



FCC ID: 2AR5RRMX44BT
Report No.: T210713N01-RP1-2

Ref. No.: T200610N03-RP1-2

Page: 1 / 24
Rev.: 00

FCC 47 CFR PART 15 SUBPART C AND ANSI C63.10: 2013

TEST REPORT

(Class II Permissive Change Report)

For

DJ MIXER

Model: RMX-44 BT

Brand: RELOOP

Issued for

Global Distribution GmbH & Co. KG

Schuckertstr. 28 , 48153 Muenster , Germany

Issued by

Compliance Certification Services Inc.

Tainan Lab.

No.8, Jiucengling, Xinhua Dist.,

Tainan City, Taiwan

Issued Date: September 24, 2021

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 24, 2021	See the following note rev.00	ALL	Gina Lin

Note:

※ Rev.00 Issue Date: September 24, 2021
Revised Class II Permissive Change Report and the description is shown in page 7. (3.2 DESCRIPTION OF CLASS II CHANGE)

TABLE OF CONTENTS

1. TEST REPORT CERTIFICATION	4
2. TEST RESULT SUMMARY	5
3. EUT DESCRIPTION	6
3.1 DESCRIPTION OF EUT & POWER	6
3.2 DESCRIPTION OF CLASS II CHANGE	7
4. DESCRIPTION OF TEST MODES	8
5. TEST METHODOLOGY	9
6. FACILITIES AND ACCREDITATIONS.....	9
6.1 FACILITIES	9
6.2 EQUIPMENT	9
6.3 LABORATORY ACCREDITATIONS LISTINGS	9
6.4 TABLE OF ACCREDITATIONS AND LISTINGS.....	10
6.5 MEASUREMENT EQUIPMENT USED	11
7. CALIBRATION AND UNCERTAINTY.....	12
7.1 MEASURING INSTRUMENT CALIBRATION	12
7.2 MEASUREMENT UNCERTAINTY	12
8. SETUP OF EQUIPMENT UNDER TEST	13
8.1 SETUP CONFIGURATION OF EUT	13
8.2 SUPPORT EQUIPMENT	13
8.3 EUT OPERATING CONDITION	14
9. APPLICABLE LIMITS AND TEST RESULTS.....	15
9.1 RADIATED EMISSIONS	15
10. ANTENNA REQUIREMENT	22
10.1 STANDARD APPLICABLE	22
10.2 ANTENNA CONNECTED CONSTRUCTION	22
APPENDIX I SETUP PHOTOS	23

1. TEST REPORT CERTIFICATION

Applicant : Global Distribution GmbH & Co. KG
Schuckertstr. 28 , 48153 Muenster , Germany

Manufacturer : Global Distribution GmbH & Co. KG
Schuckertstr. 28 , 48153 Muenster , Germany

Equipment Under Test : DJ MIXER

Model Number : RMX-44 BT

Brand Name : RELOOP

Date of Test : July 21, 2021

APPLICABLE STANDARD	
STANDARD	TEST RESULT
FCC Part 15 Subpart C AND ANSI C63.10: 2013	No non-compliance noted

Statements of Conformity
Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Approved by:



Eric Huang
Section Manager

2. TEST RESULT SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.247(a)	-	6dB BANDWIDTH	-
15.247(b)	-	MAXIMUM PEAK OUTPUT POWER	-
-	-	DUTY CYCLE	-
15.247(e)	-	POWER SPECTRAL DENSITY	-
15.247(d)	-	CONDUCTED SPURIOUS EMISSION	-
15.205(a)	9.1	RADIATED EMISSIONS	Pass
15.207(a)	-	POWERLINE CONDUCTED EMISSIONS	-
15.203	10	ANTENNA REQUIREMENT	Pass

