



EUROFINS ELECTRICAL TESTING SERVICE (SHENZHEN) Co., LTD.

RADIO TEST - REPORT

FCC Compliance Test Report for

Product name: Foot massager

Model name: FMS-360HJ

FCC ID: TG3-FMS-360HJ

Test Report Number: EFGX21050219-IE-01-E03

The above sample(s) and sample information was/were submitted and identified on behalf of the applicant. Eurofins assures objectivity and impartiality of the test, and fulfills the obligation of confidentiality for applicant's commercial information and technical documents.



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1 General Information

1.1 Notes

The results of this test report relate exclusively to the item tested as specified in chapter “Description of test item” and are not transferable to any other test items.

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Operator:

2021-08-12

Bruce Zheng / Project Engineer



Date

Eurofins-Lab.

Name / Title

Signature

Technical responsibility for area of testing:

2021-08-12

Tom Tian / Supervisor

Date

Eurofins-Lab.

Name / Title

Signature

1.2 Testing laboratory

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.

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The Laboratory has passed the Accreditation by the American Association for Laboratory Accreditation (A2LA). The Accreditation number is 5376.01

The Laboratory has been listed by industry Canada to perform electromagnetic emission measurements, The CAB identifier is CN0088

1.3 Details of applicant

Name : FKA Distributing Co., LLC
Address : 3000 N. Pontiac Trail
Commerce Township, MI 48390
United States
Telephone : (248) 863-3000
Fax : (248) 863-3146

1.4 Details of Manufacturer

Name : Zhangzhou Easepal Industrial Corporation
Address : No.228 JiaoSong Road,Taiwanese Investment Zone,Zhangzhou City, Fujian Province, P.R.China
Telephone : +86 18905963491
Fax : N/A

1.5 Application details

Date of receipt of application : 2021-05-28
 Date of receipt of test item : 2021-05-28
 Date of test : 2021-05-28 to 2021-07-12
 Date of issue : 2021-08-12

1.6 Test item

Product type : Foot massager
 Test Model : FMS-360HJ
 Model name : FMS-360HJ
 Brand : HoMedics
 Serial number : N/A
 Ratings : N/A
 Test voltage : DC 3V, CR2025 battery
 FCC ID : TG3-FMS-360HJ
 Additional information : N/A

RadioTechnical data

Frequency range : 433.92MHz
 Radio Tech. : ASK
 Frequency channel : 1 Channel
 Antenna type : PCB antenna
 Antenna gain : 0 dBi

1.7 Test standards

Test Standards	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

Test Method

- ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices.

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

or

The deviations as specified were ascertained in the course of the tests performed.

2.2 Test environment

Ac line conducted

Environment Parameter	Temperature	Relative Humidity
--	--	--

RF conducted

Environment Parameter	Temperature °C	Relative Humidity
101.3kPa	23.97	65.2%

Radiated

Environment Parameter	Temperature °C	Relative Humidity
101.3kPa	22.62	60.3%

2.3 Measurement uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

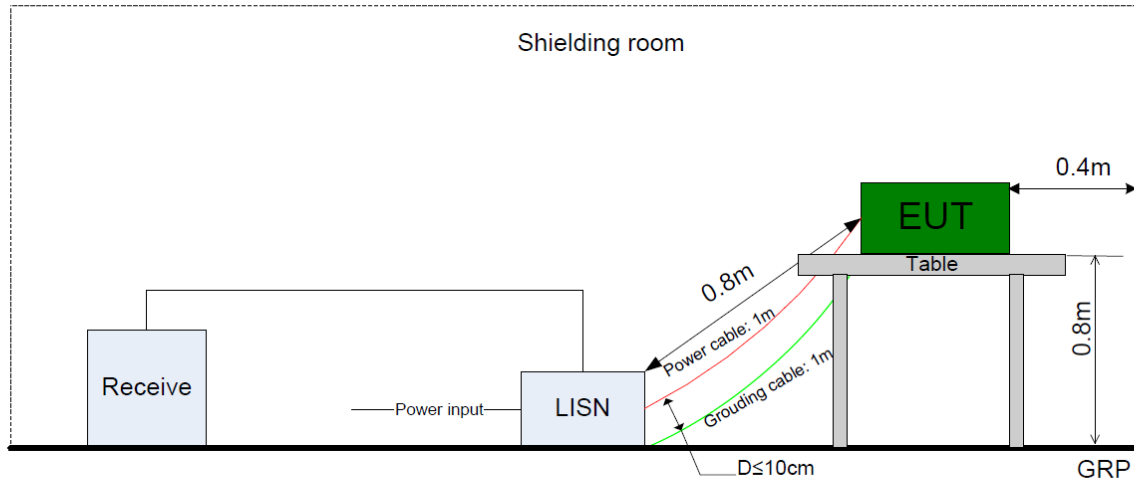
System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted RF test	RF Power Conducted: 1.16dB Frequency test involved: 1.05×10 ⁻⁷ or 1%
Uncertainty for Radiated Spurious Emission 25MHz-1000MHz	Horizontal: 4.46dB; Vertical: 4.54dB;
Uncertainty for Radiated Spurious Emission 1000Mz-6000MHz	Horizontal: 4.42dB; Vertical: 4.41dB;

