

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No. : OT-216-RWD-076

Reception No. : 2104002293

Applicant : Audio-Technica Corporation

Address : 2-46-1 Nishi-naruse, Machida, Tokyo, 194-8666, Japan

Manufacturer : Audio-Technica Corporation

Address : 2-46-1 Nishi-naruse, Machida, Tokyo, 194-8666, Japan

Type of Equipment : STEREO TRANSMITTER

FCC ID. : JFZT3205DF2

Model Name : ATW-T3205DF2

Multiple Model Name : N/A

Serial number : N/A

Total page of Report : 7 pages (including this page)

Date of Incoming : May 14, 2021

Date of issue : June 25, 2021

SUMMARY

The equipment complies with the regulation; *FCC PART 15 SUBPART C Section 15.236*

This test report only contains the result of a single test of the sample supplied for the examination.

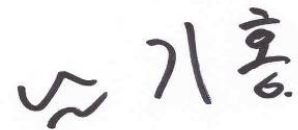
It is not a generally valid assessment of the features of the respective products of the mass-production.



Tested by
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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-216-RWD-076	June 25, 2021	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : Audio-Technica Corporation
 Address : 2-46-1 Nishi-naruse, Machida, Tokyo, 194-8666, Japan
 Contact Person : Fumio Kamimura / General Manager
 Telephone No. : +86-571-86697197
 FCC ID : JFZT3205DF2
 Model Name : ATW-T3205DF2
 Brand Name :  **audio-technica**
 Serial Number : N/A
 Date : June 25, 2021

EQUIPMENT CLASS	DWM- Part 15 Wireless Microphone
E.U.T. DESCRIPTION	STEREO TRANSMITTER
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2020
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.236 KDB 206256 D01 Wireless Microphones v02 ETSI EN 300 422-1 V1.4.2(2011-08)
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. GENERAL INFORMATION

2.1 Product Description

The Audio-Technica Corporation, Model ATW-T3205DF2 (referred to as the EUT in this report) is a STEREO TRANSMITTER. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	STEREO TRANSMITTER	
TEMPERATURE RANGE	0 °C ~ 45 °C	
OPERATING FREQUENCY	470.125 MHz ~ 607.875 MHz	
MODULATION TYPE	FM	
NUMBER OF CHANNEL	5 511 Channel	
RF OUTPUT POWER	50 mW Mode	15.448 dBm
	10 mW Mode	11.118 dBm
ANTENNA TYPE	Whip Antenna	
ANTENNA GAIN	1.298 dBi	
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32 MHz	

2.2 Alternative type(s)/model(s); also covered by this test report.

-. None

3. EUT MODIFICATIONS

-. None

4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are $f/1500$ mW/cm² for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm² for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$$E = \sqrt{(30 * P * G) / d}, \text{ and } S = E^2 / Z = E^2 / 377, \text{ because } 1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$$

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric field strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G) / (377 * 10 S)}$$

Changing to units of mW and cm, using P (mW) = P (W) / 1 000, d (cm) = 0.01 * d (m)

$$d = 0.282 * \sqrt{(P * G) / S}$$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

4.2 EUT Description

Kind of EUT	STEREO TRANSMITTER
Device Category	<input type="checkbox"/> Portable (< 20 cm separation) <input type="checkbox"/> Mobile (> 20 cm separation) <input checked="" type="checkbox"/> Others
Exposure Evaluation Applied	<input checked="" type="checkbox"/> MPE <input type="checkbox"/> SAR <input type="checkbox"/> N/A

4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained

Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance (dBm)	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm ²) @ 20 cm Separation	Limit (mW/cm ²)
			(dBm)	(mW)	Log	Linear			
470 ~ 608	50 mW	14.0 ± 1.0	15.00	31.62	1.298	1.350	1.84	0.008 5	1
	10 mW	9.0 ± 1.0	10.00	10.00			1.04	0.002 7	1

According to above table, for 470 ~ 608 MHz Band(50 mW), safe distance,

$$D = 0.282 * \sqrt{(31.62 * 1.350)/1.00} = 1.84 \text{ cm.}$$

For getting power density at 20 cm separation in above table, following formula was used.

$$S = P * G / (4\pi * R^2) = 31.62 * 1.350 / (4 * \pi * 20^2) = 0.008 5$$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna