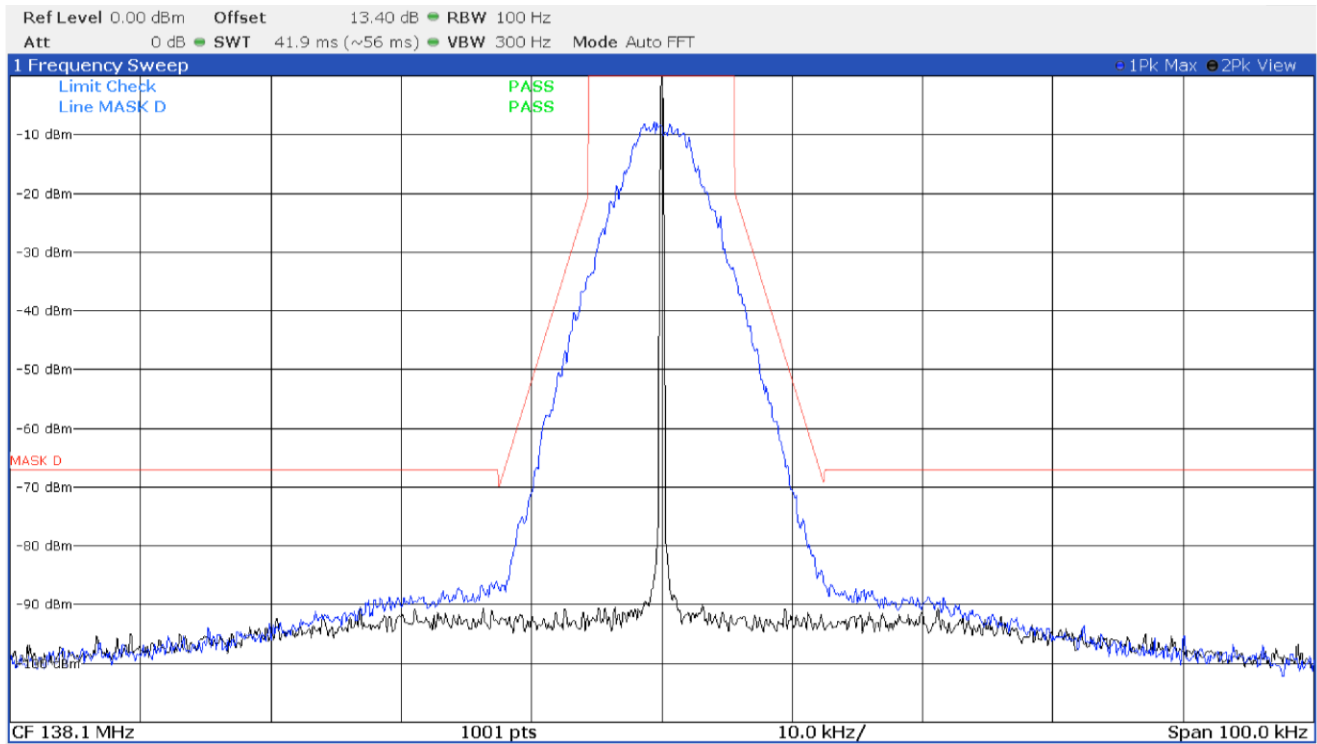
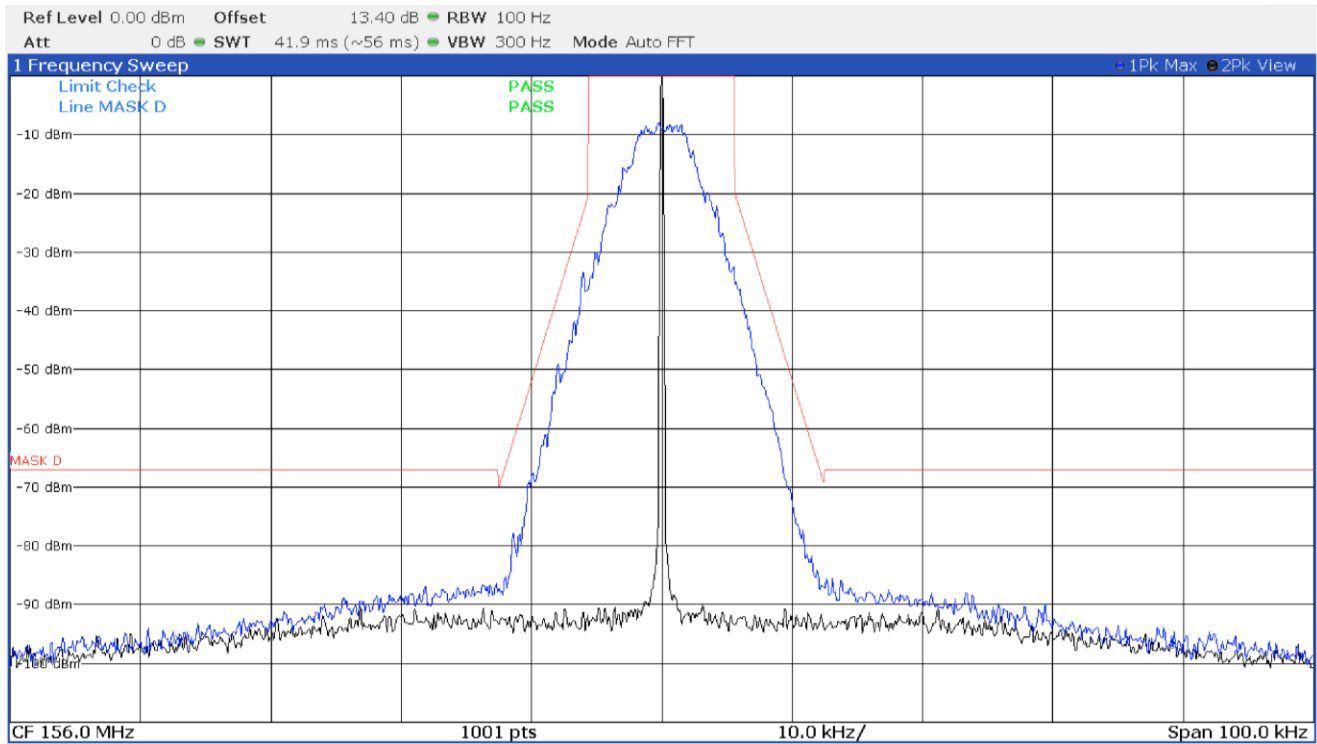


Test data, continued



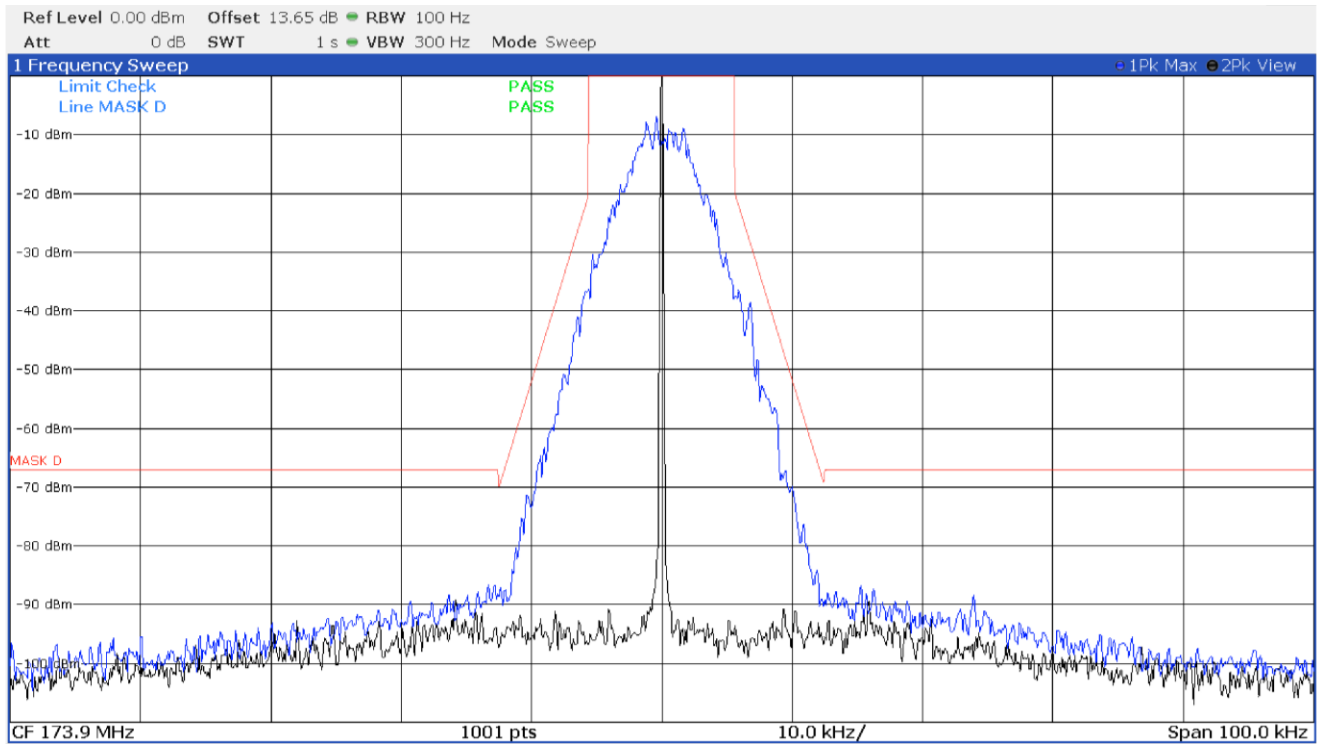
Emission mask D with modulation P25 C4FM at 138.1 MHz

Test data, continued



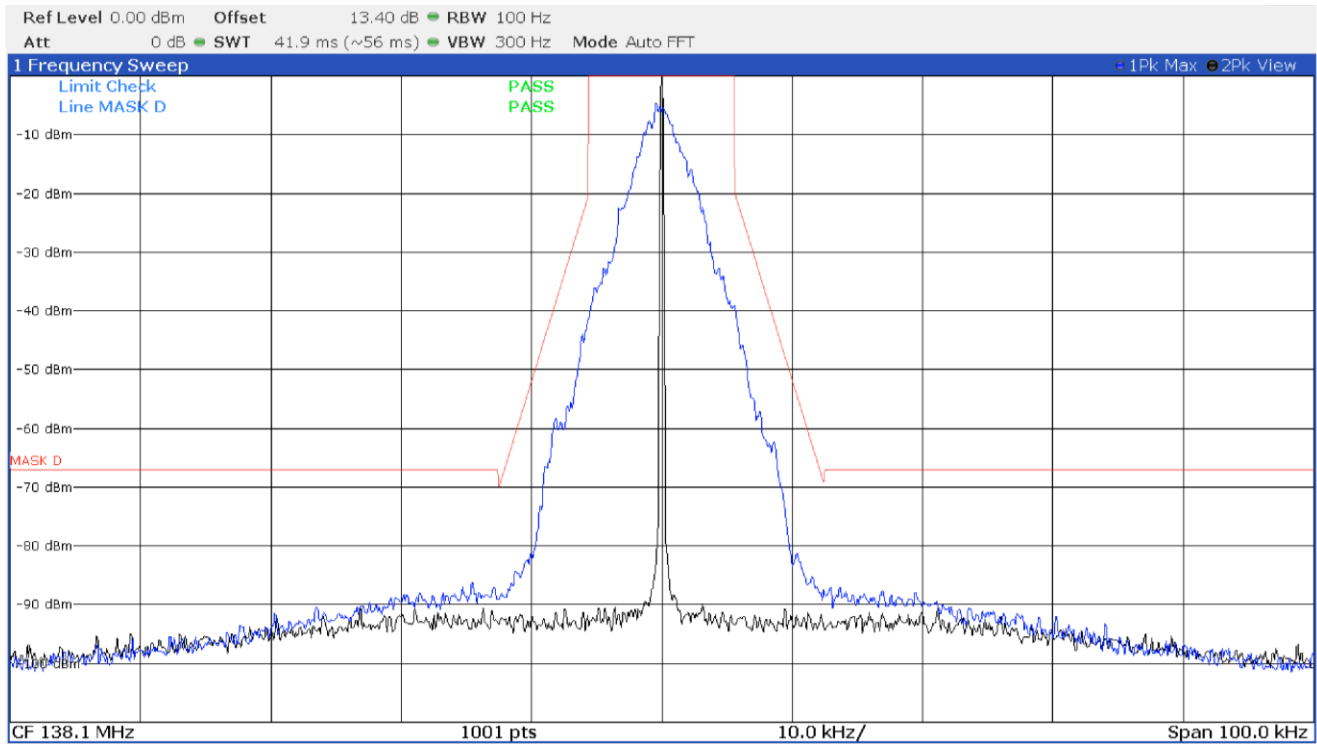
Emission mask D with modulation P25 C4FM at 156.0 MHz