3. EUT DESCRIPTION

3.1 DESCRIPTION OF EUT & POWER

Product Name	DJ MIXER
Model Number	RMX-44 BT
Brand Name	RELOOP
Received Date	July 13, 2021
Reported Date	August 27, 2021
Operating Frequency Range	GFSK(4.0) Mode: 2402MHz~2480MHz
Transmit Power	GFSK(4.0) Mode: 3.88dBm (2.45mW)
Channel Spacing	GFSK(4.0) Mode: 2 MHz
Channel Number	GFSK(4.0) Mode: 79 Channels
Transmit Data Rate	GFSK(4.0) Mode: 3 Mbps
Type of Modulation	GFSK、 $\pi/4$ DQPSK、8DPSK
Antenna Type	Manufacturer: Sunitec Type: PCB Antenna Model: BM20A Gain: 1.78 dBi
Power Source	AC 100-240V, 0.8A, 50/60Hz
Firmware Version	V1.0
Hardware Version	V1.0
Software Version	V1.0

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	Hon-Kwang Electric Co., Ltd.	HK-CW-120A200-CP	AC 100-240V, 50/60Hz, 0.8A	DC 12.0V, 2.0A, 24.0W
2	SHENZHEN FUJIA APPLIANCE CO., LTD.	FJ-SW1202000N	AC 100-240V, 50/60Hz, 0.6A	DC 12V, 2.0A, 24.0W

- REMARK:** 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **2AR5RRMX44BT** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
3. For more details, please refer to the user manual.

3.2 DESCRIPTION OF CLASS II CHANGE

The major change filed under this application is:

Updated RAD (Below 1GHz) test data for verification test of new adapter (model: FJ-SW1202000N).

Since the above changes do not influence the RF characteristics, after evaluated, the testing items of the data could be used and showed as original application document reports (report number: T200610N03-RP1-1).

4. DESCRIPTION OF TEST MODES

The EUT is a DJ MIXER.

The RF Chip is manufactured by CSR

The antenna peak gain 1.78 dBi (highest gain) were chosen for full testing.

GFSK(4.0) mode

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2402
Middle	2442
High	2480

GFSK(4.0) mode: 1Mbps long data rates (worst case) were chosen for full testing.

5. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 and FCC CFR 47 15.207, 15.209 and 15.247 and KdB 558074.

6. FACILITIES AND ACCREDITATIONS

6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at No.8, Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.7:1992, ANSI C63.10: 2013 and CISPR Publication 22.

6.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW1109).

6.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF
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The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada (ISED#: 2324H)
Germany	TUV NORD
Taiwan	BSMI
USA	FCC
Japan	VCCI

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>

6.5 MEASUREMENT EQUIPMENT USED

Chamber 966 Room (Radiation Test)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Active Loop Antenna	ETS-LINDREN	6502	8905-2356	08/02/2019	08/01/2021
Bilog Antenna With 6dB Attenuator	SUNOL SCIENCES & EMCI	JB1 & AT-N0681	A070506-1 & AT-N0681	09/14/2020	09/13/2021
Cable	Suhner	SUCOFLEX104P EA	20520/4PEA&O6	01/29/2021	01/28/2022
EMI Test Receiver	R&S	ESCI	100960	02/05/2021	02/04/2022
Type N coaxial cable	Suhner	CHA9513	6	01/19/2021	01/18/2022
Software	Excel(ccs-o6-2020 v1.1) , e3(v6.101222)				

7. CALIBRATION AND UNCERTAINTY

7.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

7.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

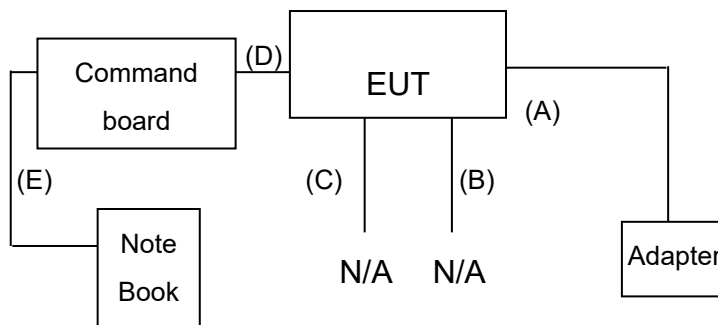
PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz Test Site : CB966	$\pm 3.1\text{dB}$
Radiated Emission, 200 to 1000 MHz Test Site : CB966	$\pm 2.7\text{dB}$
Radiated Emission, 1 to 6 GHz	$\pm 2.7\text{dB}$
Radiated Emission, 6 to 18 GHz	$\pm 2.7\text{dB}$
Radiated Emission, 18 to 26.5 GHz	$\pm 2.7\text{dB}$
Radiated Emission, 26 to 40 GHz	$\pm 3.7\text{dB}$
Power Line Conducted Emission	$\pm 2.0\text{dB}$

