

FCC PART 15C


TEST REPORT

For

XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD.

(5/F) NO.168, QIANPU ROAD, SIMING DISTRICT, XIAMEN, CHINA

FCC ID: YMX-EC3209K

Report Type: Original Report	Product Type: Massage Chair
Report Number: RTZ210315018-00B	
Report Date: 2021-04-16	
Reviewed By: RF Engineer	Candy Li 
Prepared By: Shenzhen Accurate Technology Co., Ltd. 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396 Http://www.atc-lab.com	

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★". Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk "*". Customer model name, addresses, names, trademarks etc. are not considered data. This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
JUSTIFICATION	5
EUT EXERCISE SOFTWARE	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
TEST EQUIPMENT LIST	8
FCC §15.203 – ANTENNA REQUIREMENT	9
APPLICABLE STANDARD	9
ANTENNA CONNECTED CONSTRUCTION	9
FCC §15.207 – AC LINE CONDUCTED EMISSION	10
APPLICABLE STANDARD	10
EUT SETUP.....	10
EMI TEST RECEIVER SETUP.....	10
TEST PROCEDURE	11
CORRECTED FACTOR & MARGIN CALCULATION	11
TEST RESULTS SUMMARY	11
TEST DATA	11
FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST	14
APPLICABLE STANDARD	14
EUT SETUP.....	14
EMI TEST RECEIVER SETUP.....	15
CORRECTED AMPLITUDE & MARGIN CALCULATION	15
TEST RESULTS SUMMARY	15
TEST DATA	15

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Product	Massage Chair
Tested Model	EC-3209K
Multiple Model	AM-Juno II
Model Differences	All the same except model name is different.
Frequency Range	110.5 kHz-205kHz
Antenna Specification	Coil
Voltage Range	AC110-120V/60Hz
Date of Test	2021-04-09 to 2021-04-16.
Sample serial number	RTZ210315018-RF-S1
Received date	2021-03-15
Sample/EUT Status	Good Condition

Objective

This report is prepared on behalf of *XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of EUT with FCC rules, section 15.203, 15.205, 15.207 and 15.209.

Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Expanded Measurement uncertainty
Conducted Emissions	AC Mains	2.72 dB ($k=2$, 95% level of confidence)
Radiated emission	30MHz-1GHz	4.28 dB ($k=2$, 95% level of confidence)
	1GHz-18GHz	4.98 dB ($k=2$, 95% level of confidence)

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

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, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

The test site has been registered with ISED Canada under ISED Canada Registration Number 5077A-2.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode

The device is a wireless charger operation on frequency 110.5 kHz - 205 kHz.

EUT Exercise Software

No software used in test.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	Specification
Unknown	Load 1	Wireless load 01	Unknown	5W
Unknown	Load 2	USB load 02	Unknown	5V/2A

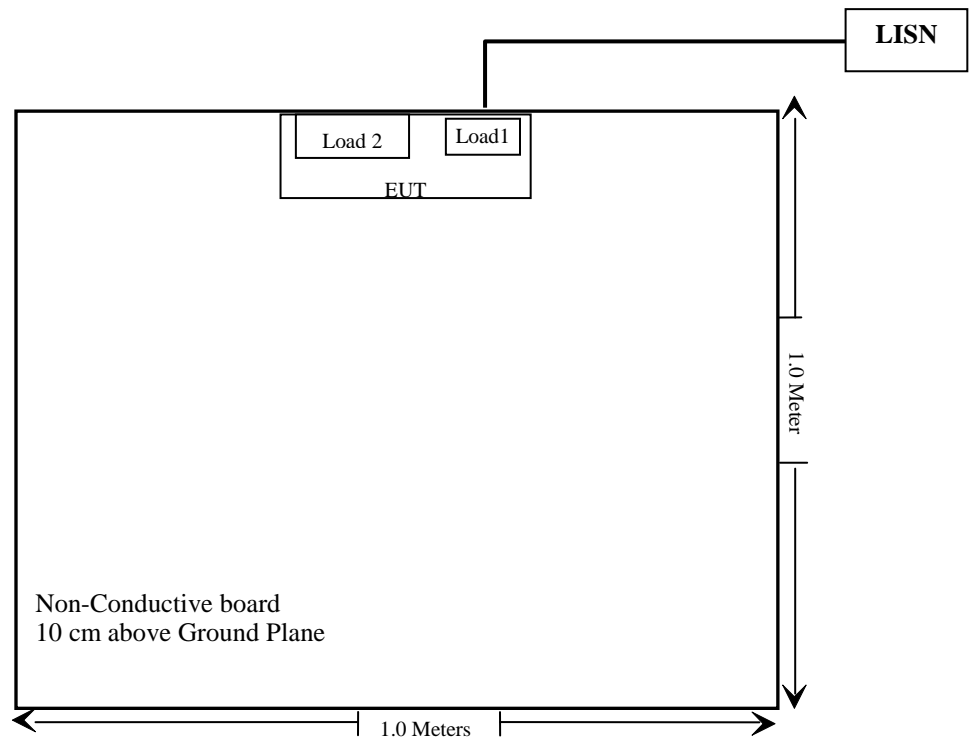
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable AC Line	1.0	AC Main power	EUT
USB cable	0.3	EUT	USB load 02

