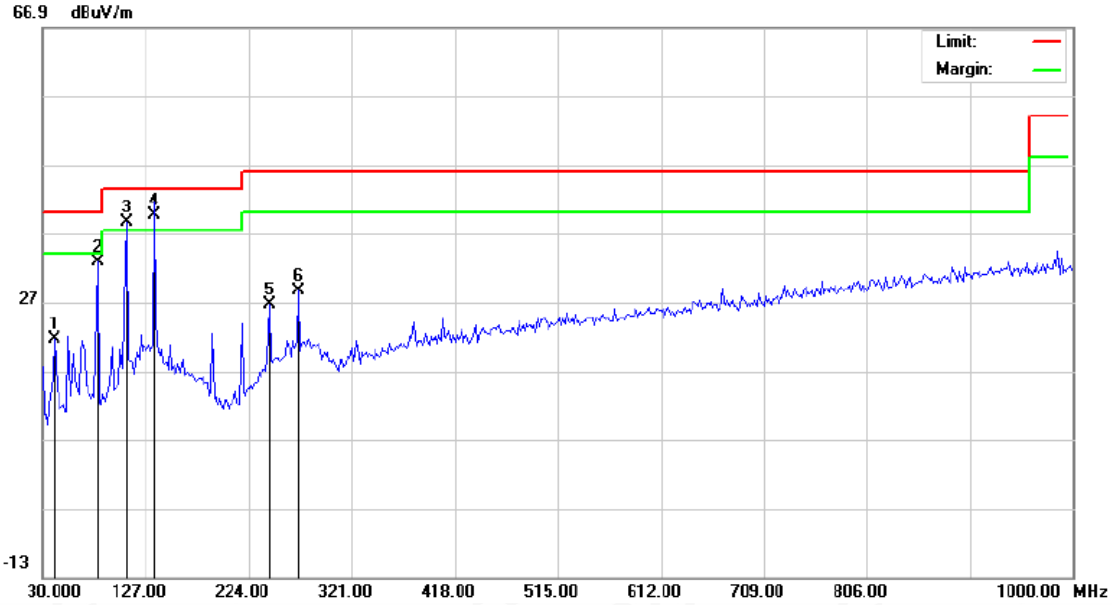
RADIATED EMISSION 30MHz- 1GHZ

EUT:	Bluetooth Receiver	Model Name	A201
Temperature:	21.8℃	Relative Humidtity:	58%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	Mode 1	Polarization :	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		41.3167	6.75	14.91	21.66	40.00	-18.34	peak
2		81.7333	17.83	14.95	32.78	40.00	-7.22	peak
3	!	109.2167	21.71	16.91	38.62	43.50	-4.88	peak
4	*	135.0833	20.64	18.92	39.56	43.50	-3.94	QP
5		243.4000	8.02	18.60	26.62	46.00	-19.38	peak
6		270.8833	9.37	19.20	28.57	46.00	-17.43	peak

RESULT: PASS

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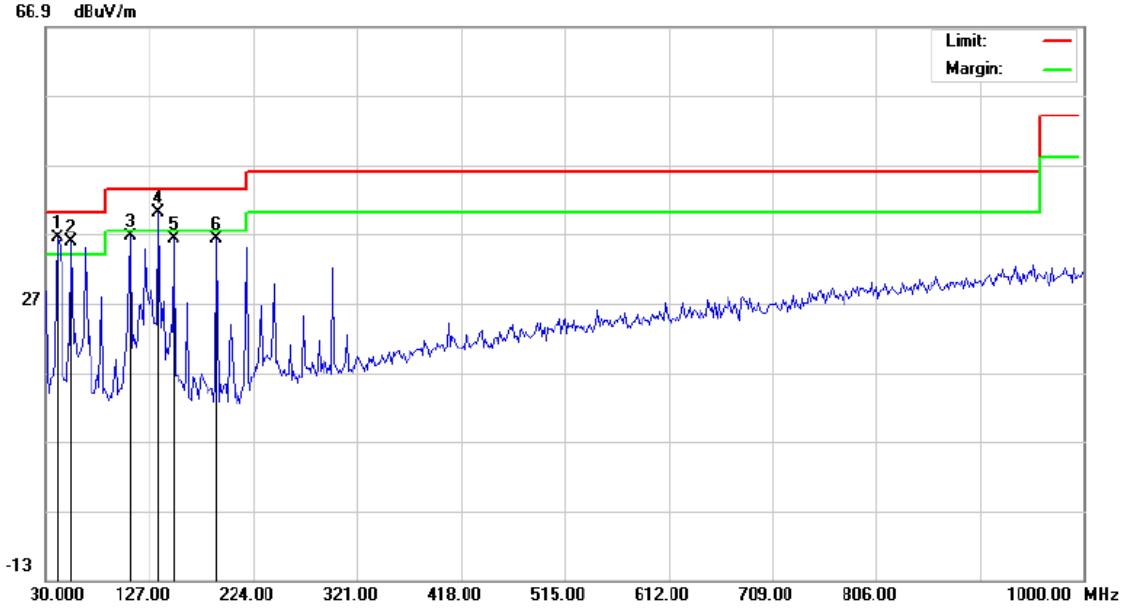
EUT：	Bluetooth Receiver	Model Name	A201
Temperature：	21.8℃	Relative Humidtity：	58%
Pressure：	1010 hPa	Test Voltage ：	Normal Voltage
Test Mode ：	Mode 1	Polarization :	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	!	41.3166	21.40	14.91	36.31	40.00	-3.69	peak
2	!	54.2500	21.15	14.64	35.79	40.00	-4.21	peak
3		109.2167	19.63	16.91	36.54	43.50	-6.96	peak
4	*	135.0833	20.99	18.92	39.91	43.50	-3.59	peak
5		149.6332	16.96	19.21	36.17	43.50	-7.33	peak
6		190.0500	21.08	15.08	36.16	43.50	-7.34	peak

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin= Measurement-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

The mode 1 is the worst case, and only the data of the worst case recorded in this test report.

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8. FREQUENCY STABILITY

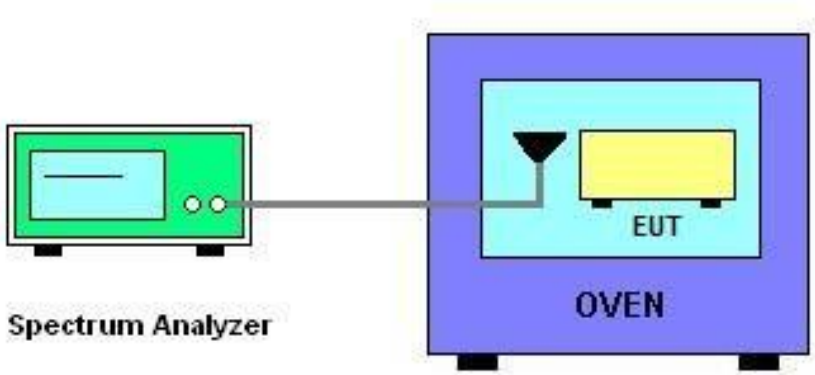
8.1. TEST LIMIT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) 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. For battery operated equipment, the equipment tests shall be performed using a new battery.

8.2. MEASUREMENT PROCEDURE

1.The spectrum analyzer connected via a receive antenna placed near the EUT.
2.EUT have transmitted signal and fixed channelize.
3.Set the spectrum analyzer span to view the entire emissions bandwidth.
4.Set RBW = 1 kHz, VBW = 3 kHz with peak detector and maxhold settings.
5.The fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±100ppm.
6.Extreme temperature rule is -20°C~50°C.

8.3. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)



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8.4. MEASUREMENT RESULTS

Operating frequency: 13.56MHz

Voltage vs. Frequency Stability (Test Temperature: 20℃)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
4.25	13.56077	+58	±100	PASS
5	13.56073			
5.75	13.56078			

Temperature vs. Frequency Stability (Test Voltage: 5.5V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
- 20℃	13.56073	+58	±100	PASS
-10℃	13.56077			
0℃	13.56075			
10℃	13.56072			
20℃	13.56079			
30℃	13.56075			
40℃	13.56073			
50℃	13.56075			

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9. 20 dB SPECTRUM BANDWIDTH

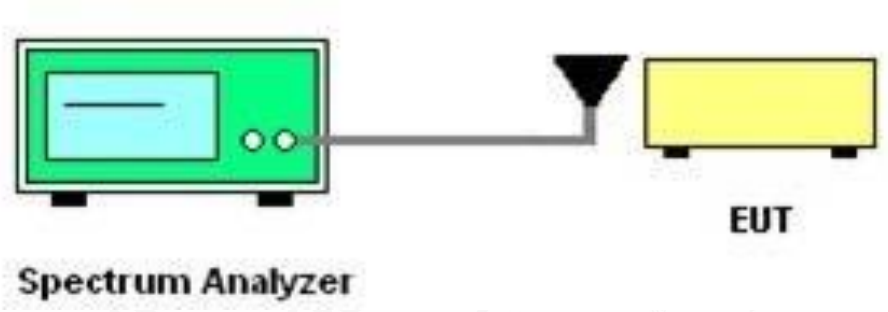
9.1. TEST LIMIT

Intentional radiators must be designed to ensure that the 20dB and 99% emission bandwidth in the specific band 13.553~13.567MHz

9.2. MEASUREMENT PROCEDURE

1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
2. The resolution bandwidth of 10 kHz and the video bandwidth of 30 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.
4. Measured the 99% OBW.

9.3. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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