



# Test Report - RF Exposure Evaluation Report for SAR Exclusion

## Applicant: Tungsten Audio, LLC

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 2/17/2023

This test report shall not be reproduced except in full without the written and signed permission of Timco Engineering Inc. (IIA). This test report relates only to the items tested as identified and is not valid for any subsequent changes or modifications made to the equipment under test.



Timco Engineering, Inc., an IIA Company  
849 NW State Road 45, Newberry, Florida 32669  
(352) 472-5500 / [testing@timcoengr.com](mailto:testing@timcoengr.com)

## Table of Contents

---

CUSTOMER INFORMATION.....	3
LOCATION OF TESTING .....	3
1.1    TEST LABORATORY .....	3
1.2    TESTING WAS PERFORMED, REVIEWED BY .....	4
TEST SAMPLE(S) (EUT/DUT) .....	5
1.3    DESCRIPTION OF THE EUT.....	5
HISTORY OF TEST REPORT CHANGES .....	8



Timco Engineering, Inc., an IIA Company  
849 NW State Road 45, Newberry, Florida 32669  
(352) 472-5500 / [testing@timcoengr.com](mailto:testing@timcoengr.com)

## Customer Information

**Applicant:** Tungsten Audio, LLC  
**Address:** 9864 E. Grand River, Suite 110, Unit 147  
Brighton, MI 48116  
USA

## Location of Testing

### 1.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at Timco's permanent laboratory located at 849 NW State Road 45, Newberry, Florida 32669

FCC test firm # 578780  
FCC Designation # US1070  
FCC site registration is under A2LA certificate # 0955.01  
ISED Canada test site registration # 2056A  
EU Notified Body # 1177  
For all designations see A2LA scope # 0955.01



Timco Engineering, Inc., an IIA Company  
849 NW State Road 45, Newberry, Florida 32669  
(352) 472-5500 / [testing@timcoengr.com](mailto:testing@timcoengr.com)

### 1.2 Testing was performed, reviewed by

Dates of Testing: 11/09/2022

Signature:

A handwritten signature of "Tim Royer" in black ink.



Name & Title:

Tim Royer, EMC Engineer

Date of Signature

2/17/2023

Signature:

A handwritten signature of "Terri Allen" in black ink.

Name & Title:

Terri Allen, Lab Assistant

Date of Signature

2/17/2023



Timco Engineering, Inc., an IIA Company  
849 NW State Road 45, Newberry, Florida 32669  
(352) 472-5500 / [testing@timcoengr.com](mailto:testing@timcoengr.com)

## Test Sample(s) (EUT/DUT)

The test sample was received: 11/09/2022

### 1.3 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

Identification	
FCC ID / IC:	2A8PBLSS4001 / 29693-LSS4001
Brief Description	Bluetooth Speaker
Model(s) #	LSS4-001

Technical Characteristics	
Technology	Bluetooth Speaker
Frequency Range	2402 – 2483.5 MHz
RF O/P Power (Max.)	6.95 dBm/ 0.005 W
Duty Cycle	100 %
Antenna Connector	N/A
Voltage Rating (AC or Batt.)	AC Charging/ Internal Battery

Antenna Characteristics			
Antenna	Frequency Range	Mode / BW	Antenna Gain
1	n/a	n/a	0 dBi

- Note: Information such as antenna gain, firmware/software numbers are provided by manufacturer and cannot be validated by the test lab.

## SAR EXCLUSION CALCULATION:

Section 4.3.1 General SAR test exclusion guidance

Equation:

For 100 MHz to 6 GHz and *test separation distances*  $\leq$  50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}}] \leq 3.0 \text{ for 1-g SAR, and} \leq 7.5 \text{ for 10-g extremity SAR,}^{30} \text{ where}$

- $f_{(\text{GHz})}$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation<sup>31</sup>
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

RSS 102 Section 2.5 Exemption Limits for Routine Evaluation

Equation:

- below 20 MHz<sup>6</sup> and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- 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;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).



Timco Engineering, Inc., an IIA Company  
849 NW State Road 45, Newberry, Florida 32669  
(352) 472-5500 / [testing@timcoengr.com](mailto:testing@timcoengr.com)

Conclusion: SAR testing is not required.

FCC Table Data:

**MPE**

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
2400-2483.5 MHz	20	6.95	0.00	100%	0.00	0.001 mW/cm <sup>2</sup>	1 mW/cm <sup>2</sup>	5 mW/cm <sup>2</sup>	20.00

ISED Table Data:

**MPE**

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
2400-2483.5 MHz	20	6.95	0.00	100%	0.00	0.01 W/m <sup>2</sup>	5.47 W/m <sup>2</sup>	32.17 W/m <sup>2</sup>	20.00

Conclusion: SAR testing is not required.



Timco Engineering, Inc., an IIA Company  
849 NW State Road 45, Newberry, Florida 32669  
(352) 472-5500 / [testing@timcoengr.com](mailto:testing@timcoengr.com)

## History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_5070-22 & 5071-22_RF Exp SAR Exclusion_	1	Initial release	11/22/2022



Timco Engineering, Inc., an IIA Company  
849 NW State Road 45, Newberry, Florida 32669  
(352) 472-5500 / [testing@timcoengr.com](mailto:testing@timcoengr.com)

---

END OF TEST REPORT

---