Test data, continued



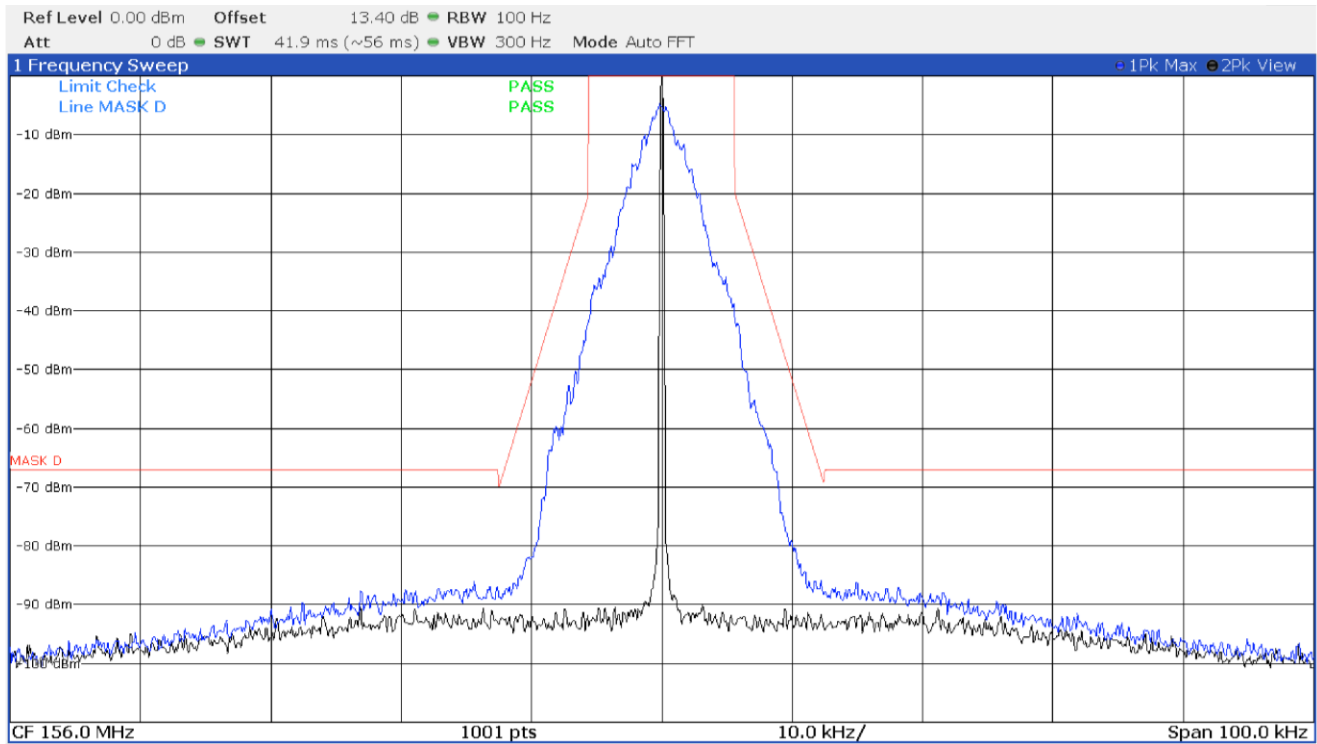
Emission mask D with modulation P25 C4FM at 173.9 MHz

Test data, continued



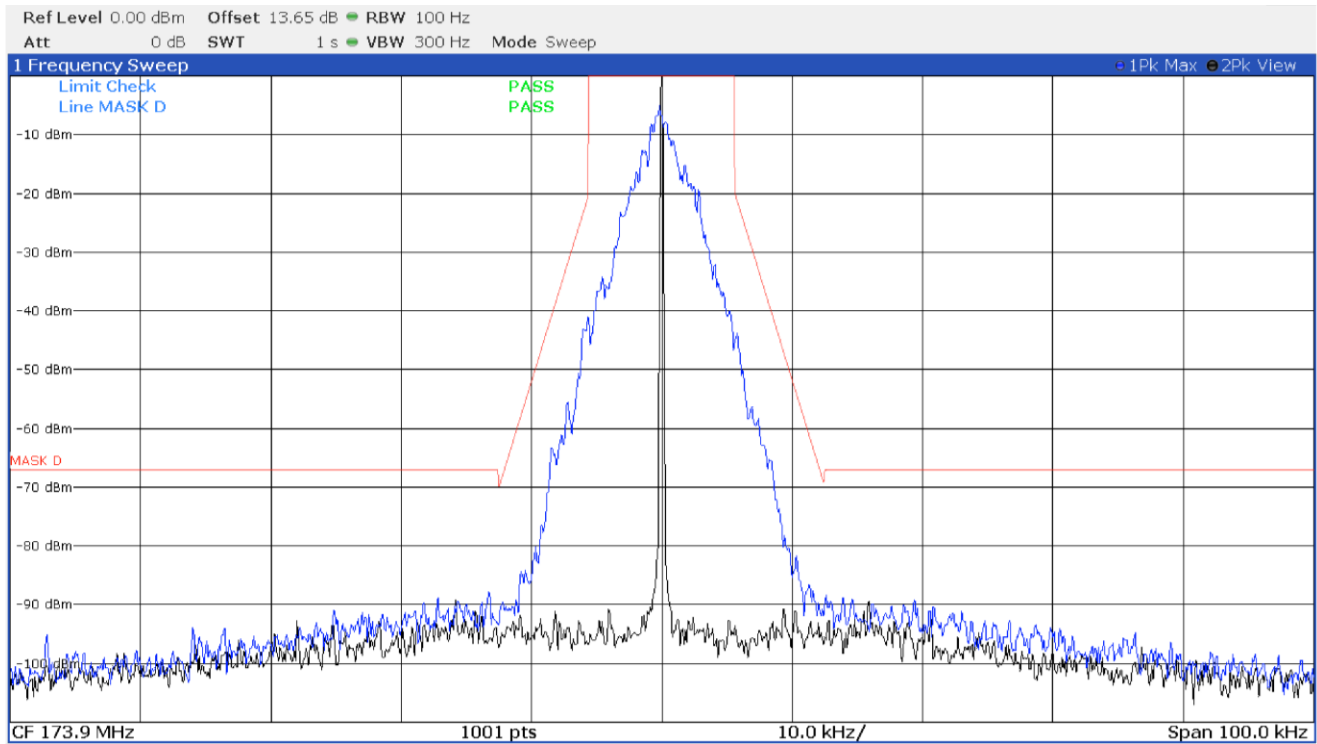
Emission mask D with modulation CST 4FSK at 138.1 MHz

Test data, continued



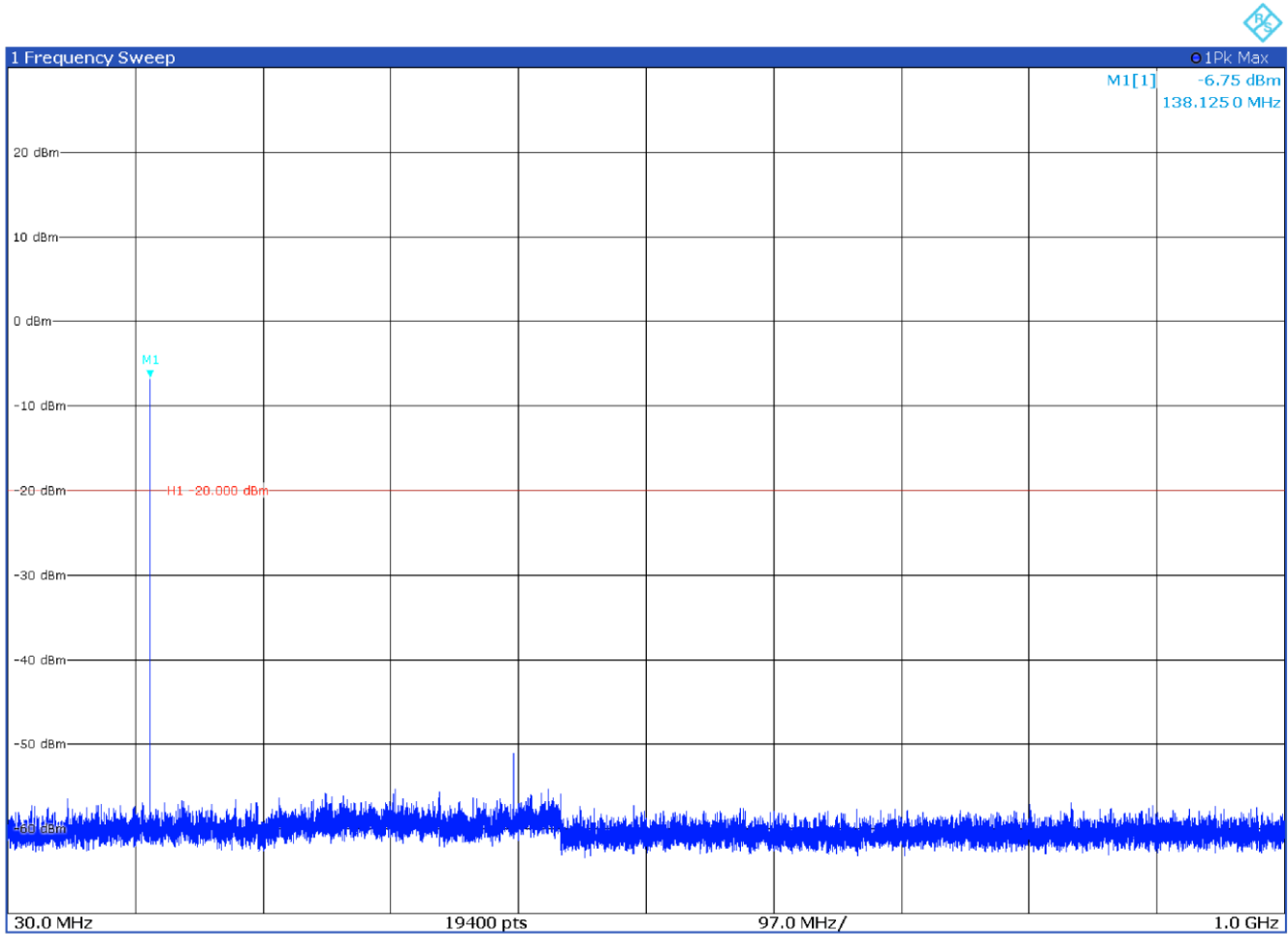
Emission mask D with modulation CST 4FSK at 156.0 MHz