2.4 Test equipment utilized

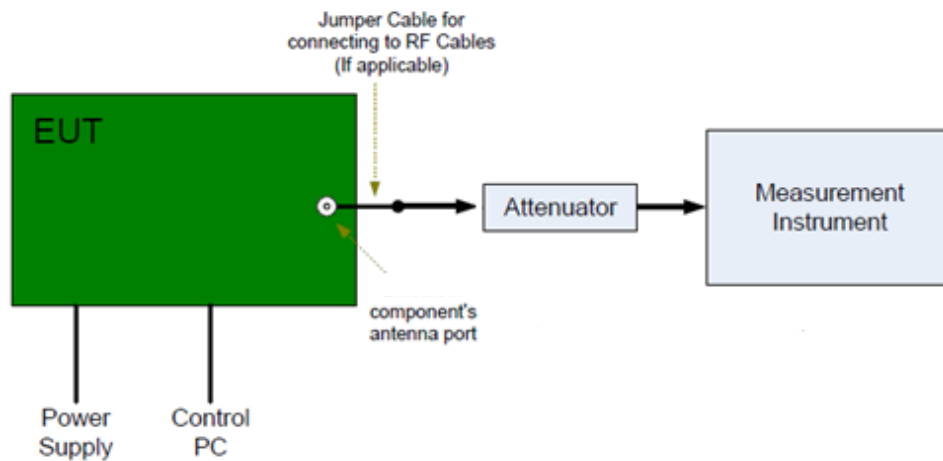
EQUIPMENT ID	EQUIPMENT NAME	MODEL NO.	CAL. DUE DATE
23-2-13-05	EMI Test Receiver	ESR3	2022-03-15
23-2-13-06	LISN	NNLK 8127 RC	2022-03-15
23-2-10-16	Attenuator	VTSD 9561-F	2022-03-16
23-2-10-63	Temperature & Humidity Meter	COS-03	2022-03-27
23-2-10-65	Barometer	Baro	2022-03-23
23-2-13-12	Signal Analyzer	N9010B-544	2022-03-15
23-2-13-13	BT/WLAN Tester	CMW270	2022-03-15
23-2-13-14	Signal Generator	N5183B-520	2022-03-15
23-2-13-15	Vector Signal Generator	N5182B-506	2022-03-15
23-2-10-43	Switch and Control Unit	ERIT-E-JS0806-2	2022-06-17
23-2-10-44	DC power supply	E3642A	2022-07-03
23-2-10-45	Temperature test chamber	SG-80-CC-2	2022-03-15
23-2-10-50	Temperature & Humidity Meter	COS-03	2022-03-27
23-2-10-66	Barometer	Baro	2022-03-23
23-2-13-01	EMI Test Receiver	ESR7	2022-03-15
23-2-13-02	Signal Analyzer	N9020B-544	2022-03-15
23-2-12-01	Active Loop Antenna	FMZB 1519B	2022-05-13
23-2-12-02	TRILOG Broadband Antenna	VULB9168	2022-04-27
23-2-12-03	Horn Antenna	3117	2022-05-11
23-2-12-04	Horn Antenna	BBHA 9170	2022-05-11
23-2-10-01	Preamplifier	BBV9745	2022-03-16
23-2-10-02	Preamplifier	TAP01018048	2022-03-16
23-2-10-03	Preamplifier	TAP18040048	2022-03-22
23-2-10-62	Temperature & Humidity Meter	COS-03	2022-03-27
23-2-10-64	Barometer	Baro	2022-03-23
23-2-10-14	Switch and Control Unit	ERIT-E-JS0806-SF1	N/A
23-2-13-03	EMI Test Receiver	ESR7	2022-03-16
23-2-13-04	Signal Analyzer	N9020B-526	2022-03-15
23-2-12-06	Active Loop Antenna	FMZB 1519B	2022-05-13
23-2-12-07	TRILOG Broadband Antenna	VULB9168	2022-04-27
23-2-12-08	Horn Antenna	3117	2022-05-11
23-2-10-46	Preamplifier	BBV9745	2022-03-16
23-2-10-47	Preamplifier	TAP01018048	2022-03-16
23-2-10-61	Temperature & Humidity Meter	COS-03	2022-03-27
23-2-10-52	Barometer	Baro	2022-03-23
23-2-10-15	Switch and Control Unit	ERIT-E-JS0806-SF1	N/A

2.5 Setup

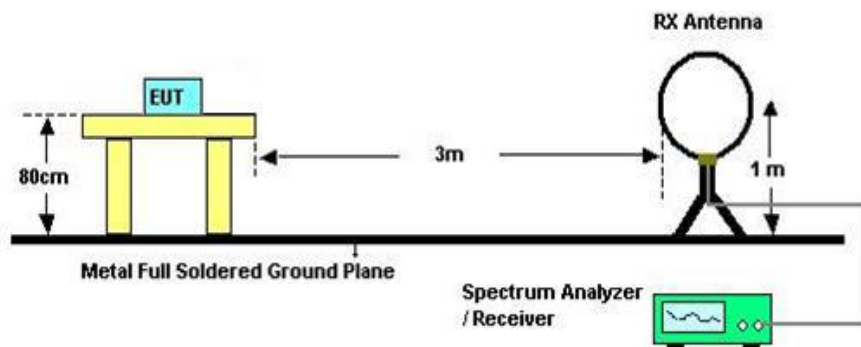
Ac line conducted



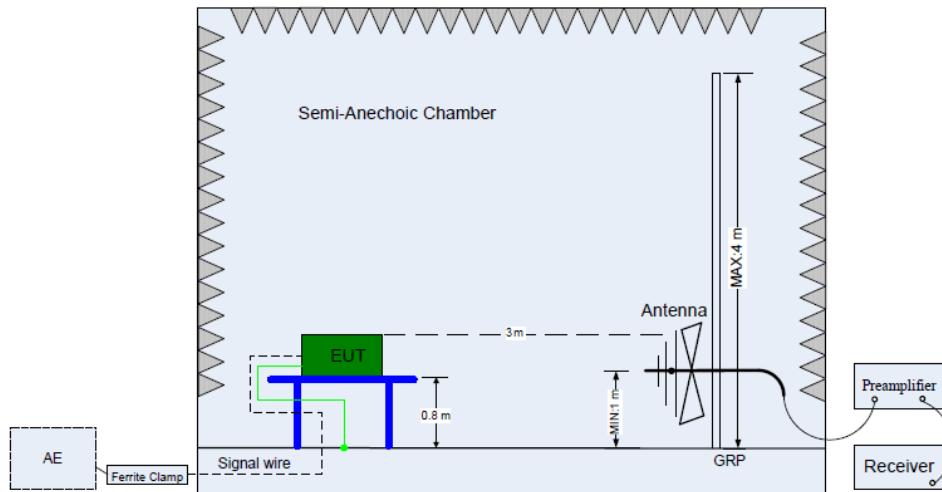
RF conducted tests



Radiated tests below 30MHz

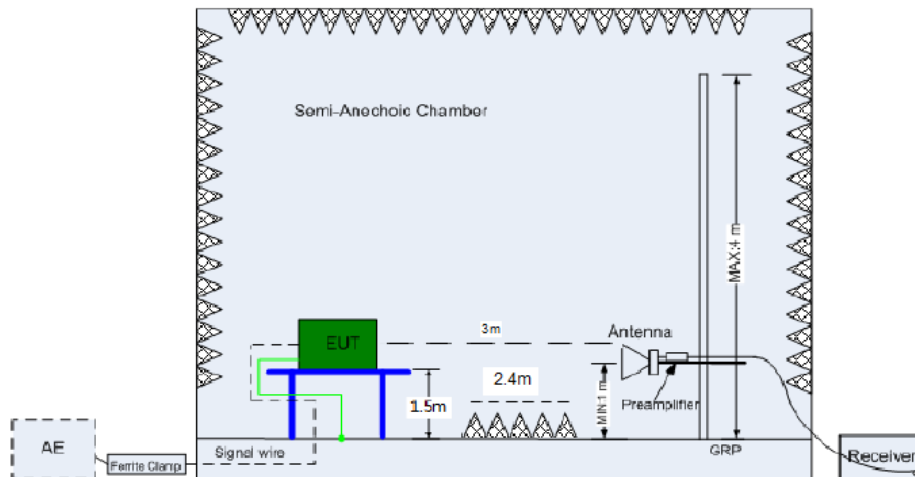


Radiated tests below 1GHz



(Below 1 GHz)

Radiated tests above 1GHz



(Above 1 GHz)

2.6 Test results

 1st test

 test after modification

 production test

Technical Requirements			
FCC Part 15 Subpart C			
Test Condition		Verdict	Test Site
§15.207	Conducted emission AC power port	N/A	--
§15.231(a)(1)	Automatically Deactivate	Pass	Site 1
§15.231(b)(3) §15.209 §15.205	Radiated emission	Pass	Site 1
§15.231(c)	-20dB Bandwidth	Pass	Site 1
--	99% Occupied Bandwidth	Pass	Site 1
§15.203	Antenna requirement	See note 1	--

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a PCB antenna, the gain: 0 dBi. According to §15.203, it is considered sufficiently to comply with the provisions of this section.

3 Technical Requirement

3.1 Conducted emission AC power port

Test Method:

ANSI C63.10 (2013) Section 6.2

Limit:

FCC §15.207 (a)

Frequency	QP Limit	AV Limit
MHz	dB μ V	dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linear.

Test Result:

Not Applicable, the EUT was supplied by 3Vdc from CR2025 battery.

3.2 Automatically Deactivate

Test Method:

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer set the center frequency, than set the spectrum analyzer to Zero Span for the release time reading. During the testing, the transmission duration was measured and recorded.

