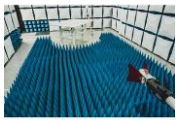
ELEMENT WASHINGTON DC LLC
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.element.com



RF EXPOSURE EVALUATION
Maximum Permissible Exposure (MPE)

Applicant Name:
Atos
Avenue Jean Jaurès,
Les Clayes sous Bois
France 78340

Date of Testing:
5/2 – 8/3/2023
Test Report Issue Date:
8/12/2023
Test Site/Location:
Element Lab. Columbia, MD, USA
Test Report Serial No.:
1M2304200057-03.2A289

FCC ID:	**2A289-LFW-EXTENSE48**
APPLICANT:	**ATOS**

EUT Type:	CBRS Remote Radio Head
FCC Classification:	Category B Citizens Band Radio Service Devices (CBSD)
FCC Rule Part:	FCC Part 1 (§1.1310) and Part 2 (§2.1091)
Test Procedure(s):	KDB 447498 D01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC KDB 447498 D01. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RJ Ortanez
Executive Vice President

ACCREDITED
CERT #2041.01

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without written permission from Element. If you have any questions about this or have an inquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

TABLE OF CONTENTS

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without written permission from Element. If you have any questions about this or have an inquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

1.0 RF EXPOSURE EVALUATION – MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 Introduction

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 of the FCC Rules and Regulations and RSS-102 of Industry Canada.

The limit for Maximum Permissible Exposure (MPE), specified in FCC §1.1310, is listed in Table 1-1. According to FCC §1.1310 and RSS-102: the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b).

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (Minutes)
(A) Limits For Occupational / Control Exposures (f = frequency)				
30-300	61.4	0.163	1.0	6
300-1500	…	…	f/300	6
1500-100,000	…	…	5.0	6
(B) Limits For General Population / Uncontrolled Exposure (f = frequency)				
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

Table 1-1. Limits for Maximum Permissible Exposure (MPE)

1.2 EUT Description

The **Atos FCC ID: 2A289-LFW-EXTENSE48** is a CBRS Remote Radio Head (CBRS RRH). It has two antenna ports which transmit simultaneously in the 3550 – 3700 MHz band. Only the highest power mode is assessed for compliance. The CBRS RRH operated with two antennas which can be either cross-polarized or co-polarized. Therefore, the calculation is based on directional gain for the co-polarized antenna which results in worst-case operation.

Measurements were performed using 67.847% Duty cycle.

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without written permission from Element. If you have any questions about this or have an inquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

1.3 Procedure

The procedure used to determine the RF power density was based upon a calculation for determining compliance with the MPE requirements.

The power generated by each transmitter used in this product was initially measured by a power meter or spectrum analyzer and the powers were recorded. Through use of the Friis transmission formula and knowledge of the maximum antenna gain to be used, the power density level is calculated at a distance of 51cm.

Friis Transmission Formula

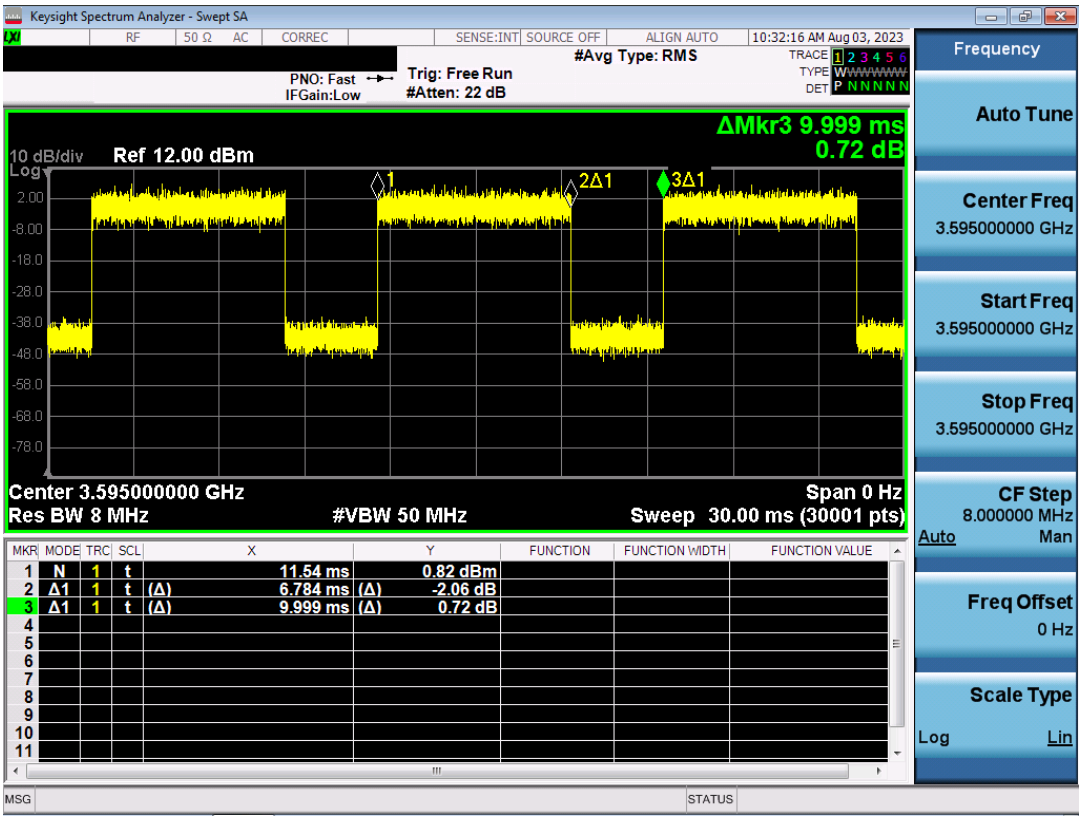
Friis transmission formula: $P_d = (P_{out}*G) / (4\pi r^2)$

Where,

P_d = Power Density (mW/cm^2) π = 3.1416
P_{out} = output power to antenna (mW) r = distance between observation point and center of the radiator (cm)
G = gain of antenna in linear scale

Calculated MPE

The power density limit for General Population/Uncontrolled Exposure at each frequency is determined based on the information in Table 1-1.



Plot 1.1 Duty Cycle Plot

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without written permission from Element. If you have any questions about this or have an inquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

Duty Cycle = Pulse Width / Period – 6.784ms / 9.999ms = 67.847%

Time Averaged Power = Max MIMO Power + Directional Antenna Gain + Duty Cycle Correction
39.75dBm + 7dBi + 10log(0.67847)
39.75dBm + 7dBi – 1.68dB = 45.07dBm

Frequency	3595	MHz
FCC Limit	1.000	mW/cm^2
Distance	51	cm
Max Power	39.75	dBm
Duty Cycle	67.85	%
Duty Cycle Correction	-1.68	dB
Power	9440.61	mW
Max FCC Tx Ant Gain	7.00	dBi
Time-Averaged Power	45.07	dBm
Time-Averaged Power	32103.31	mW
FCC Power Density	0.98220	mW/cm^2

Table 1-2. Calculated MPE Data for CBRS Band

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without written permission from Element. If you have any questions about this or have an inquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

2.0 CONCLUSION

The device meets the mobile RF exposure limit at a 51cm separation distance as specified in §2.1091 of the FCC Rules and Regulations. An appropriate RF exposure compliance statement will be placed in the user's manual.

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without written permission from Element. If you have any questions about this or have an inquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.