Test data, continued



Emission mask D with modulation CST 4FSK at 173.9 MHz

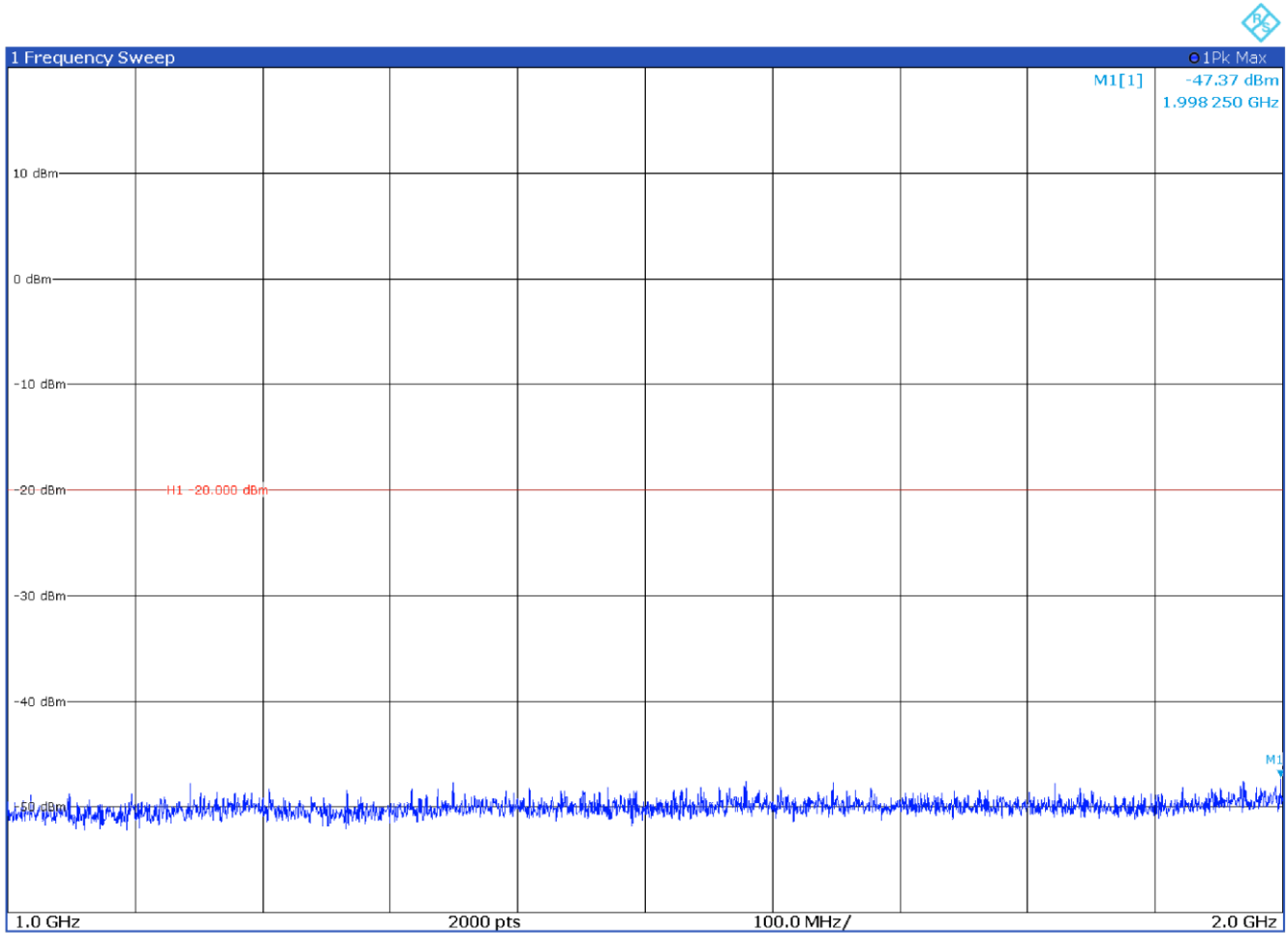
Test data, continued



Conducted spurious emissions with modulation DMR 4FSK at 138.1 MHz

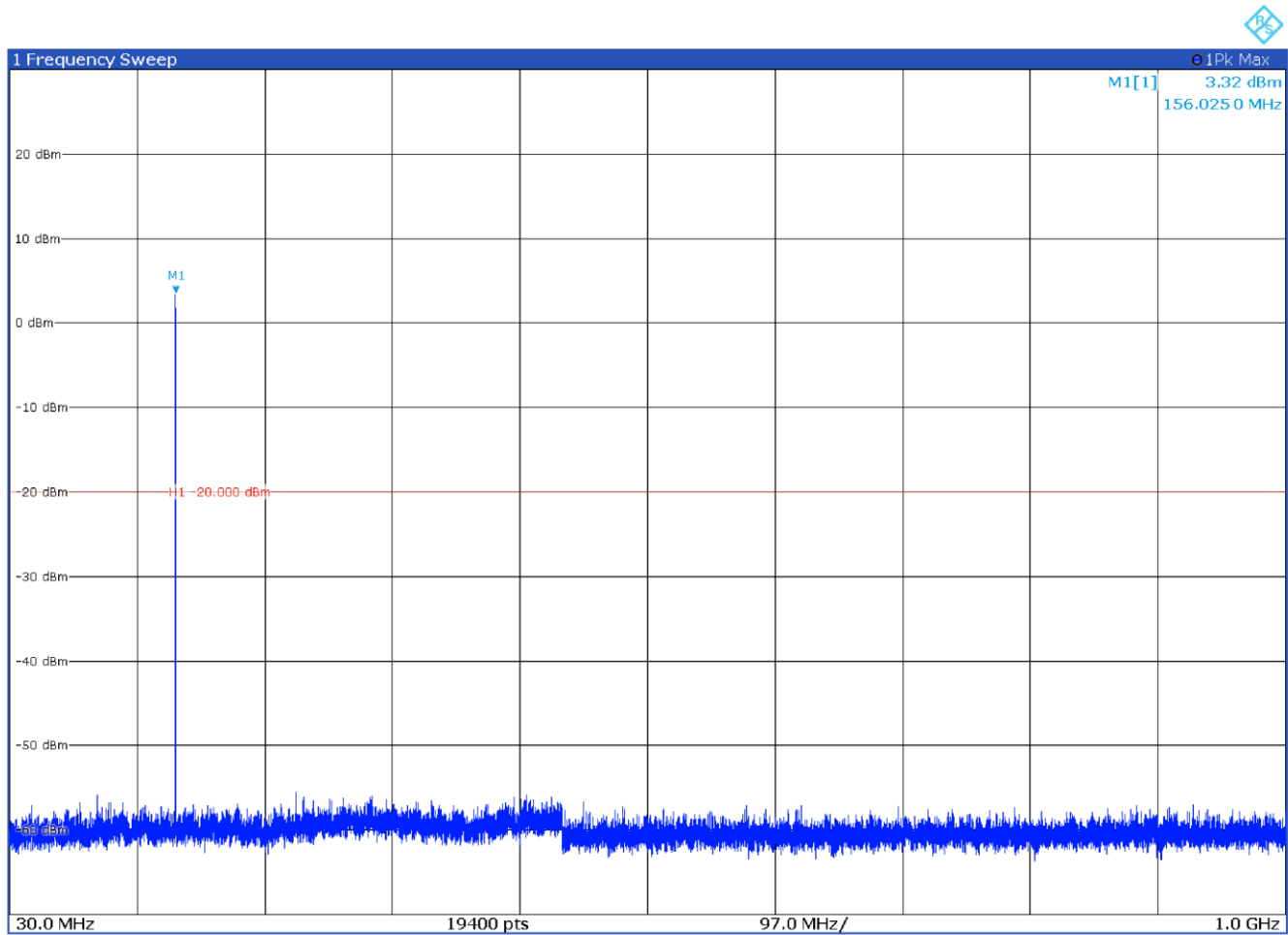
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation DMR 4FSK at 138.1 MHz

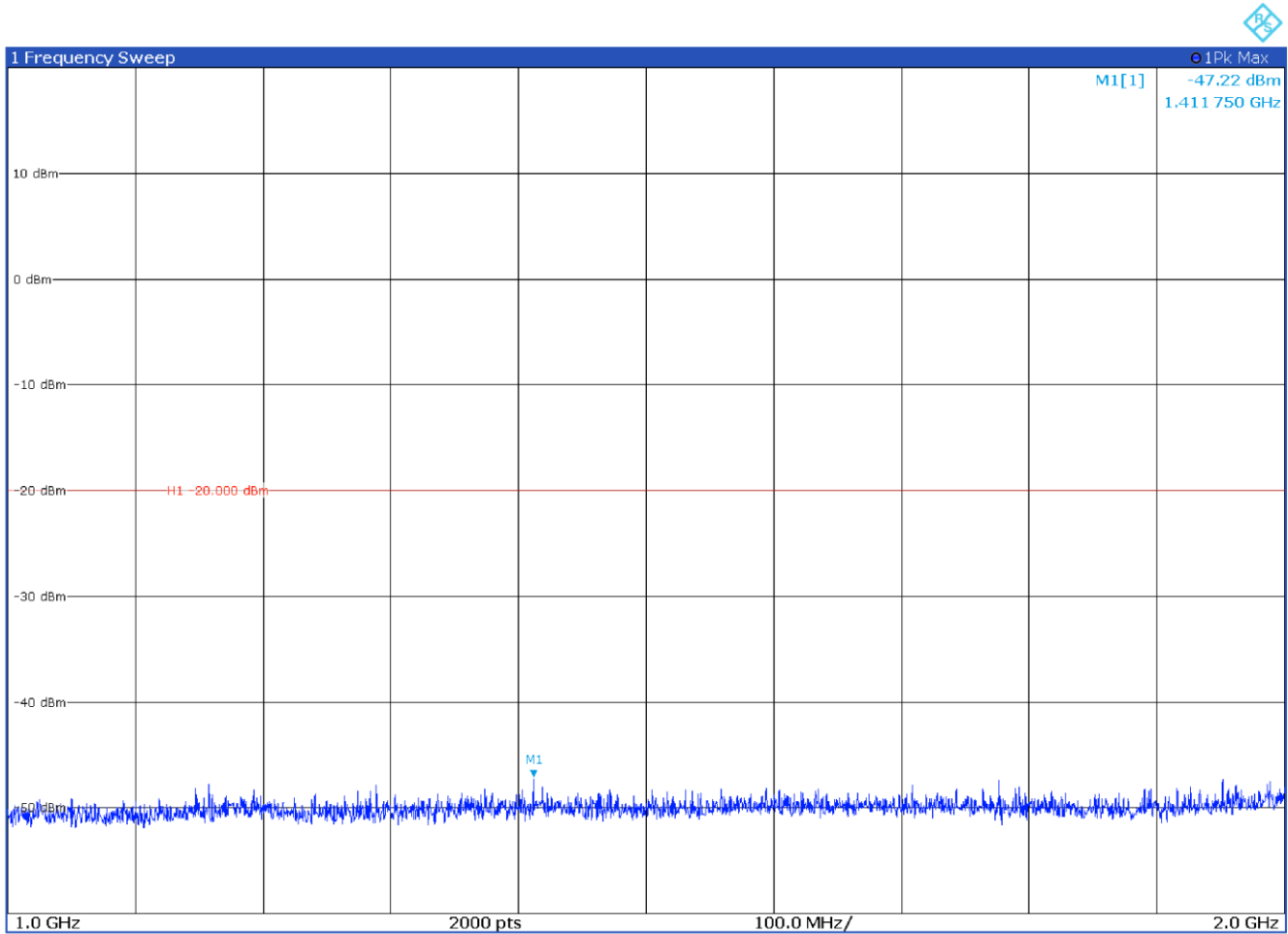
Test data, continued



Conducted spurious emissions with modulation DMR 4FSK at 156.0 MHz

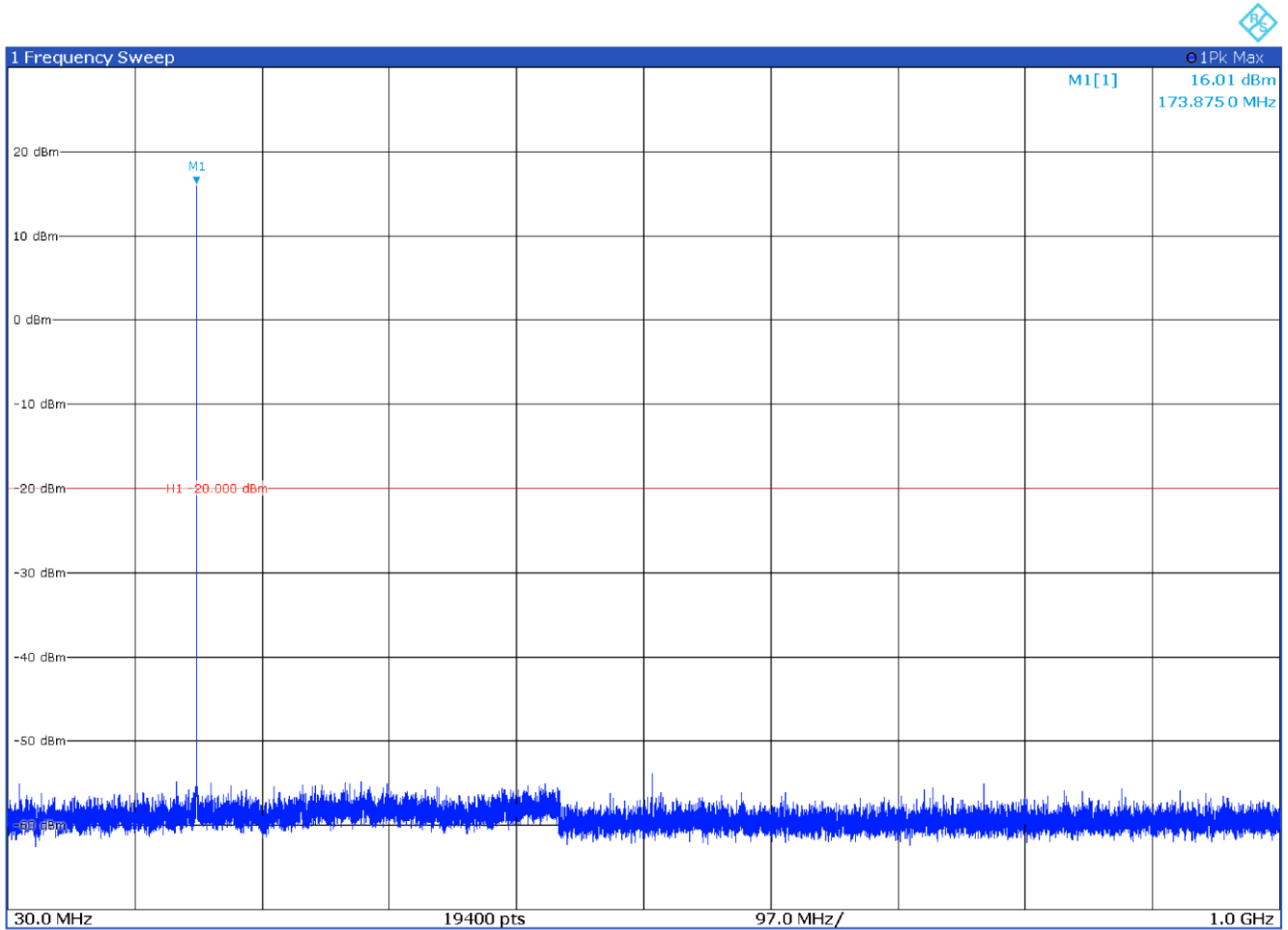
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation DMR 4FSK at 156.0 MHz