This measurement uncertainty is confidence of approximately 95%, $k=2$

8. SETUP OF EQUIPMENT UNDER TEST

8.1 SETUP CONFIGURATION OF EUT

RF



8.2 SUPPORT EQUIPMENT

For RF test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	Note Book	Acer	AS 3830TG	DoC	Power cable, unshd, 1.6m

No.	Signal cable description	
A	Power	Unshielded, 1.5m 1 pcs.
B	MIC	Unshielded, 0.8m 2 pcs.
C	Audio	Unshielded, 1.0m 13 pcs.
D	Command	Unshielded, 0.3m 1 pcs.
E	USB	Shielded, 1.7m 1 pcs with 1 core.

Note:

- 1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3) shd. = shielded; unshd. = unshielded

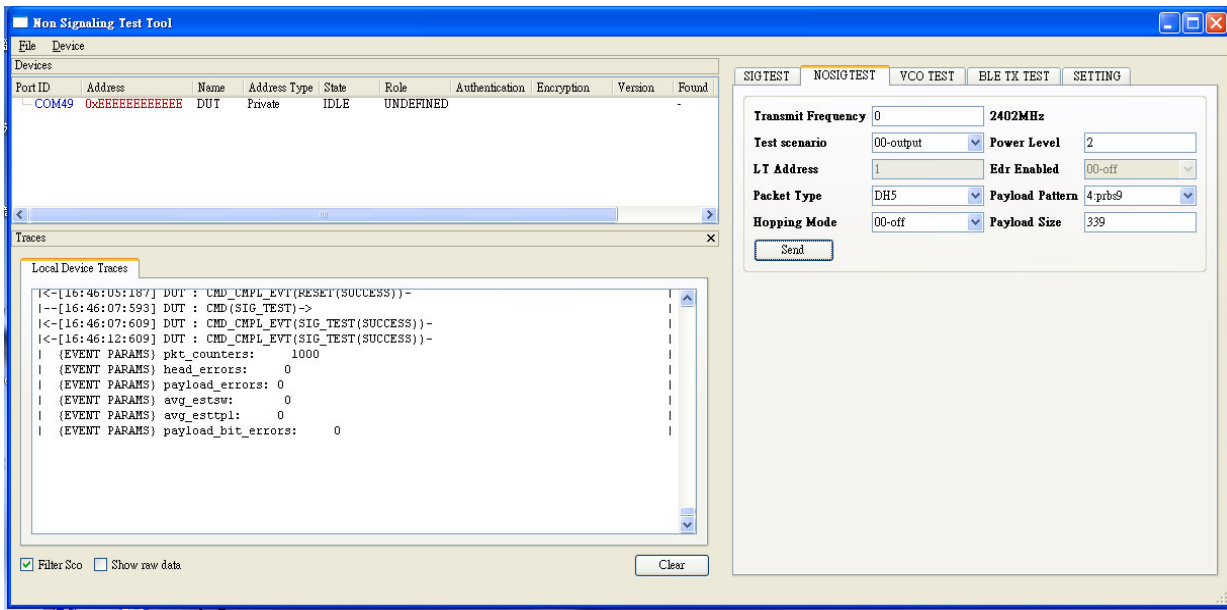
Report No.: T210713N01-RP1-2

Ref. No.: T200610N03-RP1-2

8.3 EUT OPERATING CONDITION

RF Setup

1. Set up all computers like the setup diagram.
2. The “BQB” software was used for testing.
3. Choose “Device” → “Add Platform Device” → “Auto Detect” → “Connect”.