Limit:

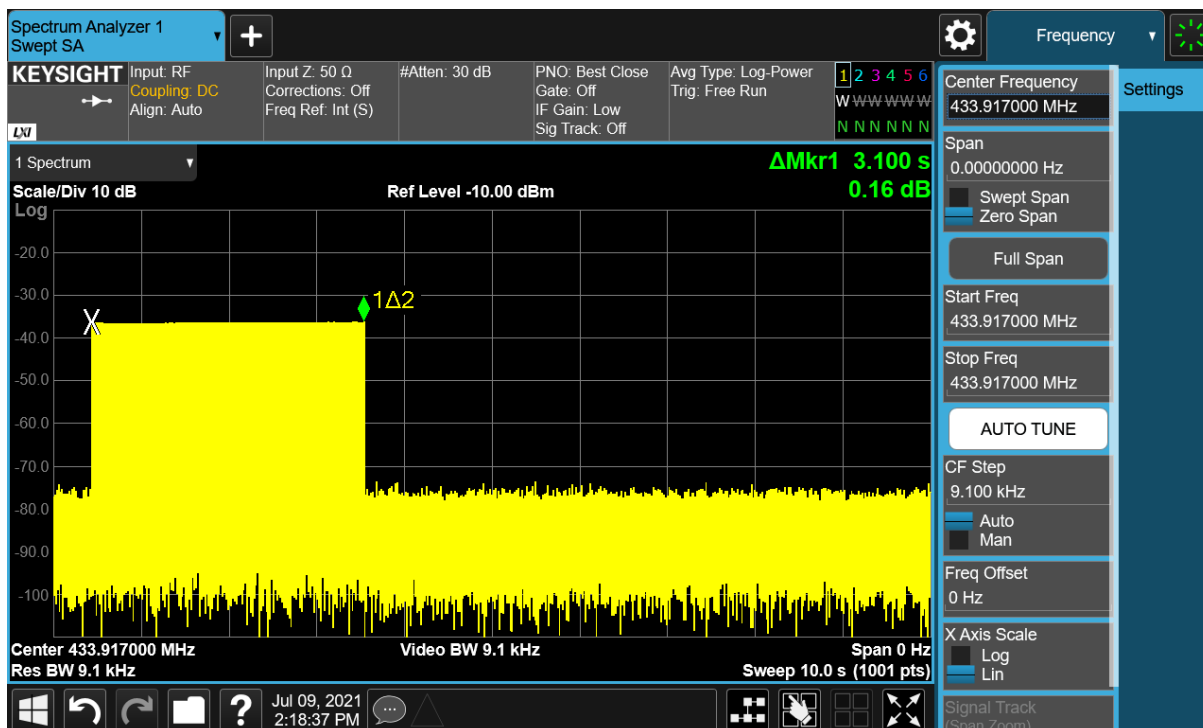
FCC § 15.231 (a)

(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

Test Result:

Time of Transmitting (sec)	Limit (sec)	Result
3.1	5	Pass



3.3 20dB bandwidth

Test Method:

ANSI C63.10 (2013) Section 6.9

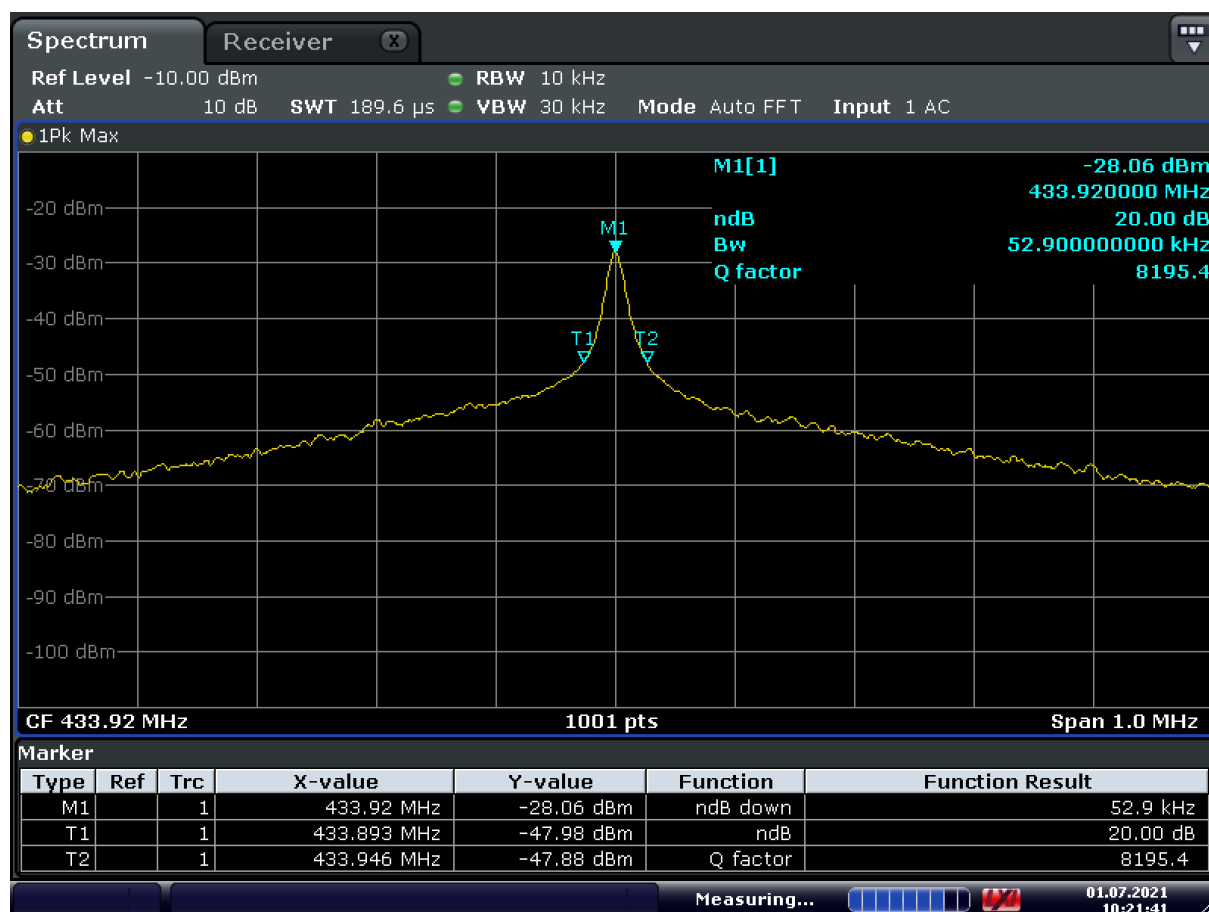
Limit:

FCC §15.231

(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Result

20dB Bandwidth (KHz)	20dB Bandwidth Limit (KHz)	Result
52.9	1084.80	Pass



Date: 1.JUL.2021 10:21:41

3.4 99% emission bandwidth

Test Method:

ANSI C63.10 (2013) Section 6.9

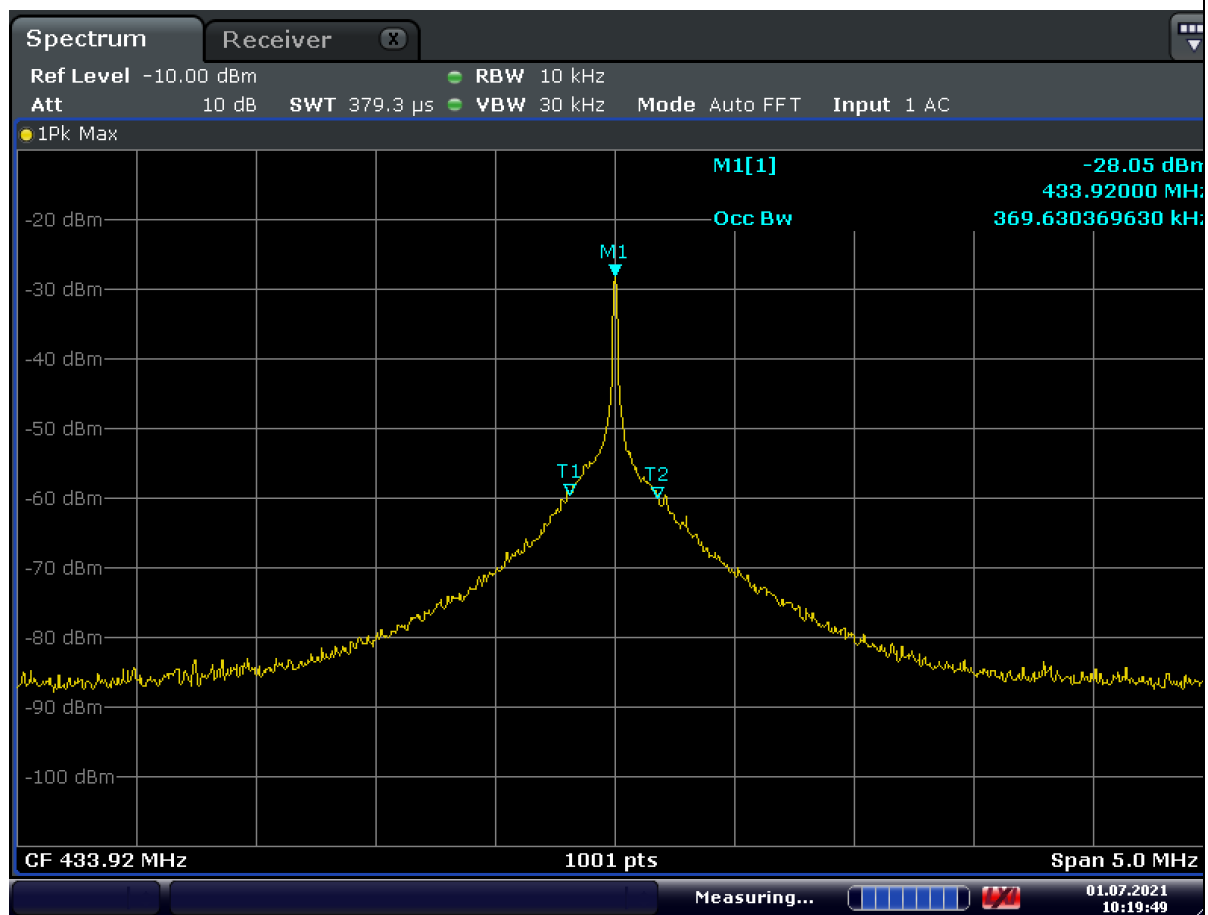
Limit:

None; for reporting purposes only.

Results

Test Frequency (MHz)	99 % Occupied Bandwidth (kHz)
433.92	369.63

Please refer to the test plots:



Date: 1.JUL.2021 10:19:50

3.5 Radiated emission

Test Method:

ANSI C63.10 (2013) Section 6.4, 6.5, 6.6

Test Procedures for emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
- c. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- d. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Test Procedures for emission from 30 MHz to 1 000 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

Test Procedures for emission above 1 GHz

- a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1 GHz.

Limit
FCC
Radiated emission limits; general requirements.

