
TEST REPORT

Report No.: SRTC2020-9003(F)-0040
Product Name: Fi Smart Collar 2
Model Name: FC2
Applicant: Barking Labs
Manufacturer: Barking Labs
Specification: FCC Part15B (Certification 2019 edition)
FCC ID: 2ARXN-FC2

The State Radio_monitoring_center Testing Center (SRTC)
15th Building, No.30 Shixing Street, Shijingshan District,
Beijing, China

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1. General information

1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: 15th Building, No.30 Shixing Street, Shijingshan District
Testing location: No.80, Zhaojiachang, BeizangCun, Daxing District, Beijing, China.
City: Beijing
Country or Region: China
Contacted person: Liu Jia
Tel: +86 10 57996183
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1.3 Applicant's details

Company: Barking Labs
Address: 215 Plymouth St., Fl. 1
City: Brooklyn, NY
Country or Region: USA
Contacted person: Bob Blake
Tel: +1-914-249-9347
Email: bob@tryfi.com

1.4 Manufacturer's details

Company: Barking Labs
Address: 215 Plymouth St., Fl. 1
City: Brooklyn, NY
Country or Region: USA
Contacted person: Bob Blake
Tel: +1-914-249-9347
Email: bob@tryfi.com

1.5 Application details

Date of reception of test sample: 28th Aug. 2020

Date of test: 30th Aug. 2020 to 12th Sept. 2020

1.6 Reference specification

FCC Part 15B, 2019 (Certification)

1.7 Information of EUT

1.7.1 General information

Name of EUT	Fi Smart Collar 2
Model Name	FC2
FCC ID	2ARXN-FC2
Frequency Range	LTE cat-M: FDD 2/ FDD 4/ FDD 12 Bluetooth: 2.4~2.4835GHz WiFi: 2.4~2.4835GHz
Equipment Class	Class B
Power Supply	Charger/Battery
Rated Power Supply Voltage	3.85V
Extreme Temperature	Lowest:-20°C Highest: 60°C
Extreme Voltage	Minimum: 3.0V Maximum: 4.35V
HW Version	Rev.A
SW Version	1.0

1.7.2EUT details

Product Name	Model Name	IMEI
Fi Smart Collar 2	FC2	/

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Battery

Manufacturer	Jiade Energy Technology(Zhuhai)Co.,Ltd.
Model Number	JKIT

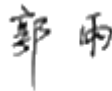
AE (Auxiliary Equipment) 2#: Charger

Manufacturer	JIANGSU CHENYANG ELECTRON CO., LTD.
Model Number	CA05-050100U

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Conducted emissions	15.107	Pass
2	Radiated emissions	15.109	Pass

Approved By: Liu Wei Director of the test department 	Checked By: Guo Yu Vice director of the test department 
Tested by: Mr. Lv Youyou Test engineer	Issued date: 2020.09.25

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
24.5°C	40.3%	100.8kPa

Test Setup with charger:

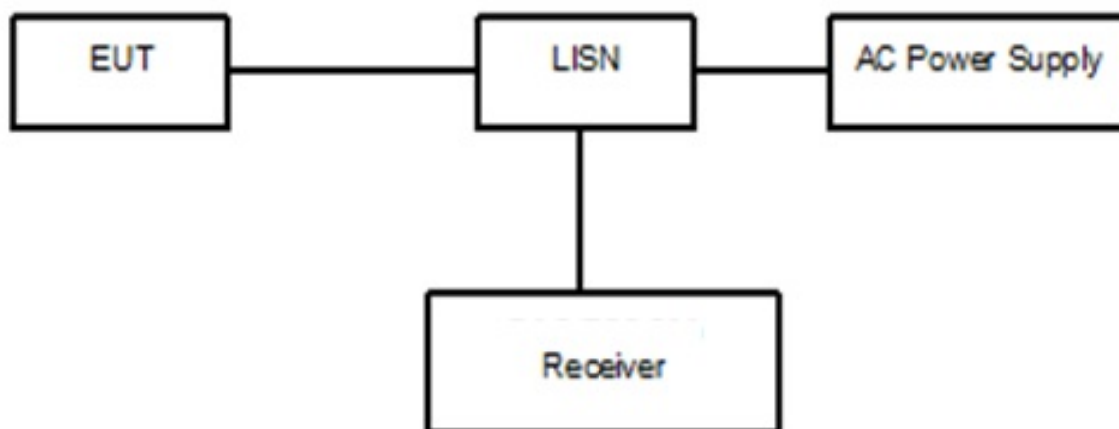


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The EUT is connected with LISN via the charger. The LISN is connected to the reference ground. The EUT was working at charging mode and Receiver mode.