TX Mode:

BT1.0

NOSIG TEST

Transmit Frequency:0 (0,39,78)

Packet Type:DH5 (DH1,DH3,DH5)

Send

BT3.0

NOSIG TEST

Transmit Frequency:0 (0,39,78)

Packet Type:DH5_3 (DH1-3,DH3_3,DH5_3)

Send

BT4.0

BLE TX TEST

Transmit Frequency:0 (0,20,39)

Send

RX Mode:

BLE TX TEST

Receiver Frequency:0 (0,20,39)

4. All of the function are under run.

5. Start test.

9. APPLICABLE LIMITS AND TEST RESULTS

9.1 RADIATED EMISSIONS

9.1.1 TRANSMITTER RADIATED SUPURIOUS EMISSIONS

LIMITS

§ 15.205 (a) Except as shown 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	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	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	2655 - 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 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§ 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)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

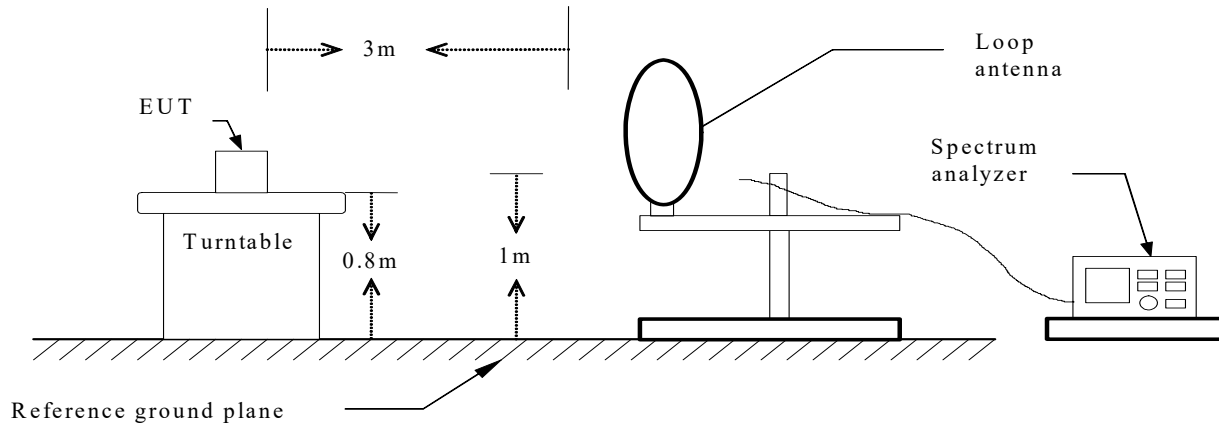
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz, However, operation within these frequency bands is permitted under other sections of this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

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

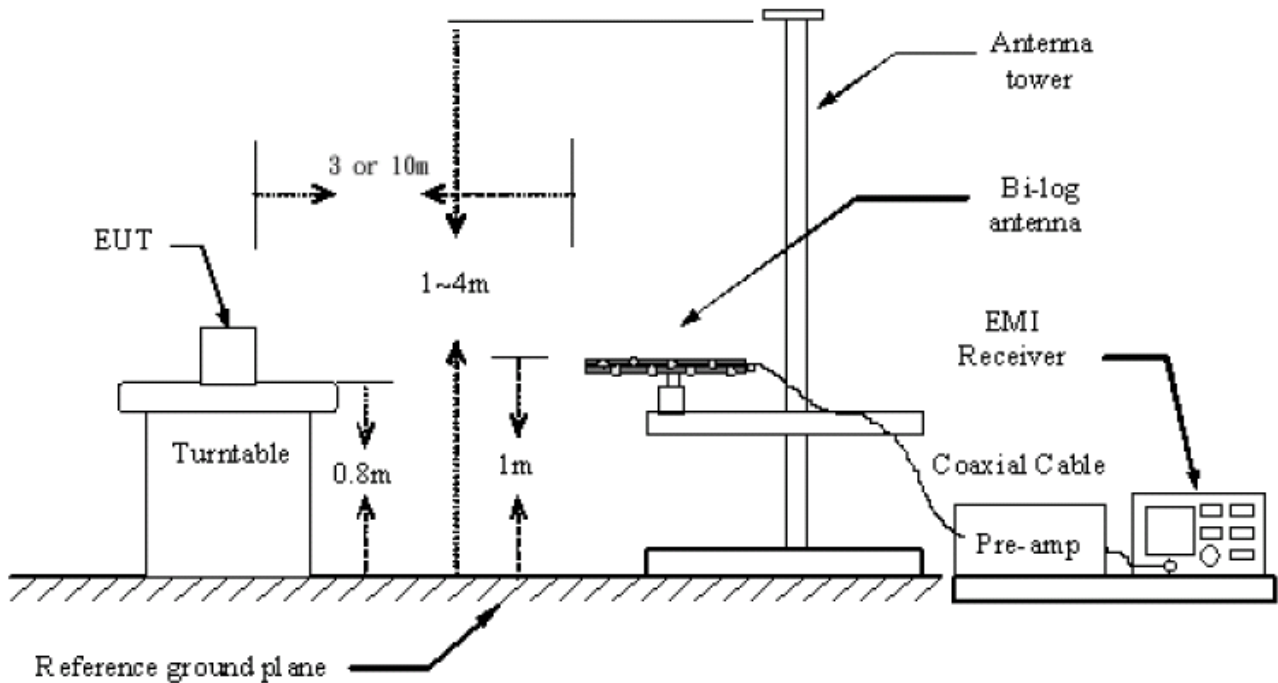
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.