According to §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 (microvolts/meter)	Measurement Distance (meter)
0.009-0.490	2 400/F(KHz)	300
0.490-1.705	24 000/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 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz

According to §15.231(b), in addition to the provisions of Section §15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	11,250 to 3,750	1125 to 375
174-260	3,750	375
260-470	13,750 to 12,500	1375 to 1,250
Above 470	12,500	1,250

1 linear interpolations

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, $\mu\text{V}/\text{m}$ at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, $\mu\text{V}/\text{m}$ at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

Remark:

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Result of QP=Reading Level +Antenna Factor + Cable Loss - Amplifier Gain.

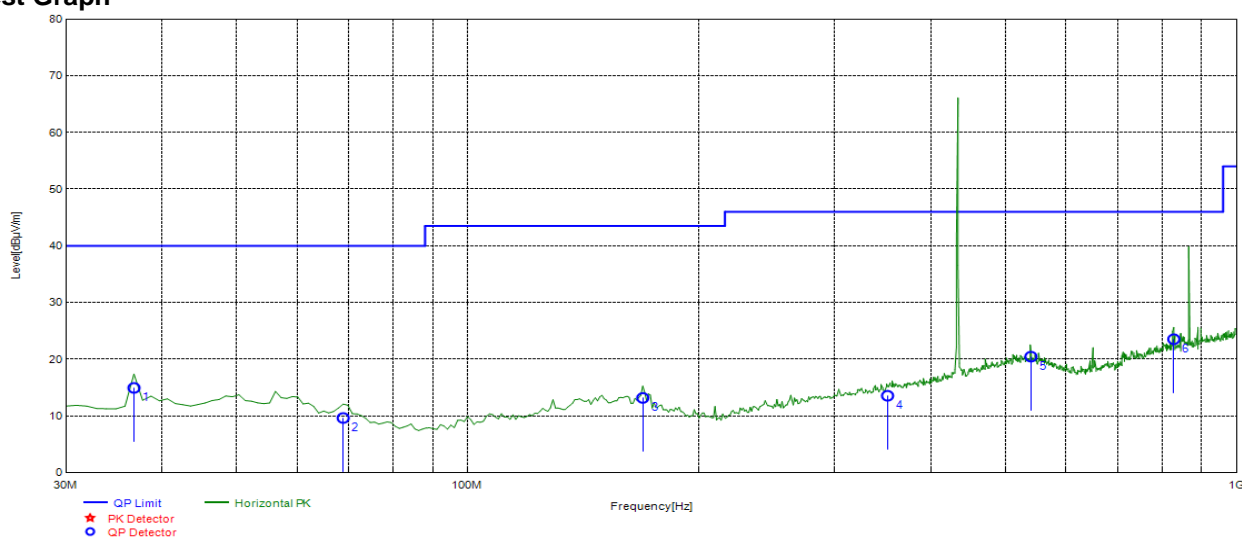
Result of PK=Reading Level +Antenna Factor + Cable Loss - Amplifier Gain.

Result of AV= Reading Level +Antenna Factor + Cable Loss - Amplifier Gain+Duty factor.

The low frequency, which started from 9 kHz to 30MHz with X/Y/Z axis, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

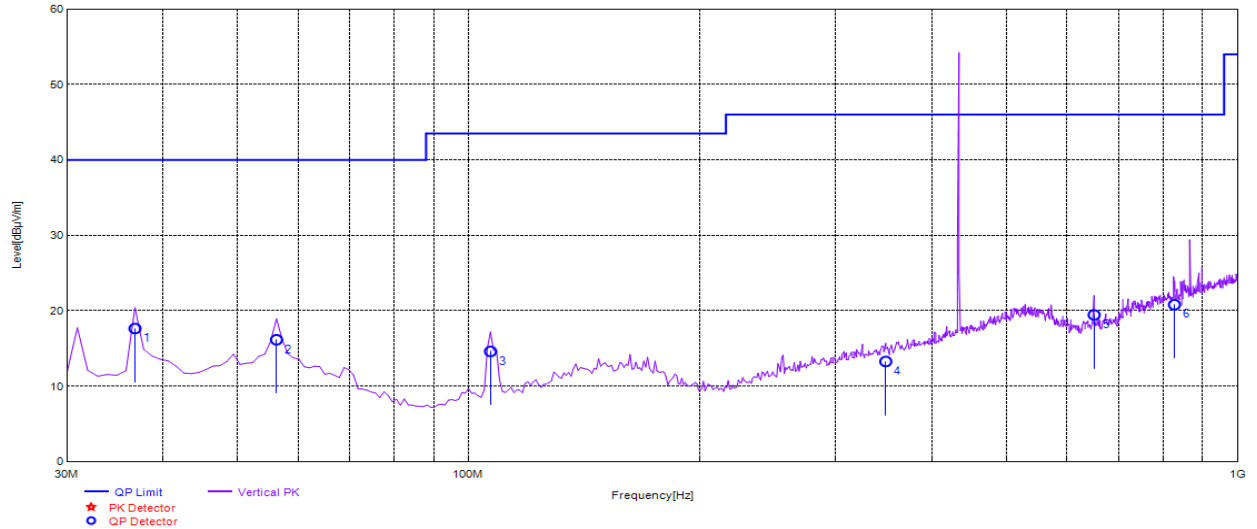
Below 1GHz

Mode:	433.92MHz Tx	Voltage:	DC 3V
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Test Graph