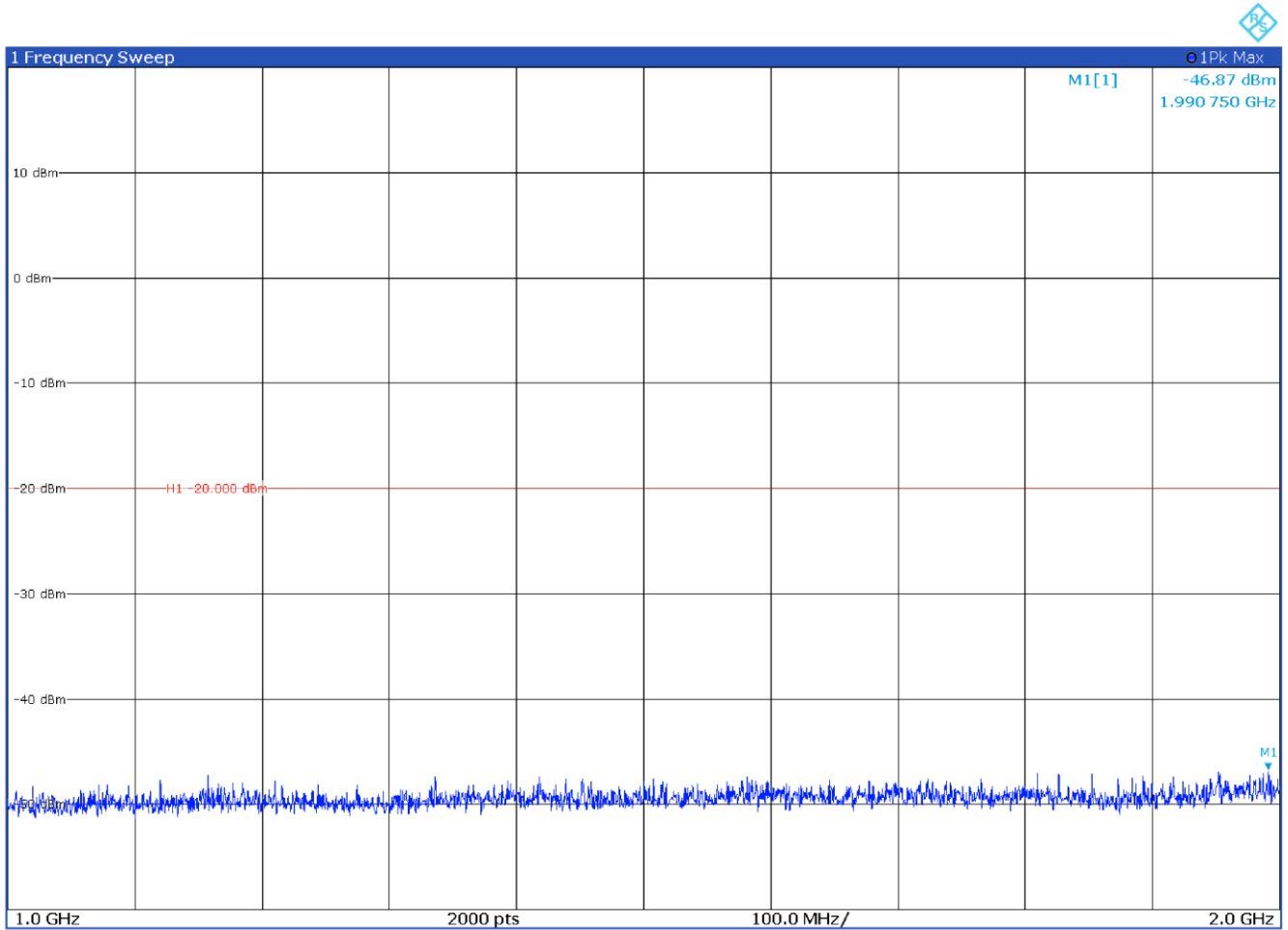
Test data, continued



Conducted spurious emissions with modulation DMR 4FSK at 173.9 MHz

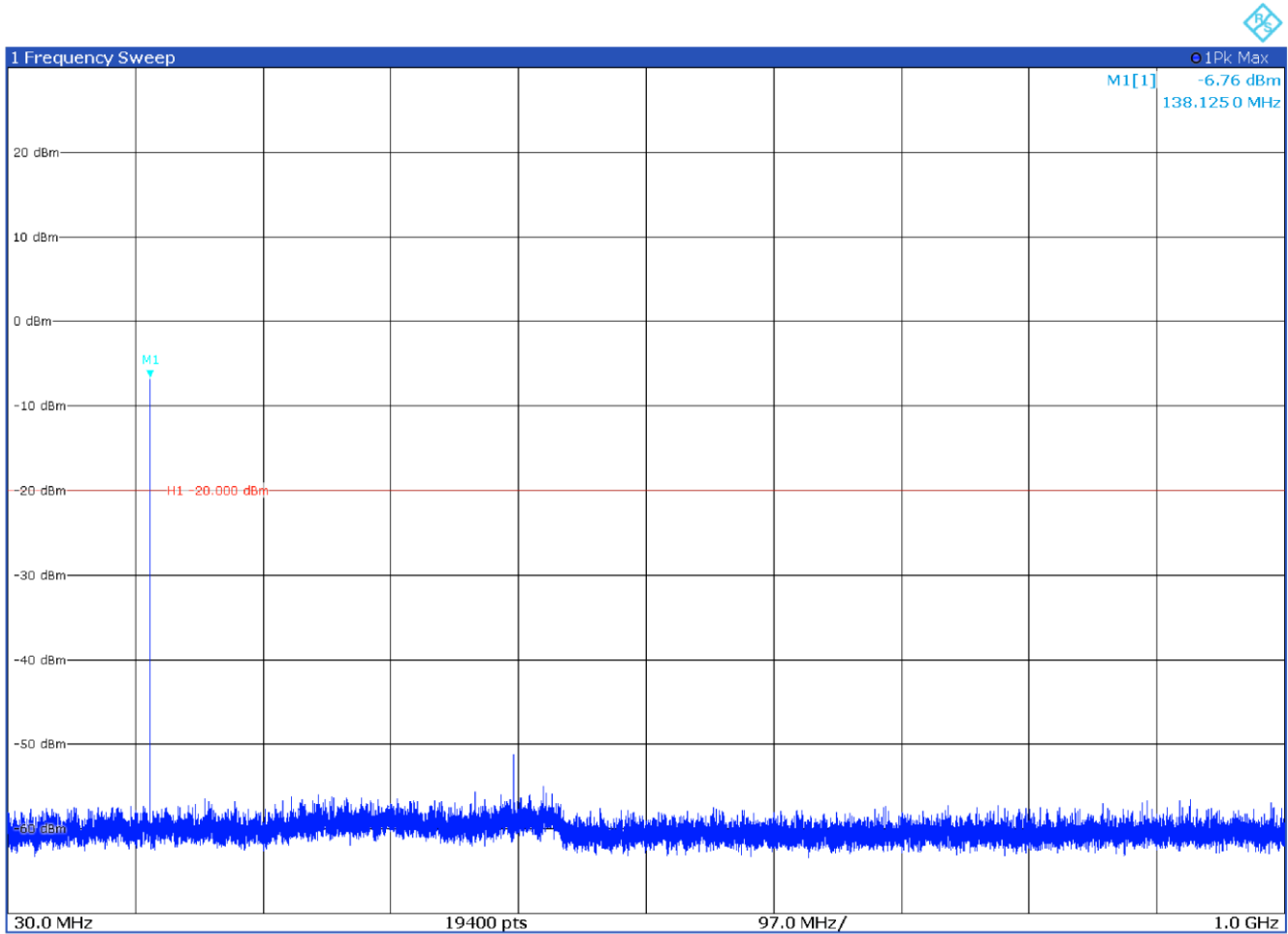
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation DMR 4FSK at 173.9 MHz

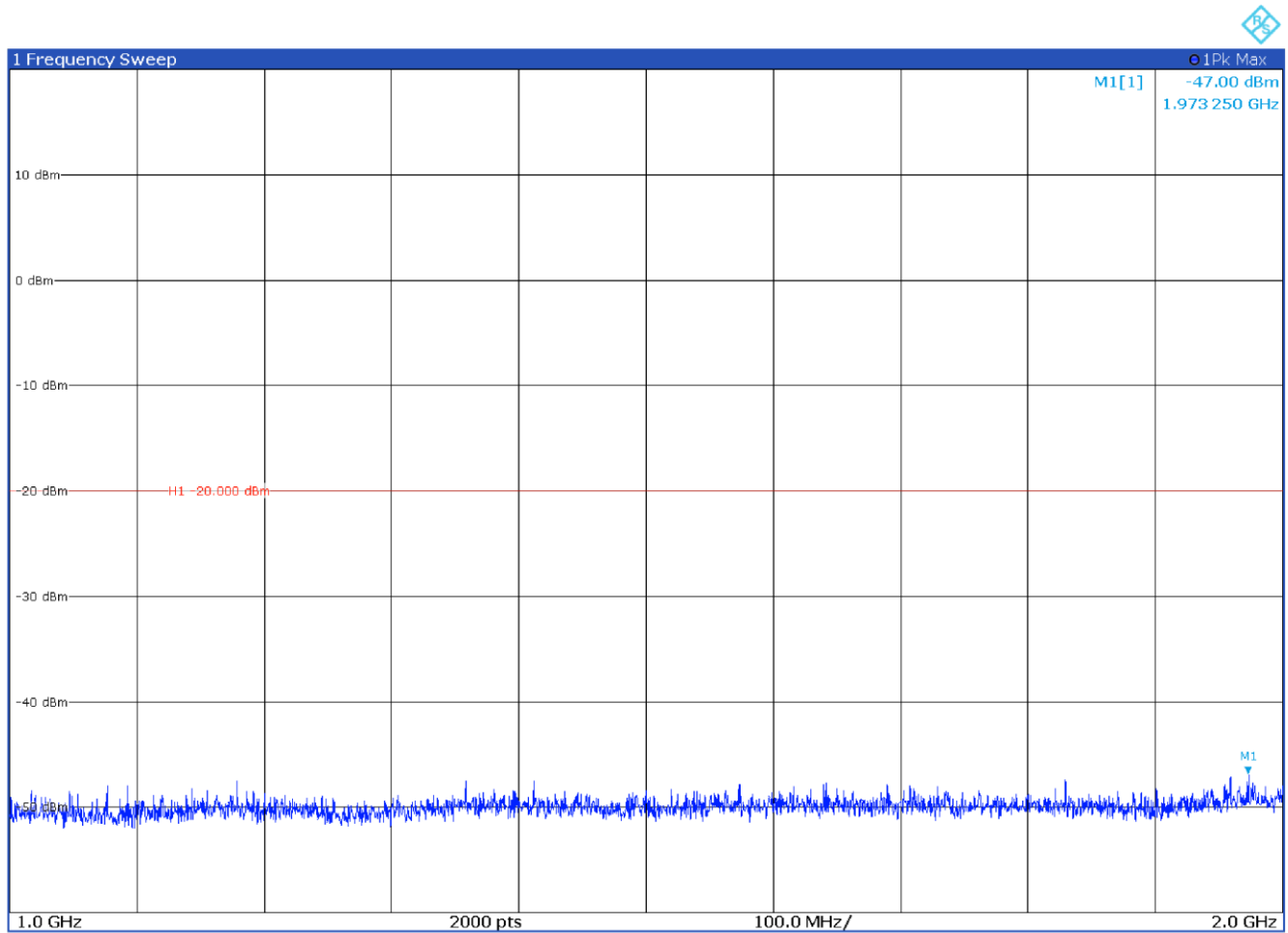
Test data, continued



Conducted spurious emissions with modulation FM 12.5 kHz at 138.1 MHz

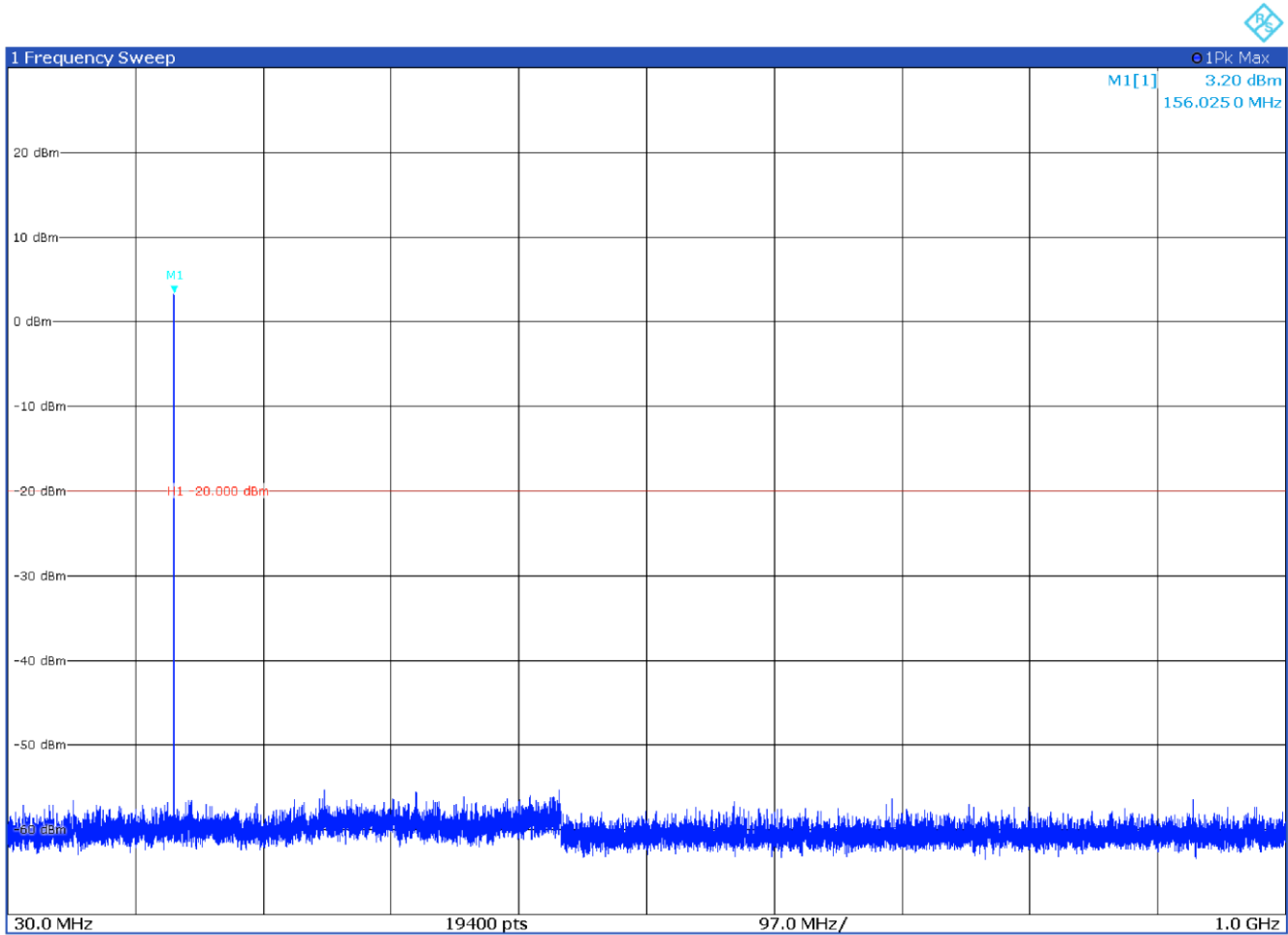
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation FM 12.5 kHz at 138.1 MHz