Block Diagram of Test Setup

For conducted emission:

For conducted emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.203	Antenna Requirement	Compliance
FCC §15.207	AC Line Conducted Emission	Compliance
§15.209 §15.205	Radiated Emission Test	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMI					
Rohde & Schwarz	Test Receiver	ESPI3	100396	2020/12/24	2021/12/23
R & S	L.I.S.N.	ENV216	101314	2020/12/25	2021/12/24
Anritsu Corp	50Ω Coaxial Switch	MP59B	6200506474	2020/12/25	2021/12/24
Schwarzbeck	RF Coaxial Cable	N-2m	No.2	2020/12/25	2021/12/24
Conducted Emission Test Software: ES-K1 V1.71					
Rohde & Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	LOOP Antenna	FMZB1516	1516131	2020/01/05	2023/01/04
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
RF Coaxial Cable	Schwarzbeck	N-5m	No.1	2020/12/25	2021/12/24
RF Coaxial Cable	Schwarzbeck	N-1m	No.6	2020/12/25	2021/12/24
RF Coaxial Cable	SUHNER	N-6m	No.10	2020/12/25	2021/12/24
RF Coaxial Cable	SUHNER	N-0.5m	No.15	2020/12/25	2021/12/24
Radiated Emission Test Software: EZ EMC V 1.1.4.2					

* **Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

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.

Antenna Connected Construction

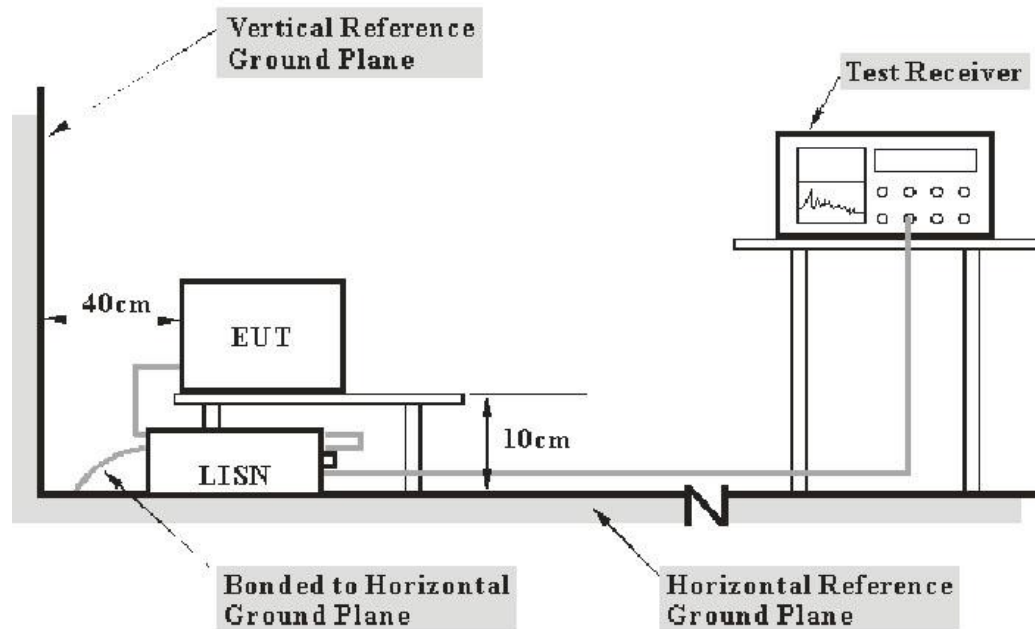
The EUT has one internal coil antenna arrangement, which were permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 – AC LINE CONDUCTED EMISSION

Applicable Standard

FCC §15.207



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 10 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 spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

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	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The basic equation is as follows:

Level (QuasiPeak or Average) = Reading Level + Transd Factor

Note:

Transd Factor = Cable loss + Factor of coupling device

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Level

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

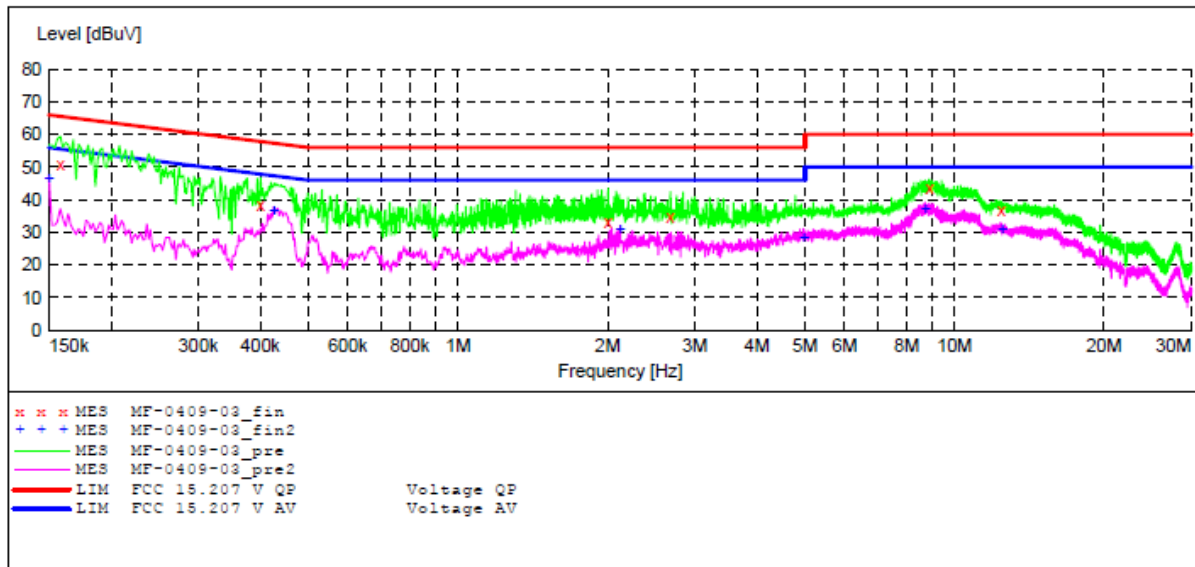
Test Data

Environmental Conditions

Temperature:	25°C
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2021-04-09.

Test Mode: Full load (worst case)