The test set-up and the test methods are performed according to ANSI C63.4:2014. Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz. The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.

The data of cable loss has been calibrated in full testing frequency range before the testing.

A “reference path loss” Corr.(dB) is established and the $L_{\text{cable}} + \text{ATT} + \text{VDF}$ is the attenuation of “reference path loss”, and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{\text{result}} = P_{\text{mea}} + \text{Corr. (dB)}$$

Sample calculation: $(27.83 \text{ dB}\mu\text{V}) = (-1.77 \text{ dB}\mu\text{V}) + (29.6 \text{ dB})$, the corresponding frequency is 0.238617MHz.

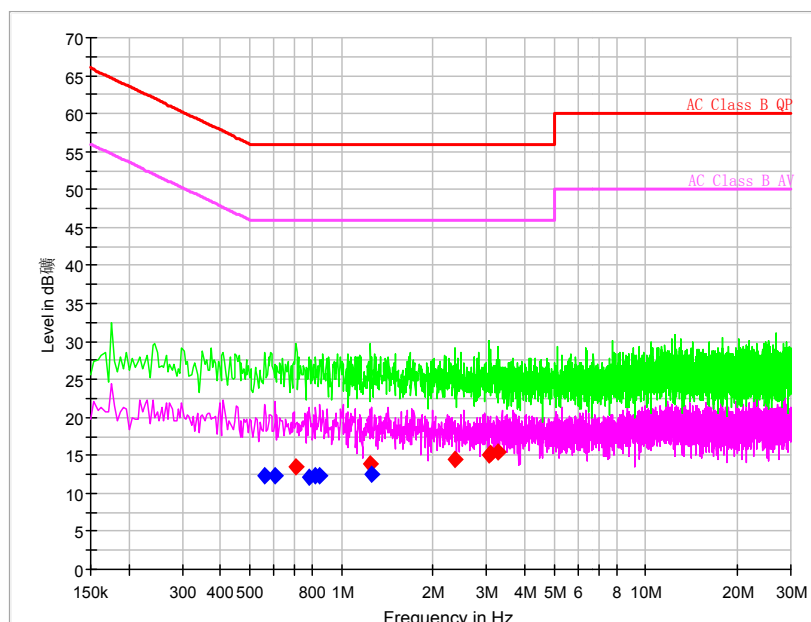
Limit:

Frequency of Emission(MHz)	Limits(dB μ V)	
	Quasi-peak	Average
0.15~0.5	66 to 56*	56 to 46*
0.5~5	56	46
5~30	60	50

Note: * Decreases with the logarithm of the frequency

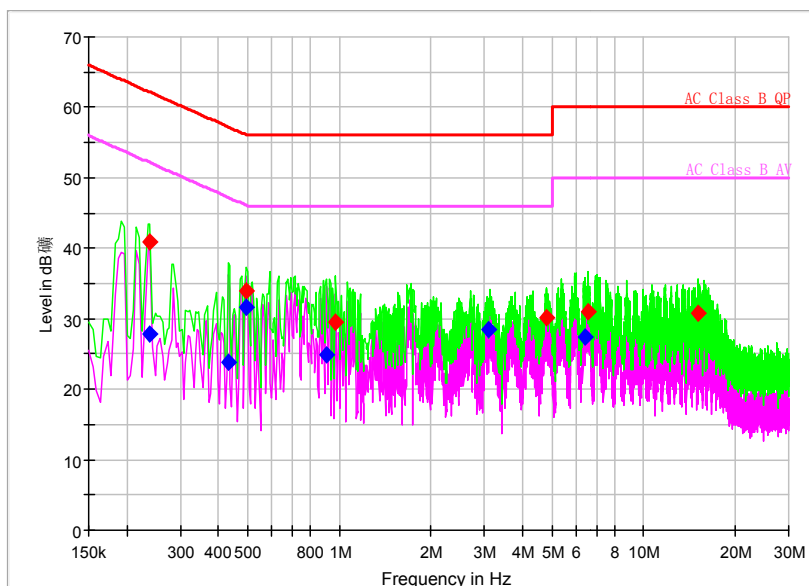
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

