



Astrobotic Technology, Inc.
RF Communications

CESIUM RADIO SPECTRUM CHARACTERISTICS

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REVISION HISTORY

Revision	Date	Description	Author	Approval
A	2025.02.14	Initial draft.	JDS	

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2 INTRODUCTION

The Cesium Radio S-Band communication subsystem was tested using an antenna hat. Spectrum plots were saved and the spectrum was analyzed.

This document is an attachment to the application for a Part 5 license for one or 2 days of outdoor testing some time in April of 2025.

3 FREQUENCY CHARACTERISTICS

3.1 FREQUENCY AND BANDWIDTH

The Cesium radio was programmed to transmit at 2250.00 MHz. The data rate requires a bandwidth of 1.75 MHz.

Start Frequency (MHz)	Center Frequency (MHz)	Stop Frequency (MHz)	Required Bandwidth (MHz)	Maximum EIRP
2249.125	2250.00	2250.875	1.75	9.2 dBW

Table 3-1. Cube Rover operational frequency and bandwidth.

Frequency Range	Maximum Power Limit in any 4 kHz BW (dBc)	Maximum Power in any 4 kHz BW (dBc)
$f = f_0 \pm 875 \text{ kHz to } f_0 \pm 1.75 \text{ kHz}$	-25	-26.3
$f = f_0 \pm 1.75 \text{ kHz to } f_0 \pm 4.375 \text{ kHz}$	-35	-36.7
$f < f_0 \pm 4.375 \text{ kHz}$	-53	-59.3

Table 3-2. Spurious Emissions

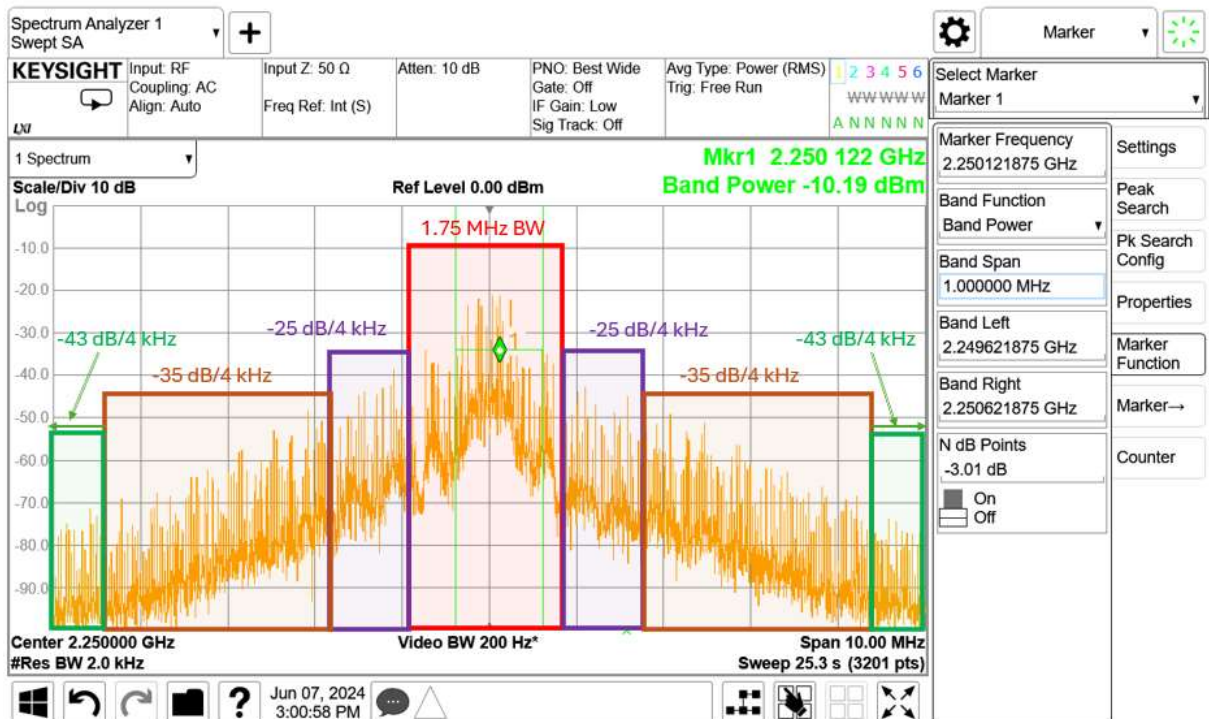


Figure 1: Spectrum Plot

Radio Power	
Center Frequency (GHz)	2.25
Occupied Bandwidth (MHz)	1.75
LGA Antenna Gain (dBi)	9.2
Tx circuit losses (dB)	0
Amplifier Output Power (W)	1
Amplifier Output Power (dBW)	0
EIRP	8.3
EIRP (dBW)	9.2

Table 3-3. Cesium Radio Power