

## RF EXPOSURE EVALUATION

### Maximum Permissible Exposure [MPE]

**Applicant Name:**  
Sirius XM Radio Inc.  
1500 Eckington Place, NE  
Washington, DC 20002  
United States

**Date of Testing:**  
7/14-9/28/2021  
**Test Site/Location:**  
PCTEST Lab. Columbia, MD, USA  
**Test Report Serial No.:**  
1M2107130077-04-R2.RS2

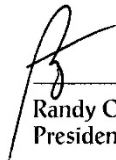
**FCC ID:** RS2SXVRBT1  
**APPLICANT:** Sirius XM Radio Inc.

**EUT Type:** Satellite Radio with FM Transmitter and Bluetooth  
**FCC Classification(s):** Low Power Communication Device Transmitter (DXX),  
FCC Part 15 Spread Spectrum Transmitter (DSS)  
**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.


This revised Test Report (S/N: 1M3107130077-04-R2.RS2) supersedes and replaces the previously issued test report (S/N: 1M3107130077-04-R1.RS2) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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.



\_\_\_\_\_  
Randy Ortanez  
President






<b>FCC ID:</b> RS2SXVRBT1	 <small>Proud to be part of </small>	<b>MAXIMUM PERMISSIBLE EXPOSURE REPORT</b>	 <small>SATELLITE RADIO</small>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2107130077-04-R2.RS2	<b>Test Dates:</b> 7/14-9/28/2021	<b>EUT Type:</b> Satellite Radio with FM Transmitter and Bluetooth		Page 1 of 5

## TABLE OF CONTENTS

---

1.0	RF EXPOSURE EVALUATION – MAXIMUM PERMISSIBLE EXPOSURE (MPE) .....	3
1.1	Introduction .....	3
1.2	EUT Description.....	3
1.3	Procedure .....	4
1.4	Summary of Results.....	4
2.0	CONCLUSION .....	5

<b>FCC ID:</b> RS2SXRBT1	 <b>PCTEST</b> <sup>®</sup> <small>Proud to be part of  element</small>	<b>MAXIMUM PERMISSIBLE EXPOSURE REPORT</b>	 <small>SATELLITE RADIO</small>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2107130077-04-R2.RS2	<b>Test Dates:</b> 7/14-9/28/2021	<b>EUT Type:</b> Satellite Radio with FM Transmitter and Bluetooth	Page 2 of 5	

# 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 <sup>2</sup> )	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 **Sirius XM Radio Inc. FCC ID: RS2SXVRBT1** is a Satellite Radio with FM Transmitter and Bluetooth.

FCC ID: RS2SXVRBT1	 <b>PCTEST</b> Proud to be part of 	<b>MAXIMUM PERMISSIBLE EXPOSURE REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2107130077-04-R2.RS2	Test Dates: 7/14-9/28/2021	EUT Type: Satellite Radio with FM Transmitter and Bluetooth		Page 3 of 5

### 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 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 20cm.

#### Friis Transmission Formula

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

Where,

$P_d$  = Power Density (mW/cm<sup>2</sup>)       $\pi$  = 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.

There is no co-location between the electric fields of any two transmitters therefore following power densities are calculated for each individual transmitter by frequency at 20cm spacing:

<b>Frequency:</b>	2441 MHz		
<b>Limit:</b>	1.000 mW/cm <sup>2</sup>		
<b>Distance (cm), R =</b>	20 cm		
<b>Power (dBm), P =</b>	12 dBm	15.85 mW	
<b>TX Ant Gain (dBi), G =</b>	2.66 dBi		
<b>Power Density (S) =</b>	0.0058 mW/cm <sup>2</sup>	(at 20cm)	
<b>Minimum Distance =</b>	1.5 cm		

Table 1-2. Calculated MPE Data for 2.4GHz Band

### 1.4 Summary of Results



Frequency Band [MHz]	Maximum Antenna Gain [dBi]	MPE @ 20cm (mW/cm <sup>2</sup> )	Test Result
2441	2.66	0.0058	PASS

Table 1-3. Maximum Permissible Exposure Summary Table

FCC ID: RS2SXVRBT1	 PCTEST® Proud to be part of element	MAXIMUM PERMISSIBLE EXPOSURE REPORT	 ((SiriusXM)) SATELLITE RADIO	Approved by: Technical Manager
Test Report S/N: 1M2107130077-04-R2.RS2	Test Dates: 7/14-9/28/2021	EUT Type: Satellite Radio with FM Transmitter and Bluetooth	Page 4 of 5	

## 2.0 CONCLUSION

The device meets the mobile RF exposure limit at a 20cm separation distance as specified in §2.1091 of the FCC Rules and Regulations and Health Canada Safety Code 6. An appropriate RF exposure compliance statement will be placed in the user's manual.

<b>FCC ID:</b> RS2SXRBT1		<b>MAXIMUM PERMISSIBLE EXPOSURE REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2107130077-04-R2.RS2	<b>Test Dates:</b> 7/14-9/28/2021	<b>EUT Type:</b> Satellite Radio with FM Transmitter and Bluetooth	Page 5 of 5	