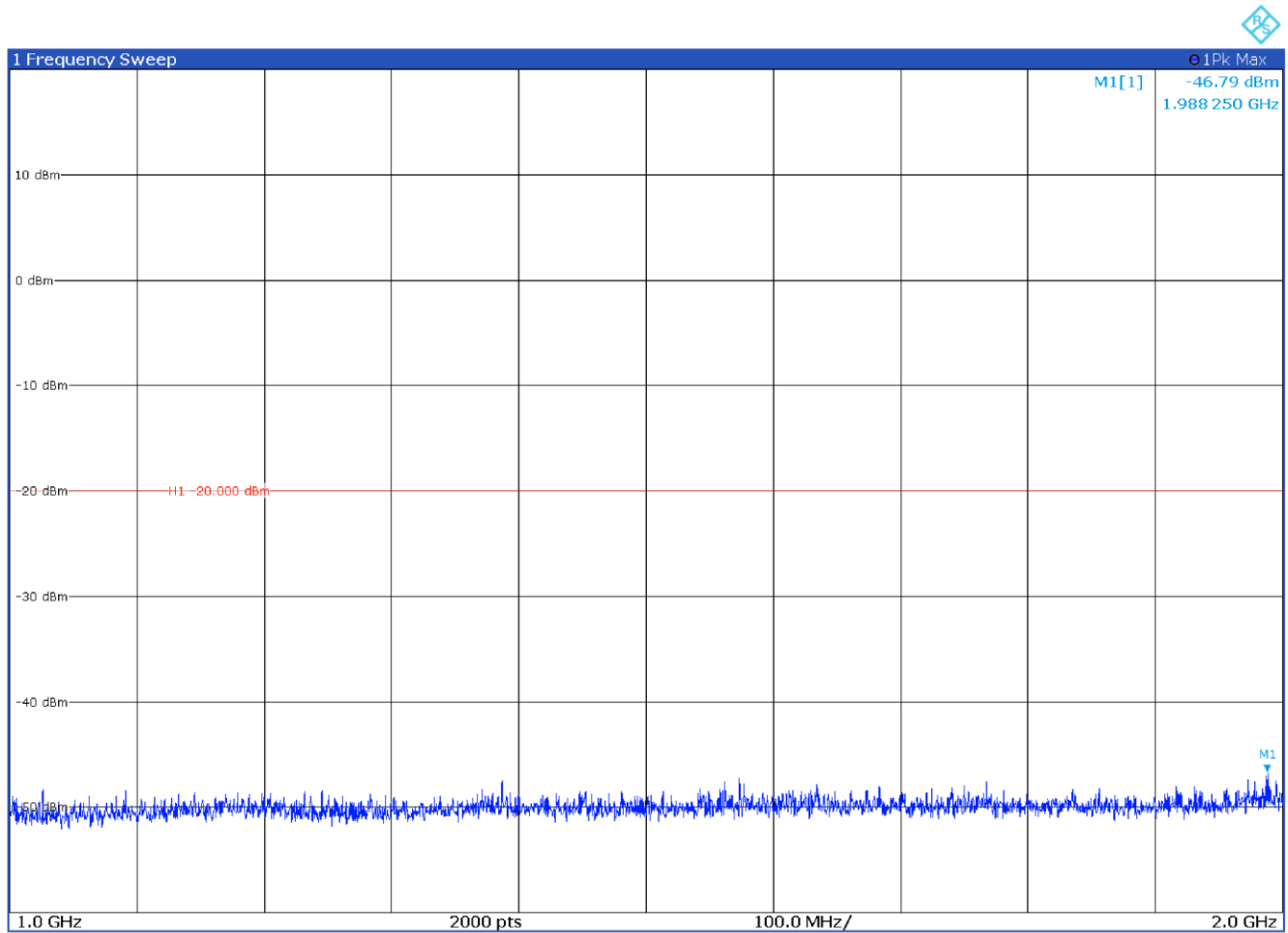
Test data, continued



Conducted spurious emissions with modulation FM 12.5 kHz at 156.0 MHz

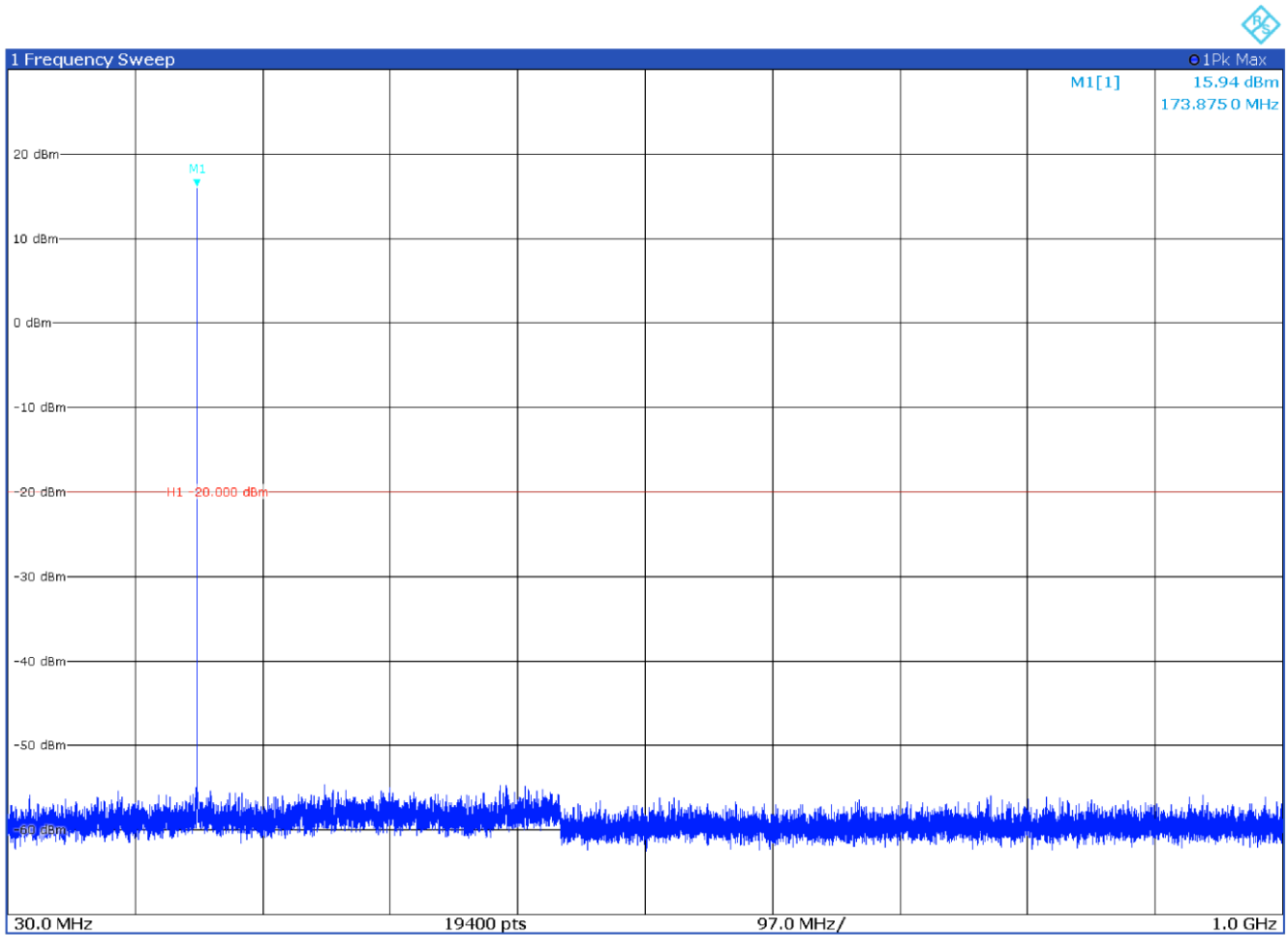
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation FM 12.5 kHz at 156.0 MHz

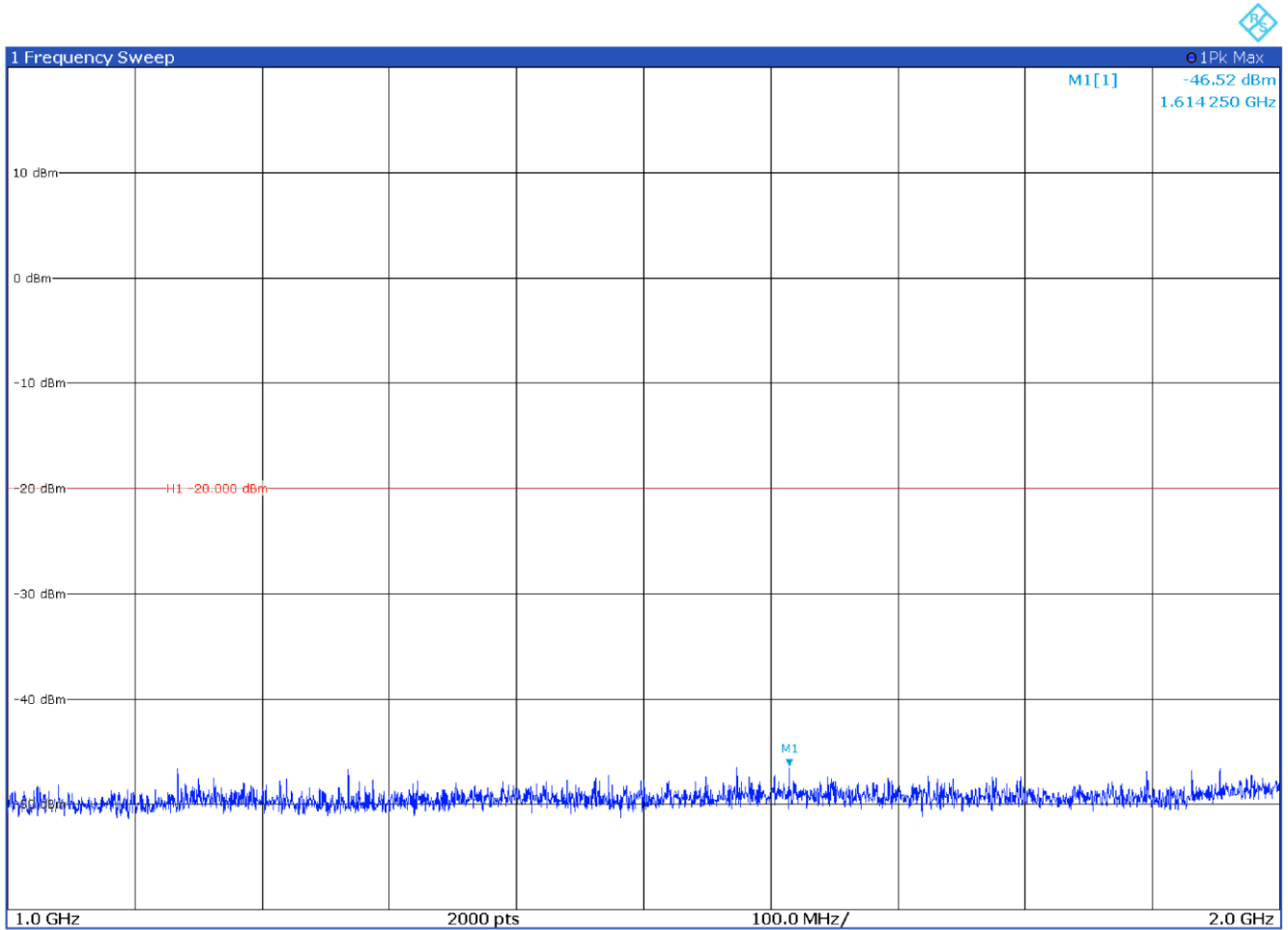
Test data, continued



Conducted spurious emissions with modulation FM 12.5 kHz at 173.9 MHz

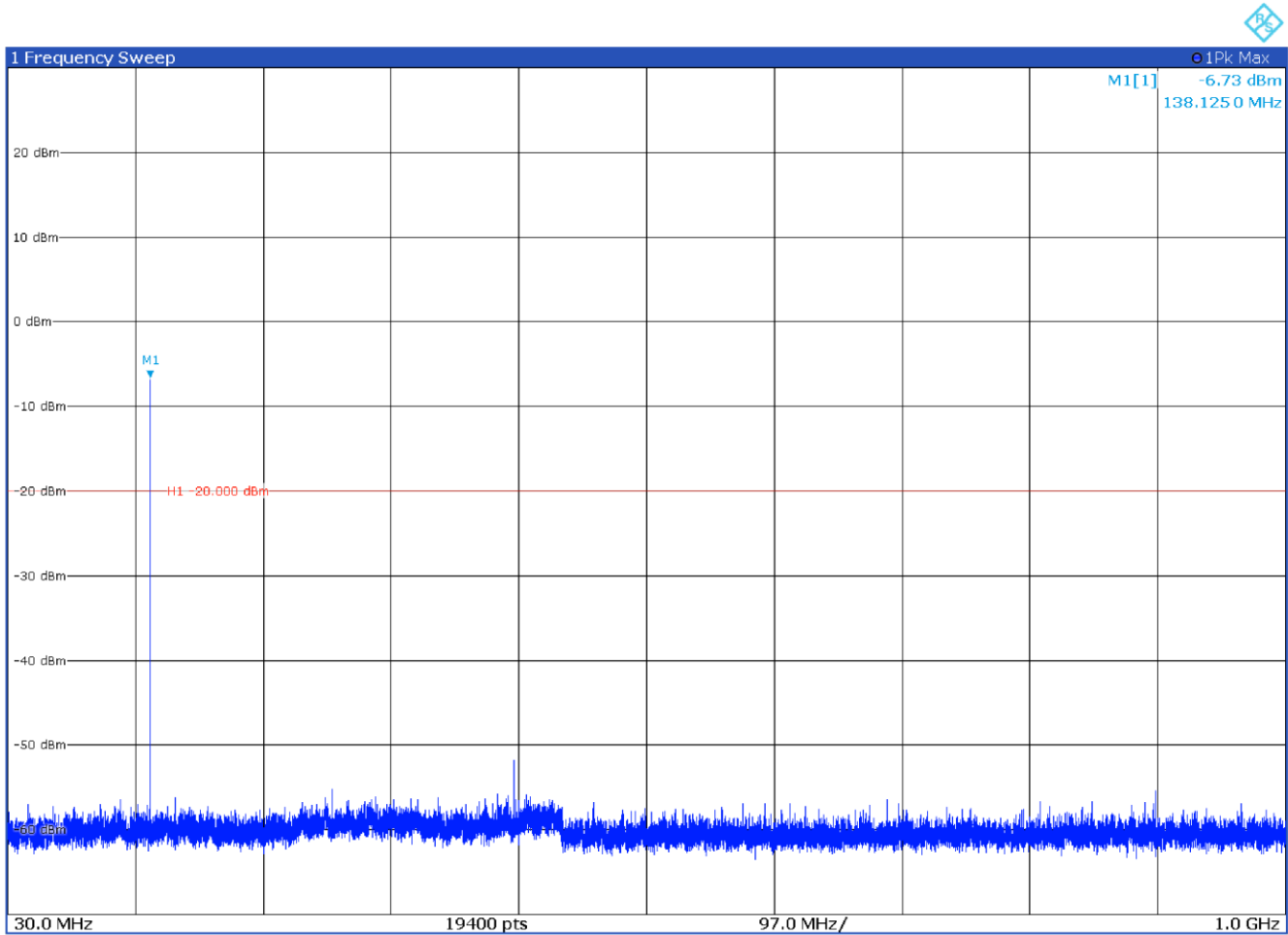
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation FM 12.5 kHz at 173.9 MHz

