Test data, continued

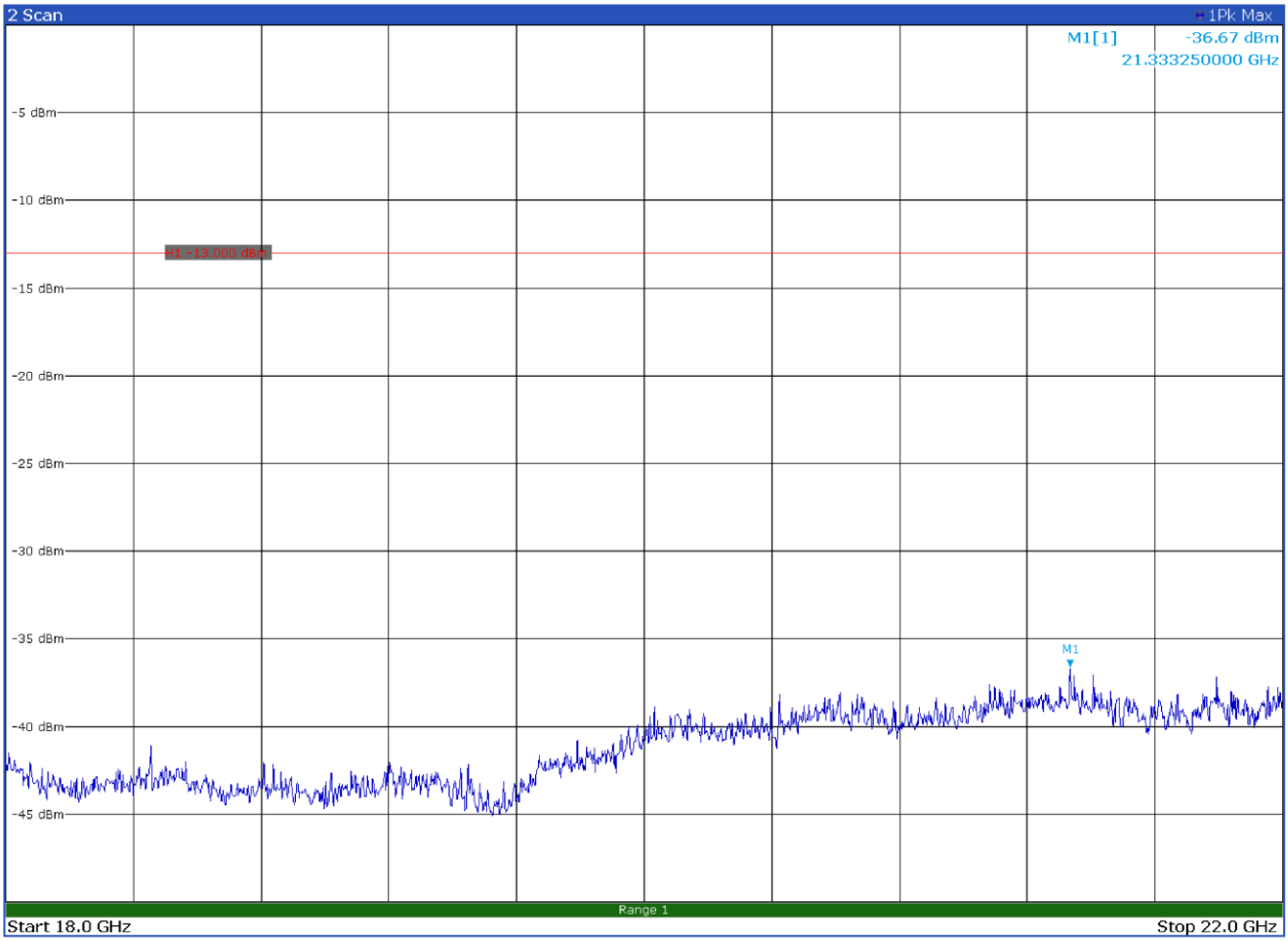


Figure 8.7-5: *Radiated spurious emissions on low channel - LoRa 125 kHz BW – Antenna in horizontal polarization*

Test data, continued

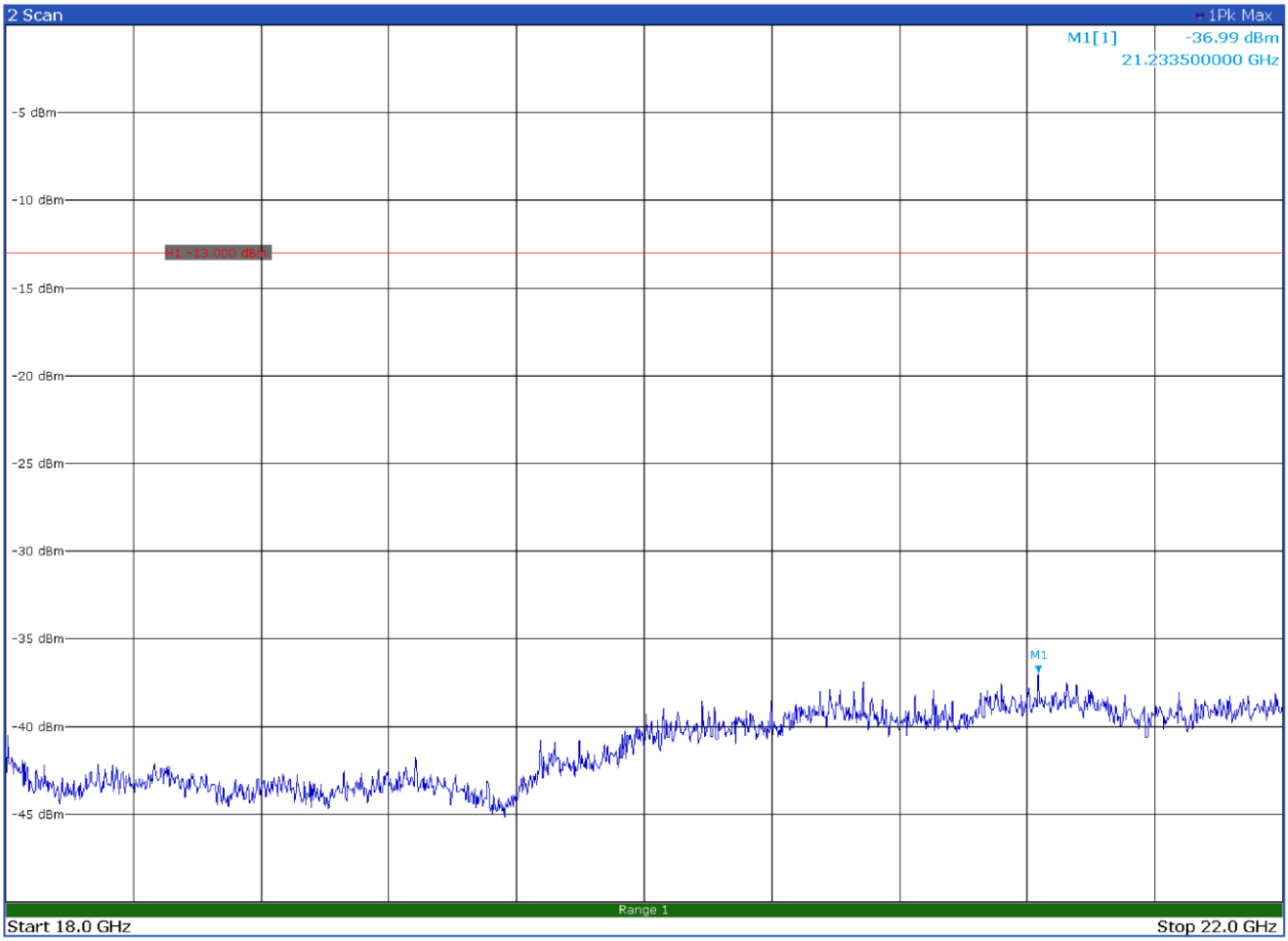


Figure 8.7-6: *Radiated spurious emissions on low channel - LoRa 125 kHz BW – Antenna in vertical polarization*

Test data, continued

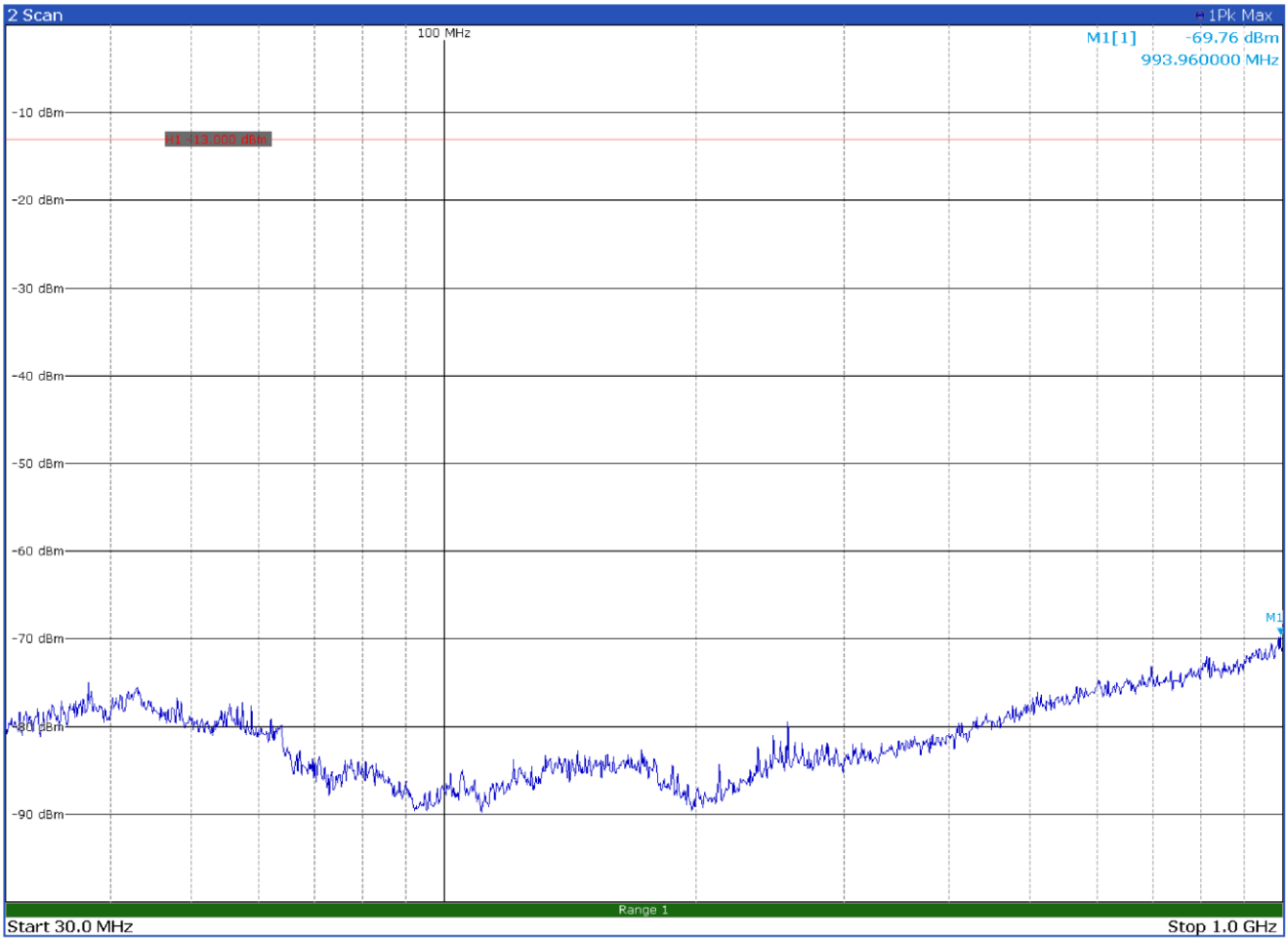


Figure 8.7-7: *Radiated spurious emissions on mid channel - LoRa 125 kHz BW – Antenna in horizontal polarization*

Test data, continued

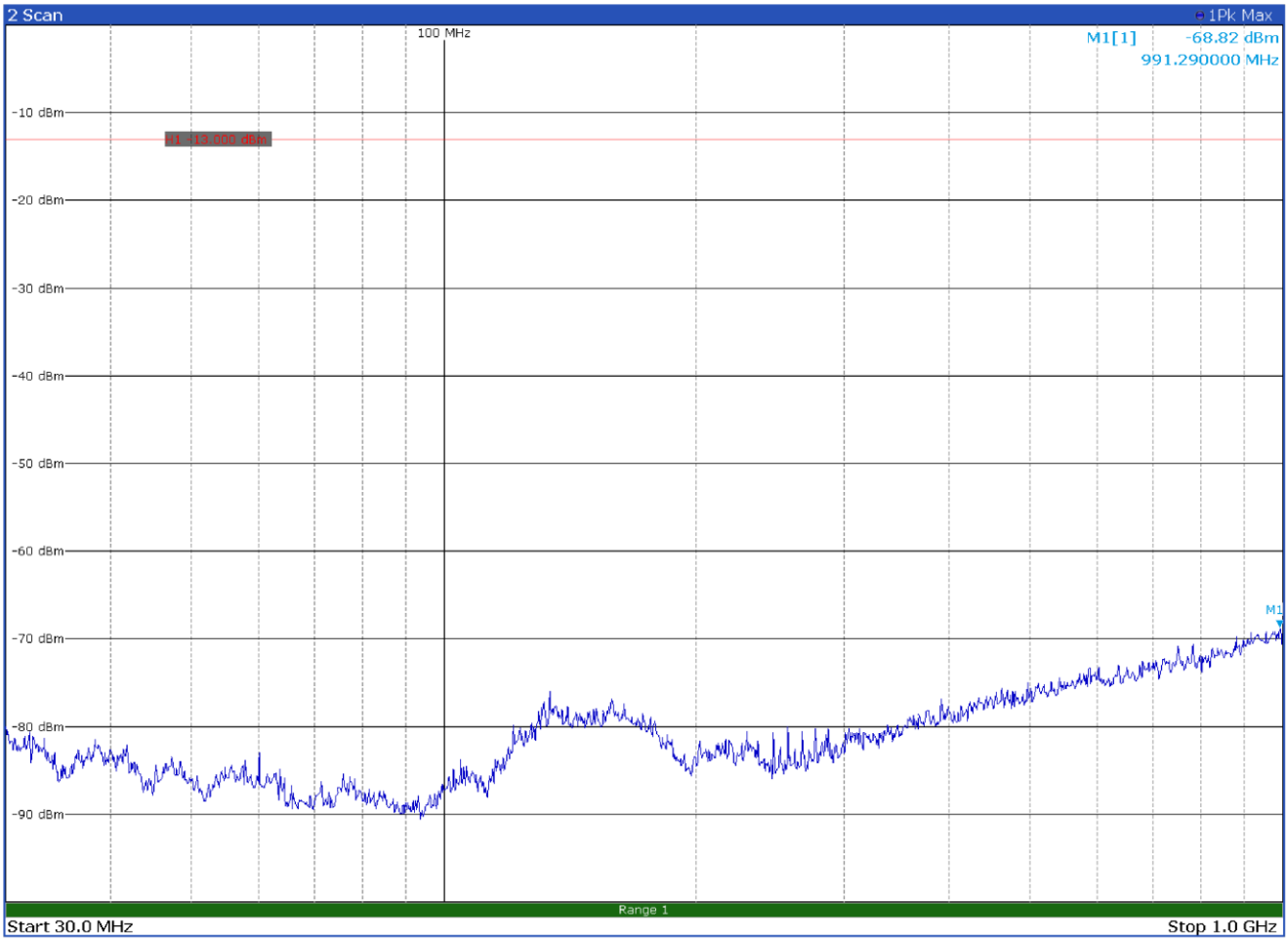


Figure 8.7-8: *Radiated spurious emissions on mid channel - LoRa 125 kHz BW – Antenna in vertical polarization*

Test data, continued

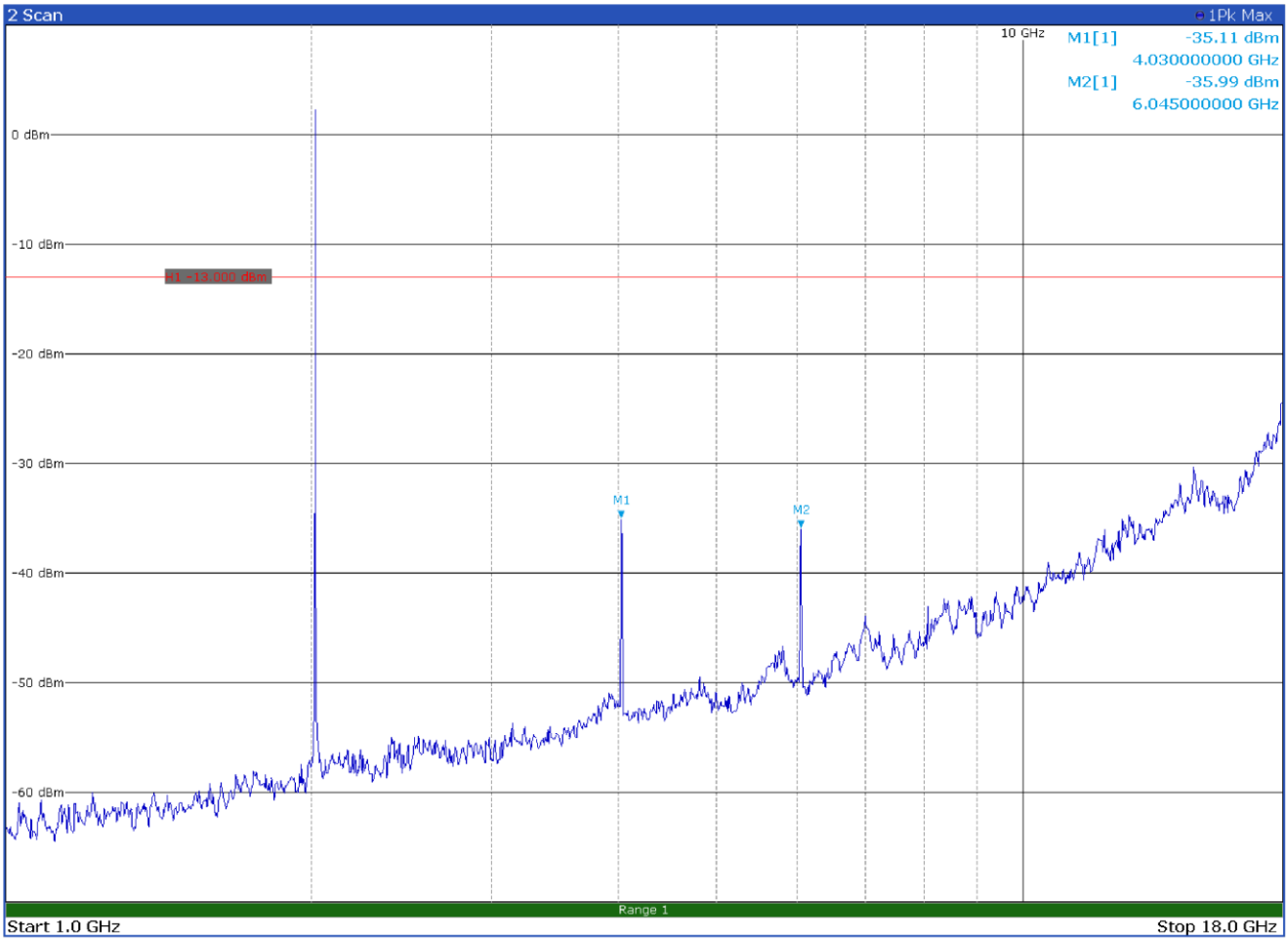


Figure 8.7-9: *Radiated spurious emissions on mid channel - LoRa 125 kHz BW – Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

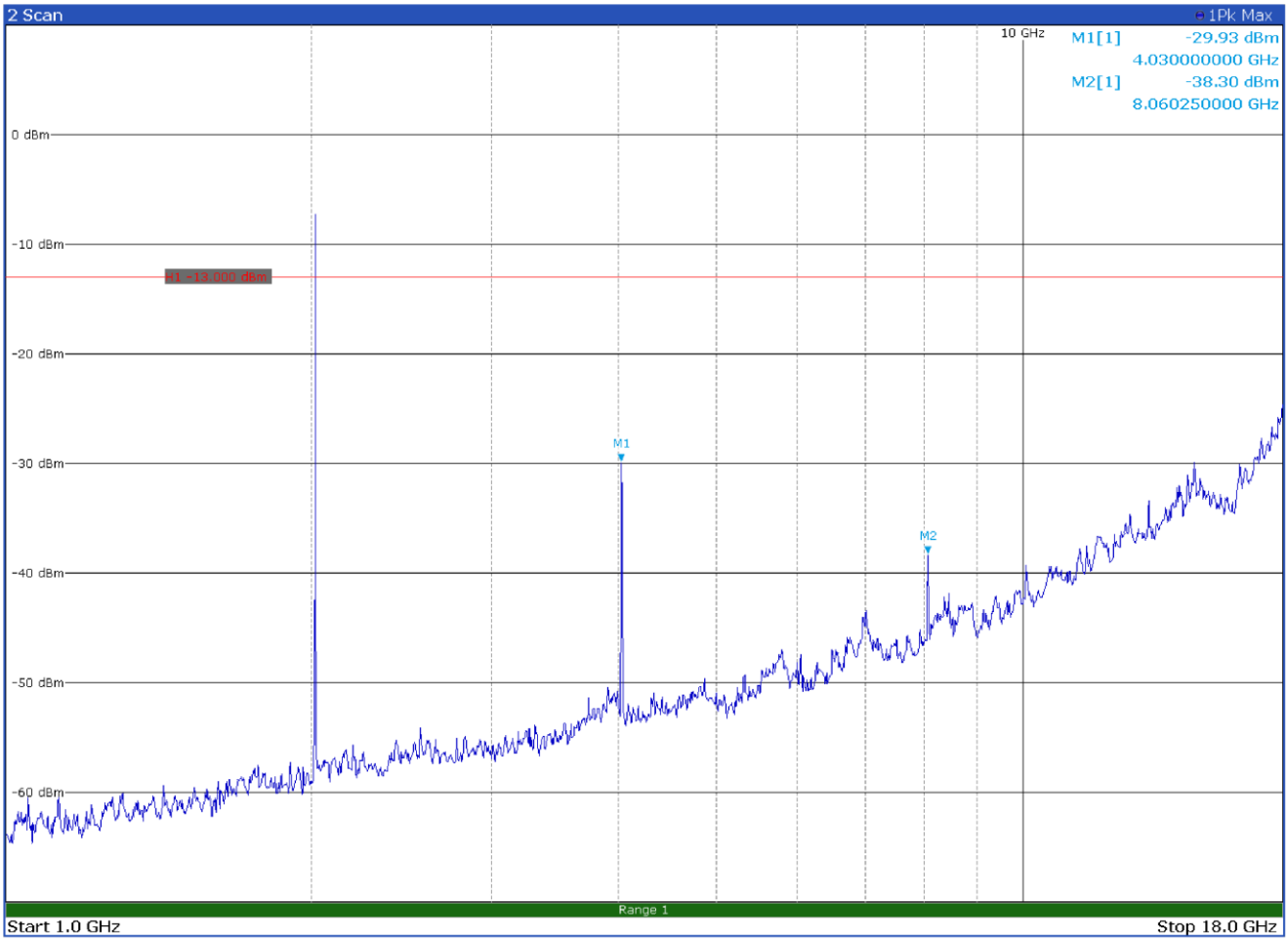


Figure 8.7-10: *Radiated spurious emissions on mid channel - LoRa 125 kHz BW – Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

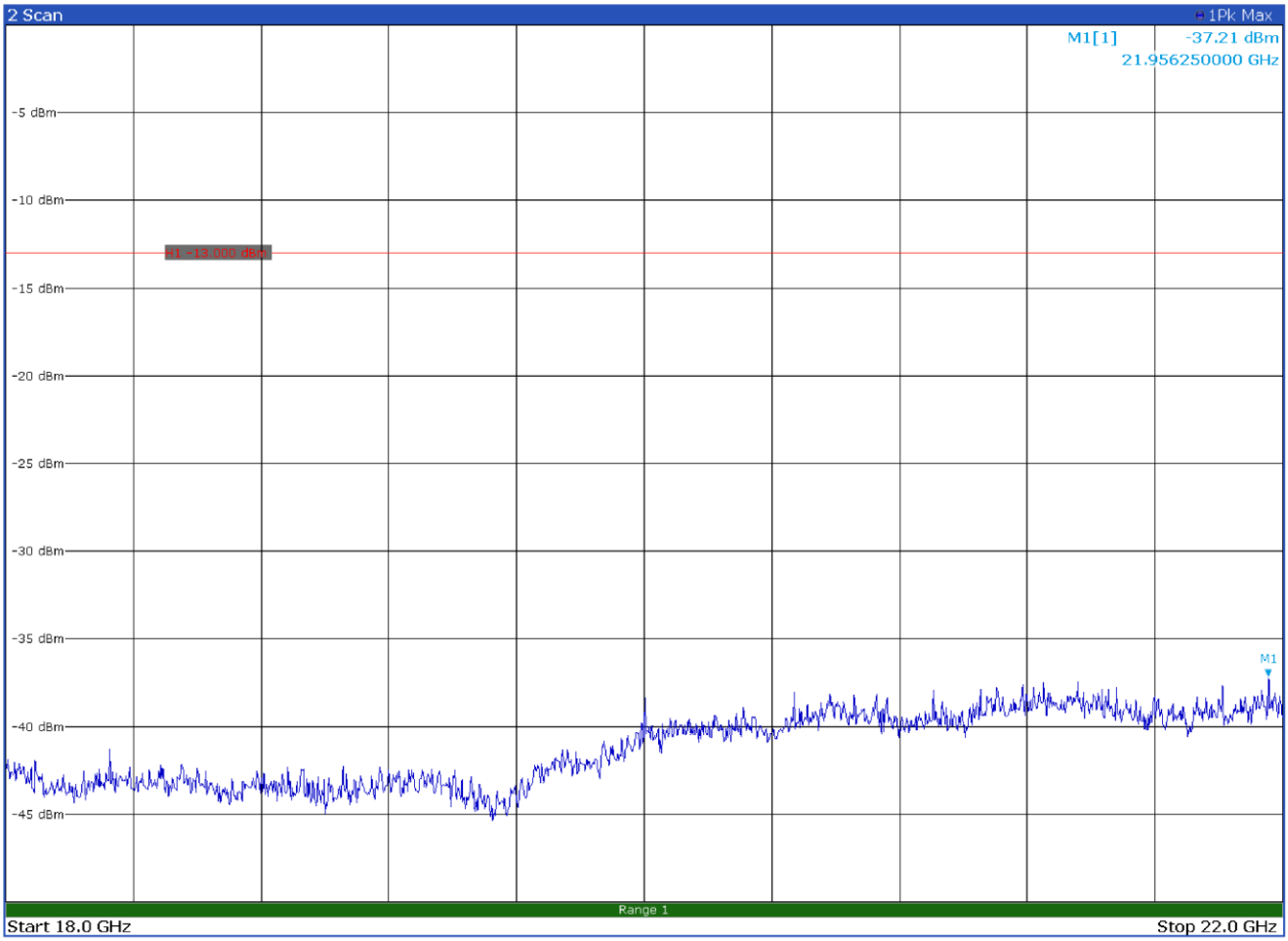


Figure 8.7-11: *Radiated spurious emissions on mid channel - LoRa 125 kHz BW – Antenna in horizontal polarization*

Test data, continued

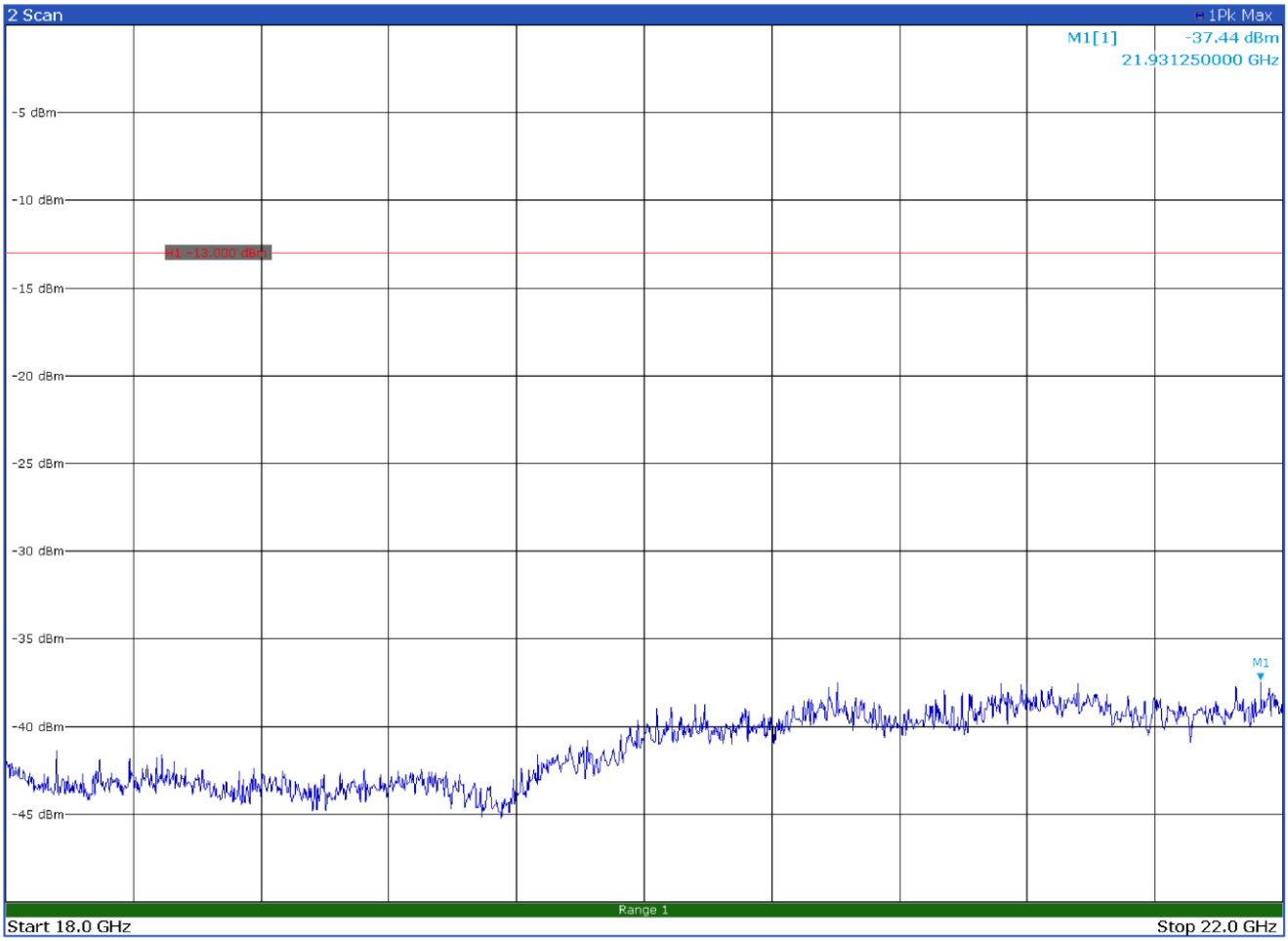


Figure 8.7-12: *Radiated spurious emissions on mid channel - LoRa 125 kHz BW – Antenna in vertical polarization*

Test data, continued

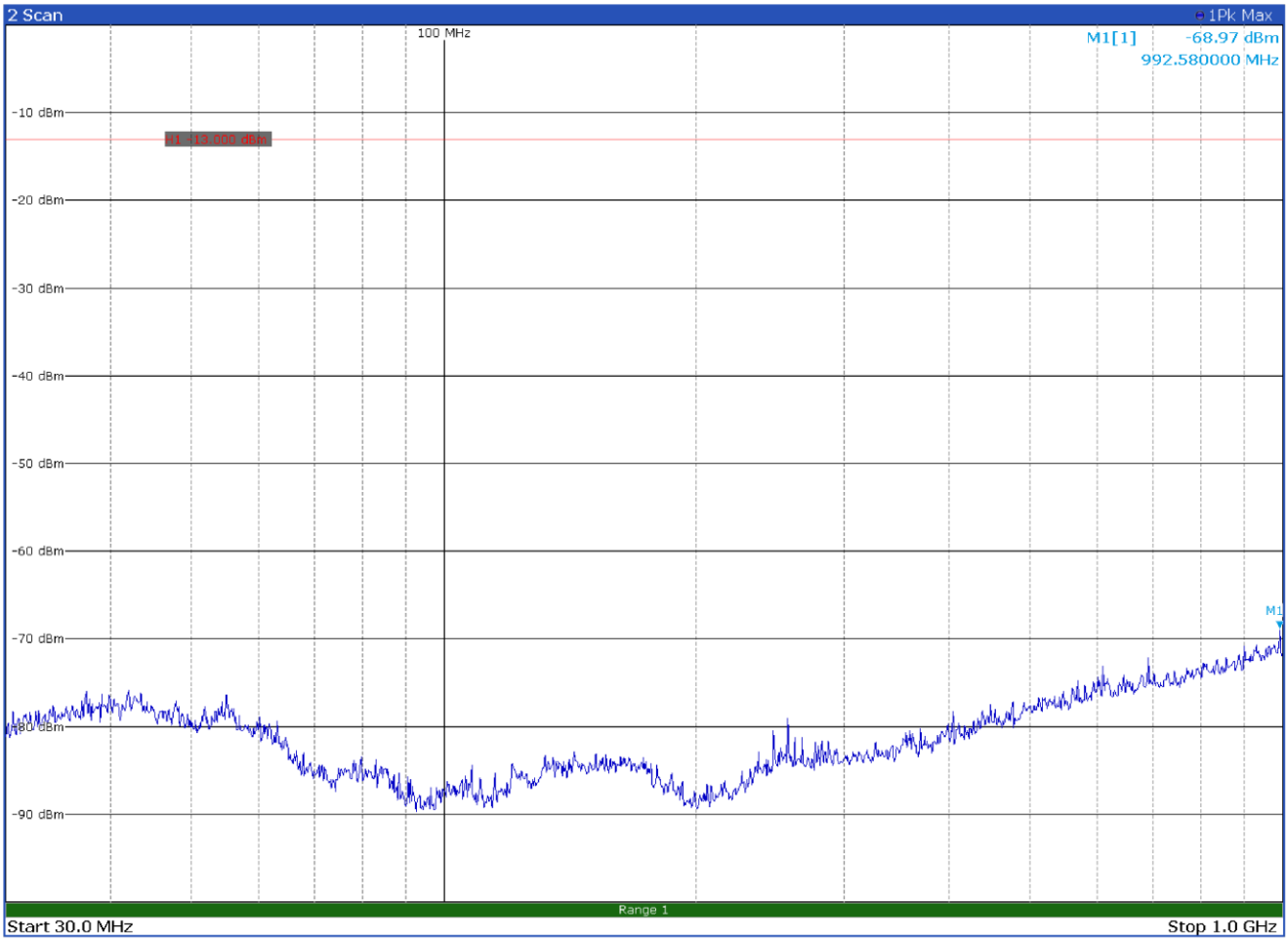


Figure 8.7-13: *Radiated spurious emissions on high channel - LoRa 125 kHz BW – Antenna in horizontal polarization*

Test data, continued

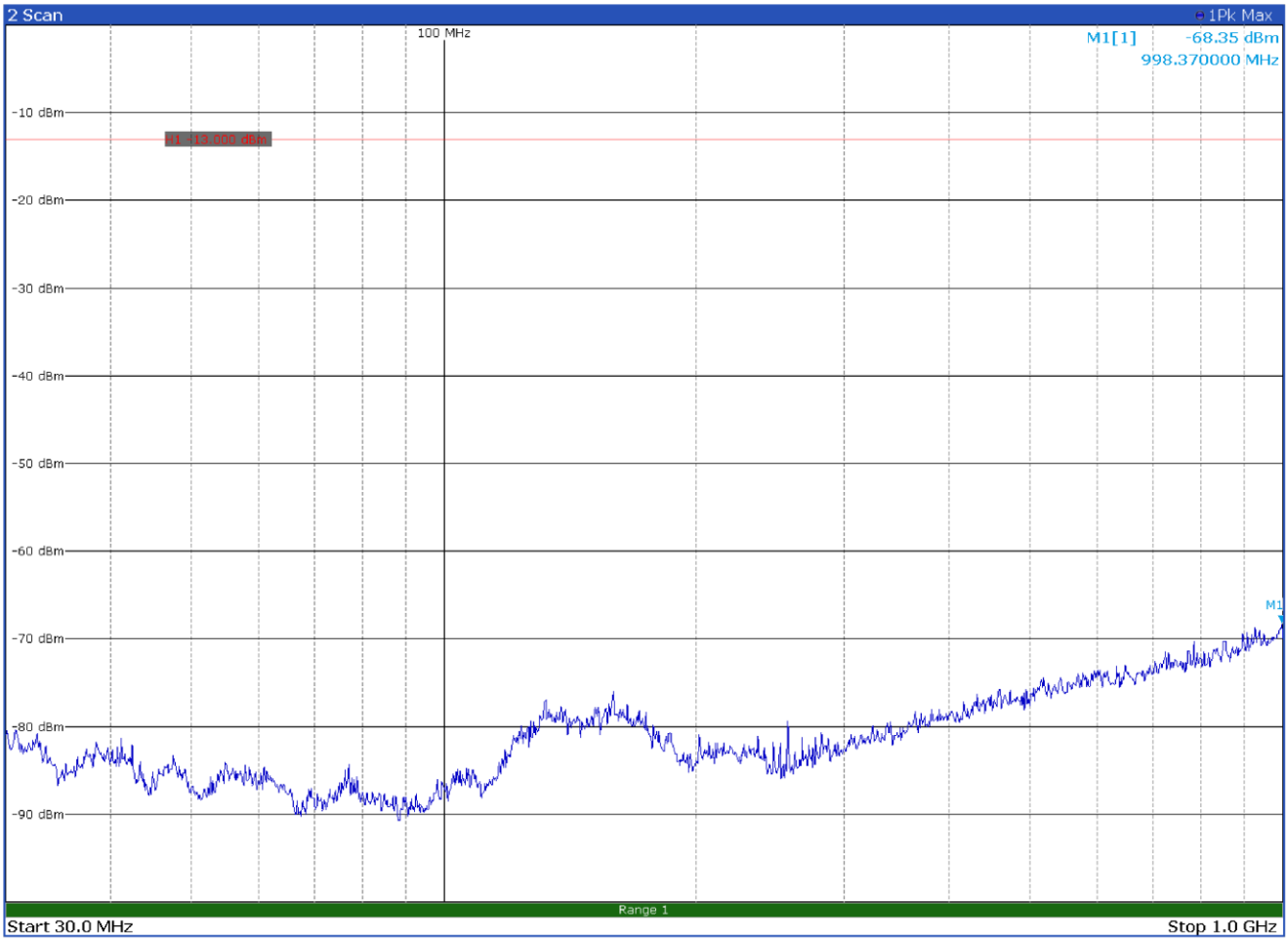


Figure 8.7-14: *Radiated spurious emissions on high channel - LoRa 125 kHz BW – Antenna in vertical polarization*

Test data, continued

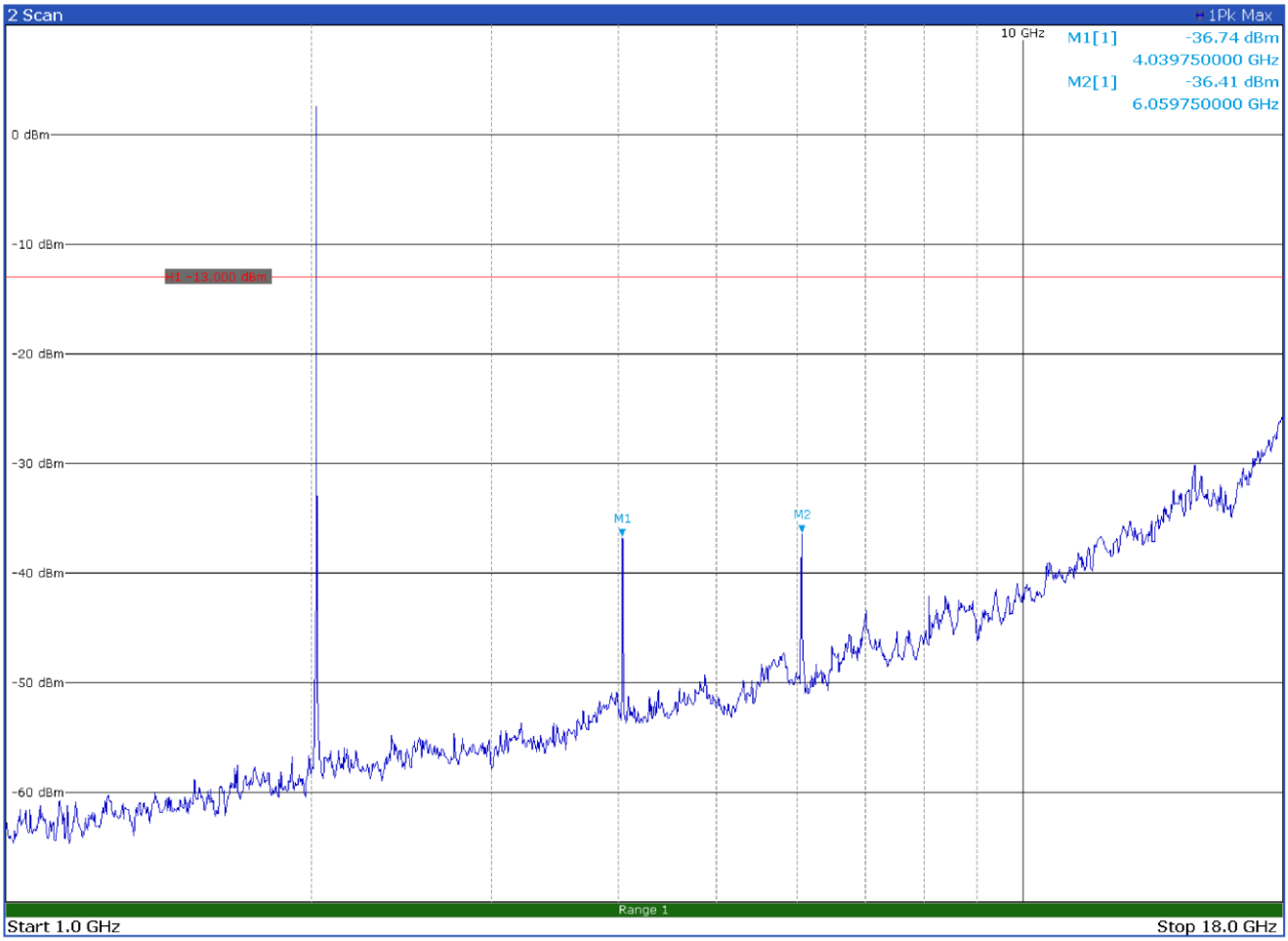


Figure 8.7-15: *Radiated spurious emissions on high channel - LoRa 125 kHz BW – Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

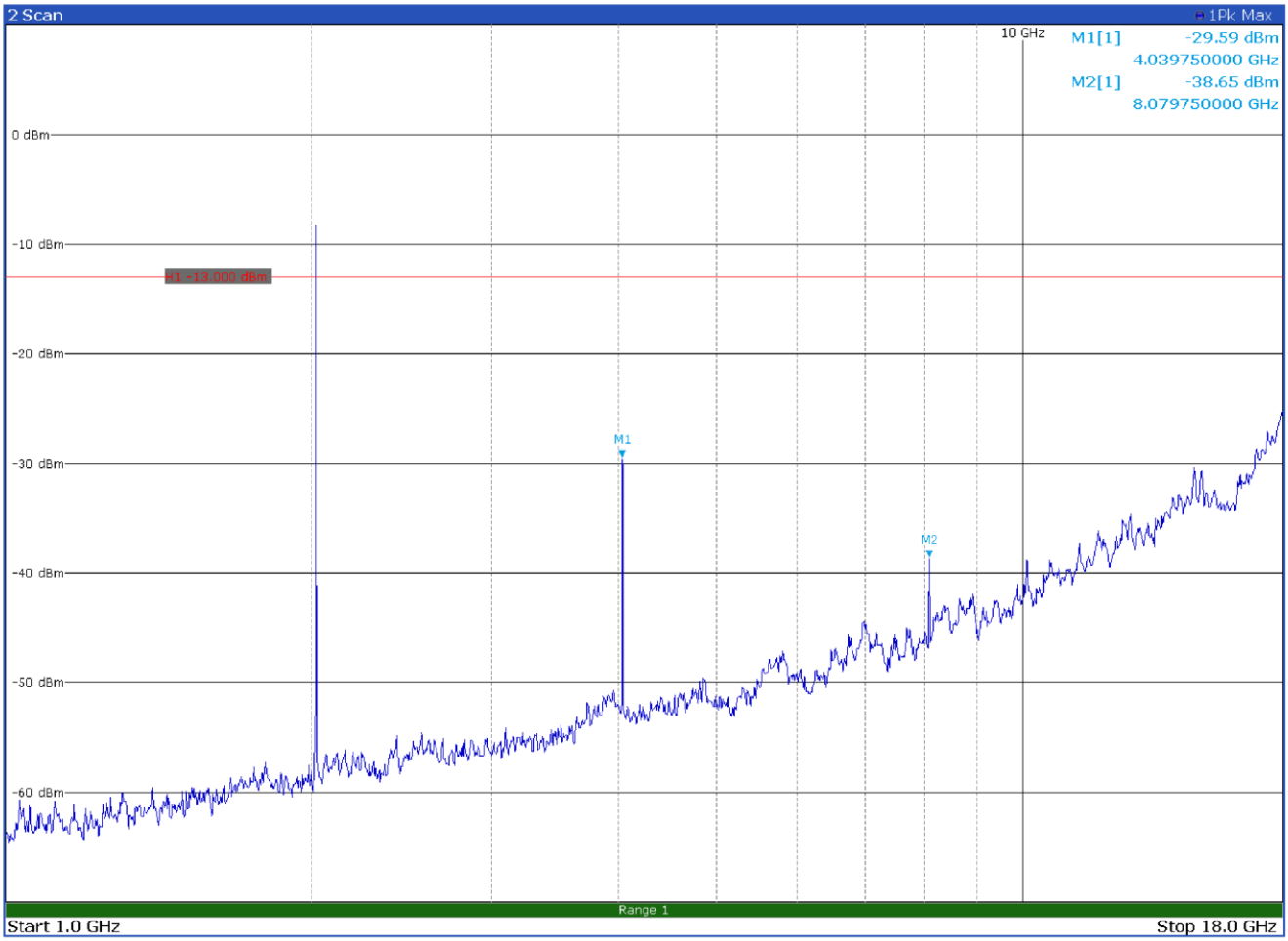


Figure 8.7-16: *Radiated spurious emissions on high channel - LoRa 125 kHz BW – Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

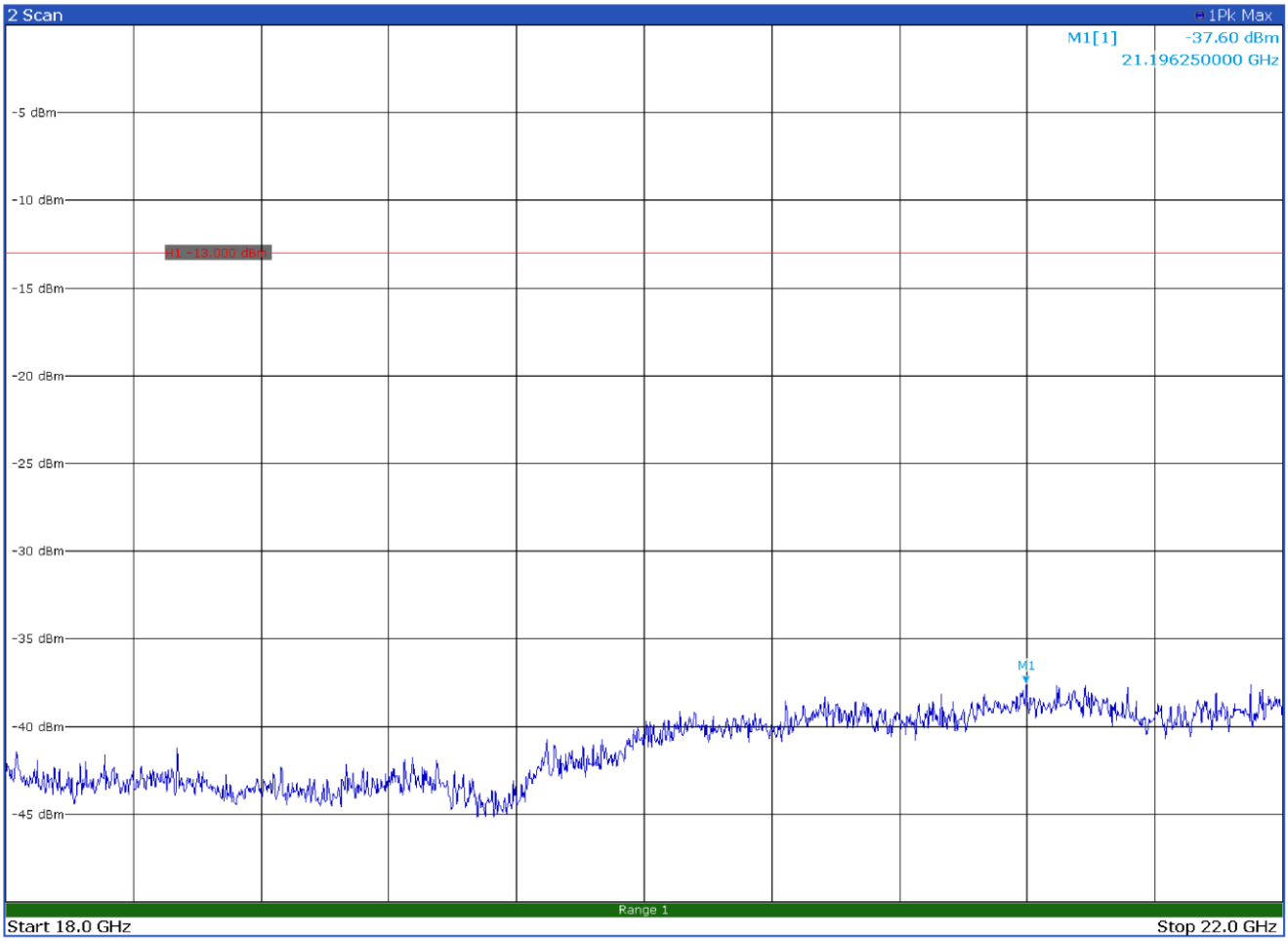


Figure 8.7-17: *Radiated spurious emissions on high channel - LoRa 125 kHz BW – Antenna in horizontal polarization*

Test data, continued

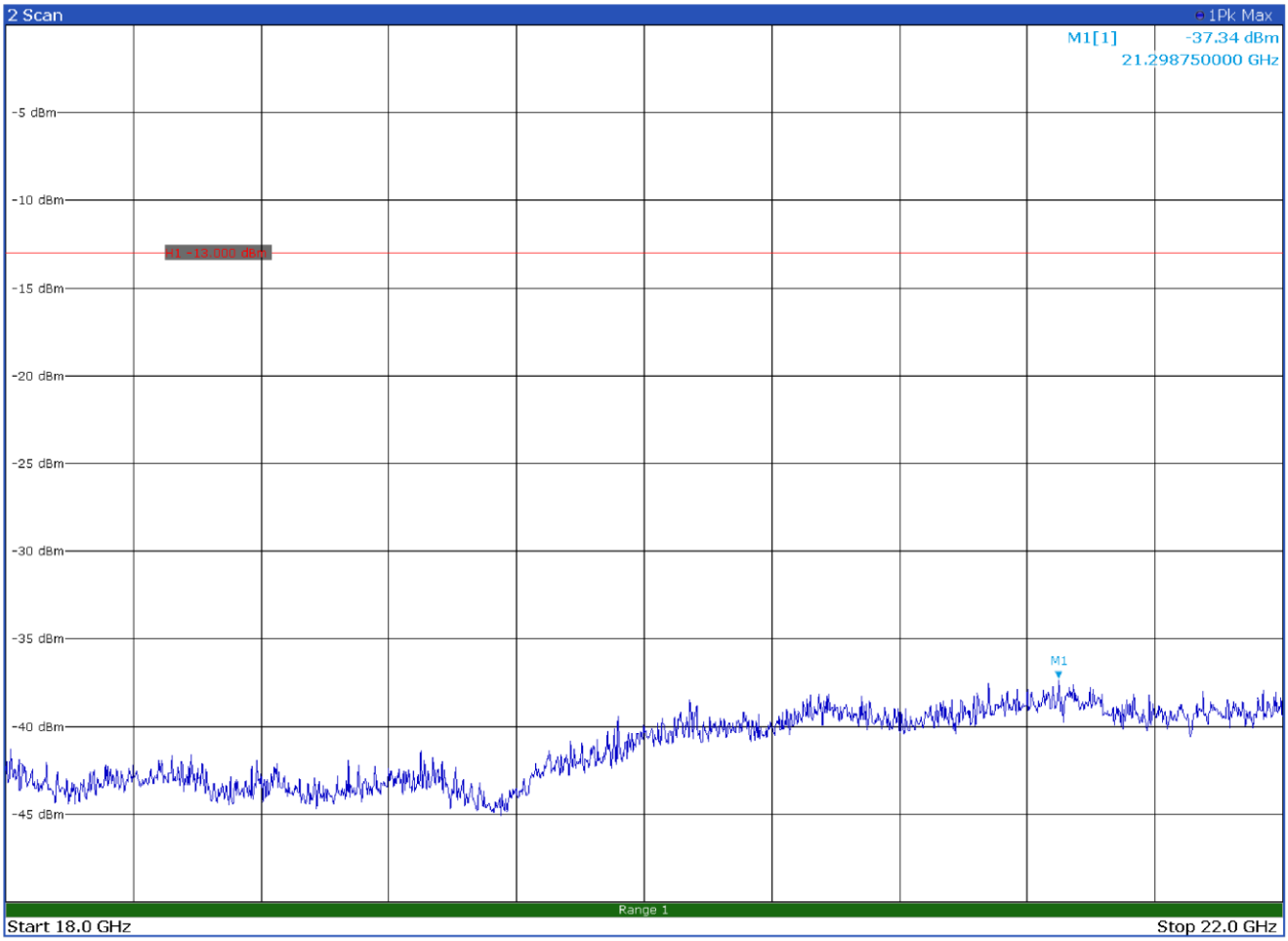


Figure 8.7-18: *Radiated spurious emissions on high channel - LoRa 125 kHz BW – Antenna in vertical polarization*

Test data, continued

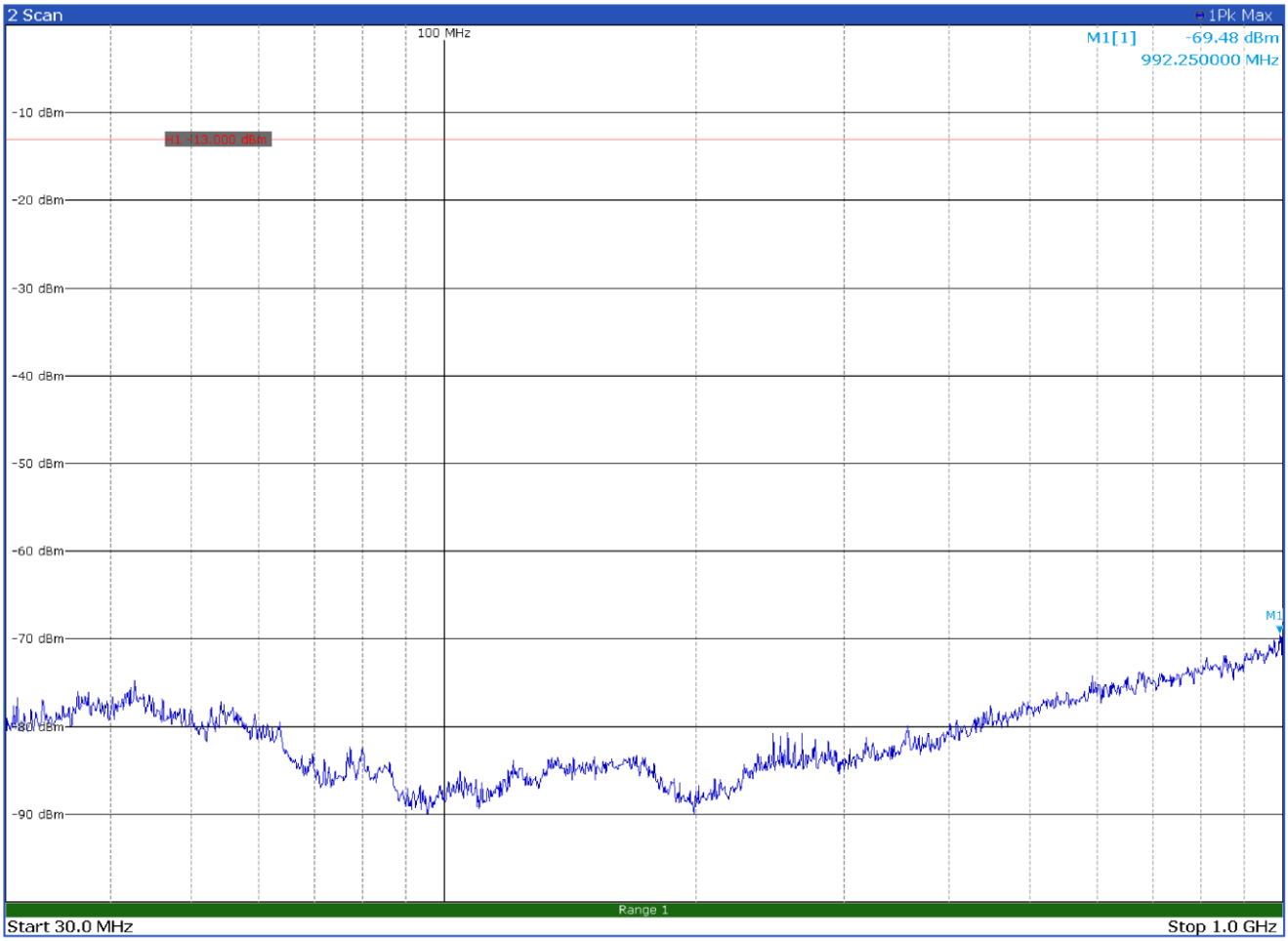


Figure 8.7-19: *Radiated spurious emissions on low channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Test data, continued

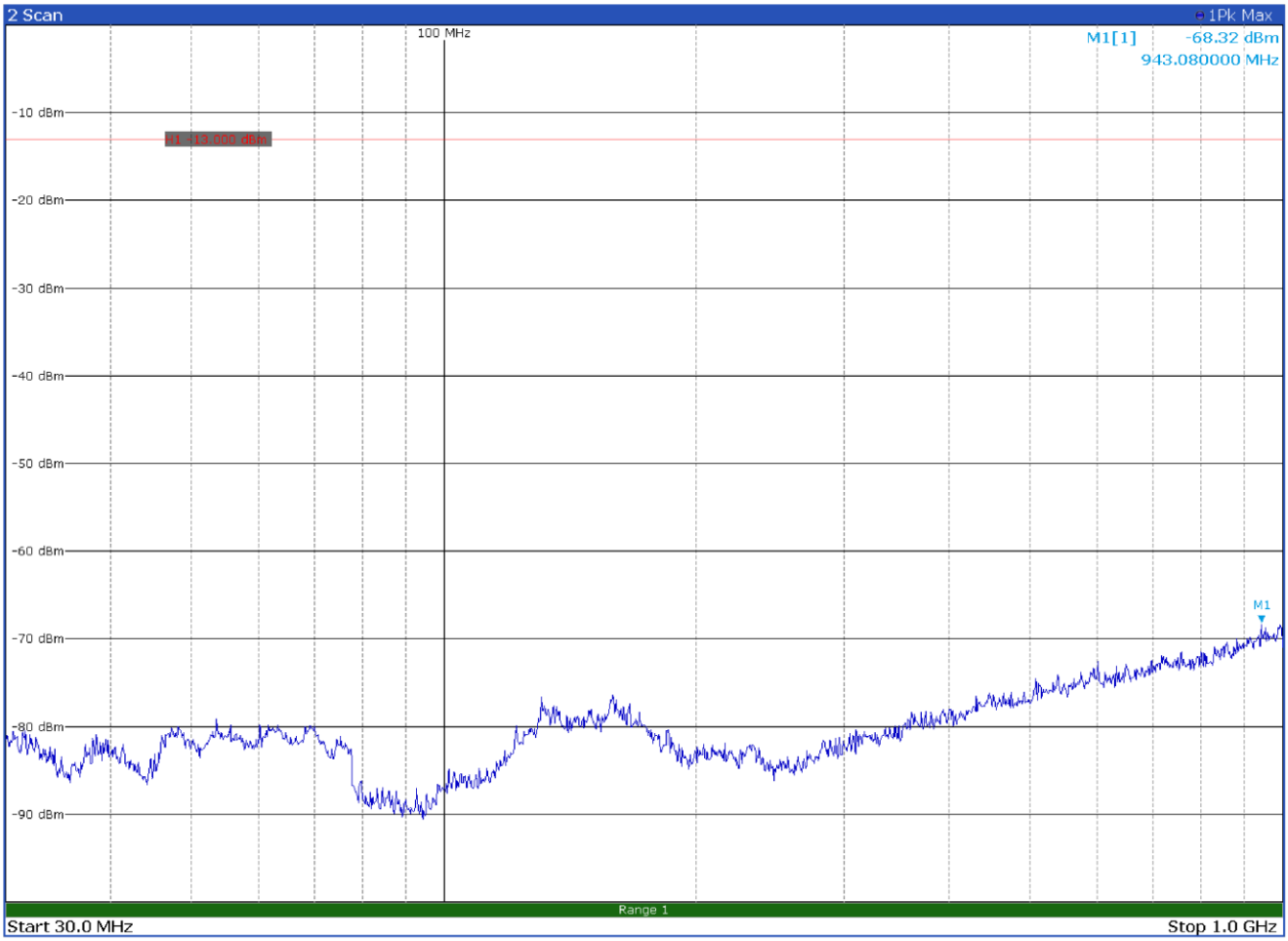


Figure 8.7-20: *Radiated spurious emissions on low channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Test data, continued

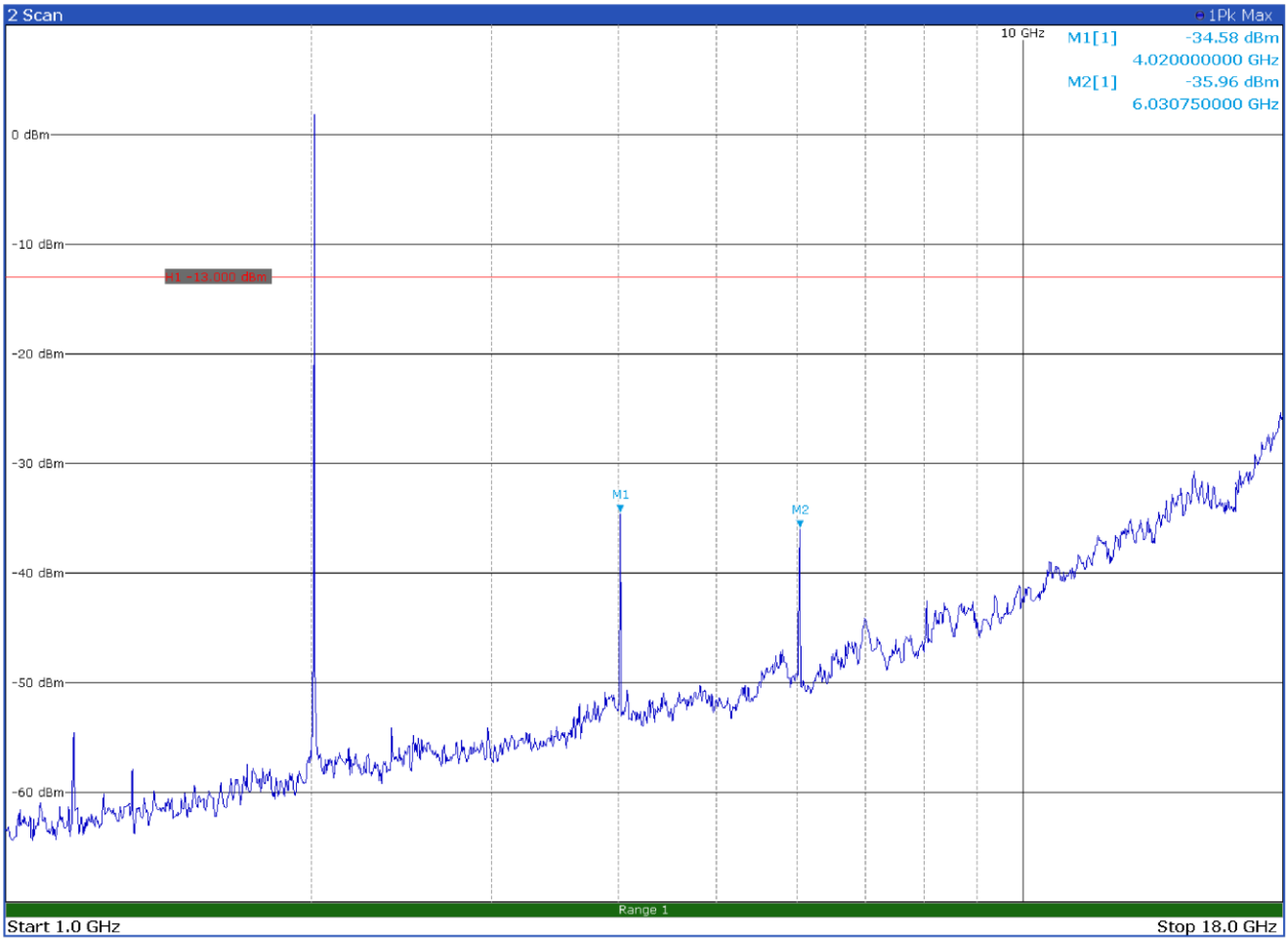


Figure 8.7-21: *Radiated spurious emissions on low channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

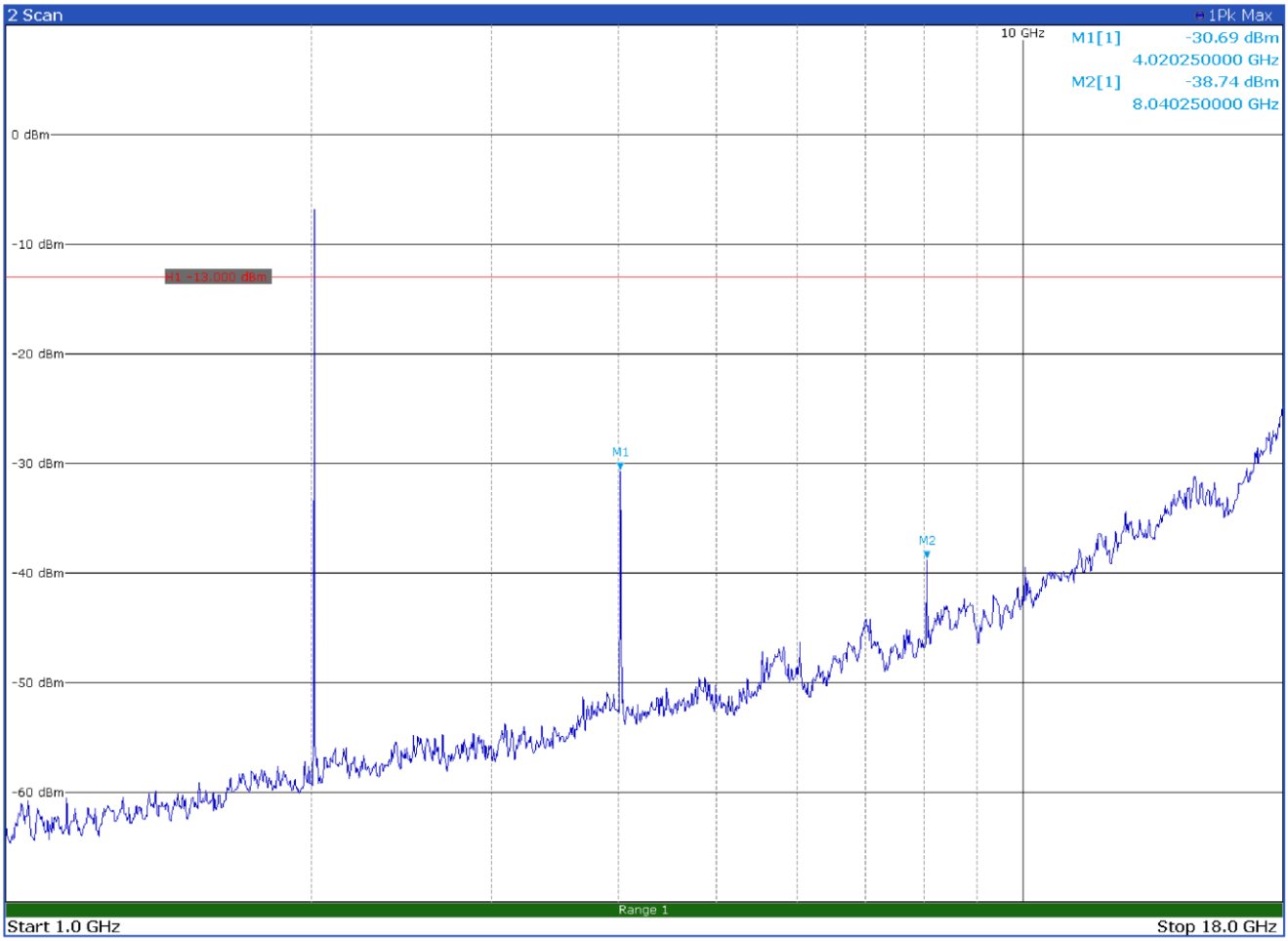


Figure 8.7-22: *Radiated spurious emissions on low channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

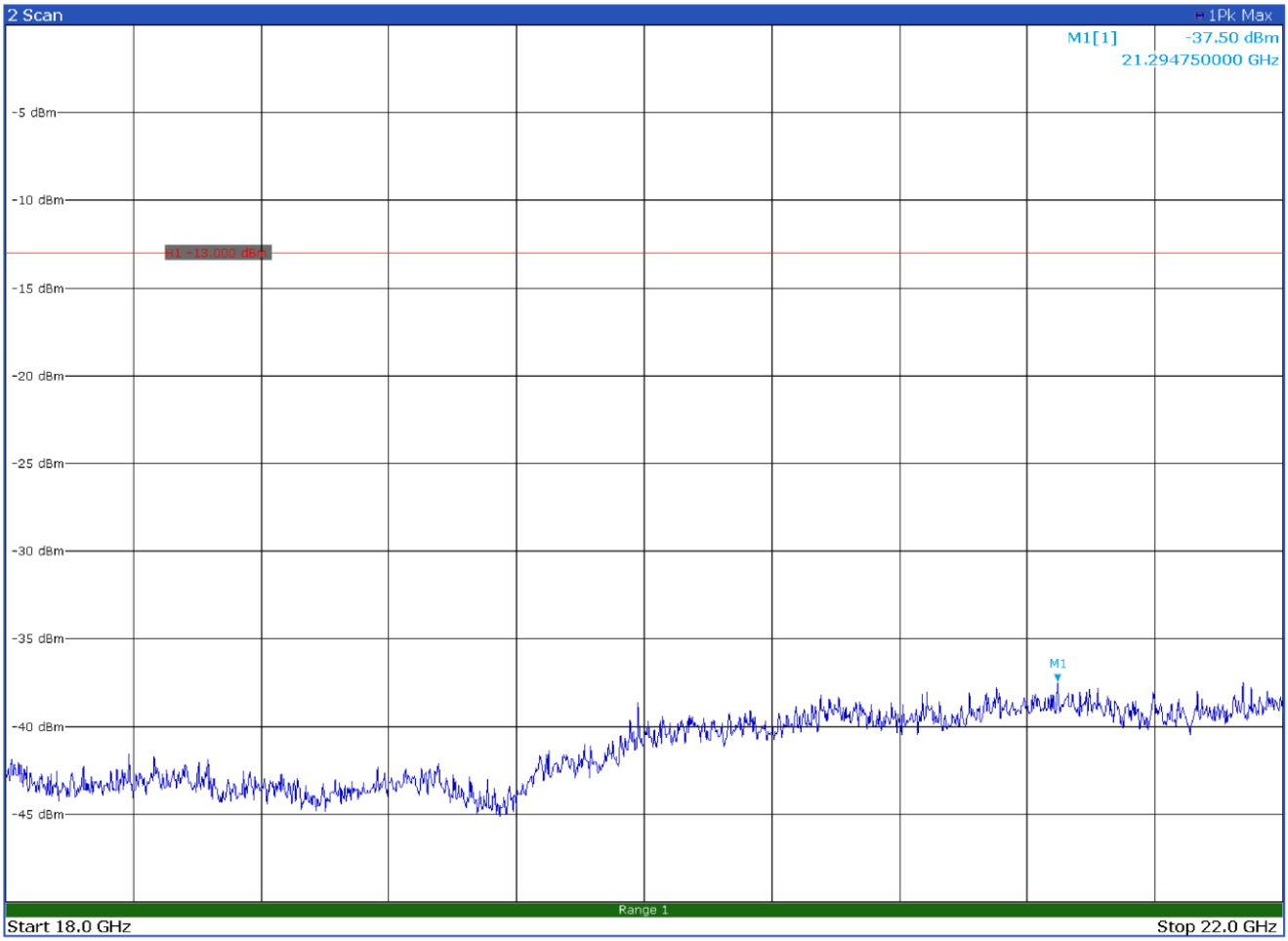


Figure 8.7-23: *Radiated spurious emissions on low channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Test data, continued

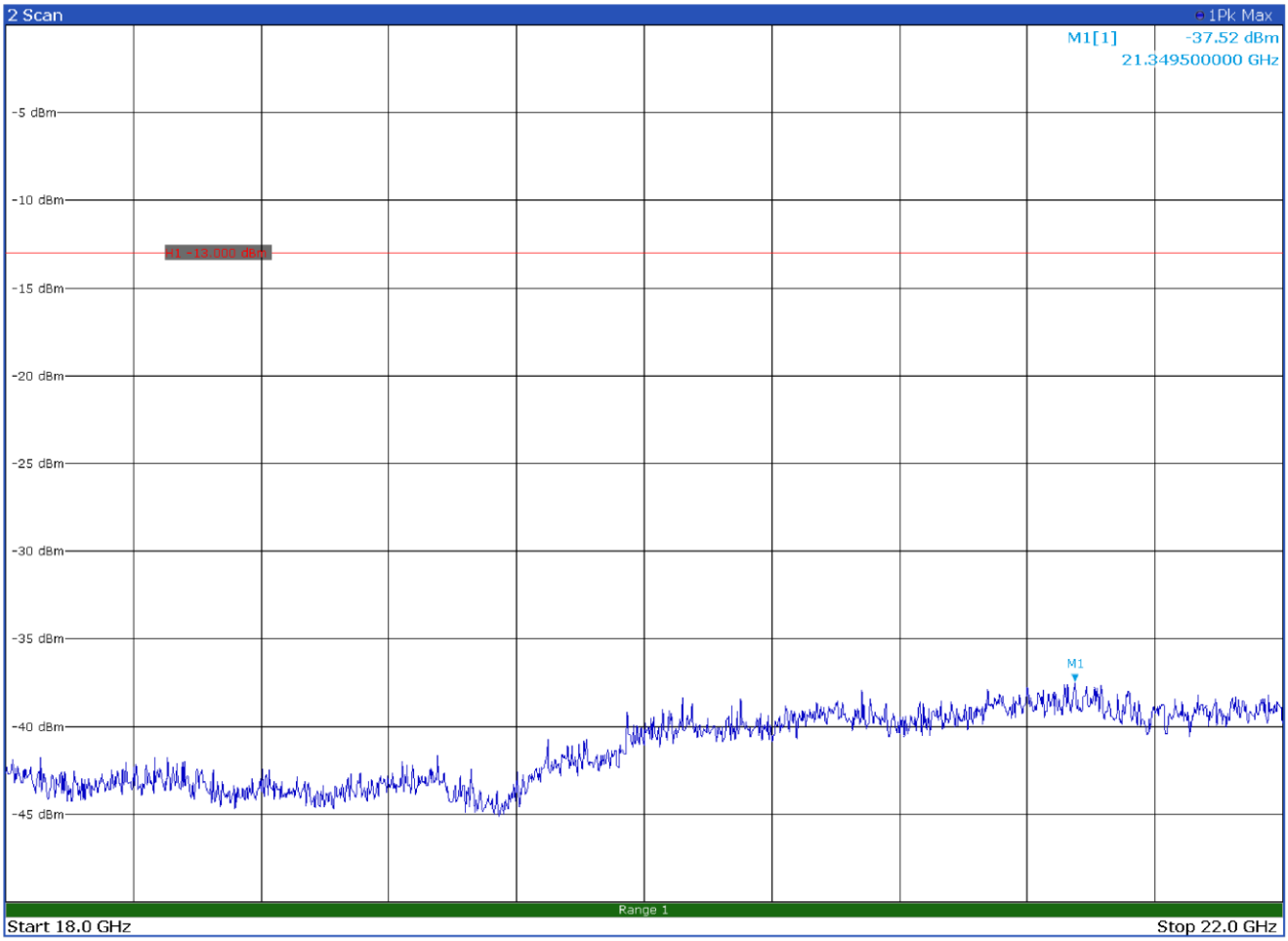


Figure 8.7-24: *Radiated spurious emissions on low channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Test data, continued

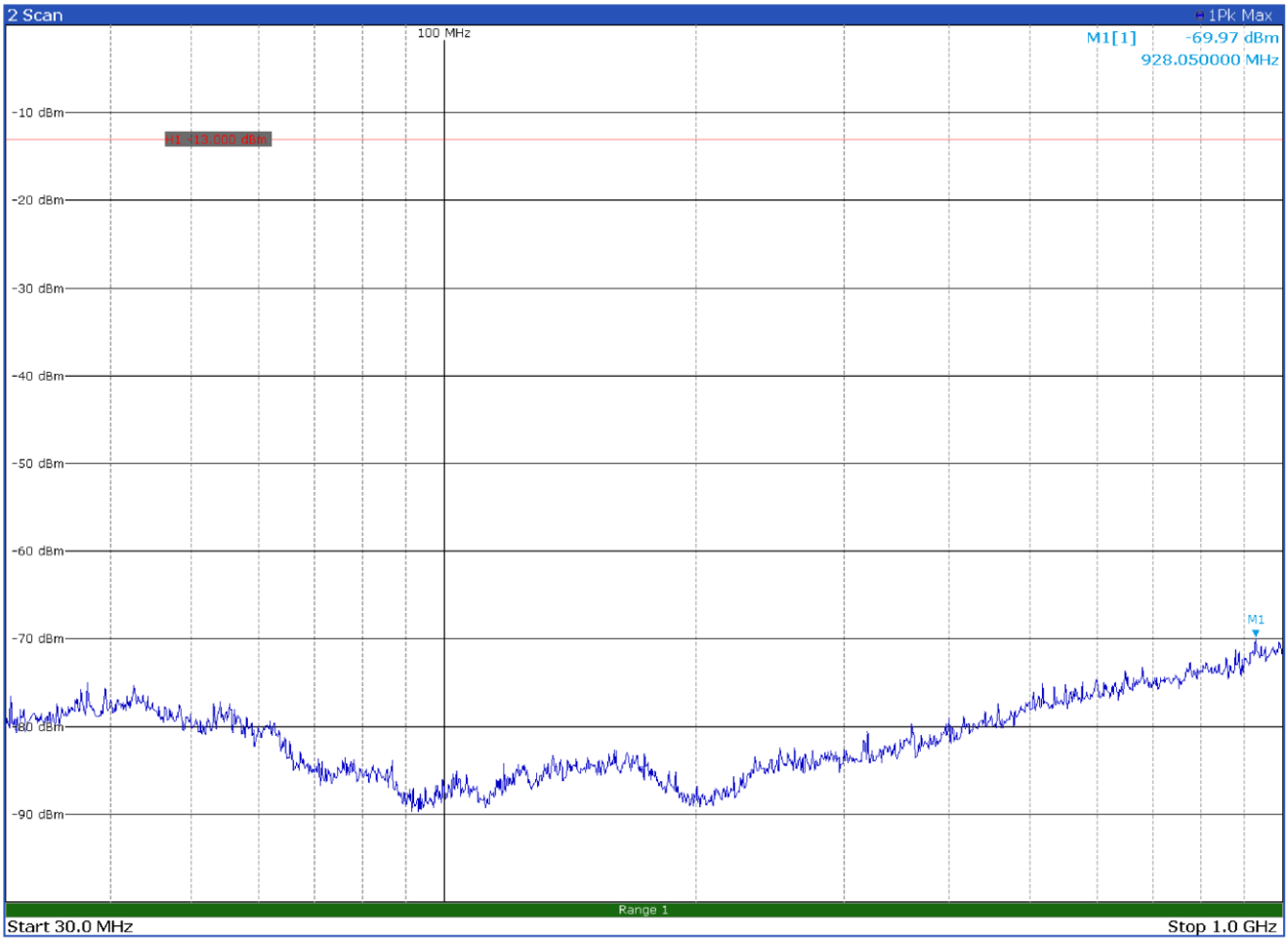


Figure 8.7-25: *Radiated spurious emissions on mid channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Test data, continued

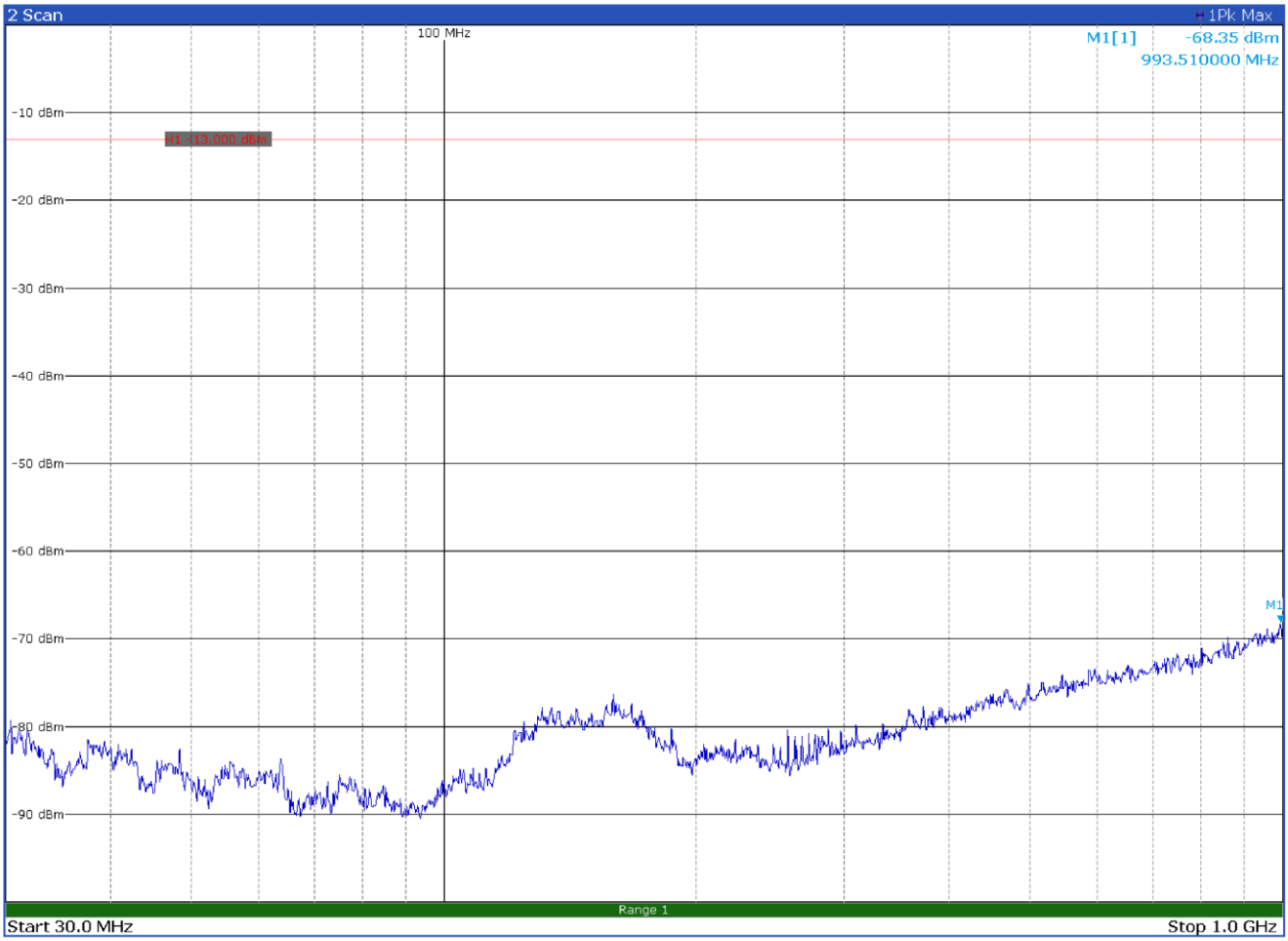


Figure 8.7-26: *Radiated spurious emissions on mid channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Test data, continued

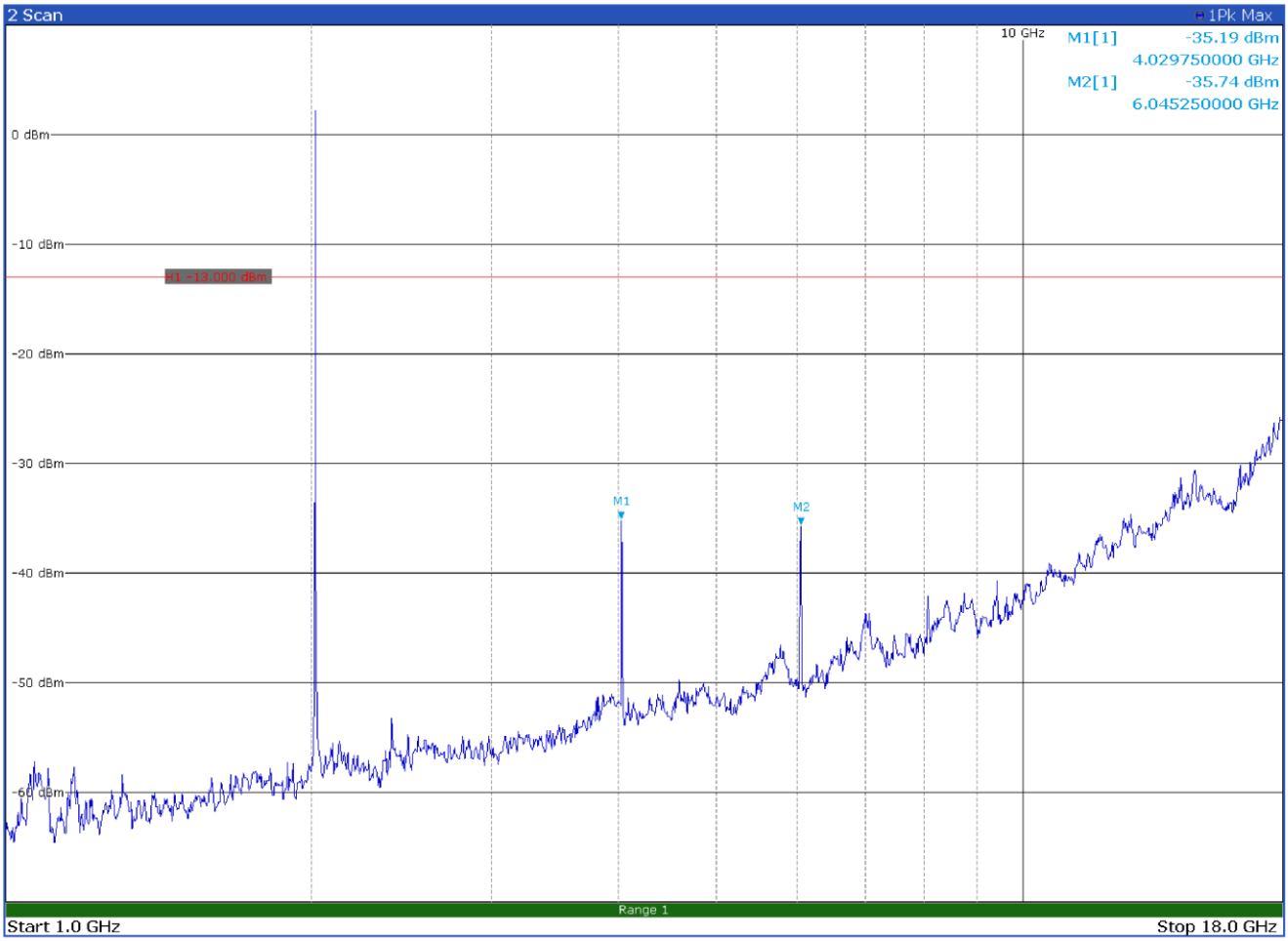


Figure 8.7-27: *Radiated spurious emissions on mid channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

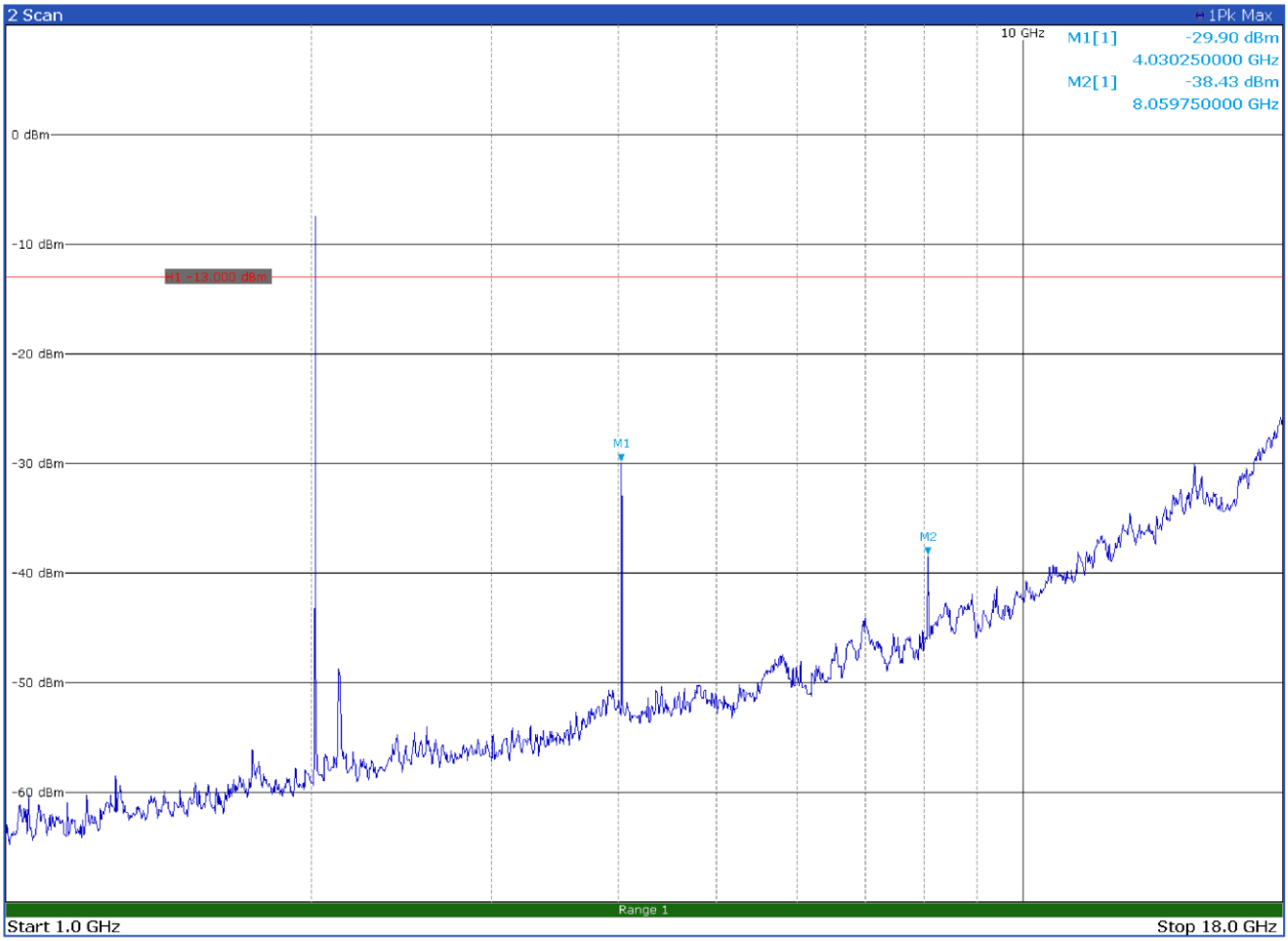


Figure 8.7-28: *Radiated spurious emissions on mid channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

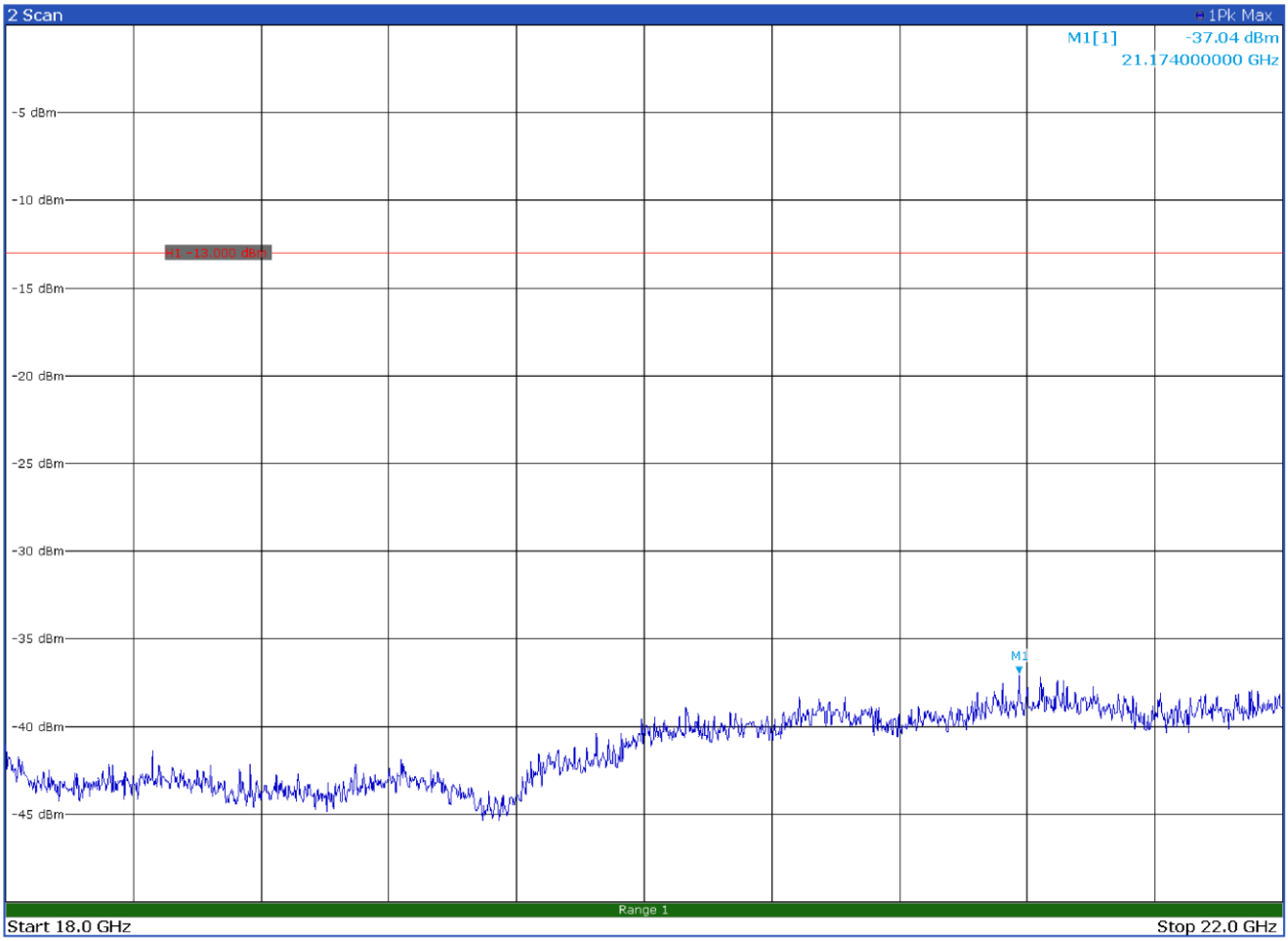


Figure 8.7-29: *Radiated spurious emissions on mid channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Test data, continued

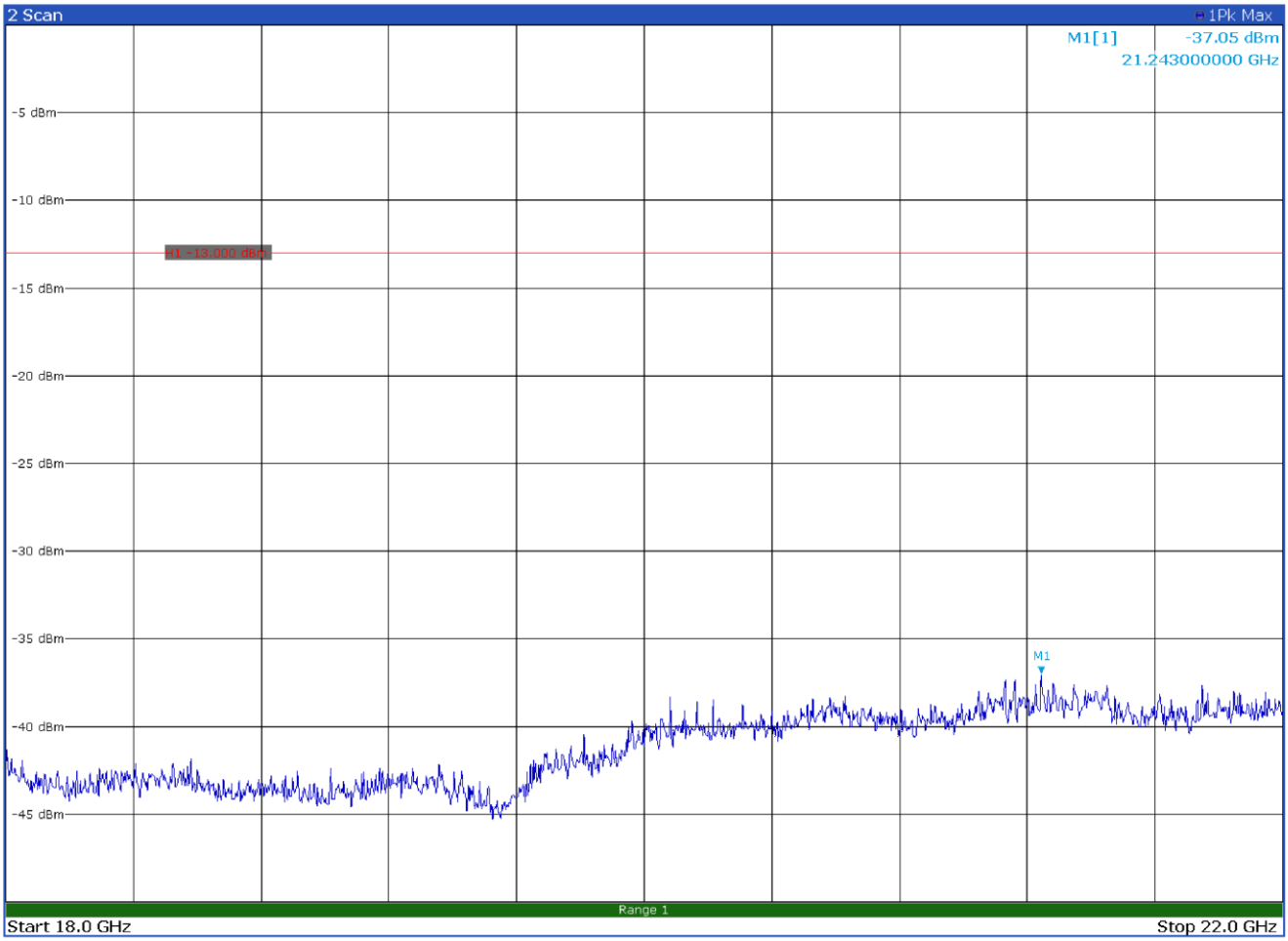


Figure 8.7-30: *Radiated spurious emissions on mid channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Test data, continued

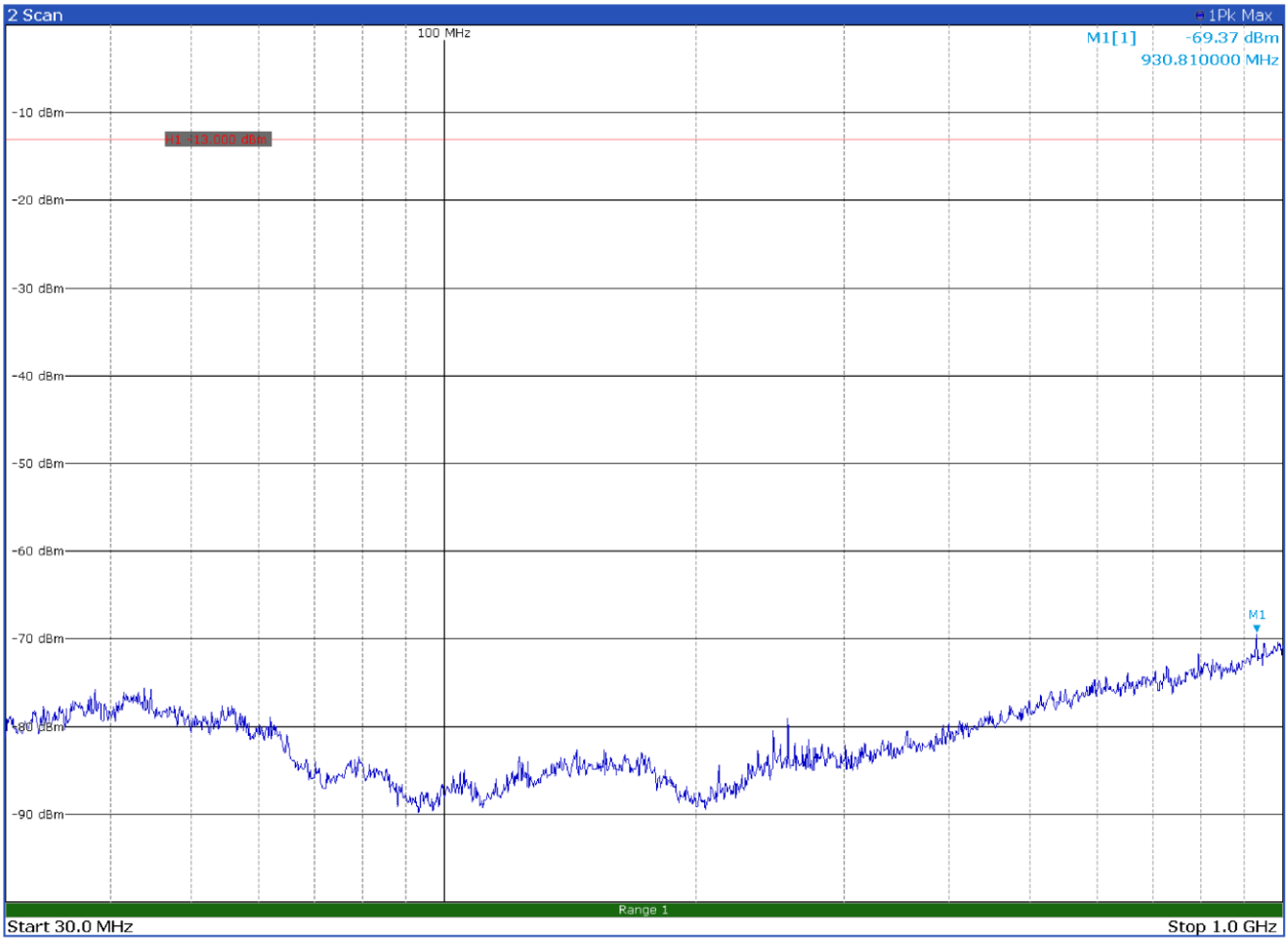


Figure 8.7-31: *Radiated spurious emissions on high channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Test data, continued

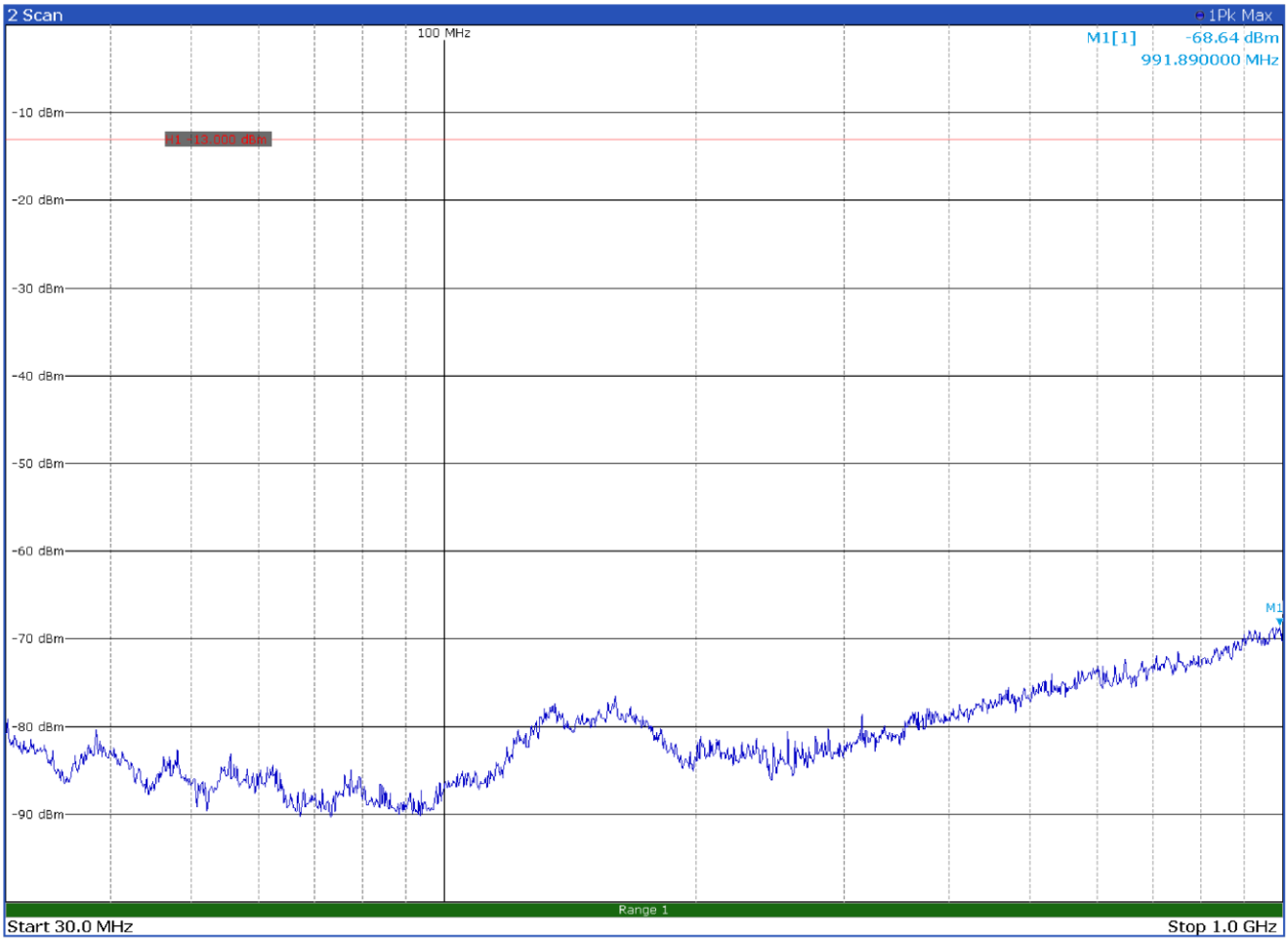


Figure 8.7-32: *Radiated spurious emissions on high channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Test data, continued

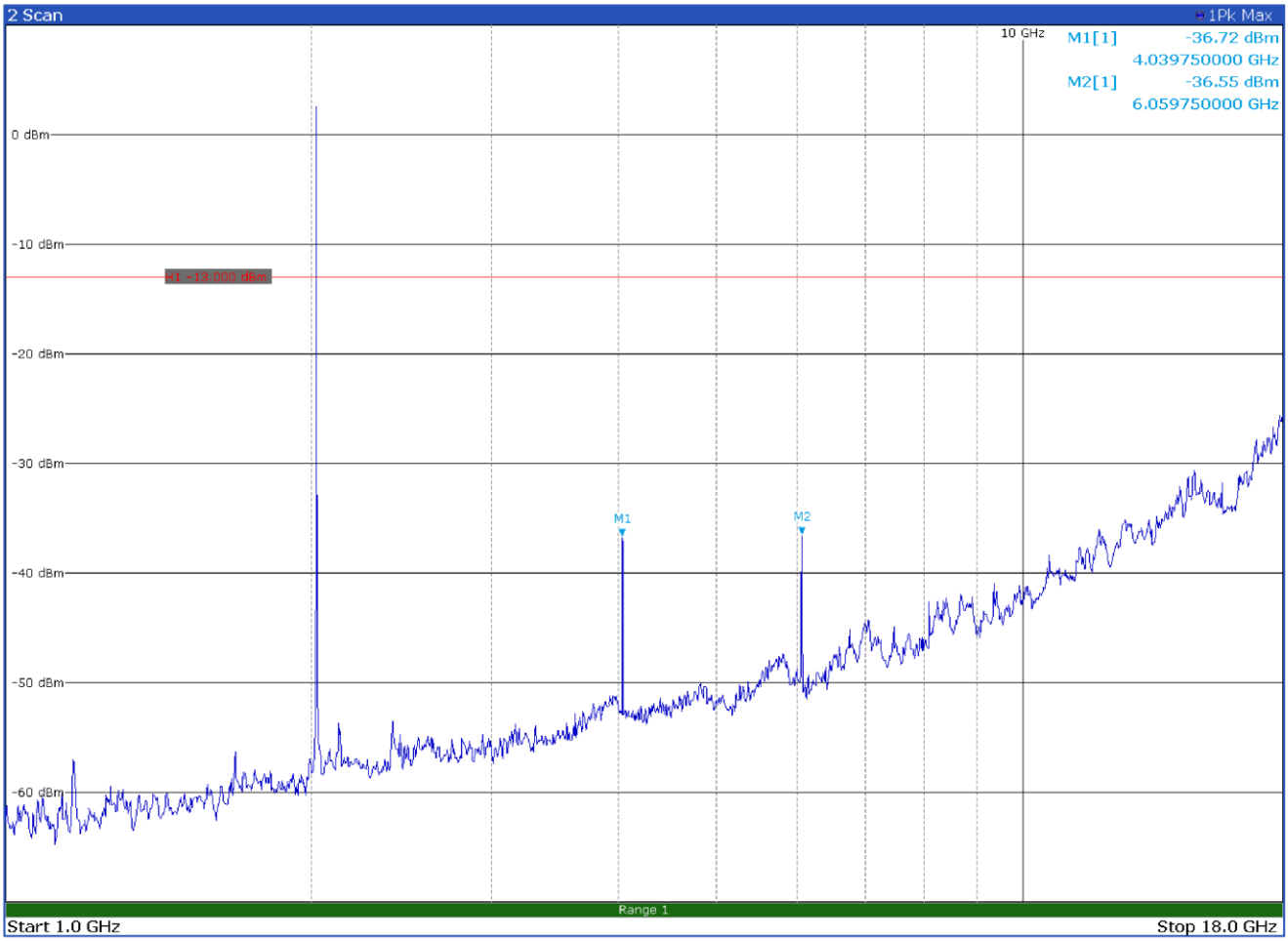


Figure 8.7-33: *Radiated spurious emissions on high channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

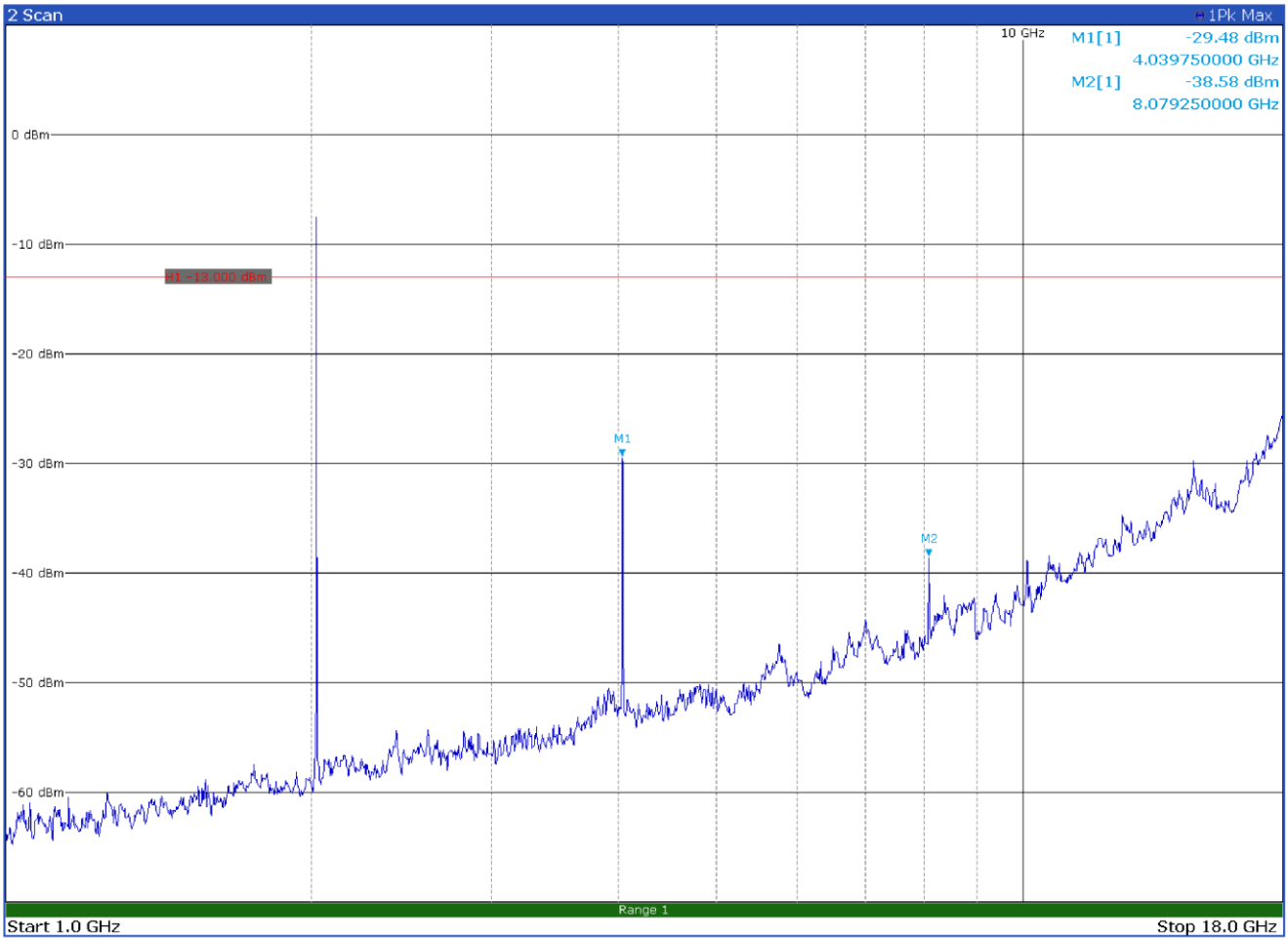


Figure 8.7-34: *Radiated spurious emissions on high channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

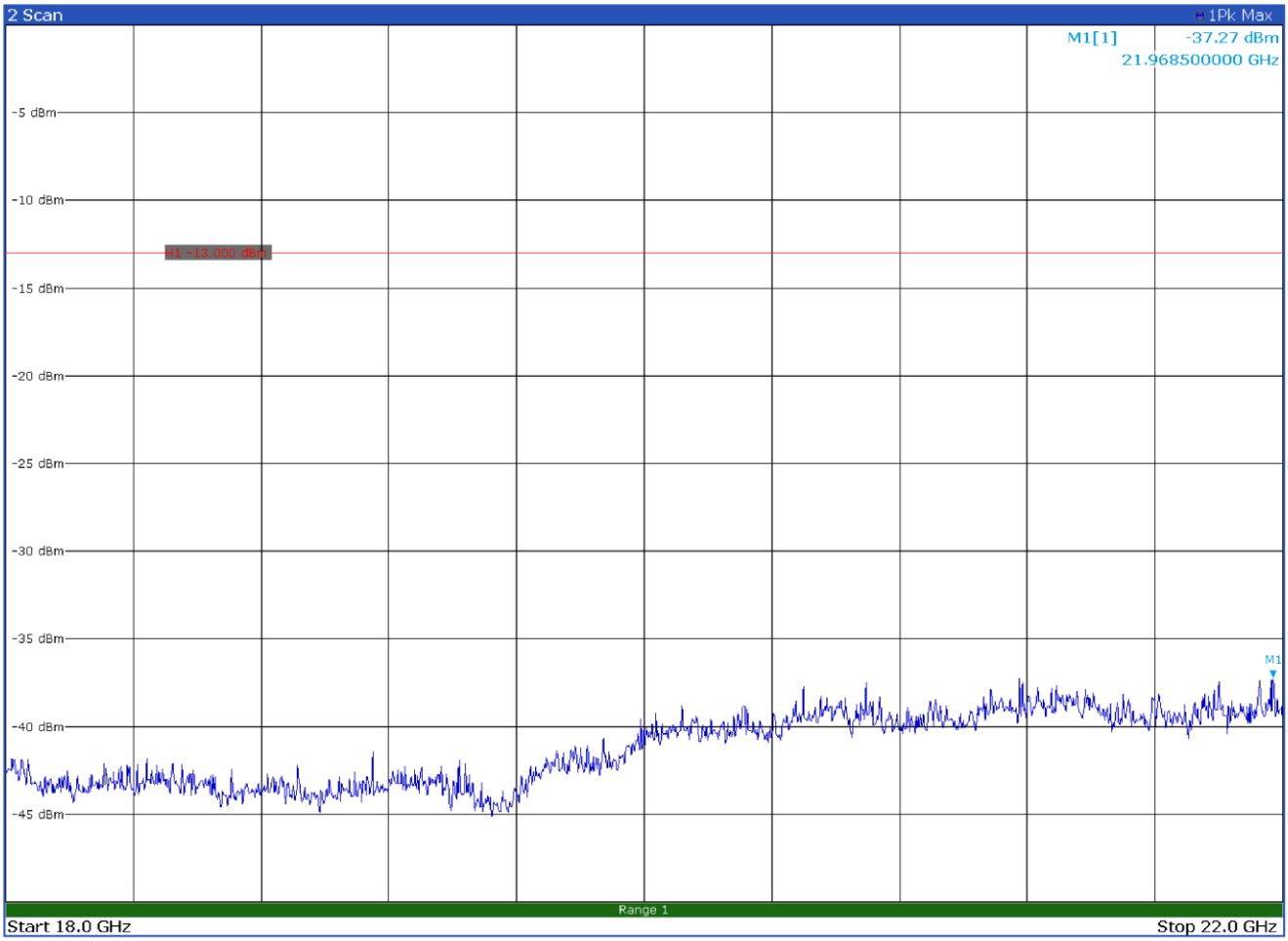


Figure 8.7-35: *Radiated spurious emissions on high channel - LoRa 250 kHz BW – Antenna in horizontal polarization*

Test data, continued

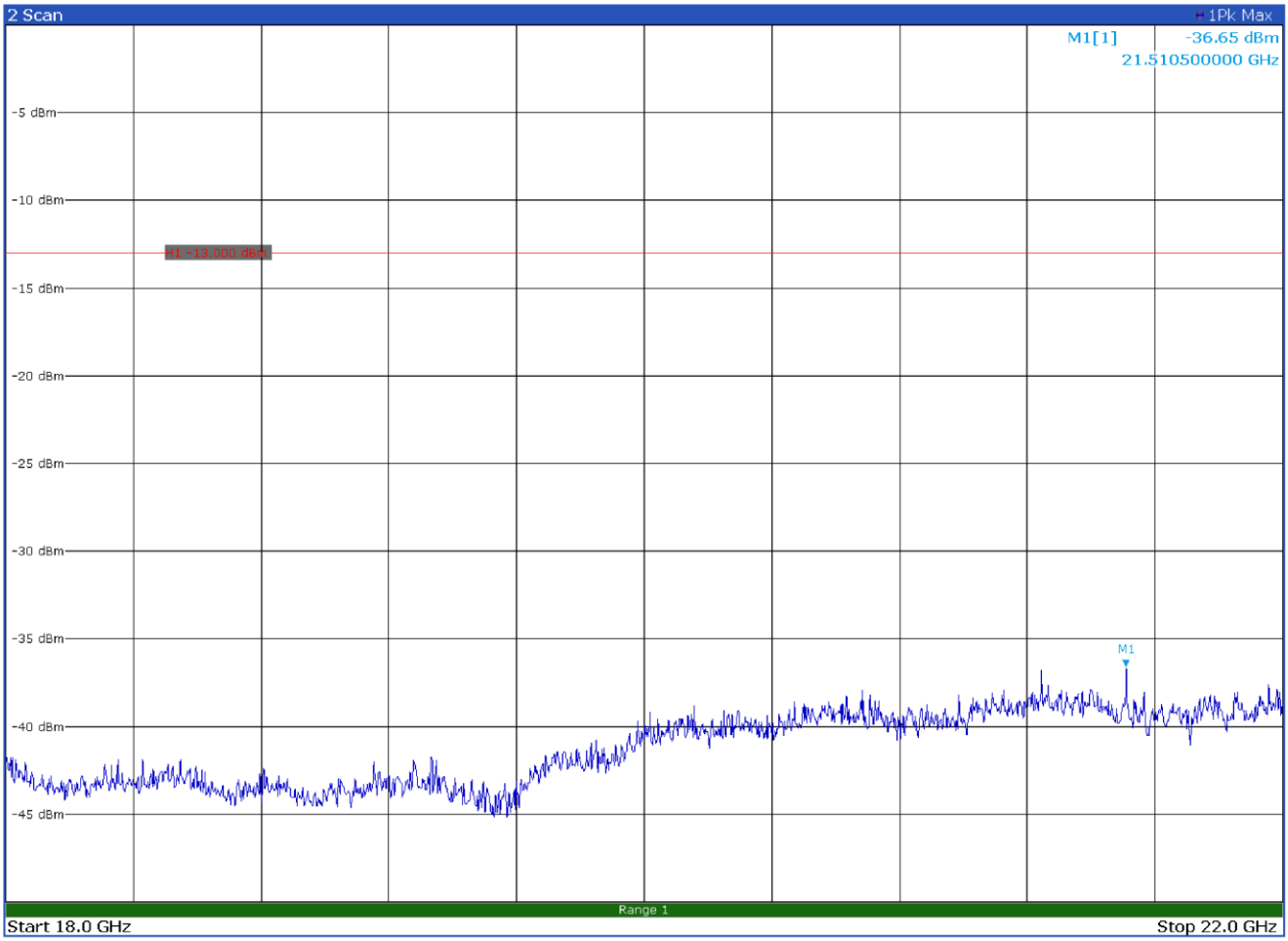


Figure 8.7-36: *Radiated spurious emissions on high channel - LoRa 250 kHz BW – Antenna in vertical polarization*

Test data, continued

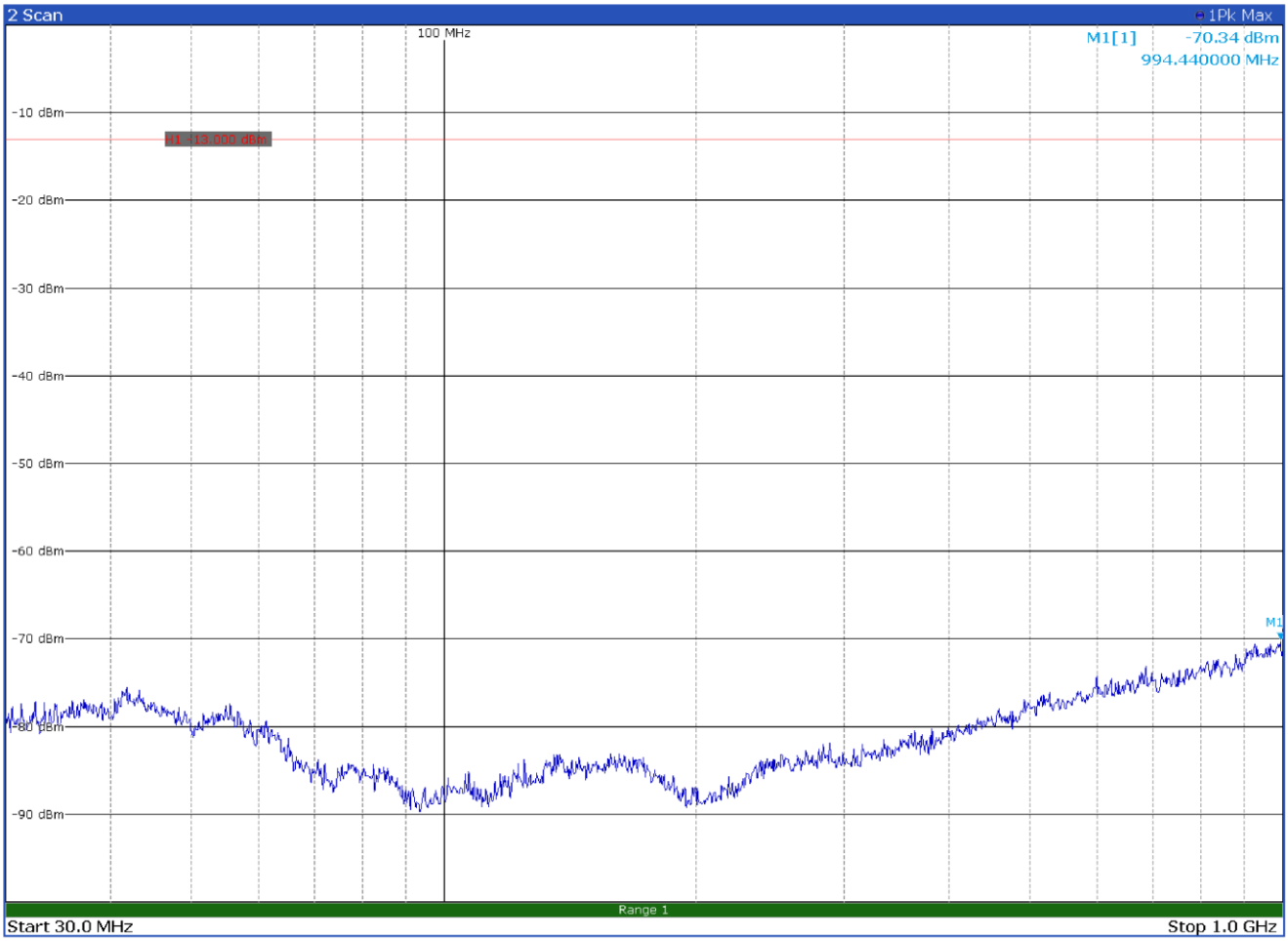


Figure 8.7-37: *Radiated spurious emissions on low channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Test data, continued

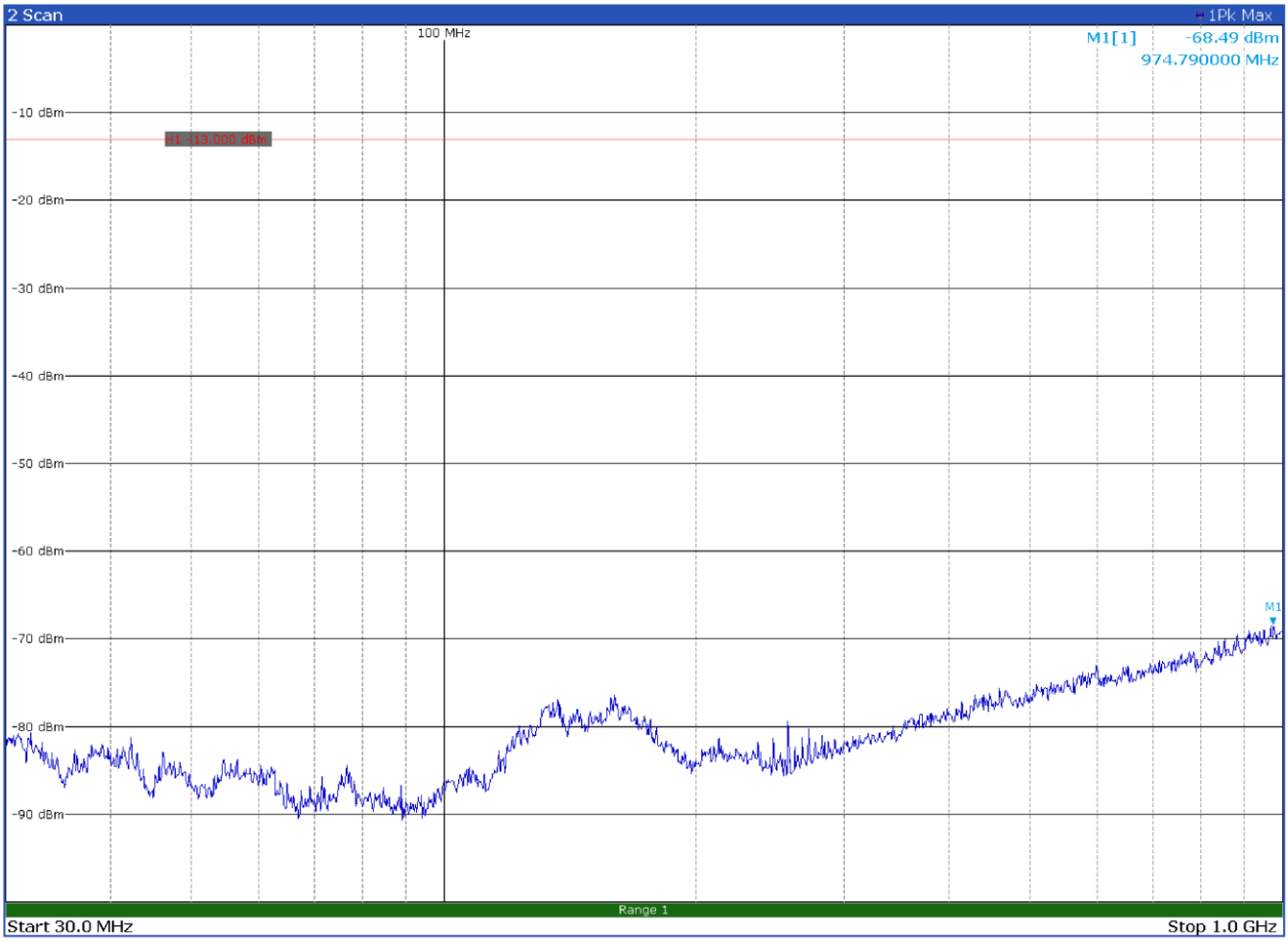


Figure 8.7-38: *Radiated spurious emissions on low channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Test data, continued

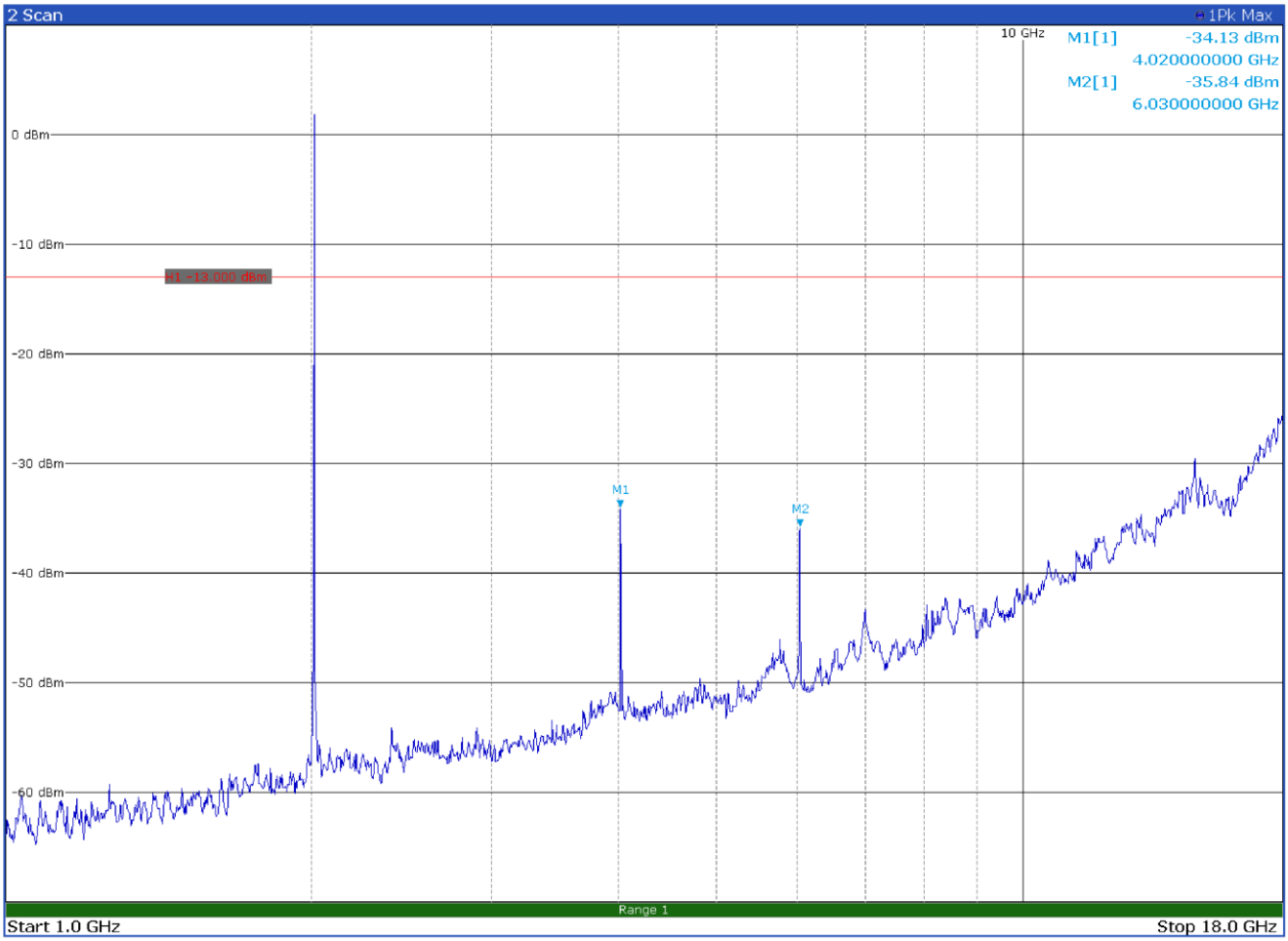


Figure 8.7-39: *Radiated spurious emissions on low channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

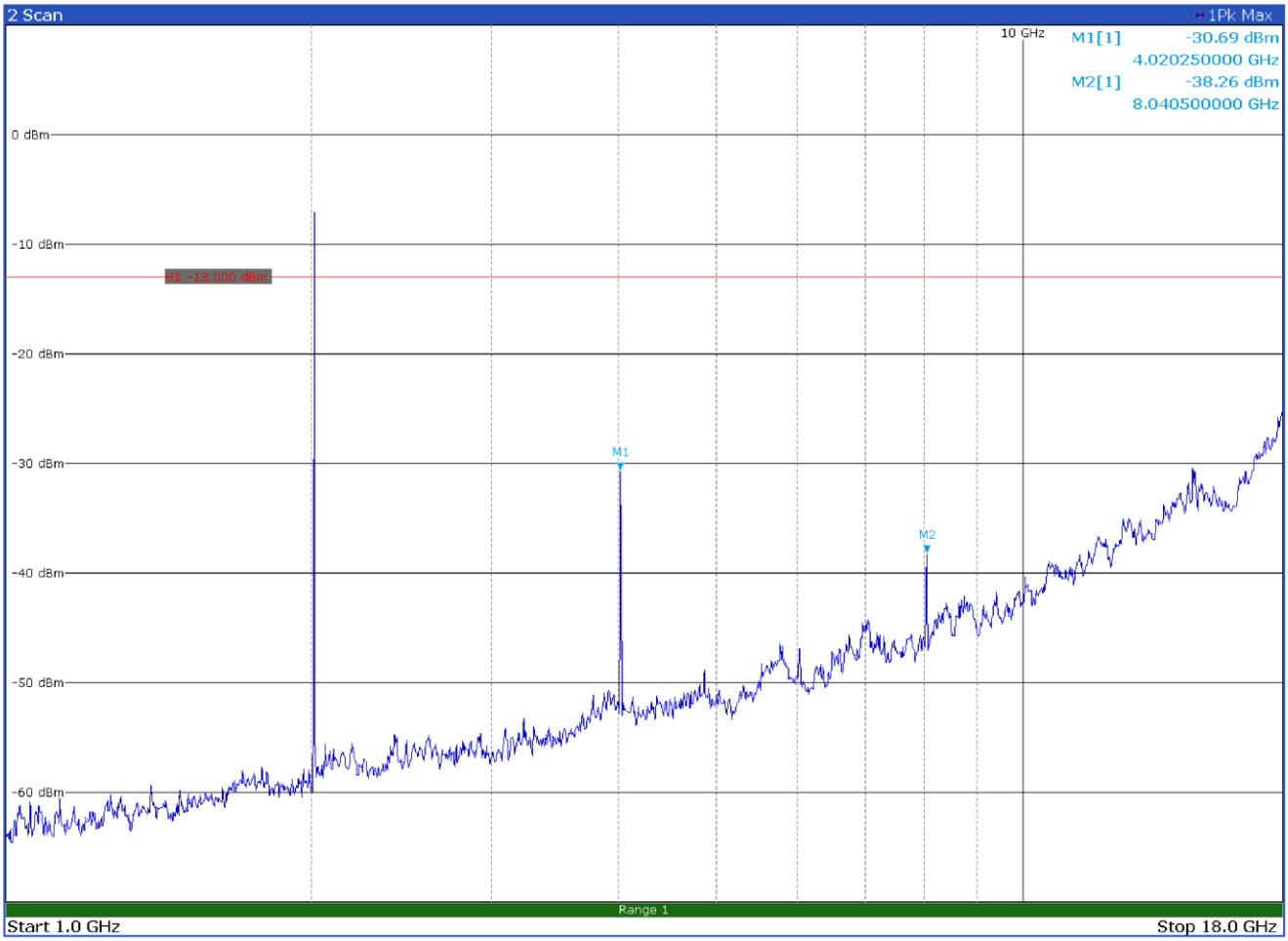


Figure 8.7-40: *Radiated spurious emissions on low channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

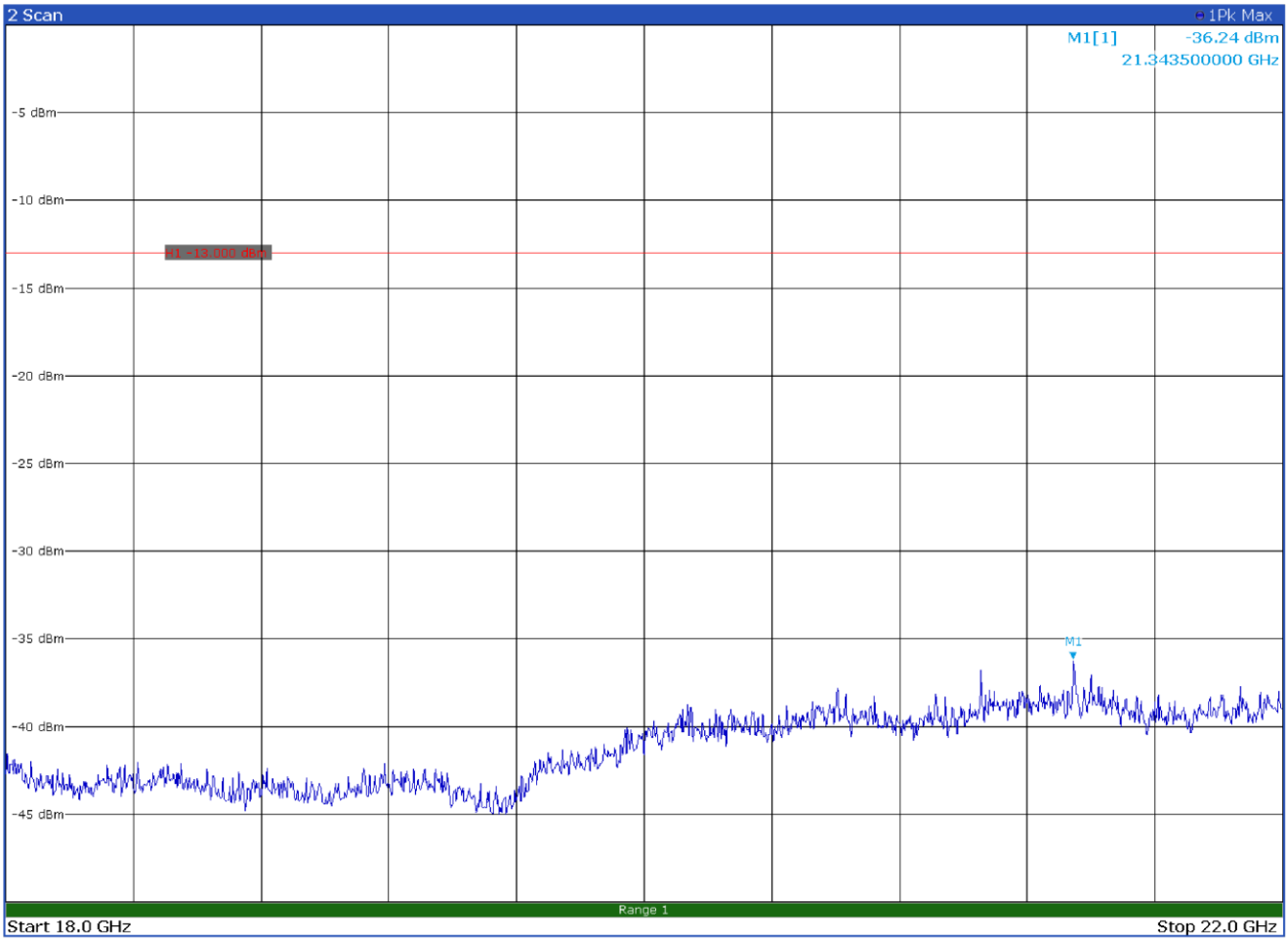


Figure 8.7-41: *Radiated spurious emissions on low channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Test data, continued

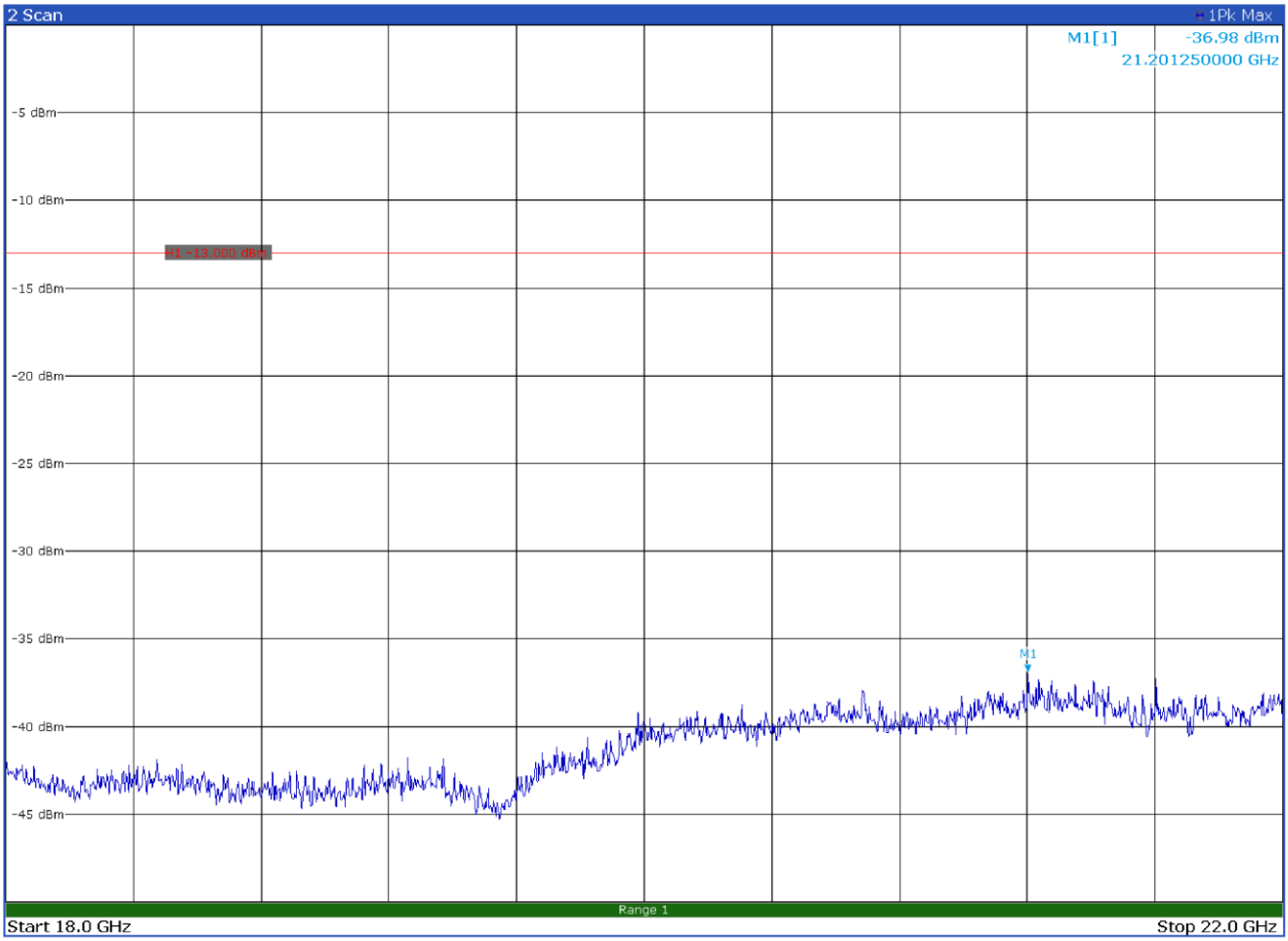


Figure 8.7-42: *Radiated spurious emissions on low channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Test data, continued

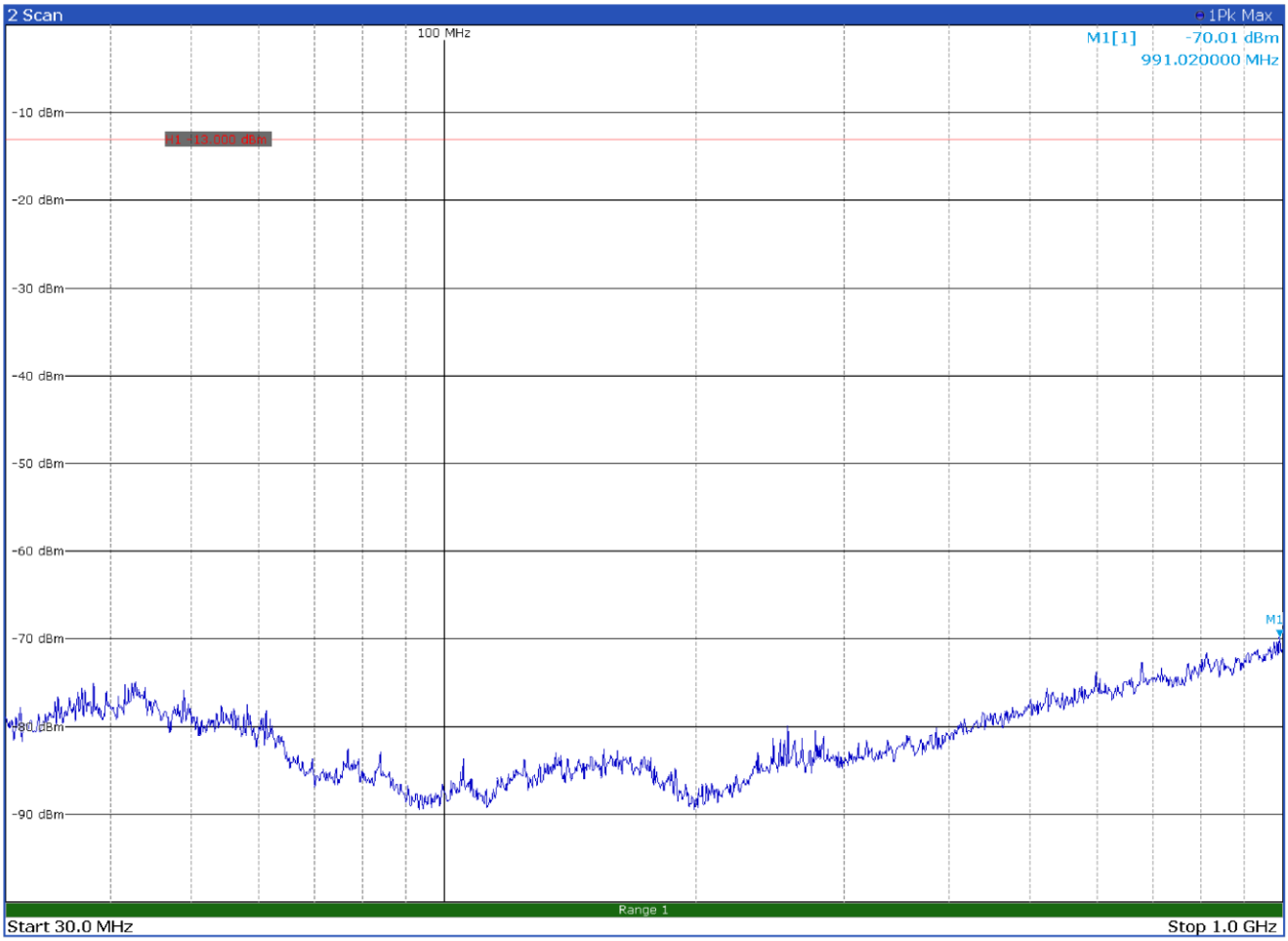


Figure 8.7-43: *Radiated spurious emissions on mid channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Test data, continued

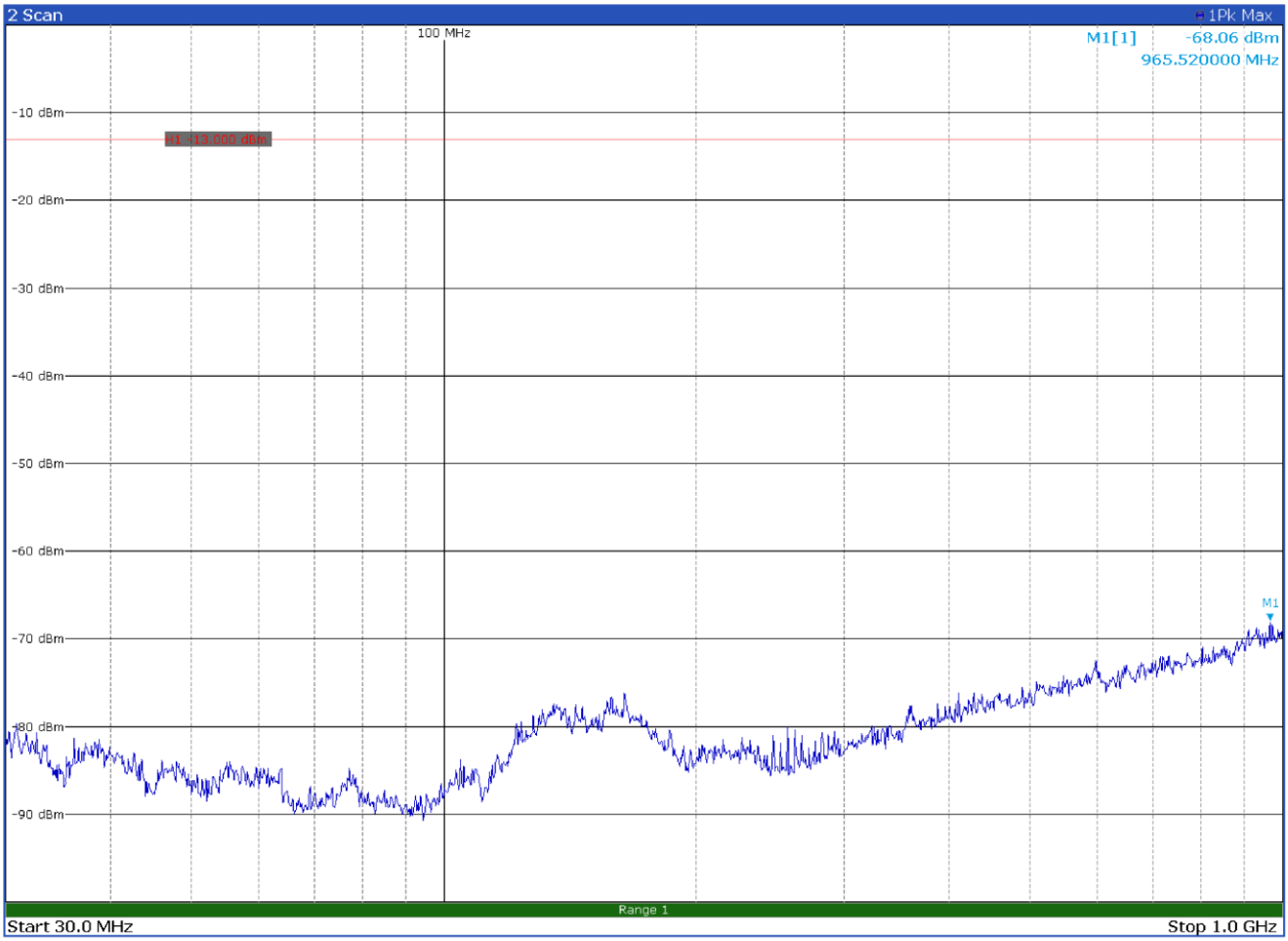


Figure 8.7-44: *Radiated spurious emissions on mid channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Test data, continued

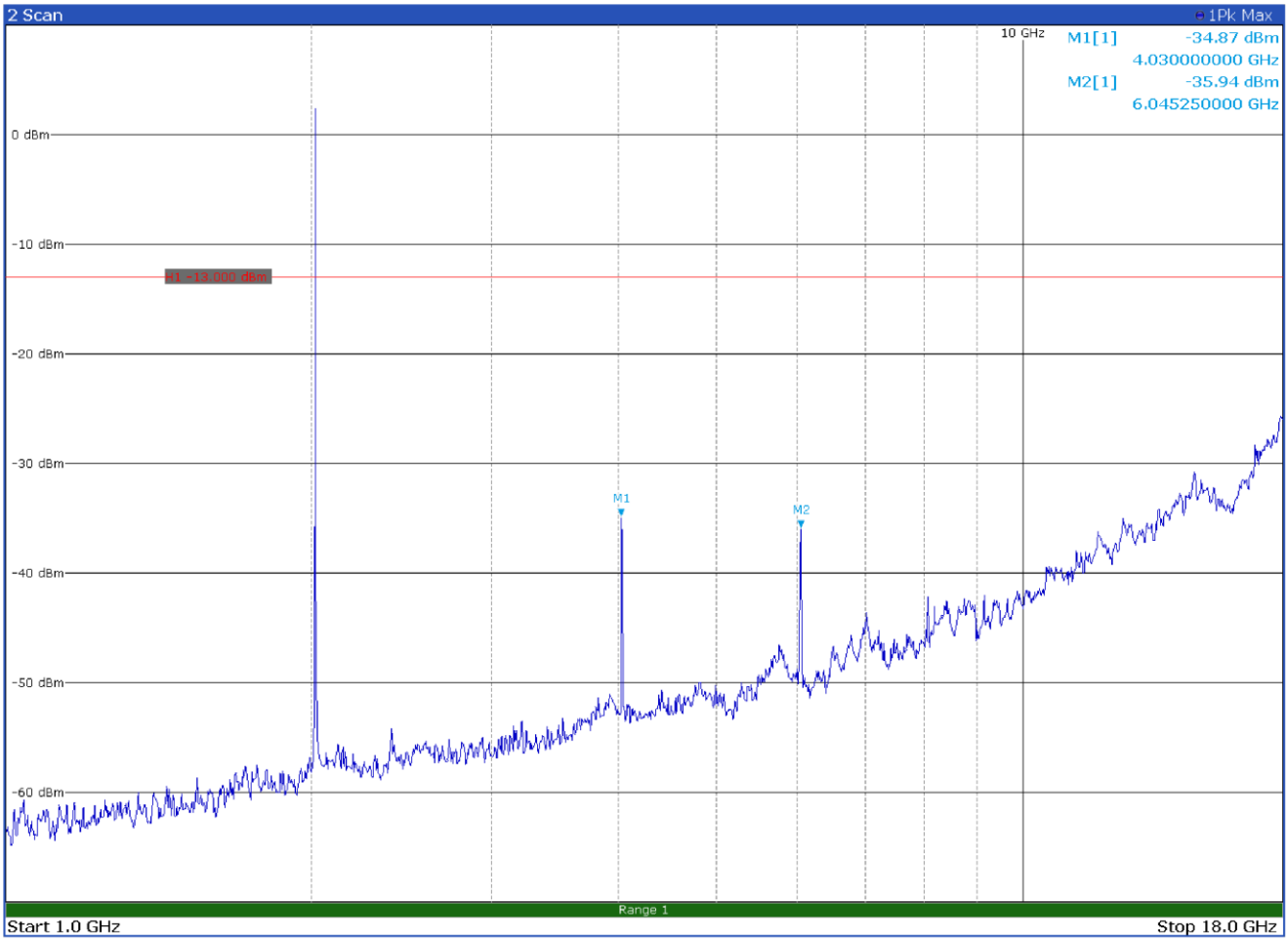


Figure 8.7-45: *Radiated spurious emissions on mid channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

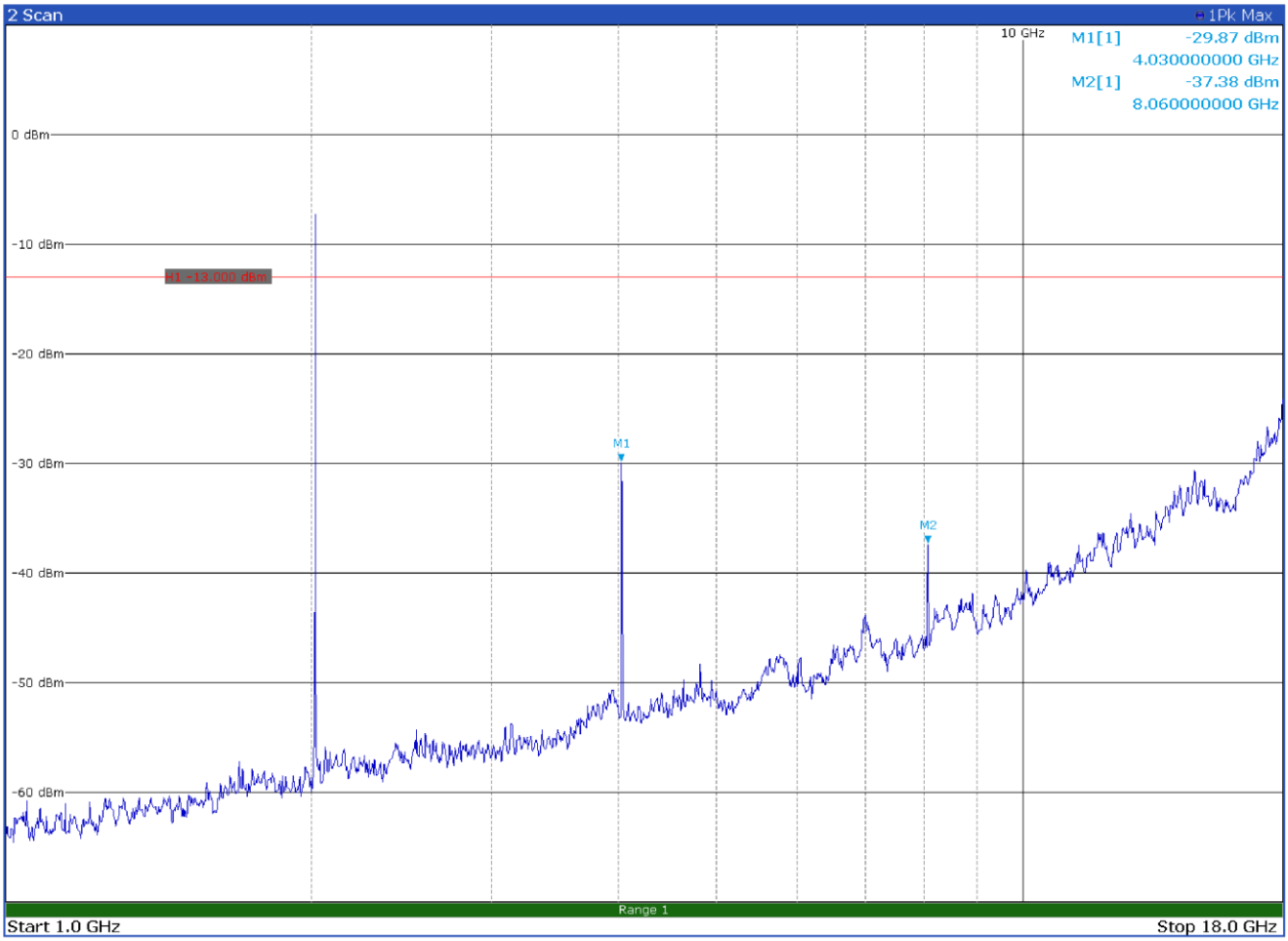


Figure 8.7-46: *Radiated spurious emissions on mid channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

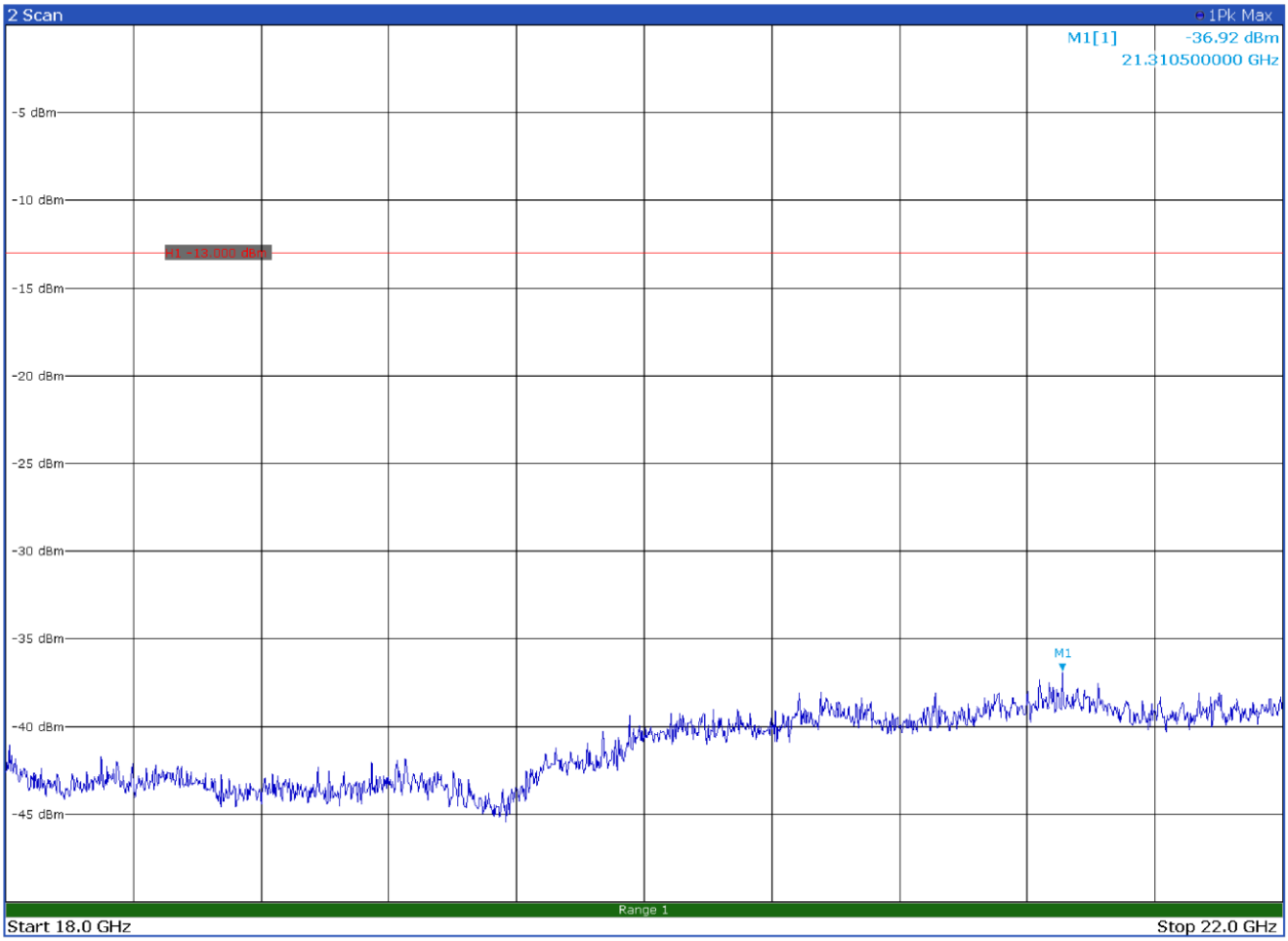


Figure 8.7-47: *Radiated spurious emissions on mid channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Test data, continued

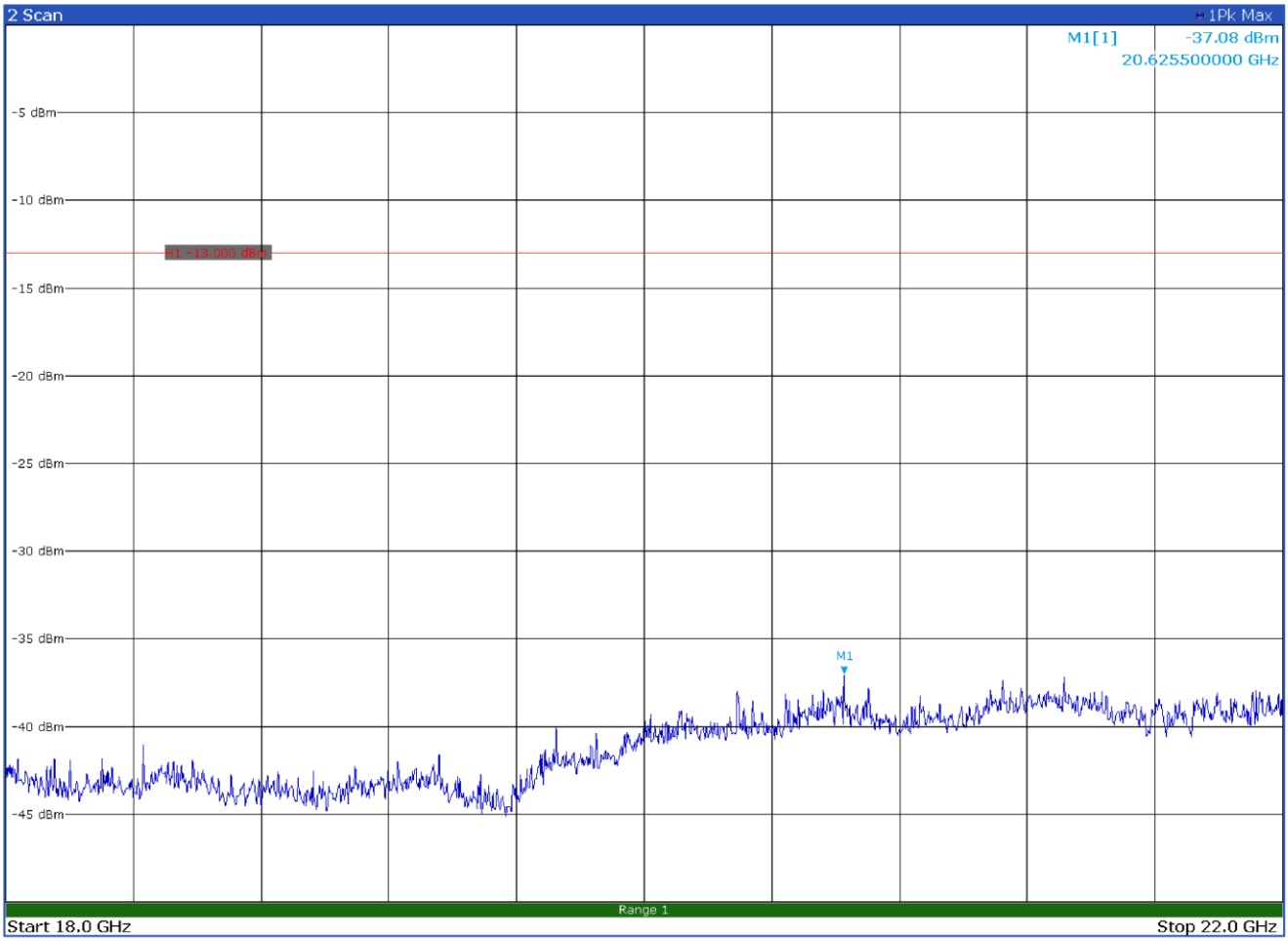


Figure 8.7-48: *Radiated spurious emissions on mid channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Test data, continued

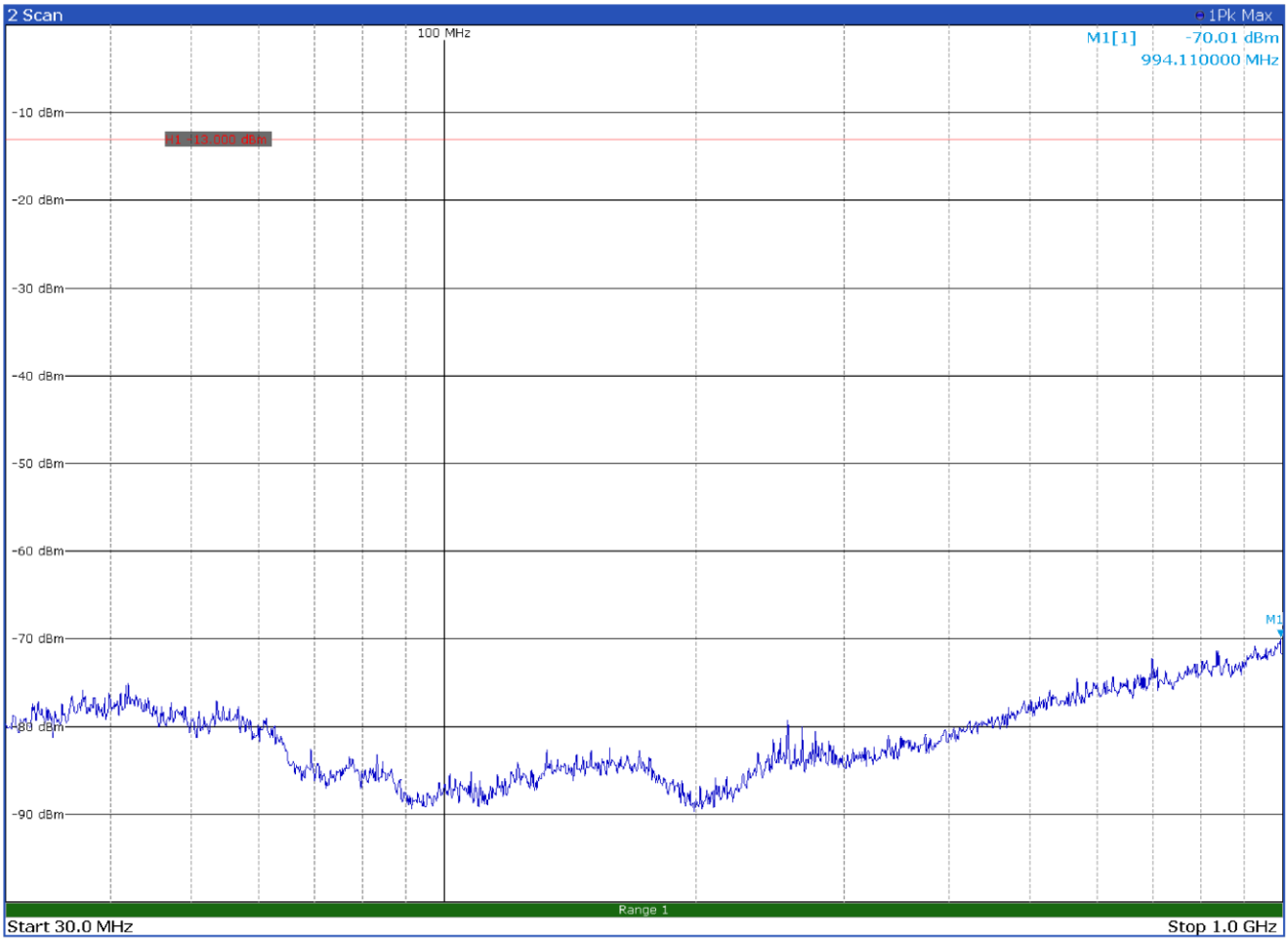


Figure 8.7-49: *Radiated spurious emissions on high channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Test data, continued

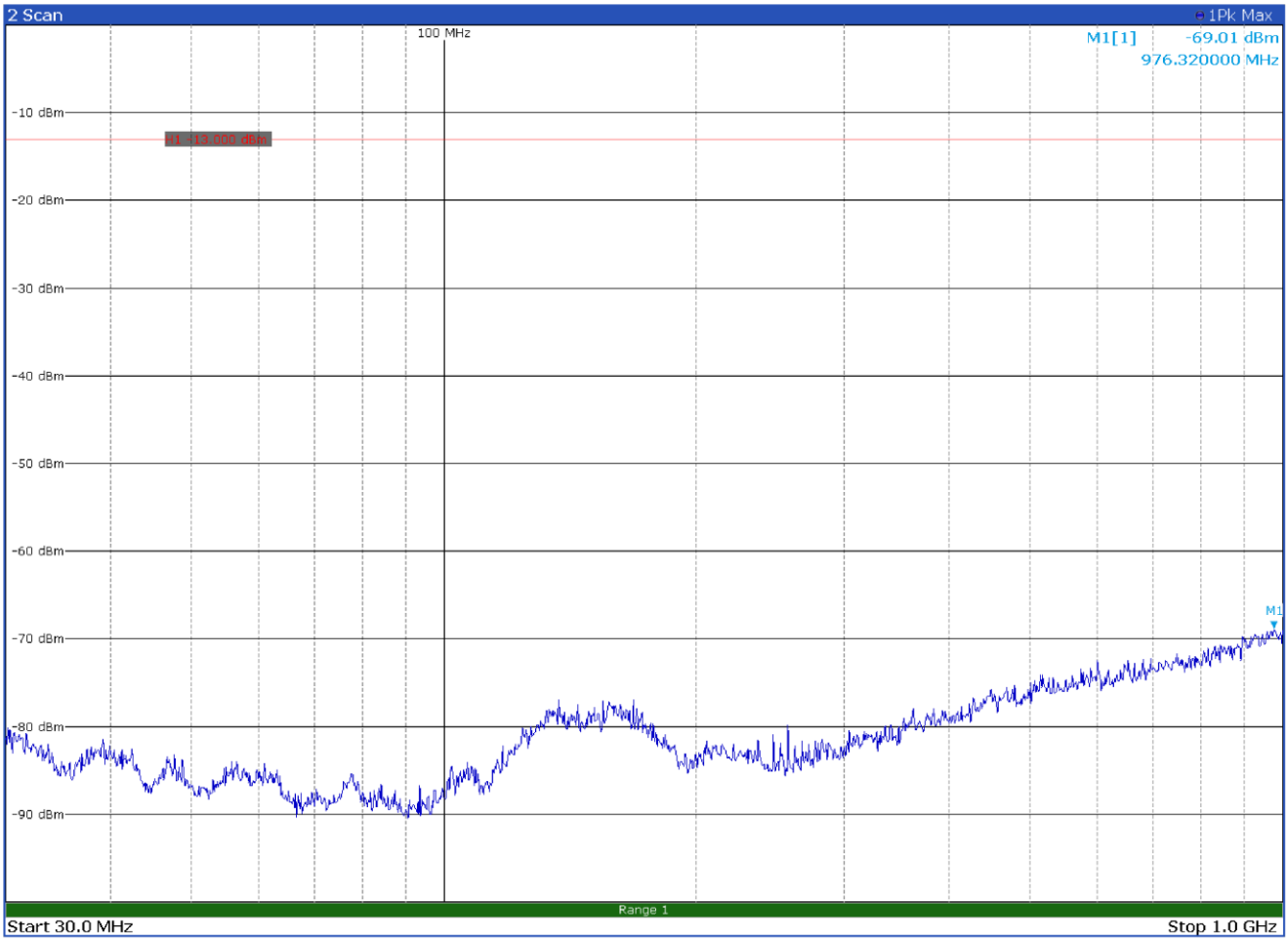


Figure 8.7-50: *Radiated spurious emissions on high channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Test data, continued

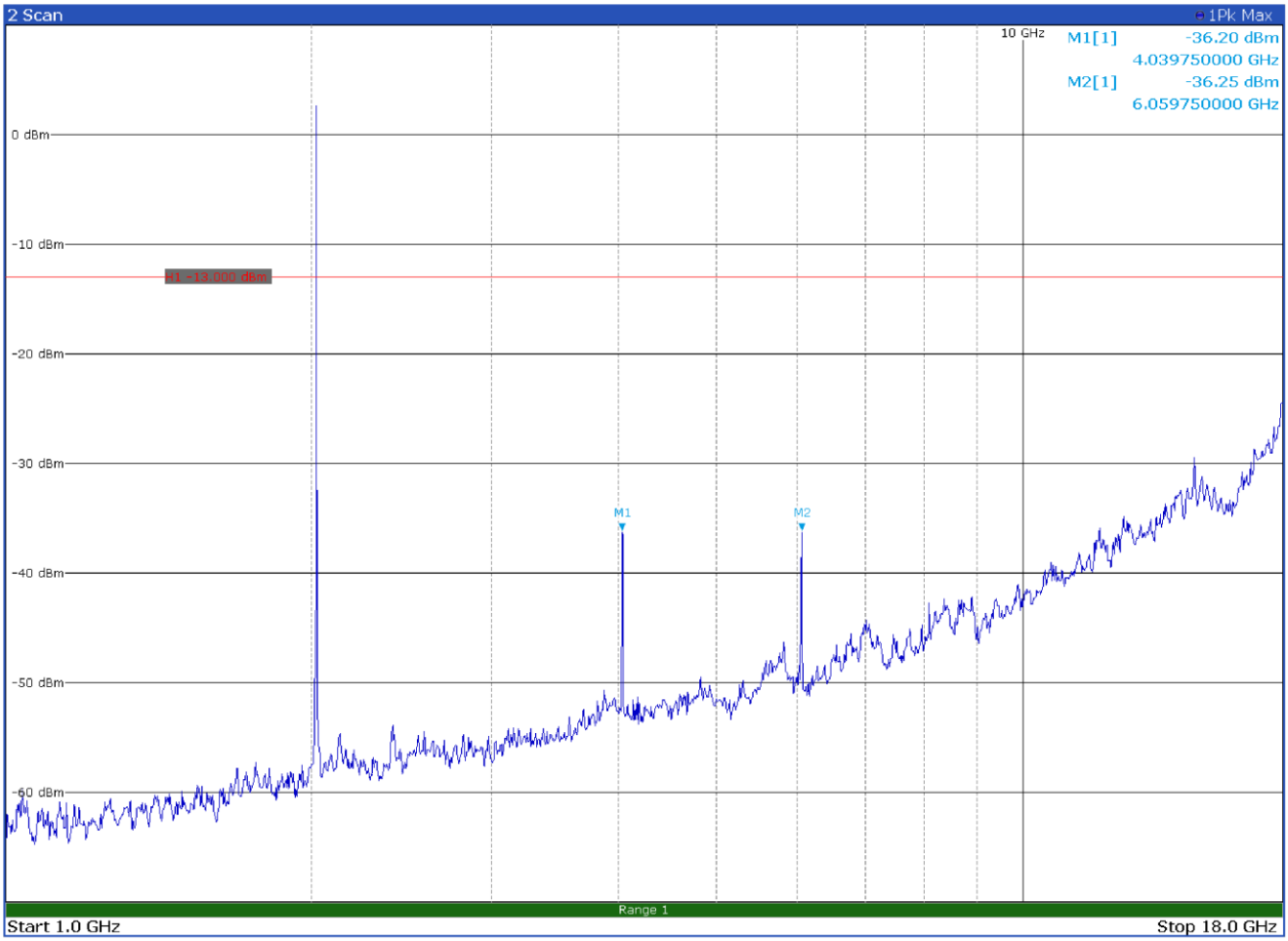


Figure 8.7-51: *Radiated spurious emissions on high channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Limit exceeded by the carrier

Test data, continued

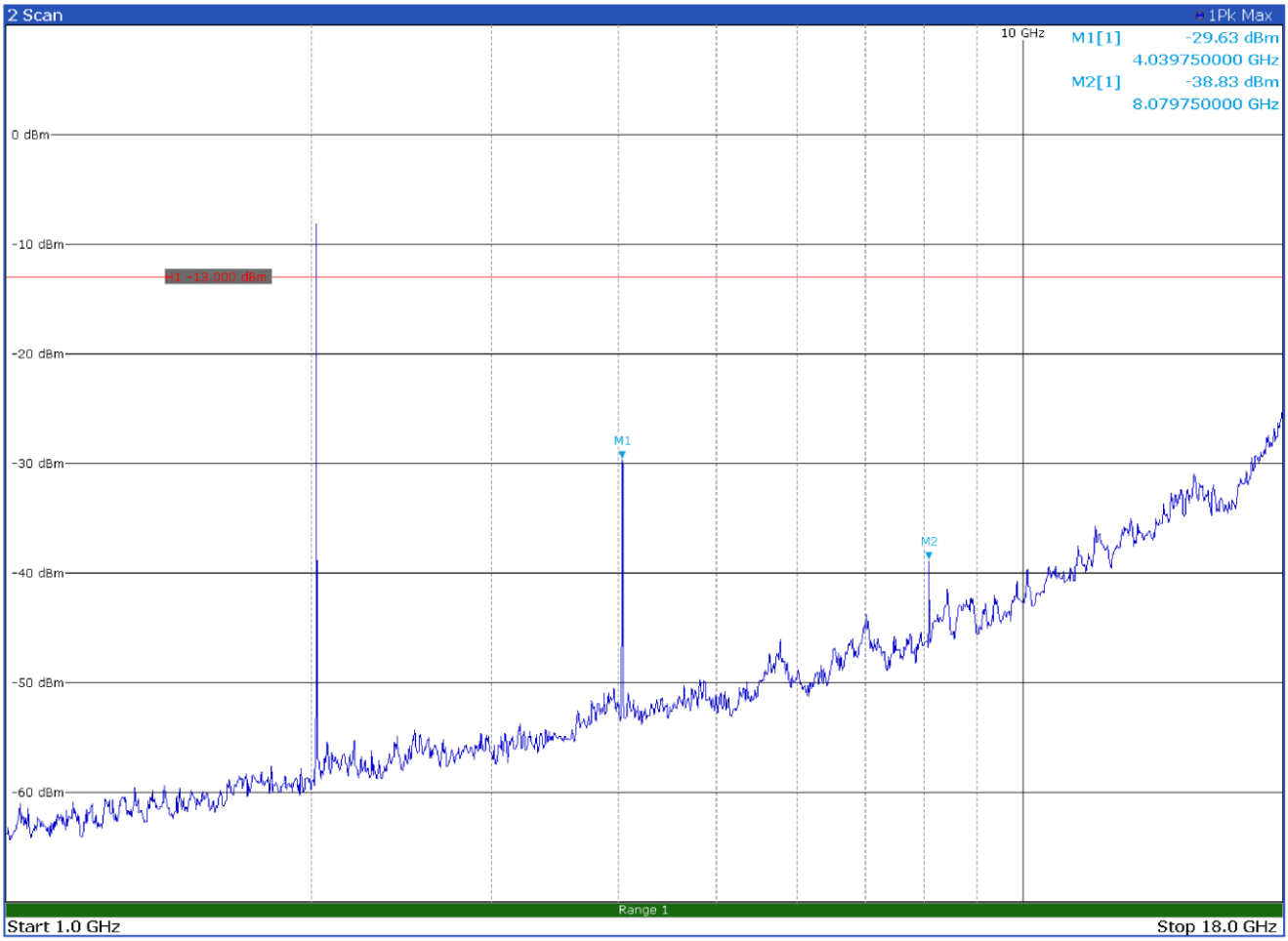


Figure 8.7-52: *Radiated spurious emissions on high channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

Limit exceeded by the carrier

Test data, continued

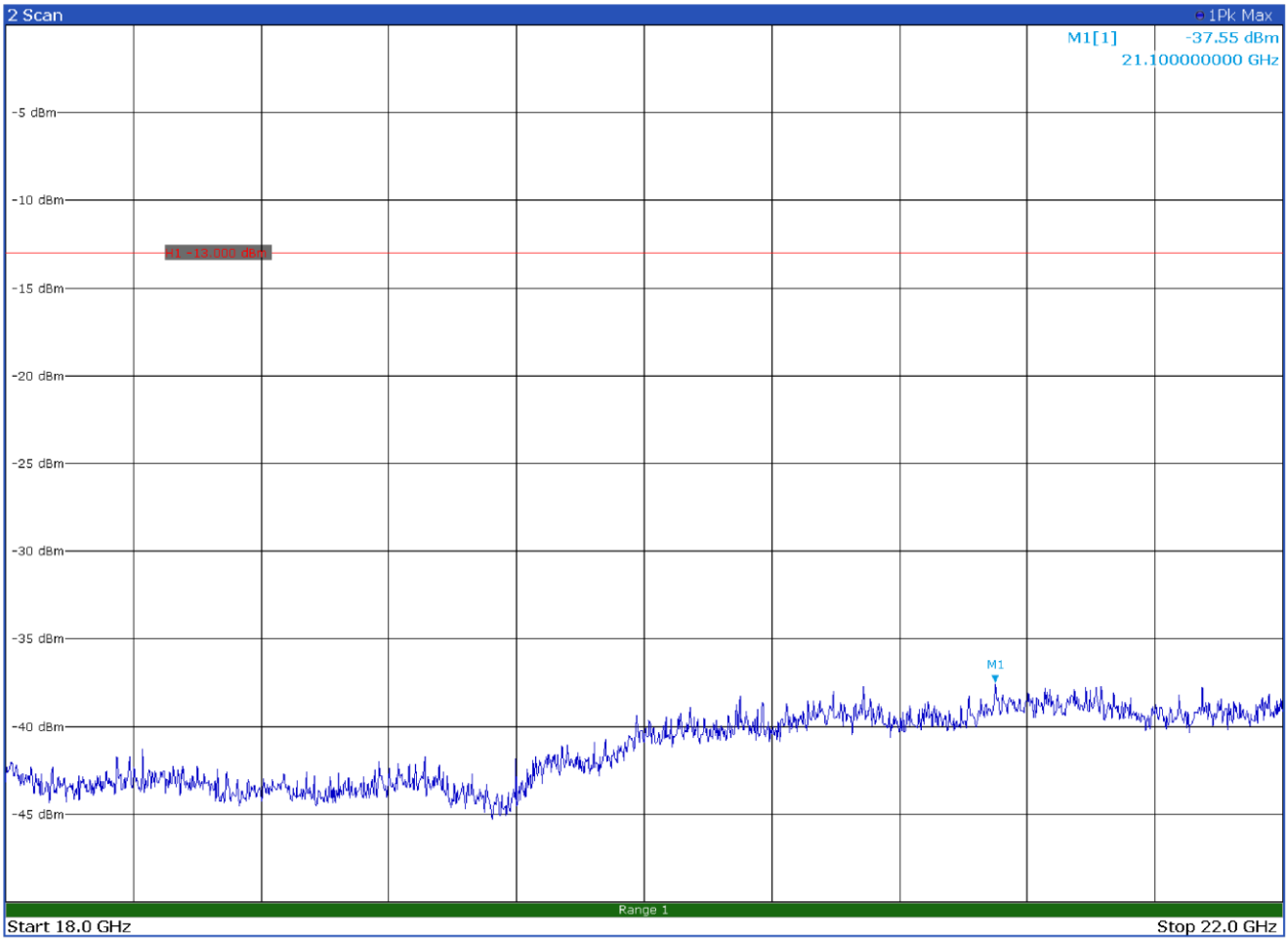


Figure 8.7-53: *Radiated spurious emissions on high channel - LR-FHSS 137 kHz– Antenna in horizontal polarization*

Test data, continued

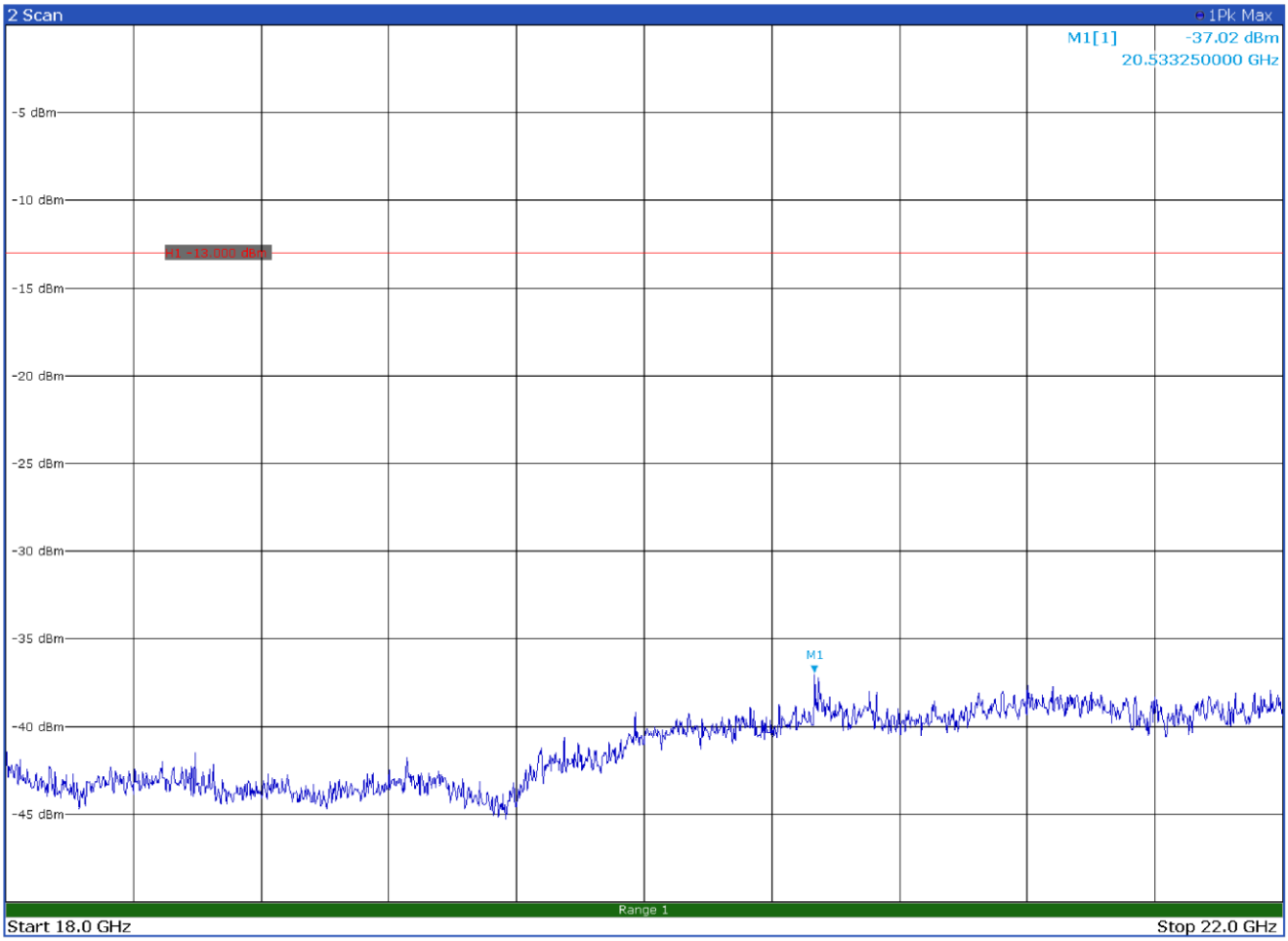


Figure 8.7-54: *Radiated spurious emissions on high channel - LR-FHSS 137 kHz– Antenna in vertical polarization*

8.8 Frequency stability

8.8.1 References, definitions and limits

FCC §25.202:

(d) Frequency tolerance, Earth stations. The carrier frequency of each earth station transmitter authorized in these services shall be maintained within 0.001 percent of the reference frequency.

RSS-170, Clause 5.3:

For mobile earth station equipment, the carrier frequency shall not depart from the reference frequency by more than ±10 ppm.

For ATC equipment operating in the bands 2000-2020 MHz and 2180-2200 MHz, the frequency stability shall be sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

For ATC equipment operating in frequency bands other than the bands 2000-2020 MHz and 2180-2200 MHz, the carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile equipment, and ±1.5 ppm for base station equipment.

8.8.2 Test summary

Verdict	Pass		
Tested by	P. Barbieri	Test date	June 13, 2024

8.8.3 Observations, settings and special notes

Test was performed on supply voltage variations as per client rated, no frequency deviation was observed.

8.8.4 Test equipment used

Equipment	Manufacturer	Model no.	Asset no.
EMI Receiver	Rohde & Schwarz	ESU8	100202
Climatic chamber	espec	ARS-1100	4100000067

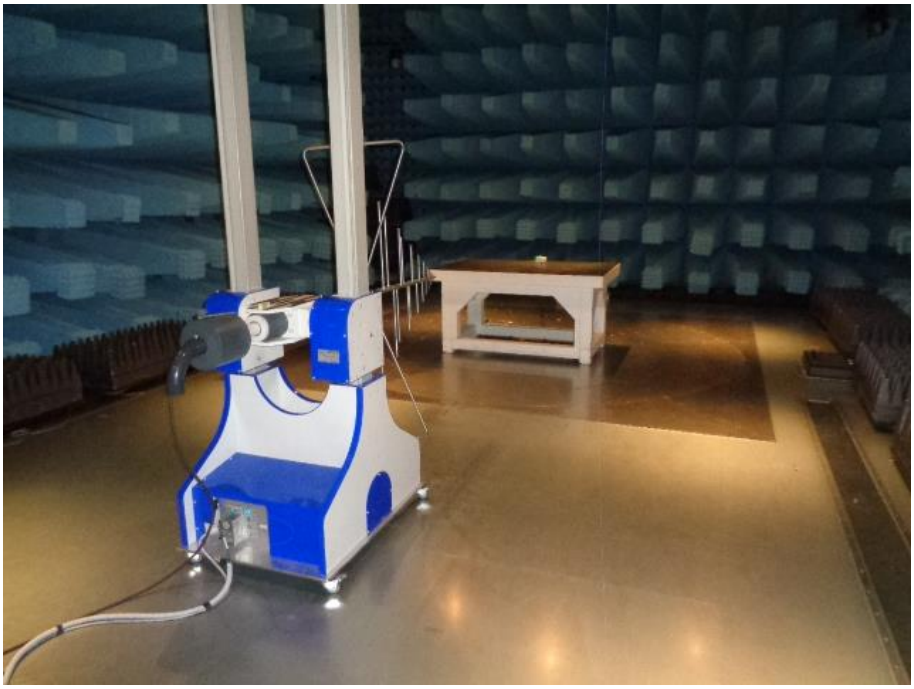
8.8.5 Test data

Table 8.8-1: *Transmitter frequency stability results*

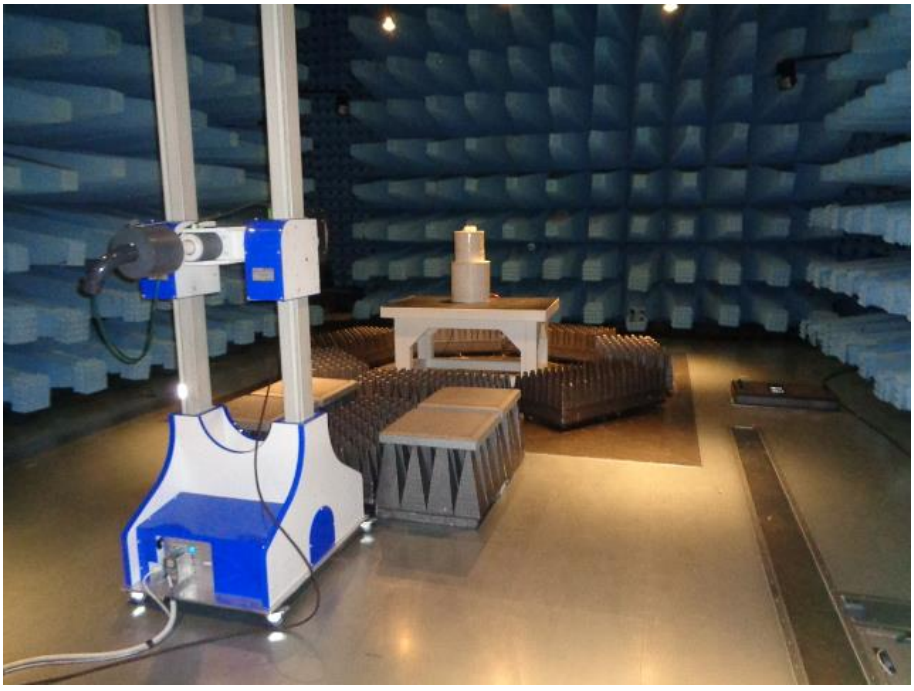
Test conditions	Frequency, Hz	Drift, Hz	Drift, ppm	Limit ±ppm	Margin, ±ppm
+50 °C, Nominal	2014996419	158	0.08	1	-0.92
+40 °C, Nominal	2014996455	122	0.06	1	-0.96
+30 °C, Nominal	2014996480	97	0.05	1	-0.95
+20 °C, Nominal	2014996577	Reference	Reference	Reference	Reference
+10 °C, Nominal	2014996484	93	0.05	1	-0.95
0 °C, Nominal	2014996442	135	0.07	1	-0.93
−10 °C, Nominal	2014996409	168	0.08	1	-0.92
−20 °C, Nominal	2014996836	259	0.13	1	-0.87
−30 °C, Nominal	2014997220	643	0.32	1	-0.68

Section 9 EUT photos

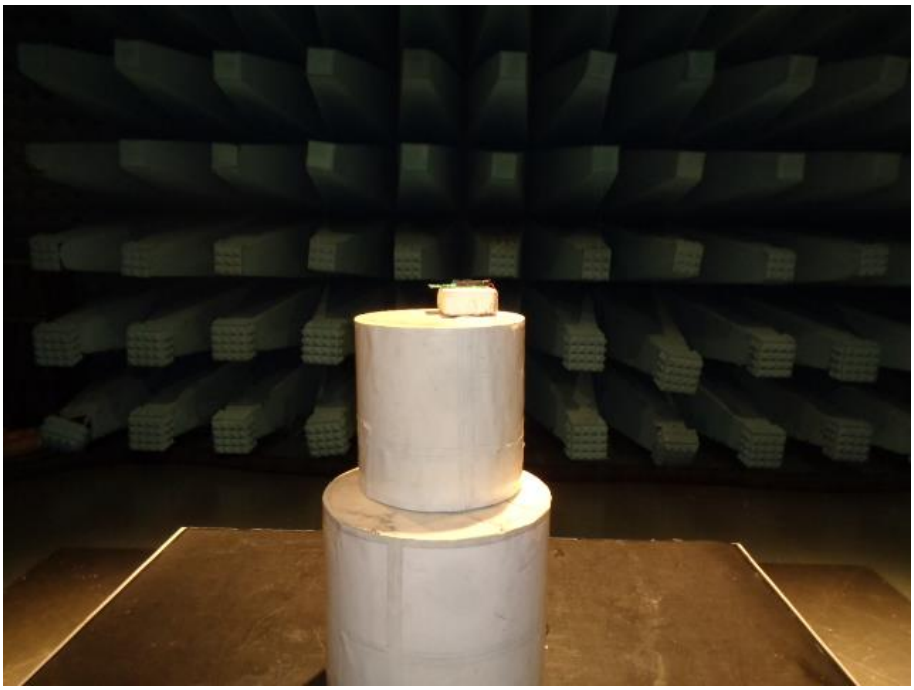
9.1 Set-up photos



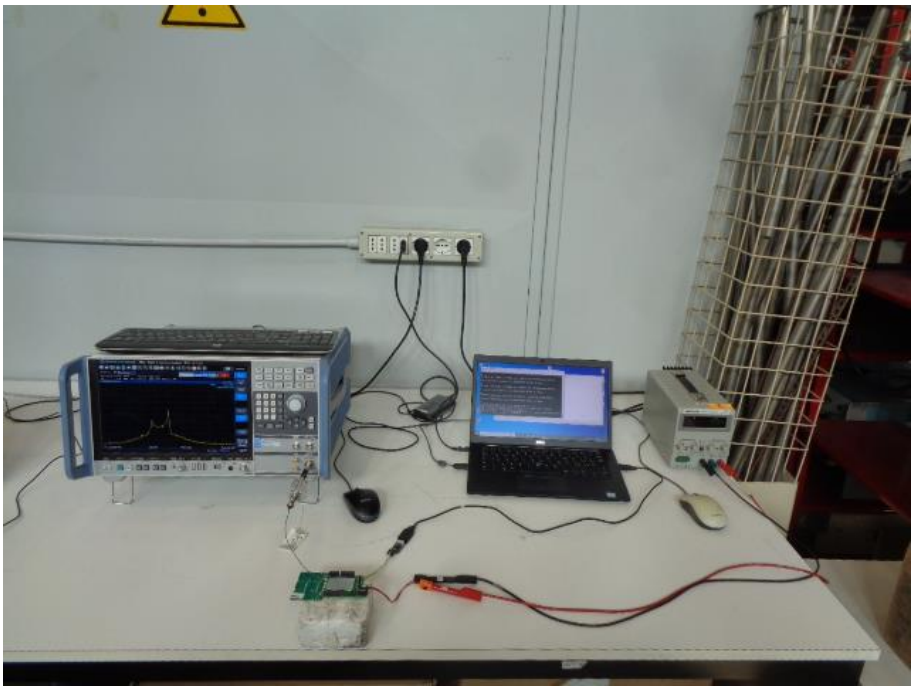
Test set-up for radiated emission test below 1 GHz



Test set-up for radiated emission test above 1 GHz

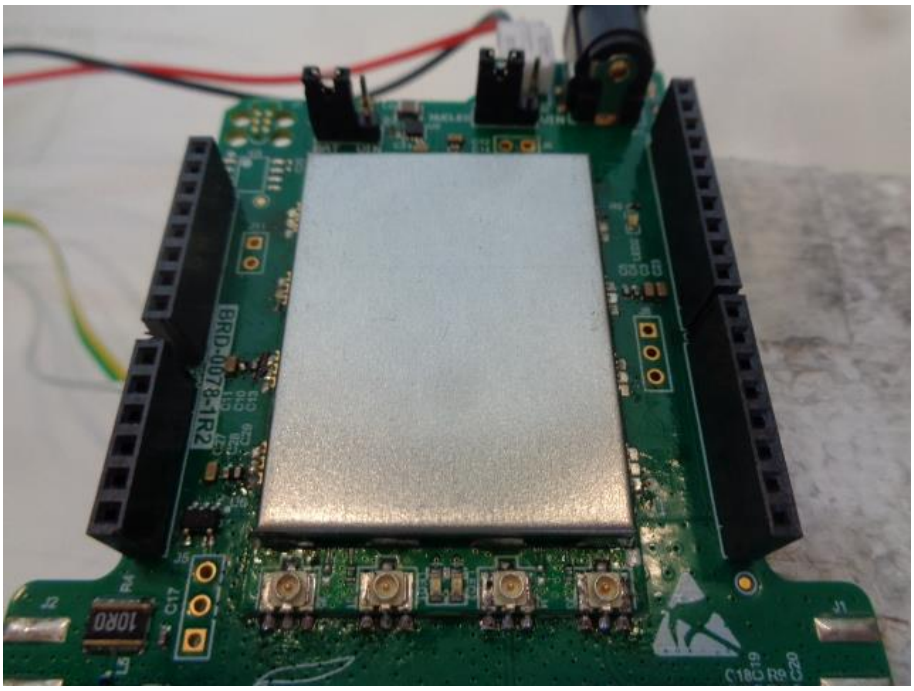


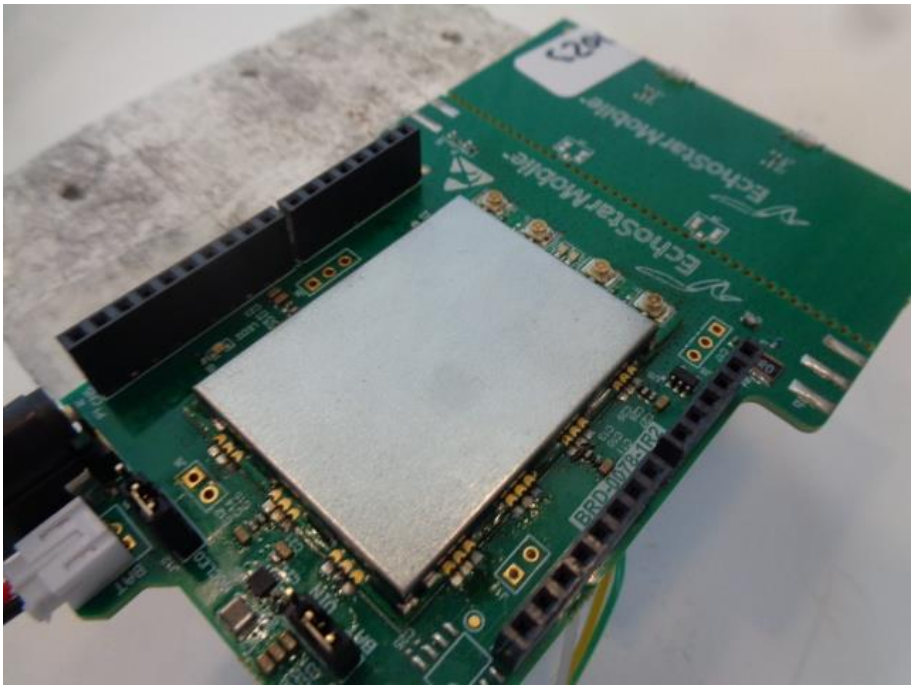
Test set-up for radiated emission test above 1 GHz



Test set-up for conducted emission test

9.2 External photos





End of the test report