AC 120 V/60 Hz, Line:**MEASUREMENT RESULT: "MF-0409-03_fin"**

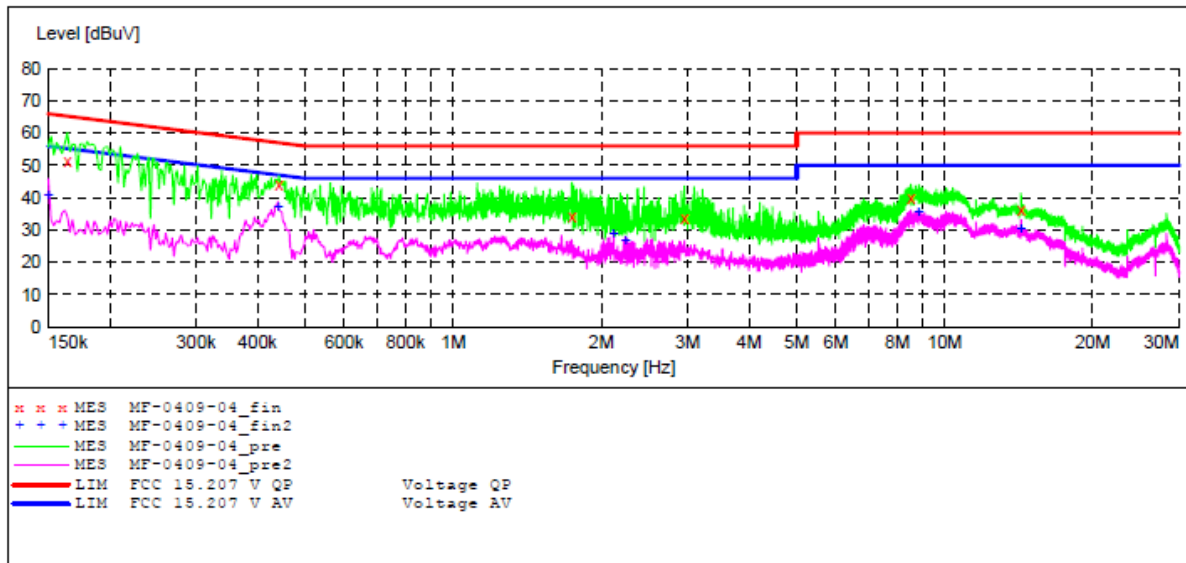
2021-4-9 10:05

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.158000	50.60	10.8	66	15.4	QP	L1	GND
0.400000	38.50	11.0	58	19.5	QP	L1	GND
2.005000	33.00	11.3	56	23.0	QP	L1	GND
2.675000	34.60	11.3	56	21.4	QP	L1	GND
8.900000	43.40	11.5	60	16.6	QP	L1	GND
12.420000	36.70	11.6	60	23.3	QP	L1	GND

MEASUREMENT RESULT: "MF-0409-03_fin2"

2021-4-9 10:05

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	46.60	10.8	56	9.4	AV	L1	GND
0.426000	36.50	11.0	47	10.5	AV	L1	GND
2.120000	31.10	11.3	46	14.9	AV	L1	GND
4.965000	28.70	11.4	46	17.3	AV	L1	GND
8.715000	37.20	11.5	50	12.8	AV	L1	GND
12.450000	31.10	11.6	50	18.9	AV	L1	GND

AC 120V/ 60 Hz, Neutral:**MEASUREMENT RESULT: "MF-0409-04_fin"**

2021-4-9 10:09

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.164000	51.20	10.8	65	13.8	QP	N	GND
0.442000	43.90	11.0	57	13.1	QP	N	GND
1.742000	34.20	11.2	56	21.8	QP	N	GND
2.955000	33.50	11.3	56	22.5	QP	N	GND
8.525000	40.10	11.5	60	19.9	QP	N	GND
14.290000	36.20	11.6	60	23.8	QP	N	GND

MEASUREMENT RESULT: "MF-0409-04_fin2"

2021-4-9 10:09

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	41.10	10.8	56	14.9	AV	N	GND
0.440000	37.10	11.0	47	9.9	AV	N	GND
2.120000	29.10	11.3	46	16.9	AV	N	GND
2.240000	26.70	11.3	46	19.3	AV	N	GND
8.850000	35.90	11.5	50	14.1	AV	N	GND
14.295000	30.40	11.6	50	19.6	AV	N	GND