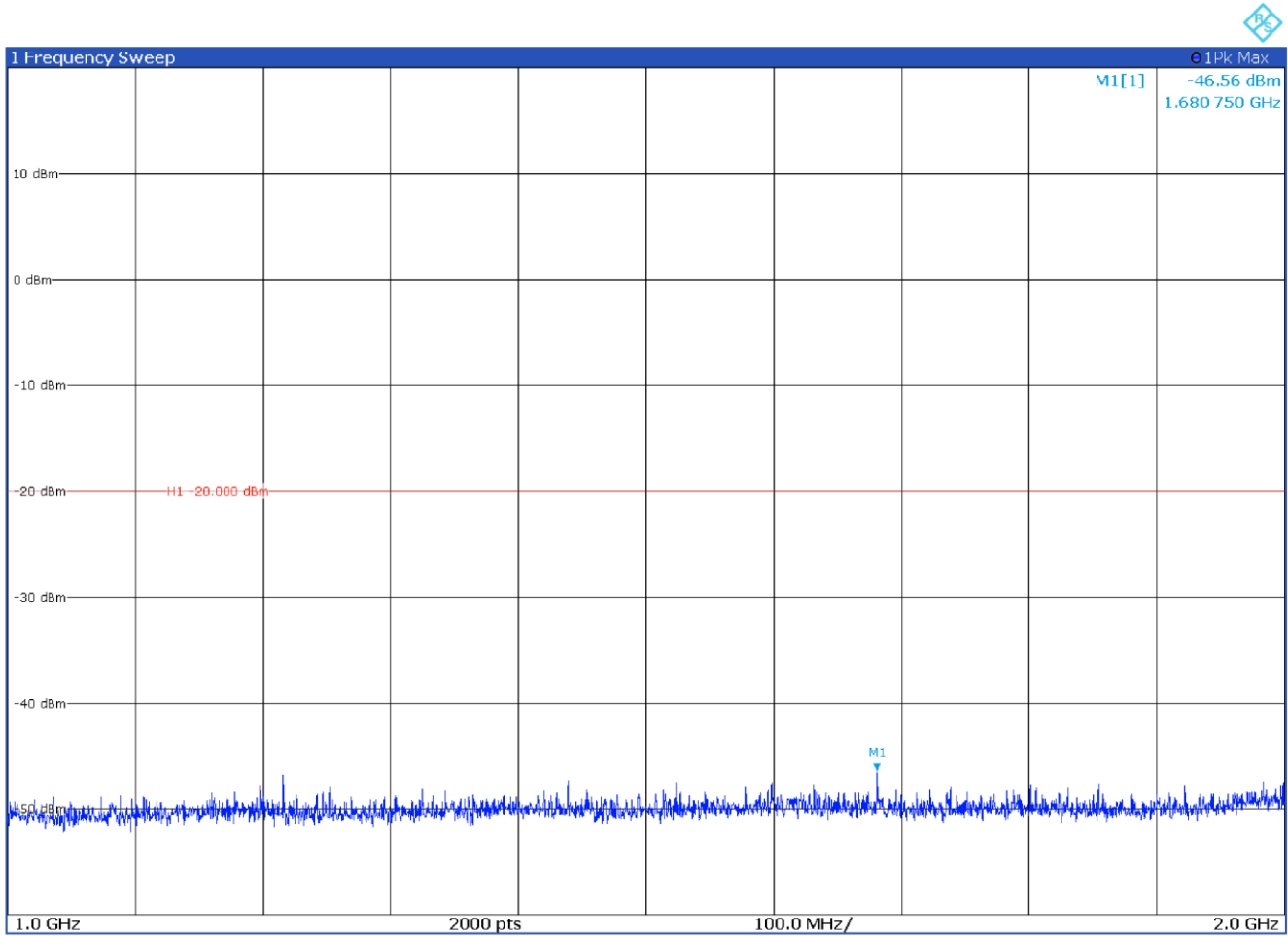
Test data, continued



Conducted spurious emissions with modulation FM 25 kHz at 138.1 MHz

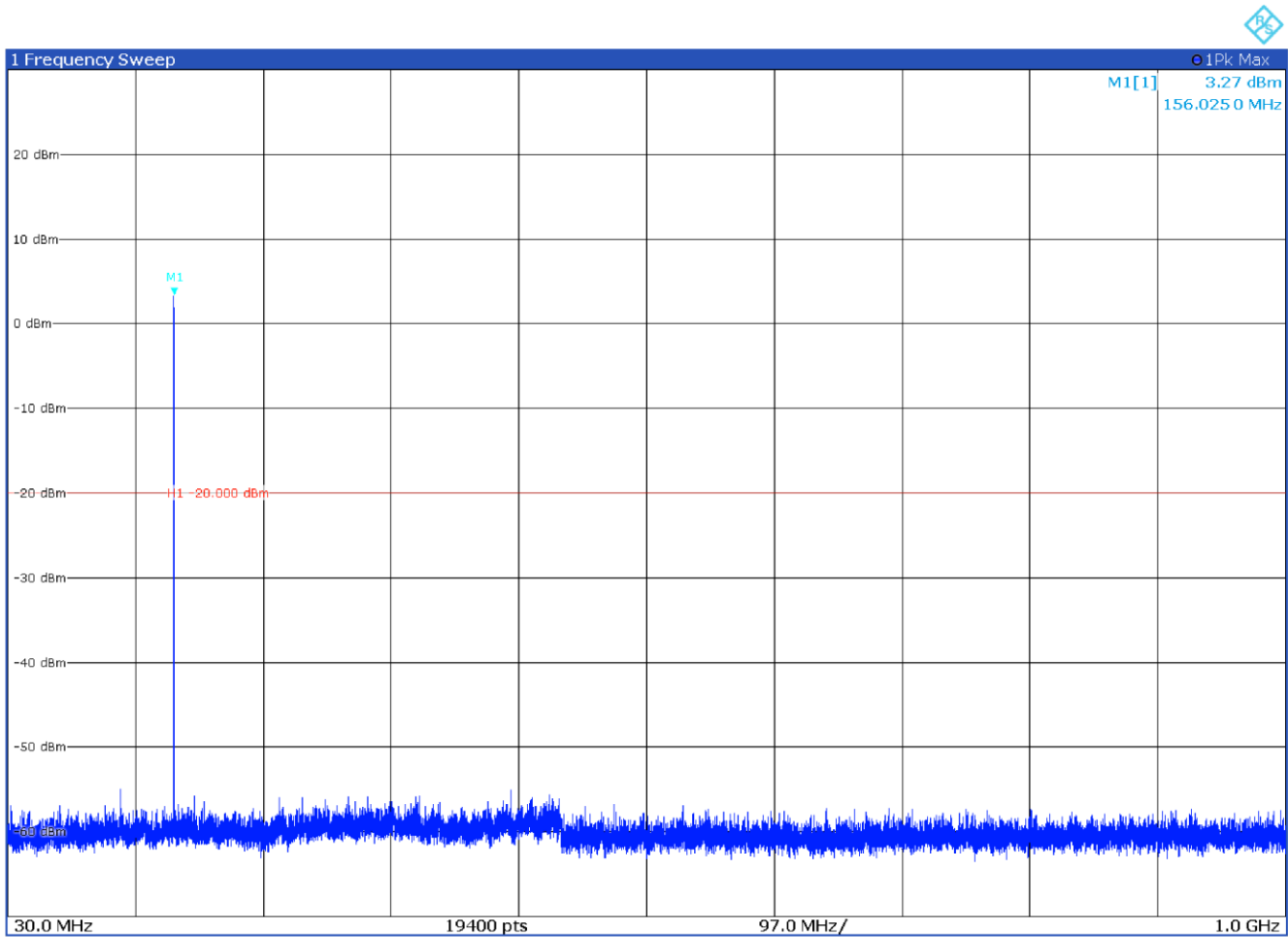
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Test data, continued



