

**Air 2124 – Waiver Test  
Report**  
*FCC-003*

| Revision | Date       | Author       |
|----------|------------|--------------|
| A        | 2024-06-17 | Jens Abraham |

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# 1 Introduction

This document describes the waiver [1] related test results for a Kontur Ground Penetrating Radar (GPR): *Air 2124*.

## 1.1 Summary

The *Air 2124* GPR complies with the extra requirements given in waiver DA 13-1739 [1], namely lowest frequency of operation, highest frequency of operation, notch bands, dwell time and cycle time.

## 1.2 Document Revision History

| Revision | Date       | Changes          |
|----------|------------|------------------|
| A        | 2024-06-17 | Initial Revision |

## 1.3 Abbreviations

- CF: Center Frequency
- DUT: device under test
- RBW: resolution bandwidth
- SWT: sweep time
- VBW: video bandwidth

## 1.4 References

| Reference | Title             | Revision | Date       |
|-----------|-------------------|----------|------------|
| 1         | Waiver DA 13-1739 |          | 2013-08-09 |
|           |                   |          |            |
|           |                   |          |            |
|           |                   |          |            |

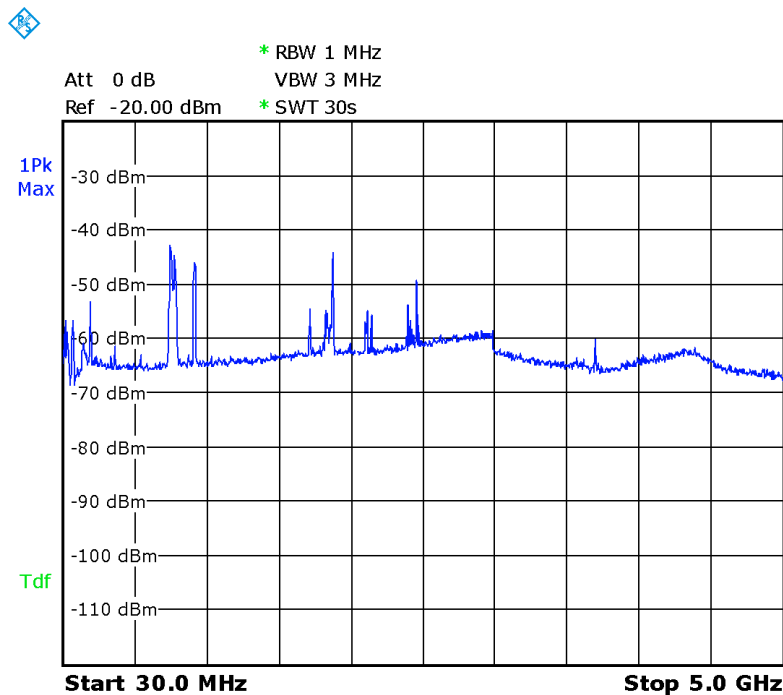
## 2 Measurement Setup

All waiver related tests can be performed with a spectrum analyzer over-the-air by line of sight coupling between the device under test (DUT) *Air 2124* and a reference antenna at about 1 m distance.

The equipment used is:

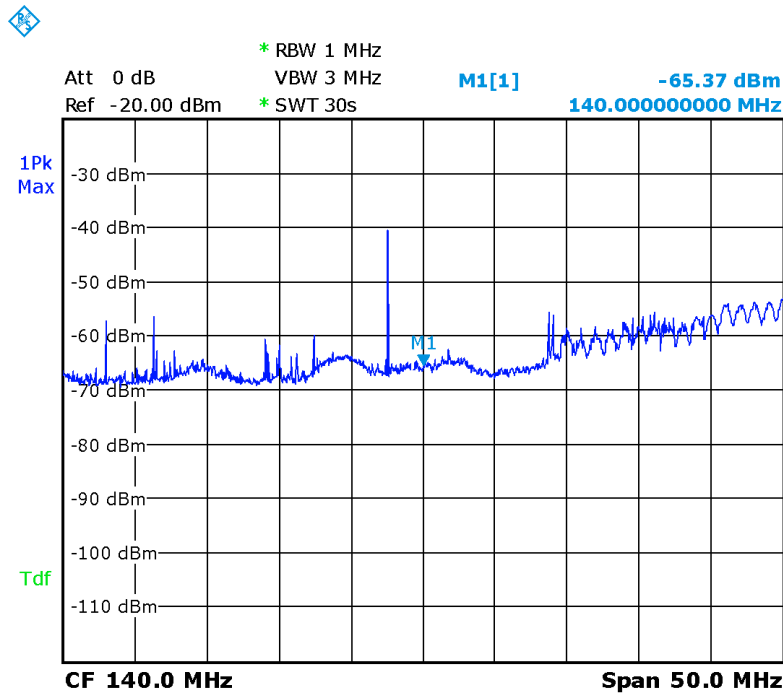
- Spectrum analyzer: Rohde & Schwarz – ZVL13
- Reference antenna: Rohde & Schwarz – HL562 (30 MHz – 3 GHz)
- Coax cable: 6.3 m RG-223

The noise floor of the spectrum analyzer varies between -65 dBm and -60 dBm in the frequency range of interest. Some ambient emissions (e.g. radio, mobile networks, WiFi, BlueTooth) are visible. Moreover, the sensitivity of the spectrum analyzer improves a bit at 3 GHz.



