

RF VENUE, INC.

MPE REPORT

SCOPE OF WORK

MPE Calculation on 6-to-1 Active RF Combiner

REPORT NUMBER

105431768BOX-001.1

ISSUE DATE

January 23, 2024

REVISION DATE

March 4, 2024

DOCUMENT CONTROL NUMBER

Non-Specific Radio Report Shell Rev. December 2017

© 2017 INTERTEK



MPE CALCULATION REPORT

(FULL COMPLIANCE)

Report Number: 105431768BOX-001.1
Project Number: G105431768

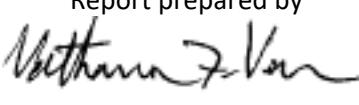
Report Issue Date: January 23, 2024
Report Revision Date: March 4, 2024

Model(s) Tested: RF VENUE COMBINE 6

Standards: **FCC Part 1 Subpart I, April 2021**
Procedures Implementing the National Environmental Policy Act of 1969
§1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.

Tested by:
Intertek
70 Codman Hill Road
Boxborough, MA 01719
USA

Client:
RF Venue, Inc.
72 Nickerson Rd
Ashland, MA 01721
USA

Report prepared by

Vathana Ven / Sr. EMC Staff Engineer

Report reviewed by

Kouma Sinn / Sr. EMC Staff Engineer

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Table of Contents

1	<i>Introduction and Conclusion</i>	4
2	<i>Evaluation Summary</i>	4
3	<i>Client Information</i>	5
4	<i>Description of Equipment Under Test and Variant Models</i>	5
5	<i>Power Density Calculation</i>	6
6	<i>Revision History</i>	8

1 Introduction and Conclusion

This evaluation report covers for a mobile device subject to routine environmental evaluation for RF exposure. A mobile device is defined as a transmitting device designed to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

The evaluation indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining sections are the verbatim text from the actual evaluation during the investigation. These sections include the evaluation name, the specified Method, and Results. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product evaluated **complies** with the requirements of the standard(s) indicated. The results obtained in this report pertain only to the item(s) evaluated. Intertek does not make any claims of compliance for samples or variants which were not evaluated.

2 Evaluation Summary

Section	Test full name	Result
3	Client Information	-
4	Description of Equipment Under Evaluation and Variant Models	-
5	System Setup and Method	-
6	Power Density Calculation (FCC §1.1310)	Compliant
7	Revision History	-

3 Client Information

This EUT was evaluated at the request of:

Client: RF Venue, Inc.
72 Nickerson Rd.
Ashland, MA 01721
USA

Contact: Matt Glass
Telephone: (800) 795-0817
Email: matt@rfvenue.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: RF Venue, Inc.
72 Nickerson Rd.
Ashland, MA 01721
USA

Description of Equipment Under Test (provided by client)
The EUT is a 6-to-1 Active RF Combiner.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
100-240 VAC	1.0 A	50/60 Hz	1

Variant Models:

The following variant models have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 Power Density Calculation

5.1 Requirement(s)

FCC §1.1310 Radiofrequency radiation exposure limits

Table 1 below sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic field.

Table 1 – Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power Density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	842/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

5.2 Method

An MPE evaluation was performed in order to show that the device was compliant with FCC §2.1091. The maximum power density was calculated for each transmitter at a separation distance of 20 cm. The calculation was performed using the maximum gain from the internal and external antennas declared by the manufacturer.

The maximum permissible exposure (MPE) is predicted by using the following equation:

$$S = PG/4\pi R^2$$

where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

5.3 Calculation:

For P = 29.12^{a)} mW, G = 11.15 dBi (13.03), R = 20 cm, F: 539 MHz

$$S = [(29.12)*(13.03)]/(4*\pi*20^2) = 0.075486 \text{ mW/cm}^2 = 0.75486 \text{ W/m}^2$$

^a The output power used for this calculation was taken from Intertek test report number # 105431768BOX-001.

5.4 Results:

The sample tested was found to Comply. The calculated maximum power density at 20 cm distance is less than the limits for general population / uncontrolled exposure of 0.35933 **mW/cm²** [from f/1500].

6 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	01/23/2024	105431768BOX-001.1	VFV <i>VFV</i>	KPS <i>KPS</i>	Original Issue
1	03/04/2024	105431768BOX-001.1	VFV <i>VFV</i>	KPS <i>KPS</i>	Removed ISED standard and updated the output power