



RF Exposure Evaluation Report

FOR:

Universal Audio, Inc.

Model Name:

GPM-LION

Product Description:

Guitar Effects Pedal

FCC ID: 2AXKQ2077

ISED: 26610-2077

Per:

CFR Part Part1 (1.1307 & 1.1310), Part 2 (2.1093),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISED RSS-102 Issue 5

Report number: EMC_UNIVE_031_23001_FCC_ISED_RF_Exposure_Rev1

DATE: 2023-09-27



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1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the equipment (as identified in section 3 of this test report) with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1.1307, Part 2 (2.1093) and ISED standard RSS-102 issue 5 under worst case conditions (measured or rated RF output power including tune-up tolerance, antenna gain, the distance towards the human body, multiple transmitter information as presented by the applicant).

In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits stipulated by the above given FCC and ISED rule parts based on available specifications for worst-case conditions at a separation distance greater than 20cm to the body.

Company	Description	Model #
Universal Audio, Inc.	Guitar Effects Pedal	GPM-LION

Responsible for Testing Laboratory:

Arndt Stoecker

2023-09-27 Compliance (Director of Regulatory Services)

Date	Section	Name	Signature
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Responsible for the Report:

Art Thammanavarat

2023-09-27 Compliance (Senior EMC Engineer)

Date	Section	Name	Signature
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The test results of this test report relate exclusively to the test item specified in Section3.

CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Stoecker, Arndt
Responsible Project Leader:	Quintal, Phillip

2.2 Identification of the Client / Manufacturer

Applicant's Name:	Universal Audio, Inc.
Street Address:	4585 Scotts Valley Drive
City/Zip Code	Scotts Valley, CA 95066
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Assessment

3.1 EUT Specifications

Product Description:	Guitar Effects Pedal
Model Name :	GPM-LION
HW Version :	10007488
SW Version :	1.1.5
FCC-ID :	2AXKQ2077
ISED :	26610-2077
Frequency Range / number of channels:	Nominal band: 2400 MHz – 2483.5 MHz; Center to center: 2402 MHz (ch 0) – 2480 MHz (ch 39), 40 channels
Bands/Modes Supported	Bluetooth Modules Model Name : Nordic NRF52810_QCAA-R Wireless Technologies BLE 5.0
Modes of Operation:	Bluetooth LE in both advertising and connected mode of operation
Antenna Information as declared:	max gain 0 dBi
Max. Peak Output Power:	Original Power 3.22 dBm
Other Radios included in the device	N/A
Power Supply/ Rated Operating Voltage Range	100-240 VAC
Operating Temperature Range	-10 °C to 40 °C
Sample Revision	<input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production
EUT Dimensions	147mm x 91mm x 65mm
Weight	605 grams
EUT Diameter	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____

4 RF Exposure Limits and FCC and ISED Basic Rules

4.1 FCC

4.1.1 § 2.1093(c)(1)

Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for mobile devices with single RF sources having either more than an available maximum time-averaged power of 1 mW or more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)(C), whichever is greater. For mobile devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 of this chapter is necessary if the ERP of the device is greater than ERP_{20cm} in the formula below. If the ERP of a single RF source at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP) in comparison with the following formula only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

$$P_{th}(\text{mW}) = ERP_{20\text{ cm}}(\text{mW}) = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

4.1.2 § 2.1093(c)(2)

For multiple mobile or portable RF sources within a device operating in the same time averaging period, routine environmental evaluation is required if the formula in § 1.1307(b)(3)(ii)(B) of this chapter is applied to determine the exemption ratio and the result is greater than 1.

4.1.3 § 1.1307(b)(3)(ii)(B)

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

4.2 ISED RSS 102

4.1.4 Clause 2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

5 Evaluations

5.1 FCC RF Exposure (Standalone)

Radio	Tech-Band	Freq-Low _[GHz]	Pwr _[dBm]	Power _[W]	Ant-G _[dBi]	EIRP _[W]	ERP _[W]	ERP _[mW]	Threshold ERP _[W]	ERP < Threshold ERP _[W]	FCC 2.1091(c)(1) P _{th} _[mW] = ERP _{20cm}
BT	LE	2.4020	3.22	0.0021	0.00	0.002	0.001	1.28	0.05	Yes	3060.00

5.2 ISED RF Exposure (Standalone)

									SAR	
									RSS-102 2.5.1 D≤20 cm (300 ≤ Freq ≤ 5800 MHz)	
Radio	Tech-Band	Freq-Low [MHZ]	Pwr _[dBm]	Power _[W]	Ant-G [dBi]	EIRP _[W]	ERP _[mW]		Exemption limit for Routine Evaluation	Exemption (Y/N)
BT	LE	2402.0	3.22	0.002	0	0.002	1.675		6.74	Yes

Conclusion:

- The device is intended to be operated by foot. The conservative distance of 5 mm is an estimate of how close a human body can be to the device in its typical application.
- The maximum RF emissions from this equipment fulfills the SAR exclusion threshold limits for separation distance between the antenna and the human body greater than 5 mm. SAR is not required.

6 Revision History

Date	Report Name	Changes to report	Prepared by
2023-09-13	EMC_UNIVE_031_23001_FCC_ISED_RF_Exposure	Initial Version	Art Thammanavarat
2023-09-27	EMC_UNIVE_031_23001_FCC_ISED_RF_Exposure_Rev1	<u>Report Revised base on TCB's Feedback.</u> 1. Section 3.1, 5.1 and 5.2: Updated Output Power.	Art Thammanavarat

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