9kHz ~ 30MHz



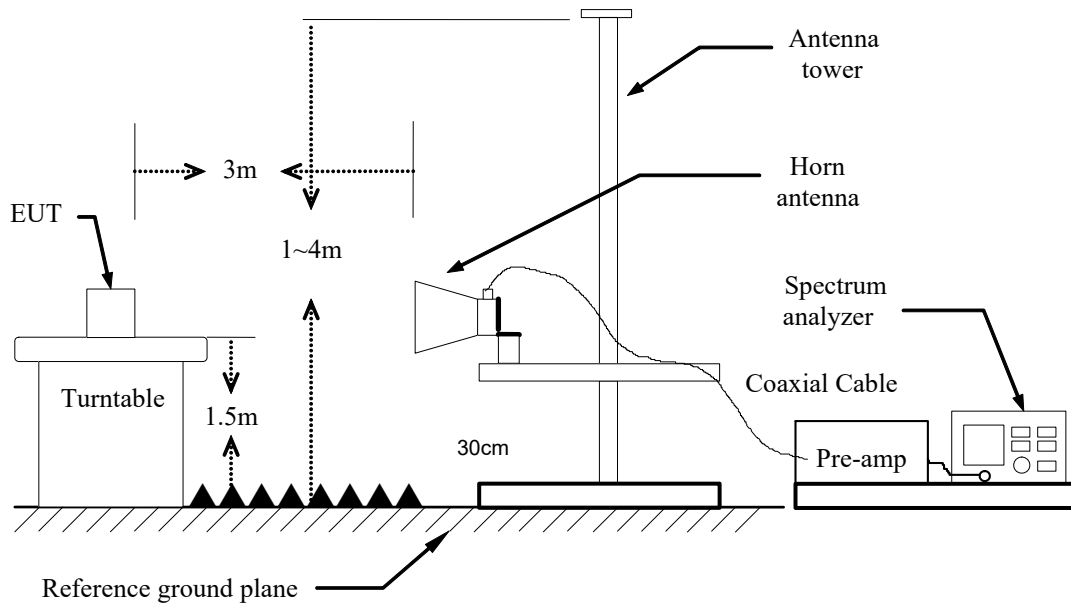
30MHz ~ 1GHz



Report No.: T210713N01-RP1-2

Ref. No.: T200610N03-RP1-2

The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

- The EUT was placed on the top of a rotating table 0.8/1.5 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- While measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. While measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna.
- 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 polarization of the antenna are set to make the measurement.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- The tests were performed in accordance with 558074 D01 15.247 Meas Guidance v05

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. No emission is found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)

TEST RESULTS

No non-compliance noted.

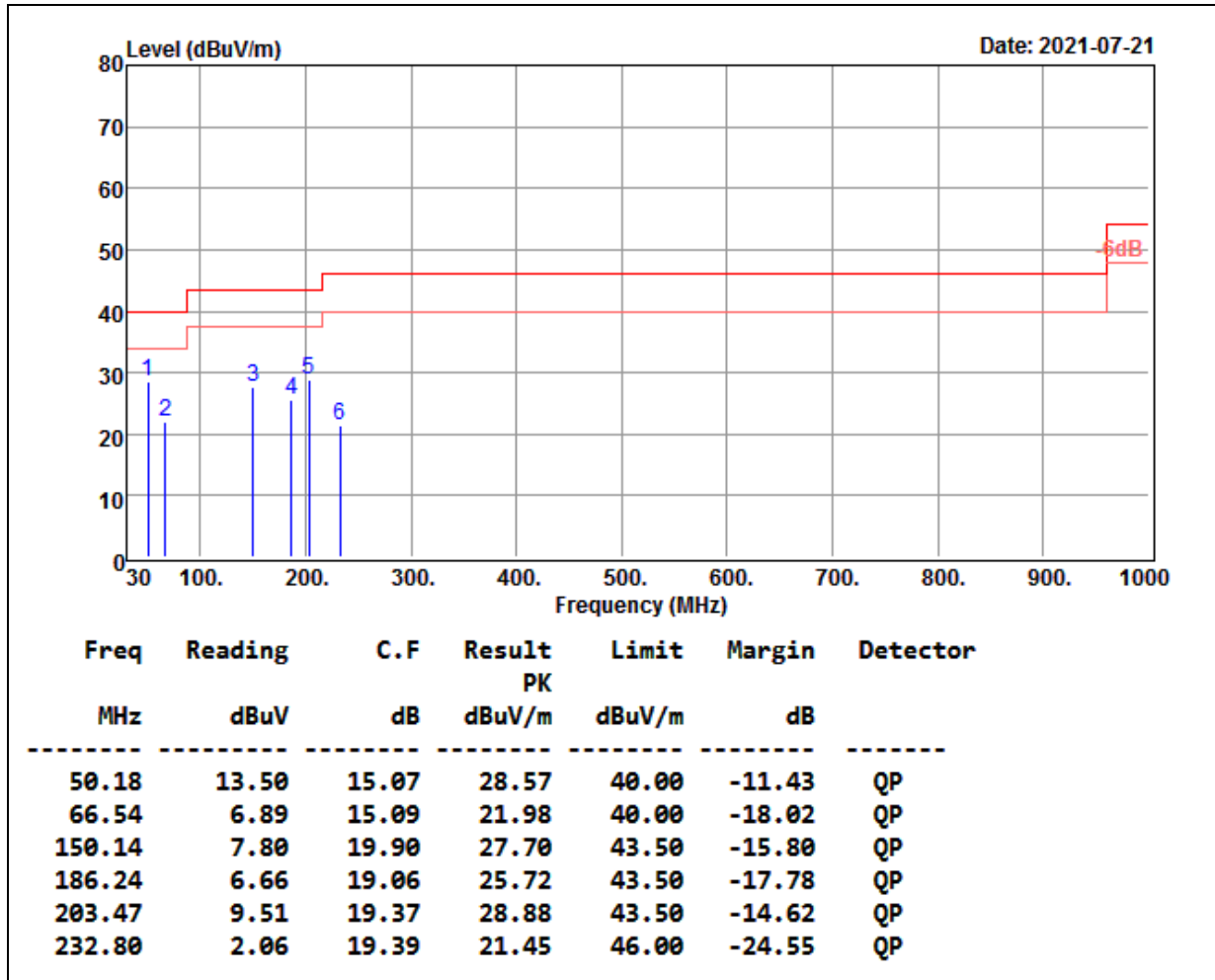
Report No.: T210713N01-RP1-2

Ref. No.: T200610N03-RP1-2

9.1.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Product Name	DJ MIXER	Test Date	2021/07/21
Model Name	RMX-44 BT	Test By	Ted Huang
Test Mode	TX	Temp & Humidity	26.2°C, 58%