Conducted spurious emissions with modulation FM 25 kHz at 138.1 MHz

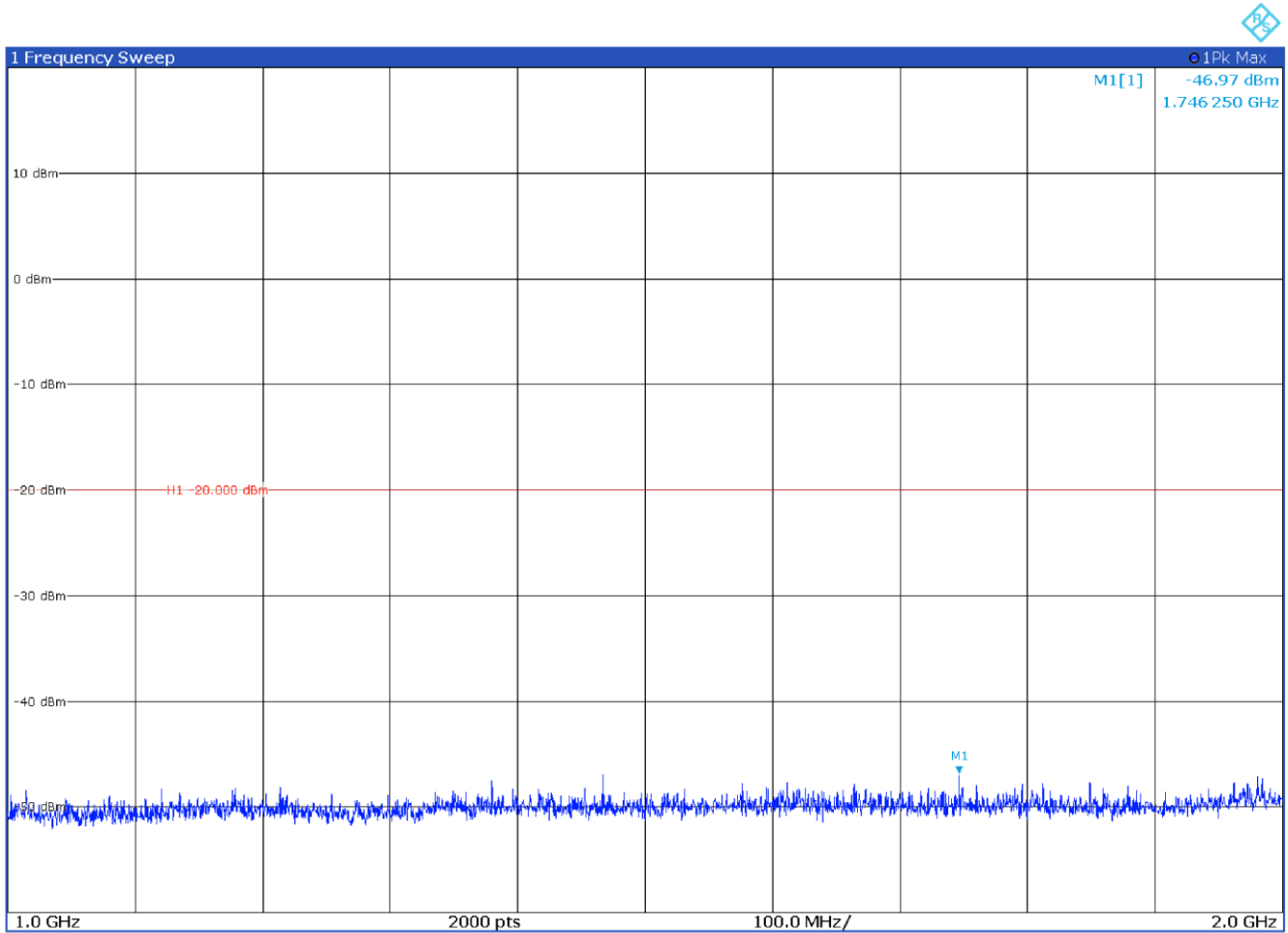
Test data, continued



Conducted spurious emissions with modulation FM 25 kHz at 156.0 MHz

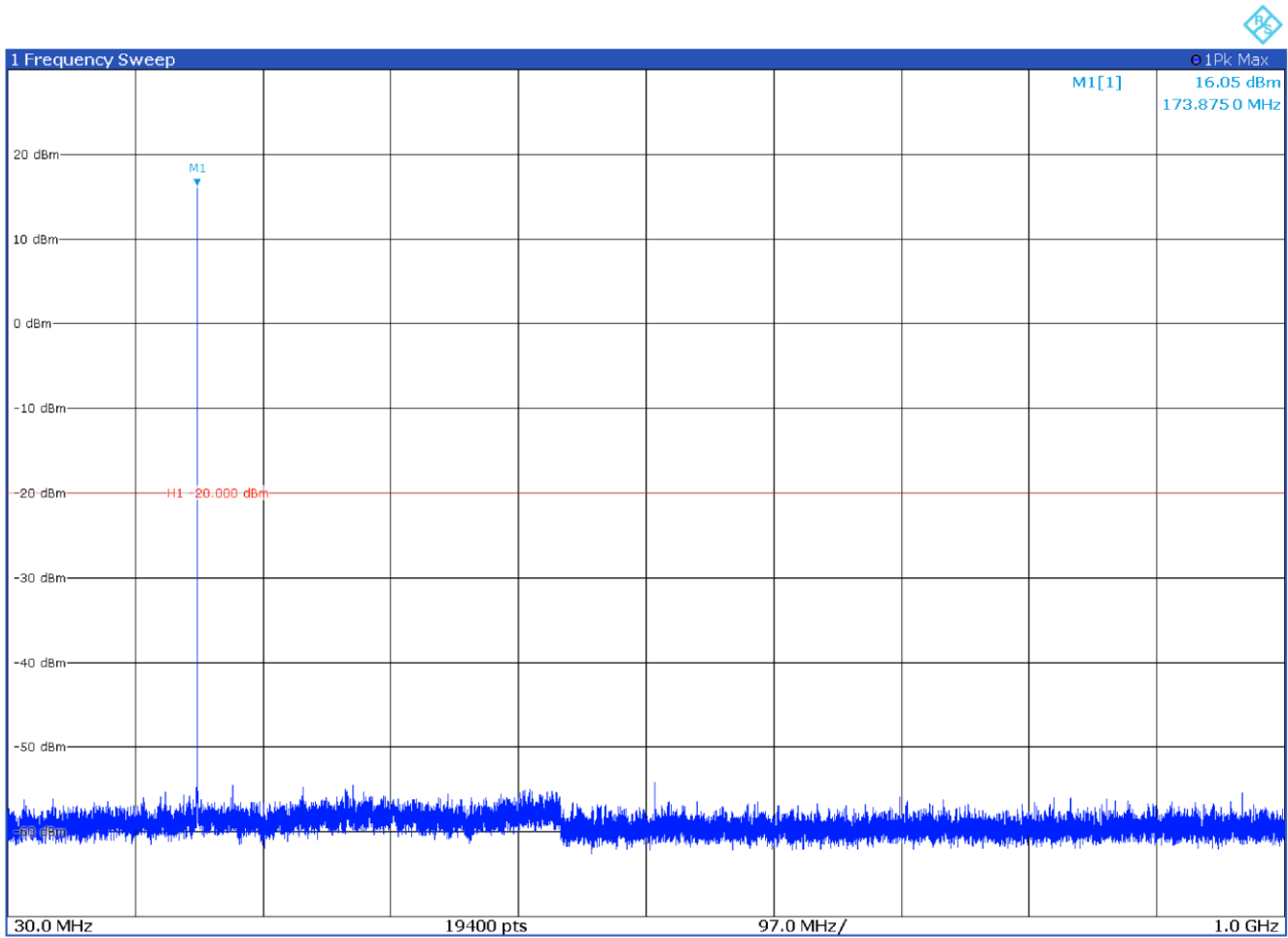
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation FM 25 kHz at 156.0 MHz

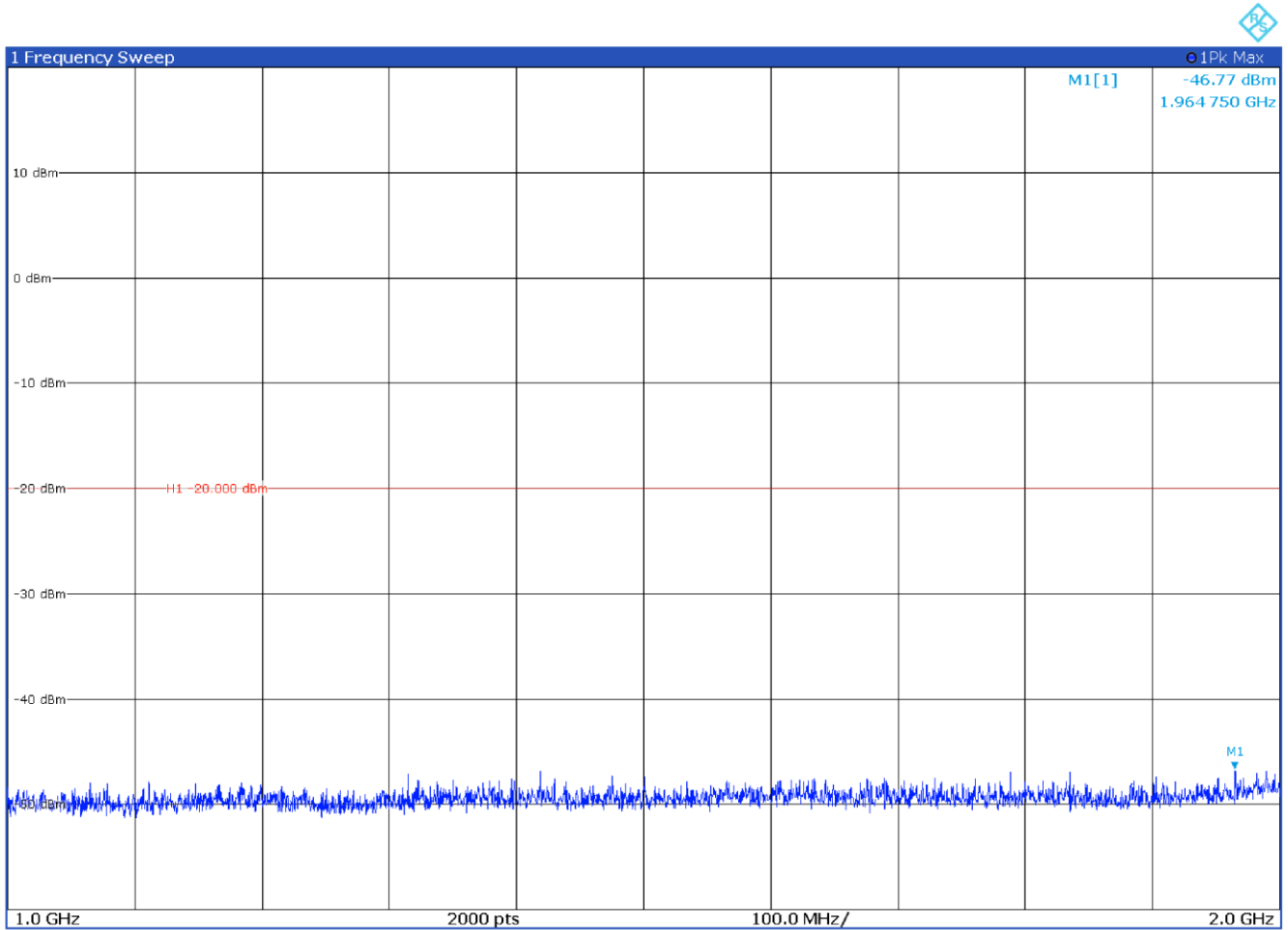
Test data, continued



Conducted spurious emissions with modulation FM 25 kHz at 173.9 MHz

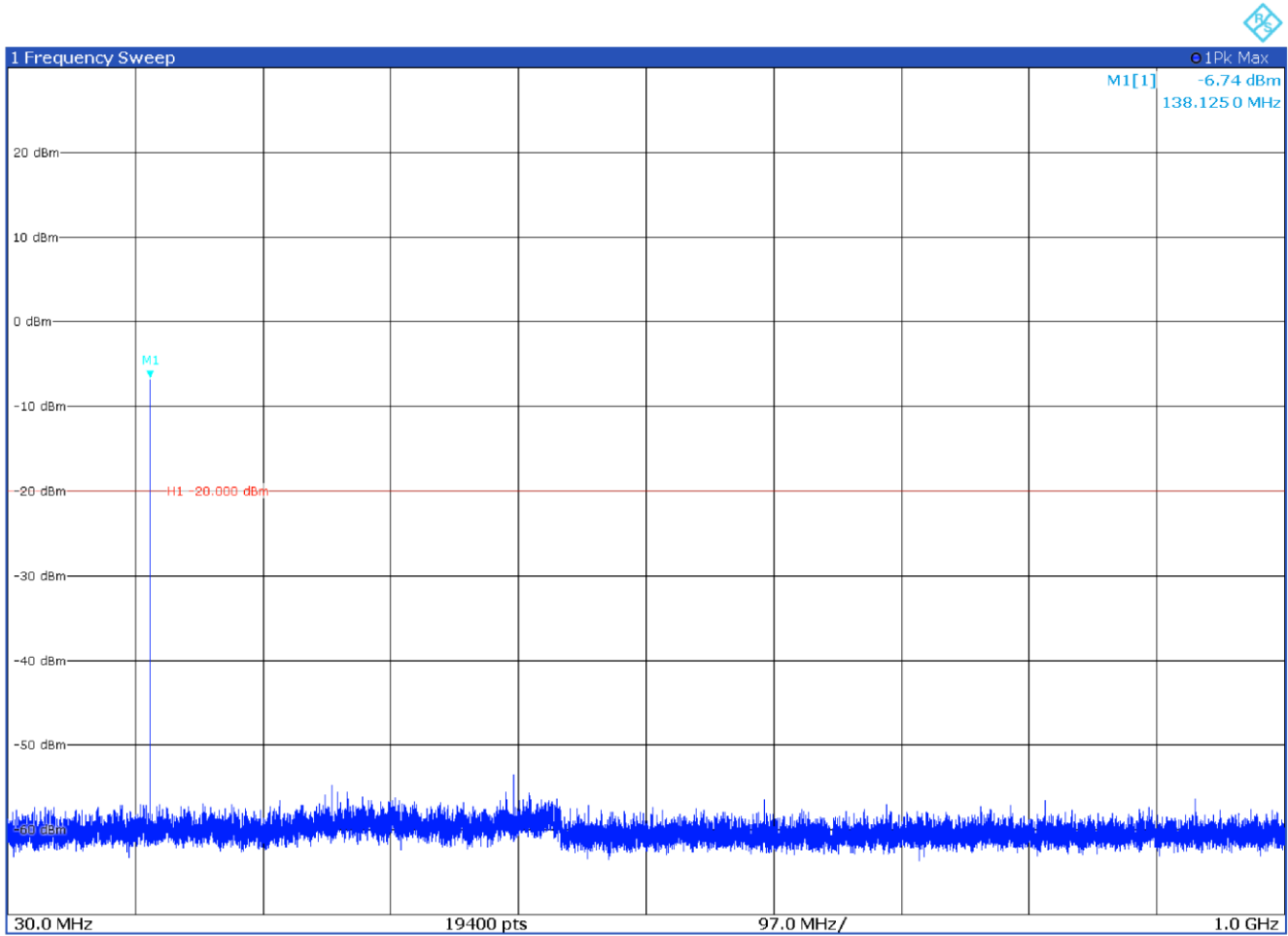
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation FM 25 kHz at 173.9 MHz