EUT+#Charger:

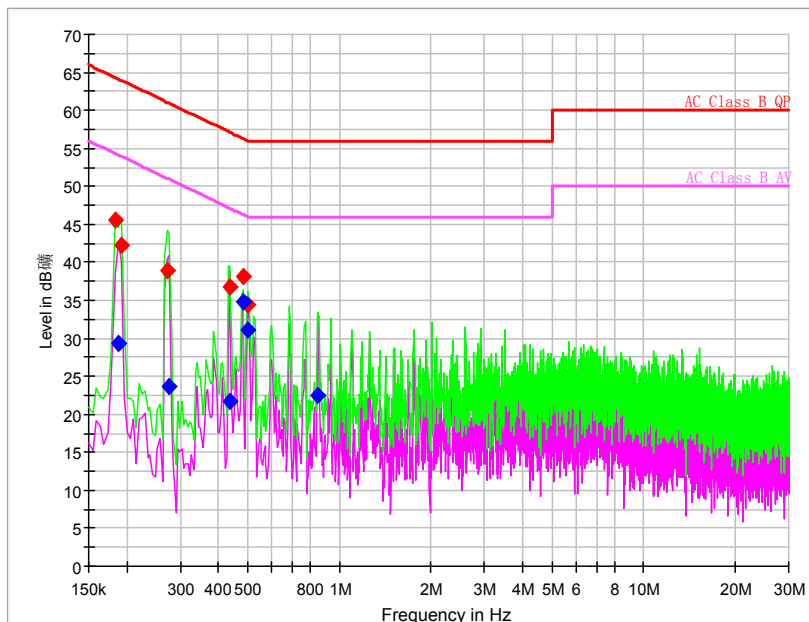


Comment

Pic2. Conducted emission L&N Line Voltage:120V

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.238617	---	27.83	52.14	24.32	L	29.6	---	-1.77
0.238617	40.82	---	62.14	21.32	L	29.6	11.22	---
0.429844	---	23.80	47.26	23.46	L	29.6	---	-5.8
0.495141	---	31.72	46.08	14.36	L	29.6	---	2.12
0.495141	33.93	---	56.08	22.15	L	29.6	4.33	---
0.905578	---	24.96	46.00	21.04	N	29.7	---	-4.74
0.970875	29.55	---	56.00	26.45	L	29.7	-0.15	---
3.102352	---	28.52	46.00	17.48	L	29.7	---	-1.18
4.786078	30.07	---	56.00	25.93	N	29.7	0.37	---
6.395180	---	27.51	50.00	22.49	L	29.7	---	-2.19
6.539766	30.98	---	60.00	29.02	L	29.7	1.28	---
15.140297	30.74	---	60.00	29.26	L	29.8	0.94	---

EUT+#Charger:



Pic3. Conducted emission L&N Line Voltage:220V

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBμV)	Pmea Average (dBμV)
0.182648	45.47	---	64.36	18.89	L	29.6	15.87	---
0.187312	---	29.41	54.16	24.75	L	29.6	---	-0.19
0.191977	42.30	---	63.95	21.65	L	29.6	12.7	---
0.271266	38.97	---	61.08	22.11	L	29.6	9.37	---
0.275930	---	23.62	50.94	27.32	L	29.6	---	-5.98
0.434508	---	21.71	47.17	25.46	N	29.6	---	-7.89
0.434508	36.73	---	57.17	20.44	L	29.6	7.13	---
0.481148	---	34.73	46.32	11.59	L	29.6	---	5.13
0.481148	38.12	---	56.32	18.20	N	29.6	8.52	---
0.499805	---	31.07	46.00	14.93	L	29.6	---	1.47
0.499805	34.42	---	56.00	21.58	L	29.6	4.82	---
0.849609	---	22.45	46.00	23.55	L	29.6	---	-7.15

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
24.3°C	40.8%	100.7kPa

Test Setup:

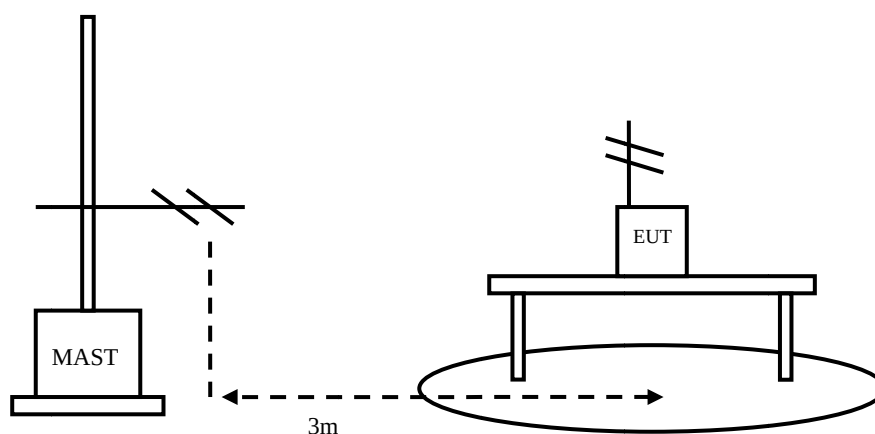


Figure 2

Test Procedure:

EUT+Charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters. When performing the test, open the GNSS function and working on LTE band 12 receiving mode of EUT, the mobile base station starts to work, EUT is in the receiving state.

The EUT should work in charging mode. The EUT is connected with the charger. The test set-up and the test methods are performed according to ANSI C63.4:2014. Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna VULB 9163.

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 spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow:
1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing

frequency range before the testing. All test results are performed with max hold at the horizontal and vertical polarity.

RBW=120kHz, VBW=300kHz, when the test frequency: 30MHz<f<1GHz

RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

Limit:

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dB μ V/m)
30~88	Quasi-peak	40
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46
960~1000	Quasi-peak	54
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average Peak	54 74

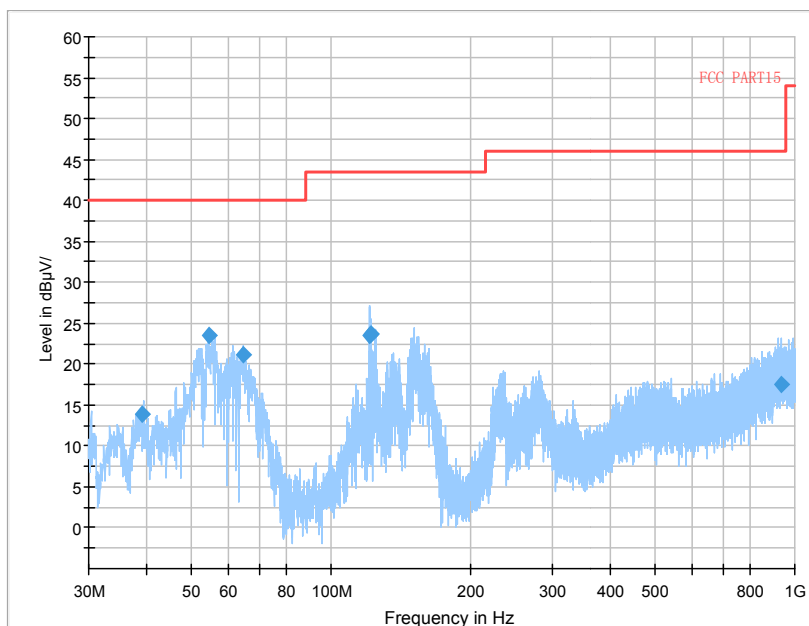
Test result:

Sample calculation: (13.80 dB μ V/m) = (32.30 dB μ V) + (-18.5 dB/m), the corresponding frequency is 39.052000MHz.

EUT+#Charger:

Frequency(MHz)	Result(dB μ V/m)	Limit (dB μ V/m)	ARpl (dB/m)	Pmea (dB μ V)	Polarity
39.052000	13.80	40.00	-18.5	32.30	V
54.415500	23.55	40.00	-17.7	41.25	V
64.826000	21.20	40.00	-20.0	41.20	V
121.168500	23.54	43.50	-20.7	44.24	V
122.304500	23.67	43.50	-20.8	44.47	V
938.950000	17.59	46.00	-1.0	18.59	V