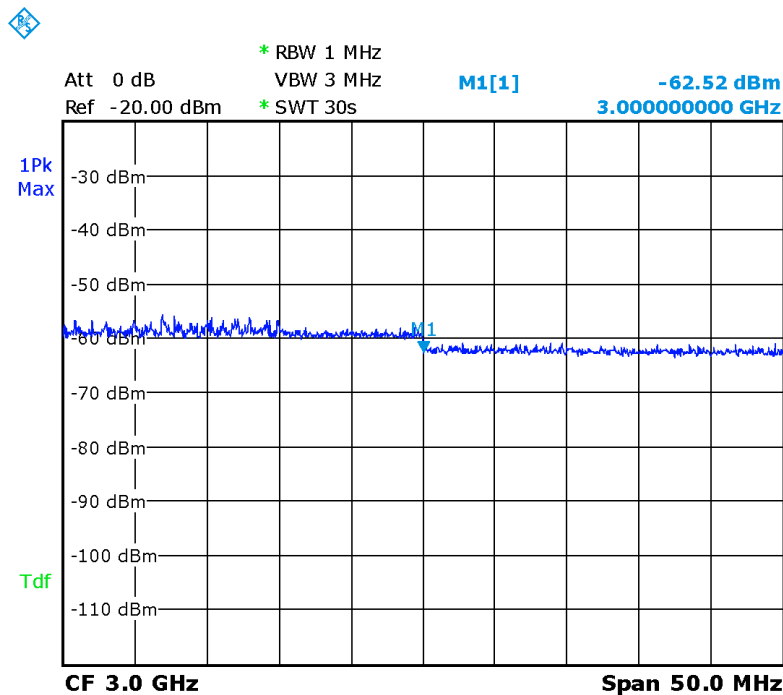
## 3 Measurements

### 3.1 Lowest Frequency of Operation



Below 140 MHz only the noise floor and ambient emissions are visible.

### 3.2 Highest Frequency of Operation

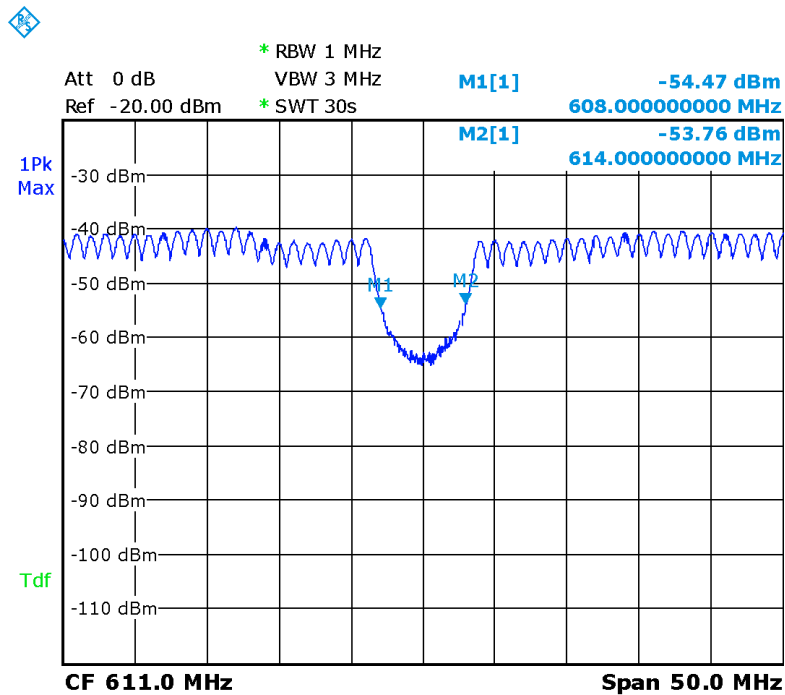


Above 3000 MHz only the noise floor of the measurement instrument is visible.

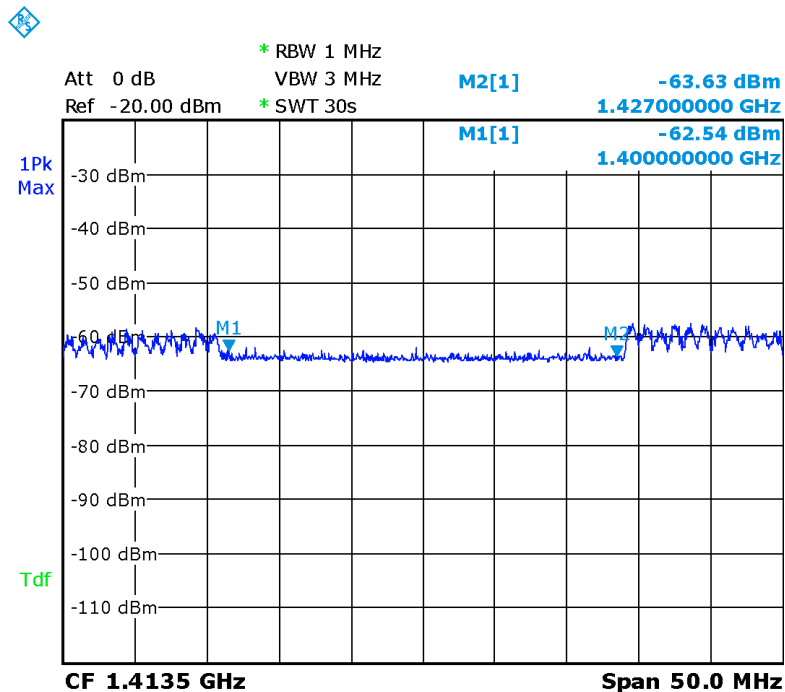
### 3.3 Notch Bands

In the following figures, markers are placed at the notch band edges to show that no intentional radiation is produced inside.

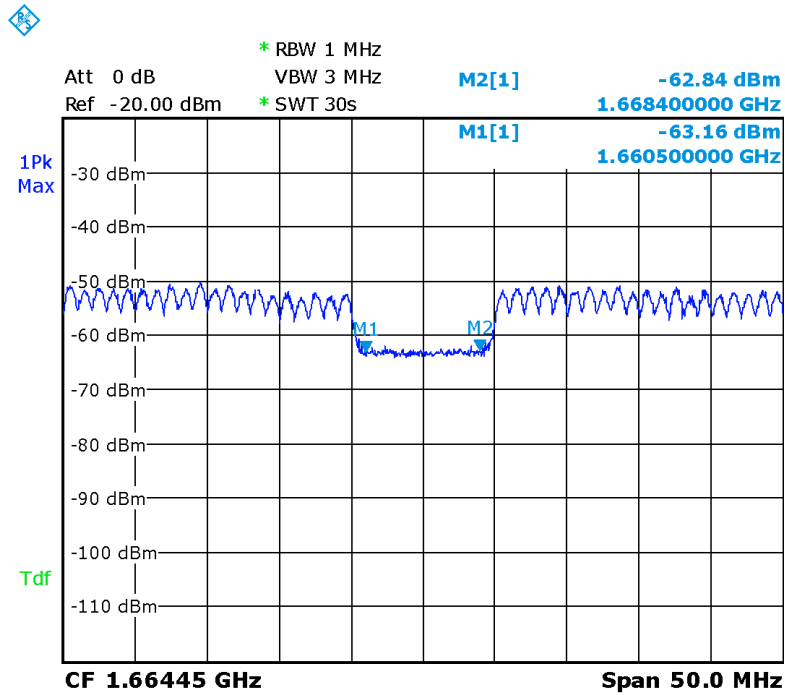
#### 3.3.1 Notch Band 608 MHz – 614 MHz



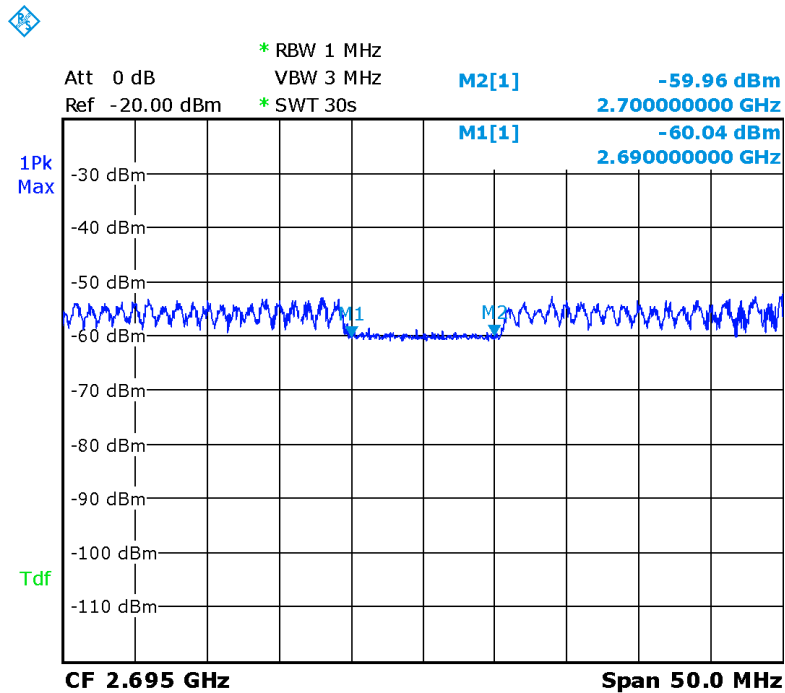
#### 3.3.2 Notch Band 1400 MHz – 1427 MHz



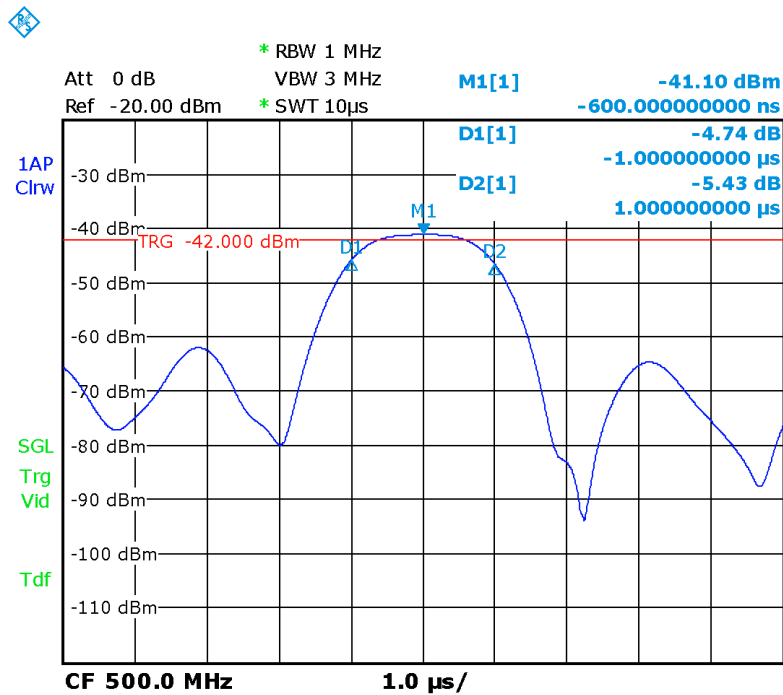
### 3.3.3 Notch Band 1660.5 MHz – 1668.4 MHz



### 3.3.4 Notch Band 2690 MHz – 2700 MHz

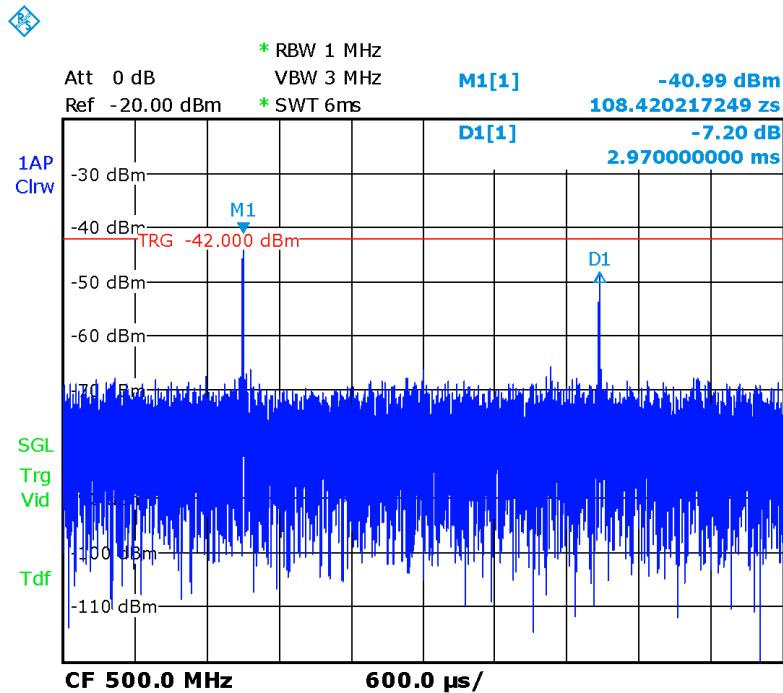


### 3.4 Dwell Time



The flanks of a single frequency step have dropped by about 5 dB with respect to the peak power of the dwell period in a 2 μs window.

### 3.5 Cycle Time



The cycle time is about 3 ms, measured in 1 MHz resolution bandwidth.