

RF Exposure Report

Project Number: 5181325

Proposal: SUW-202310005501

Report Number: 5181325EMC02

Revision Level: 2

Client: Marshall Radio Telemetry, Inc

Equipment Under Test: Tracking Device

Model: Atos Tag

FCC ID: Z4Q-G2-100

Applicable Standards: 47 C.F.R. §§ 2.1091 and 2.1093; FCC KDB 447498

FCC KDB 447498 D01 General RF Exposure Guidance v06

Report issued on: 30 July 2024

Report revised on: 08 January 2025

Test Result: Compliant



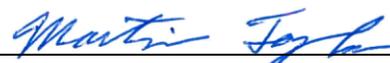
FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01

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1 General Information

1.1 Client Information

Company Name: Marshall Radio Telemetry, Inc
Address: 845 W. Center St.
City, State, Zip, Country: North Salt Lake, UT 84054

1.1 Test Laboratory

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
Type of lab: Testing Laboratory
Certificate Number: 3212.01
FCC Designation Number: US1126

1.2 General Information of EUT

Manufacturer: Marshall Radio Telemetry, Inc
Type of Product: Tracking Device
Lot Number: Atos Tag
Serial Number: 20016735

Frequency Range: 432-437 MHz
Data Modes: FSK
Antenna/Gain*: Linear Antenna (0 dBi gain)

Rated Voltage: Rated Voltage:
Test Voltage: Test Voltage:

Sample Received Date: 29 May 2024
Dates of testing: 29 May 2024 to 08 July 2024

**Data was not measured; therefore, the lab is not responsible for accuracy. Data was obtained via customer, specification sheet, previous regulatory filing, or other means.*

1.3 Operating Modes and Conditions

Manufacturer provided method and commands to put the EUT into the following TX modes for testing transmitter parameters:

- a. Analog Mode, 25 kHz - FM modulated carrier with a 1 kHz sine wave tone in a 25 kHz channel.

2 RF Exposure

2.1 Test Result

Test Description	Product Specific Standard	Test Result
RF Exposure	FCC Part 1.1310	Compliant

2.2 SAR Exclusion Calculations

The highest conducted output power in conjunction with the Upper and Lower frequency boundaries have been used to demonstrate compliance for the transmission mode.

The EUT was considered for body application.

2.3 Single transmission RF Exposure Levels

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SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	-0.37	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	20	mm	
Frequency, f:	432	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	1.000 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	20 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	0.657	[√f(GHz)]

- a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0$$
 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,

Exclusion Calculation(1g):	0.0329	number	<== [v2 / v3] must be less than 3
Exclusion Calculation(10g):	0.0329	number	<== [v2 / v3] must be less than 7.5

Conclusions (Body):	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
Conclusions (Extremity):	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

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SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	-0.37	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	20	mm	
Frequency, f:	437	MHz	

Value reference Number	Values used for Calculation		Reference number definition
v1	1.000	mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	20	mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	0.661		[√f(GHz)]

- a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:
 $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,

Exclusion Calculation(1g):	0.0331	number	<== [v2 / v3] must be less than 3
Exclusion Calculation(10g):	0.0331	number	<== [v2 / v3] must be less than 7.5

Conclusions (Body):	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
Conclusions (Extremity):	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

3 Revision History

Revision Level	Description of changes	Revision Date
Draft	Draft Release	23 July 2024
0	Initial Release	30 July 2024
1	Section 2.3 updated with use distance of 2cm	03 January 2024
2	SAR exemption calculation was used.	08 January 2025