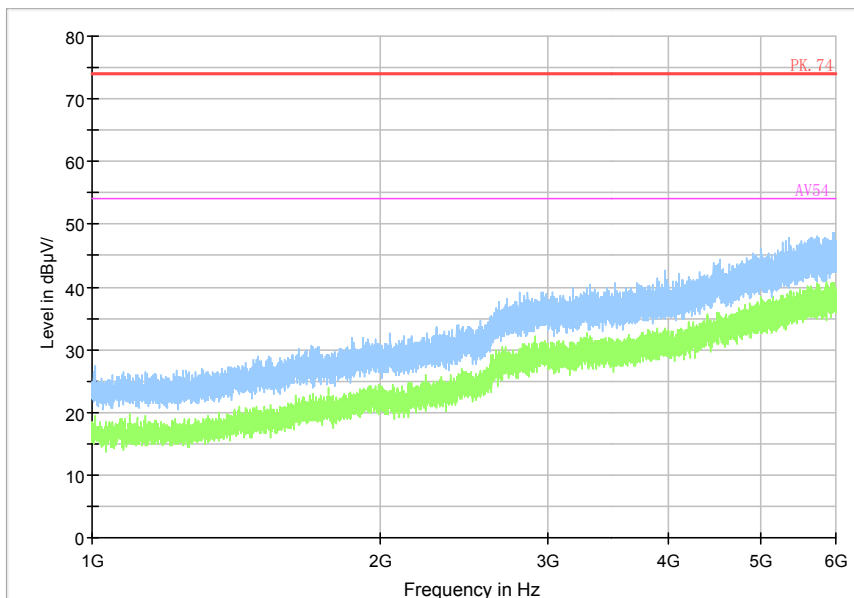
EUT+#Charger: refer to Pic4, Pic5, Pic6



Pic4. Radiated emission(30MHz – 1GHz)

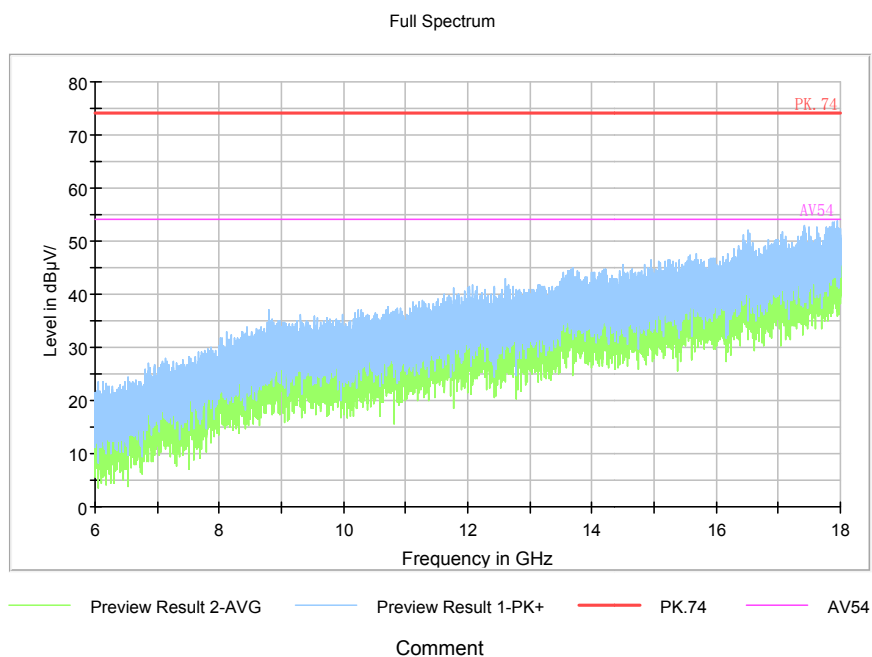
Note: The test data in the graph includes two polarizations: horizontal and vertical

Full Spectrum



Pic5. Radiated emission (1GHz –6GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical.



Pic6. Radiated emission (6GHz –18GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical.

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60mS emi-AnechoicChamber	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2021	20th Aug. 2020
3	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
4	ESR3 EMI test receiver	R&S	102361	22th Apr. 2021	21th Apr. 2020
5	VULB 9163 Ultra log test antenna	schwarzbeck	867	25th Mar. 2021	25th Mar. 2020
6	ENV216 AMN	R&S	3560.6550. 12	20th Aug. 2021	20th Aug. 2020
7	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	25th Mar. 2021	25th Mar. 2020
8	PS2000 Turn Table	FRANKONIA	-----	-----	-----
9	MA260 Antenna Master	FRANKONIA	-----	-----	-----
10	EMC32EMI test software	R&S	-----	-----	-----

-----The End-----