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

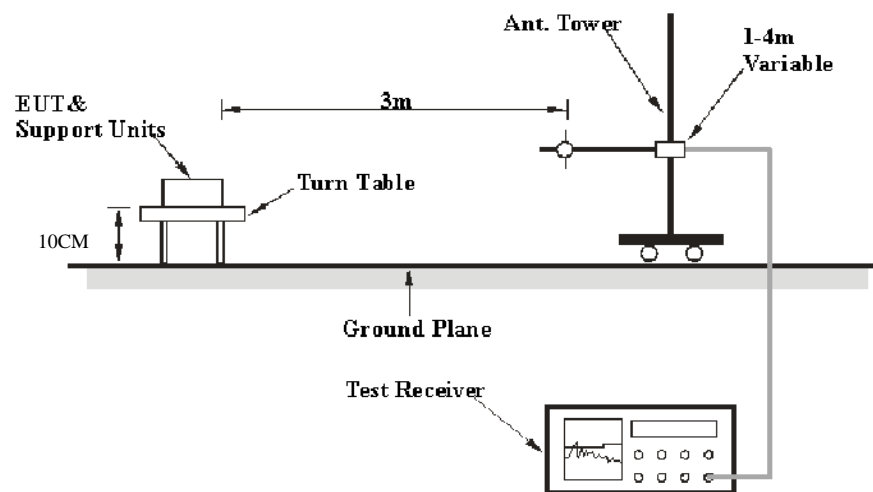
As per FCC Part 15.209

(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 (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 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	QP/Average
150 kHz – 30 MHz	9 kHz	30 kHz	QP/Average
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Factor

Note:

Factor (dB/m)= Antenna factor + Cable Loss – Amplifier gain

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Result - Limit

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209&15.205.

Test Data

Environmental Conditions

Temperature:	21 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on.2021-04-10 to 2021-04-16.

Test mode: full load (Worst case)

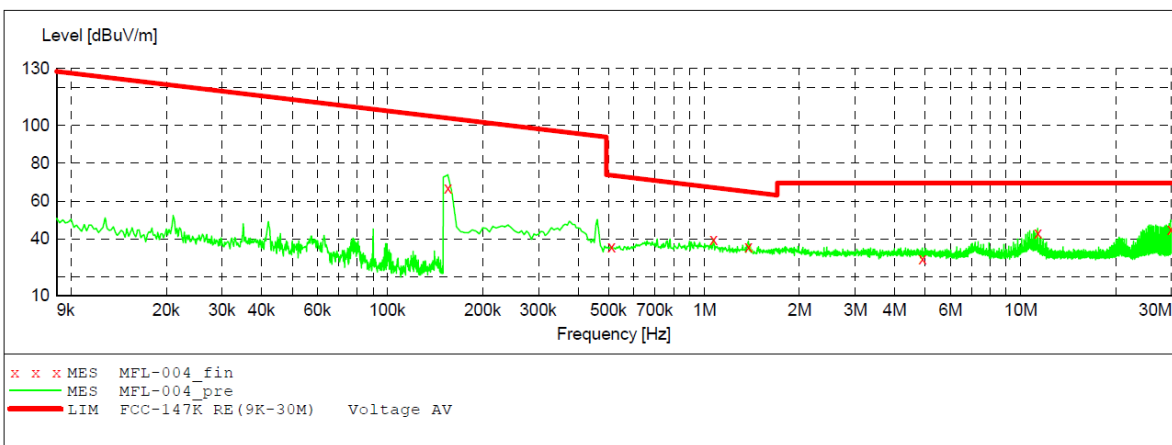
Result: Compliance

9 kHz~30MHz:

Worst case (Full load, X-axis) was recorded in the report.

SCAN TABLE: "REFCC18 9K-30MHz Fin"

Short Description:			SUB_STD_VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	200.0 Hz	QuasiPeak	1.0 s	200 Hz	1516E
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516E

**MEASUREMENT RESULT: "MFL-004_fin"**

2021-4-16 02:43

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
0.155000	67.00	20.1	103.8	-36.8	QP	105.0	0.00	X
0.510000	35.80	20.3	73.5	-37.7	QP	105.0	0.00	X
1.070000	39.90	20.4	67.0	-27.1	QP	105.0	0.00	X
1.380000	35.70	20.4	64.8	-29.1	QP	105.0	0.00	X
4.900000	29.30	20.5	69.5	-40.2	QP	105.0	0.00	X
11.315000	43.00	20.7	69.5	-26.5	QP	105.0	0.00	X
29.820000	45.00	21.9	69.5	-24.5	QP	105.0	0.00	X