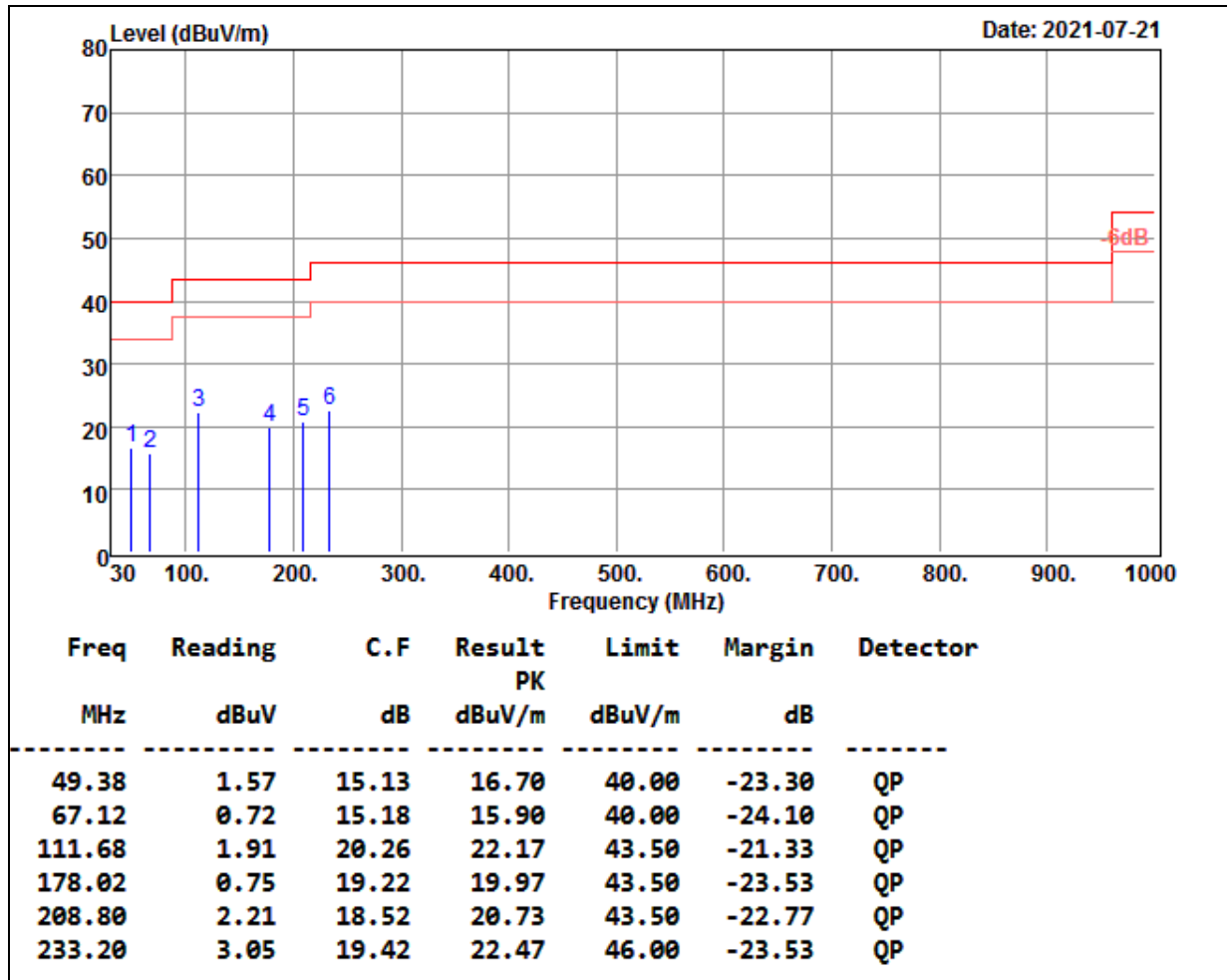
Vertical

**Remark:**

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

Product Name	DJ MIXER	Test Date	2021/07/21
Model Name	RMX-44 BT	Test By	Ted Huang
Test Mode	TX	Temp & Humidity	26.2°C, 58%

Horizontal



Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

10. ANTENNA REQUIREMENT

10.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2 ANTENNA CONNECTED CONSTRUCTION

Manufacturer: Sunitec
Type: PCB Antenna
Model: BM20A
Gain: 1.78 dBi

=== END of Report ===