QP Final Data List

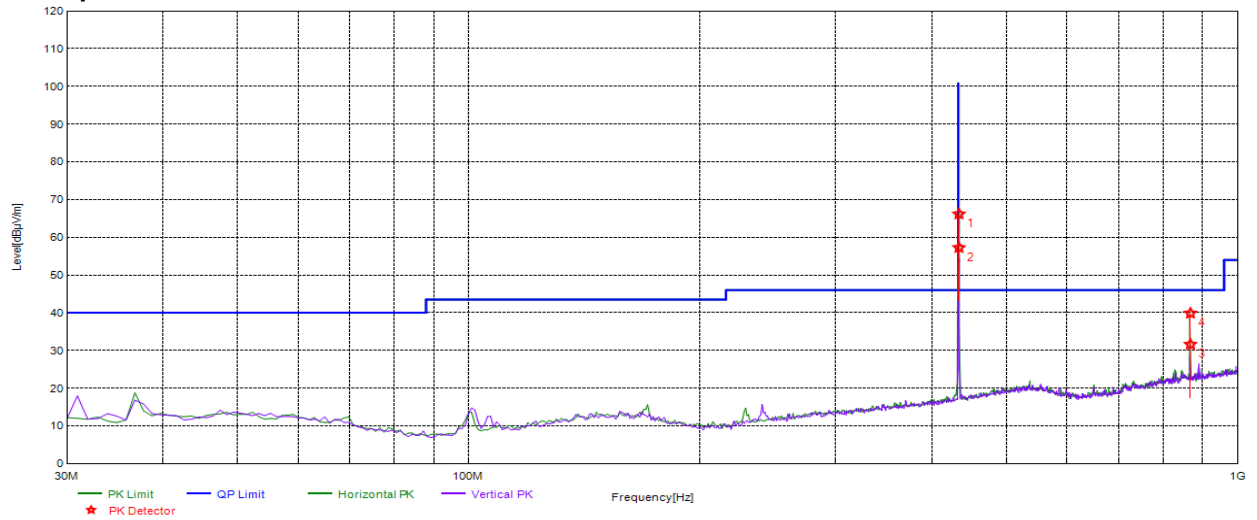
NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	36.7968	-16.35	14.93	40.00	25.07	Horizontal	PASS
2	68.8388	-17.99	9.63	40.00	30.37	Horizontal	PASS
3	168.8488	-16.37	13.16	43.50	30.34	Horizontal	PASS
4	351.3914	-14.58	13.55	46.00	32.45	Horizontal	PASS
5	539.7598	-10.63	20.45	46.00	25.55	Horizontal	PASS
6	828.1381	-6.24	23.52	46.00	22.48	Horizontal	PASS

Mode:	433.92MHz Tx	Voltage:	DC 3V
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Test Graph

QP Final Data List

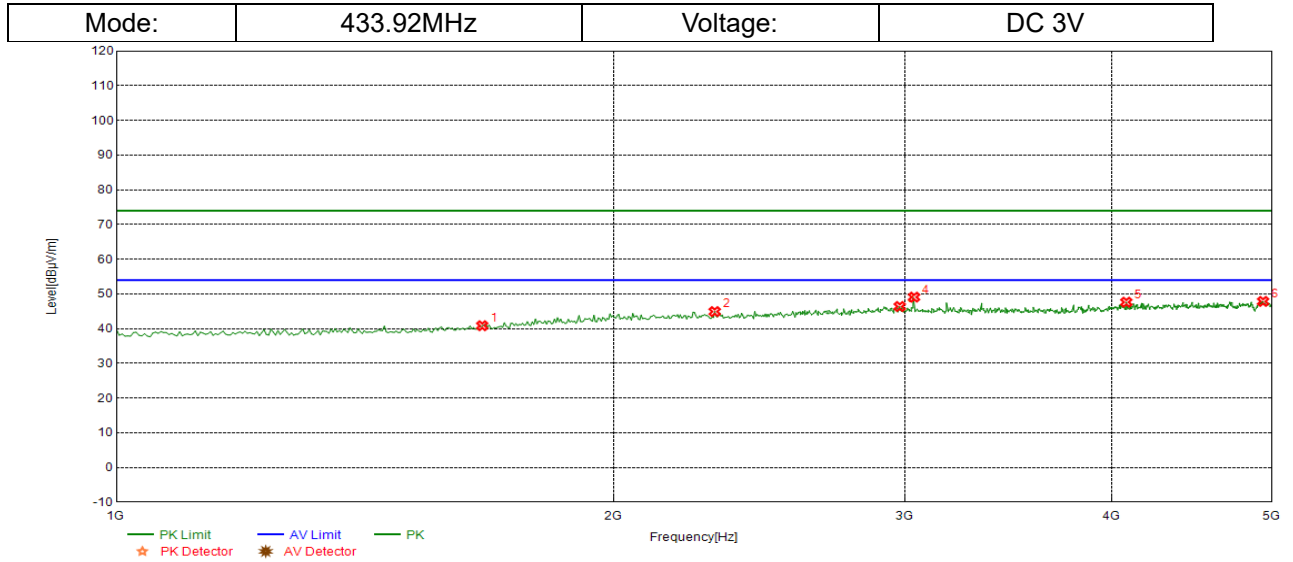
NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	36.7968	-16.35	17.65	40.00	22.35	Vertical	PASS
2	56.2162	-15.95	16.16	40.00	23.84	Vertical	PASS
3	106.7067	-19.66	14.62	43.50	28.88	Vertical	PASS
4	348.4785	-14.64	13.28	46.00	32.72	Vertical	PASS
5	650.4505	-8.88	19.45	46.00	26.55	Vertical	PASS
6	827.1672	-6.25	20.81	46.00	25.19	Vertical	PASS