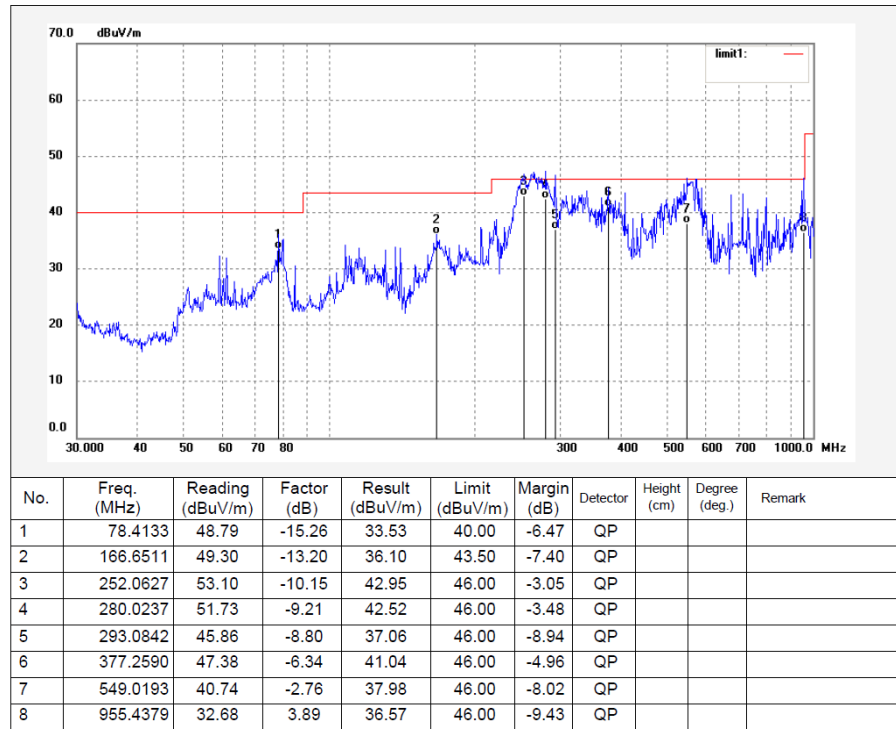
Part 15 Section 15.31(f)(2) (9kHz-30MHz)

Limit at 3m=Limit at 300m-40*log(3(m)/300(m))

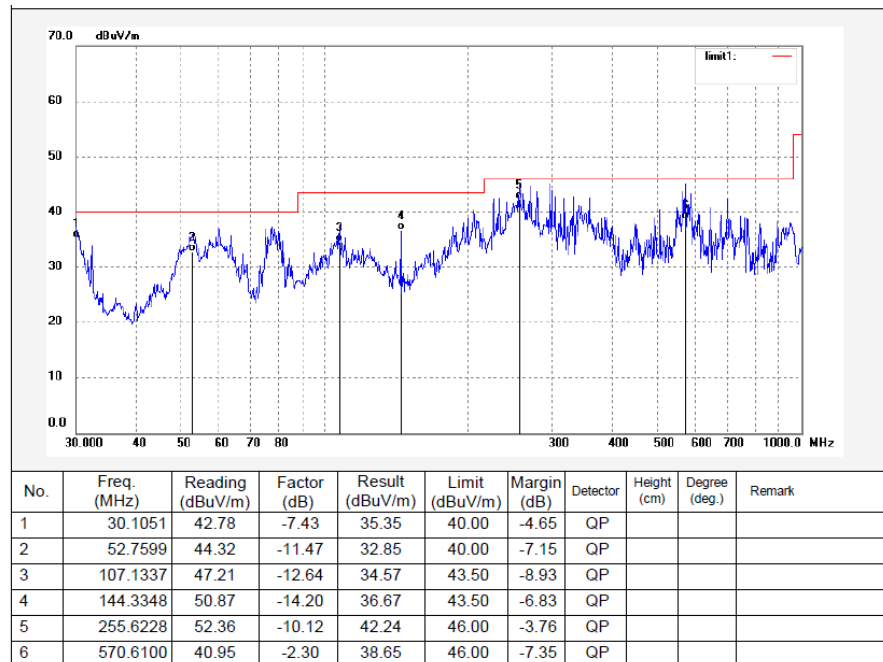
Limit at 3m=Limit at 30m-40*log(3(m)/30(m))

30 MHz ~ 1GHz

Horizontal



Vertical



***** END OF REPORT *****