Mode:	433.92MHz Tx	Voltage:	DC 3V
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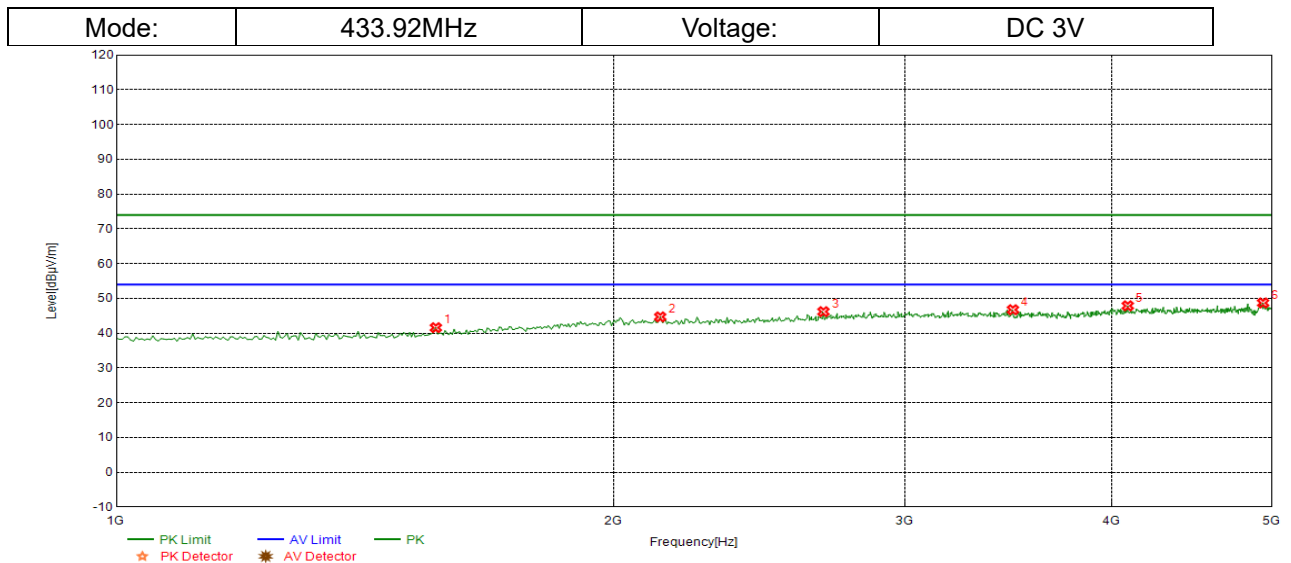
Test Graph


Final Data List							
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity	Verdict
1	433.9196	-12.84	66.19	80.83	14.64	Horizontal	PASS
2	433.9196	-12.84	57.27	80.83	23.56	Vertical	PASS
3	867.8394	-5.93	31.62	60.83	29.21	Vertical	PASS
4	867.8437	-5.93	39.88	60.83	20.95	Horizontal	PASS

Above 1GHz



PK Final Data List								
NO.	Freq. [MHz]	PK Reading [dBµV/m]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Polarity	Verdict
1	1664.66	65.39	40.85	-24.54	74.00	33.15	Horizontal	PASS
2	2301.30	66.06	44.92	-21.14	74.00	29.08	Horizontal	PASS
3	2977.97	65.53	46.39	-19.14	74.00	27.61	Horizontal	PASS
4	3038.03	68.13	49.09	-19.04	74.00	24.91	Horizontal	PASS
5	4083.08	64.41	47.63	-16.78	74.00	26.37	Horizontal	PASS
6	4939.93	63.12	47.86	-15.26	74.00	26.14	Horizontal	PASS



PK Final Data List								
NO.	Freq. [MHz]	PK Reading [dBµV/m]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Polarity	Verdict
1	1560.56	67.02	41.60	-25.42	74.00	32.40	Vertical	PASS
2	2133.13	66.15	44.70	-21.45	74.00	29.30	Vertical	PASS
3	2677.67	66.36	46.20	-20.16	74.00	27.80	Vertical	PASS
4	3486.48	65.52	46.75	-18.77	74.00	27.25	Vertical	PASS
5	4091.09	64.65	47.88	-16.77	74.00	26.12	Vertical	PASS
6	4939.93	63.97	48.71	-15.26	74.00	25.29	Vertical	PASS

4 Test Setup Photos

Ref "EFGX21050219-IE-01-E03_Setup_Photos.pdf"

5 External Photo

Ref "EFGX21050219-IE-01-E03_External_Photos.pdf"

6 Internal Photos

Ref "EFGX21050219-IE-01-E03_Internal_Photos.pdf"

-End of report-