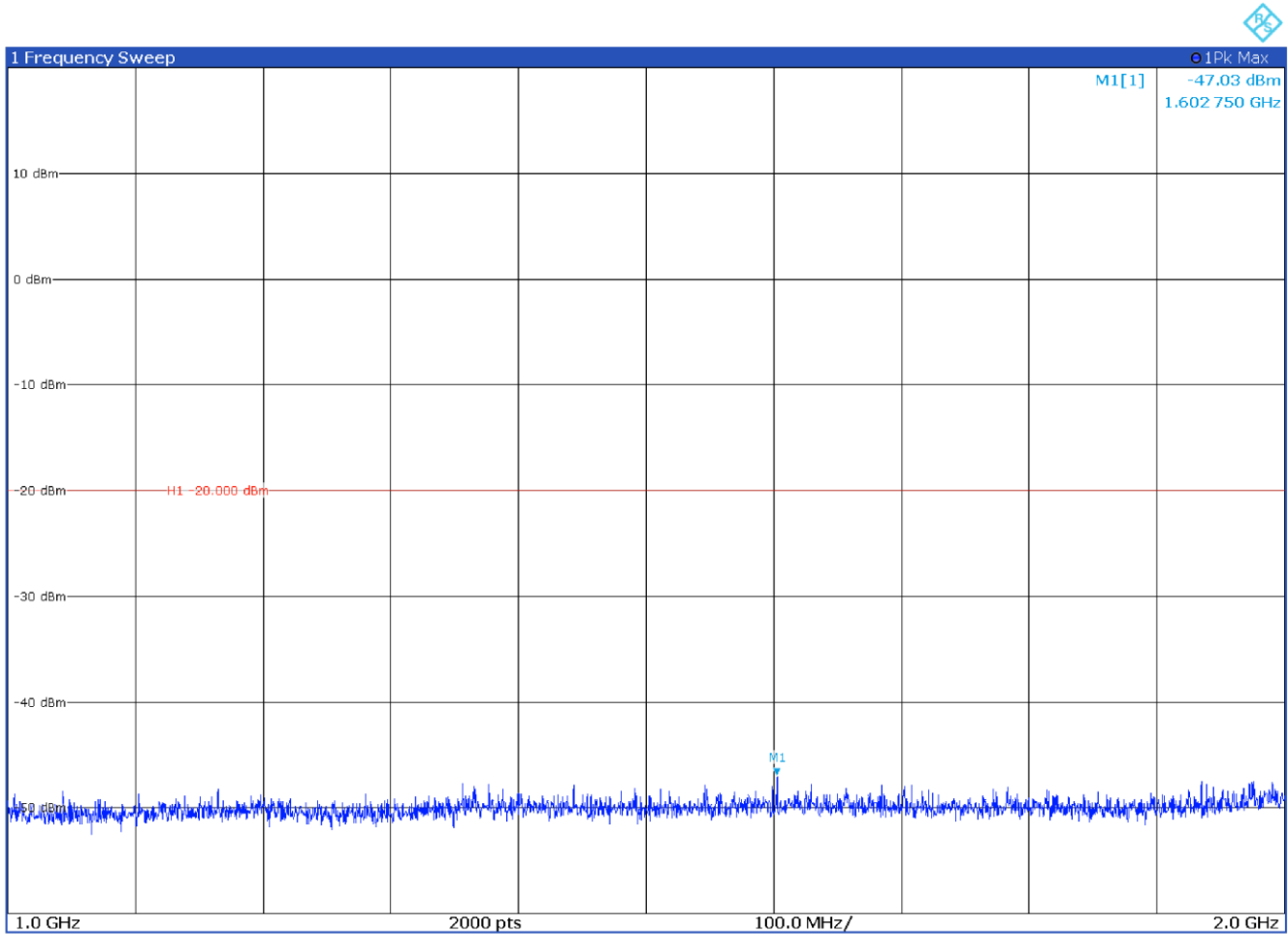
Test data, continued



Conducted spurious emissions with modulation P25 C4FM at 138.1 MHz

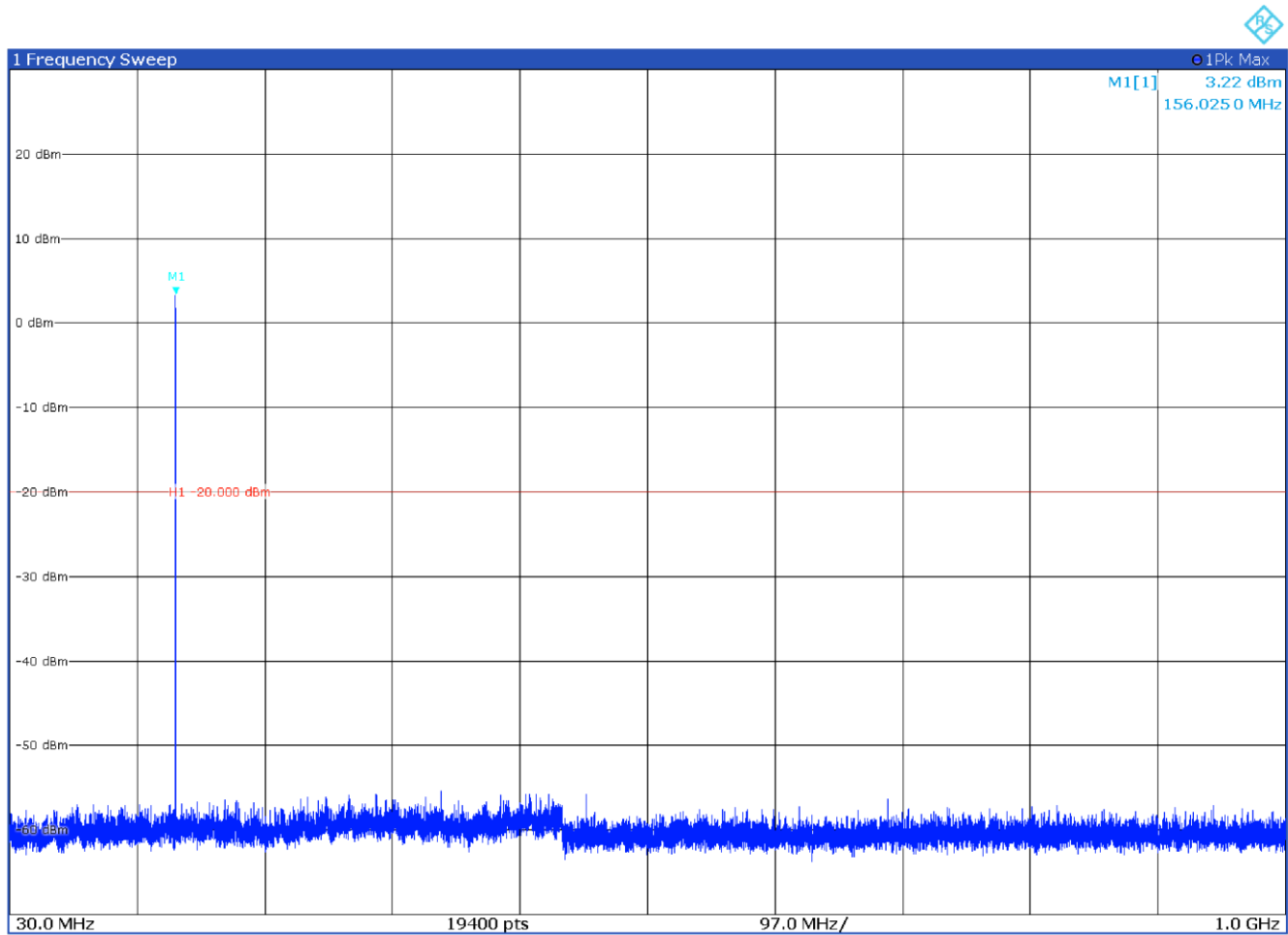
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation P25 C4FM at 138.1 MHz

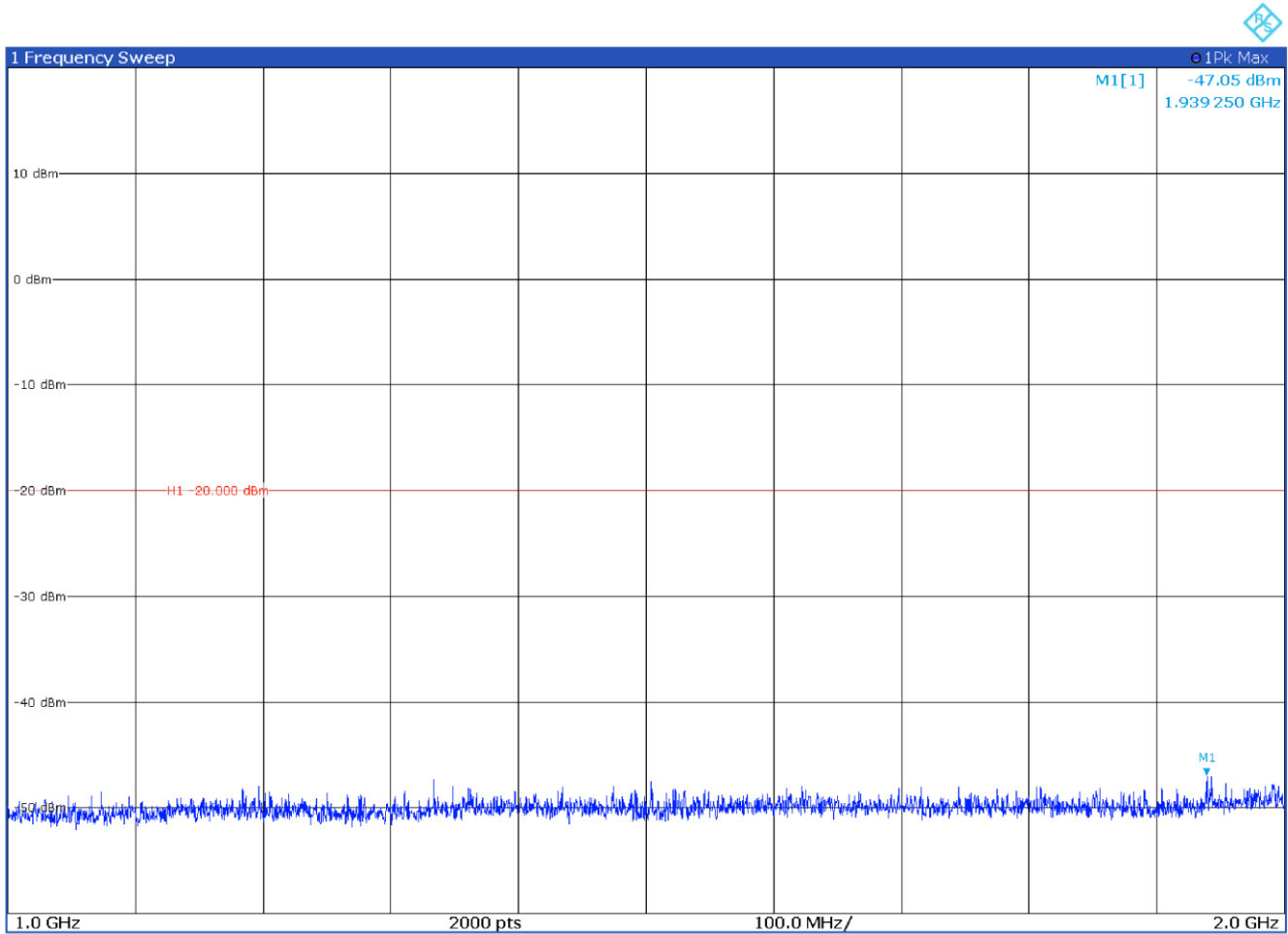
Test data, continued



Conducted spurious emissions with modulation P25 C4FM at 156.0 MHz

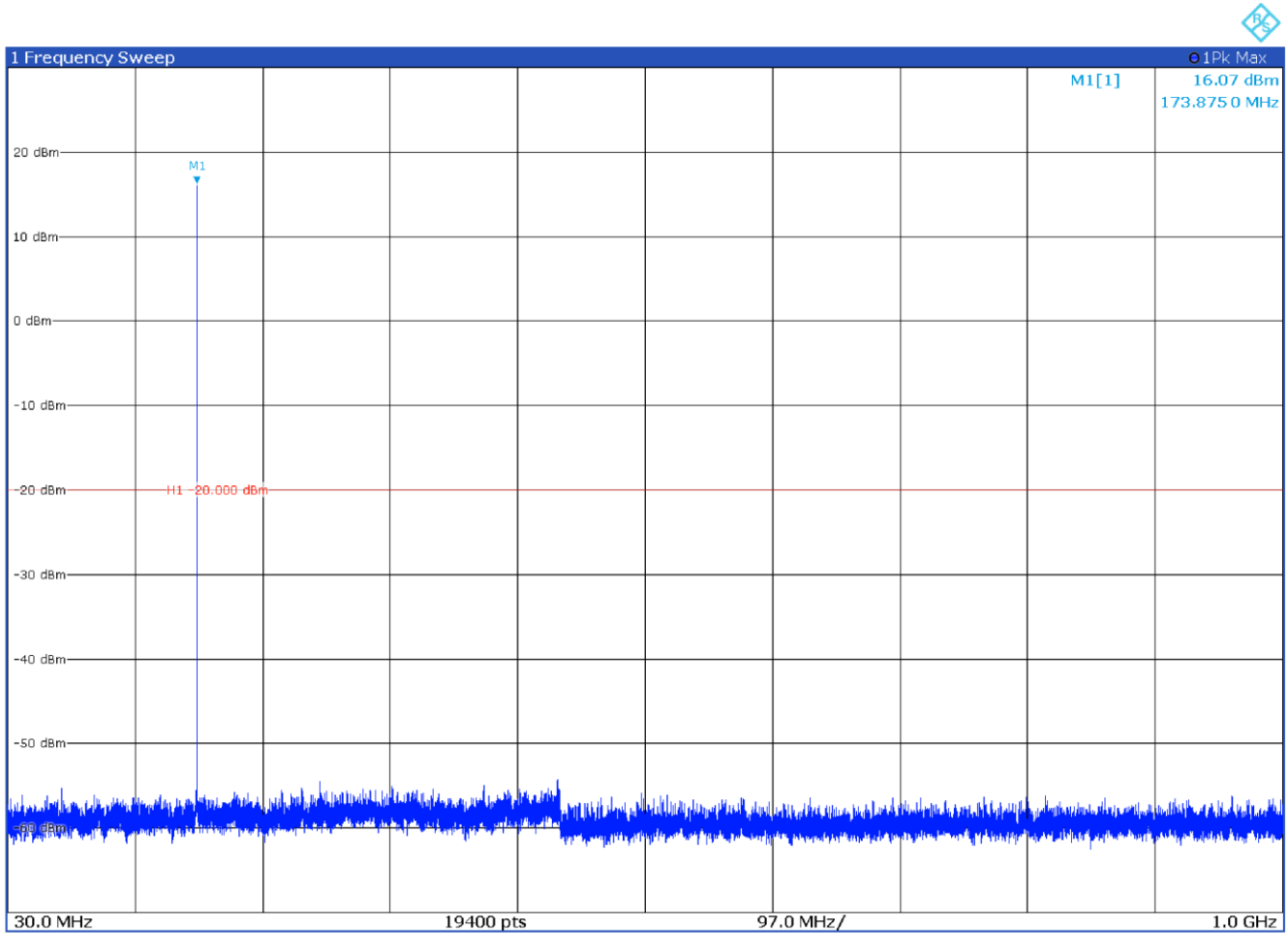
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation P25 C4FM at 156.0 MHz

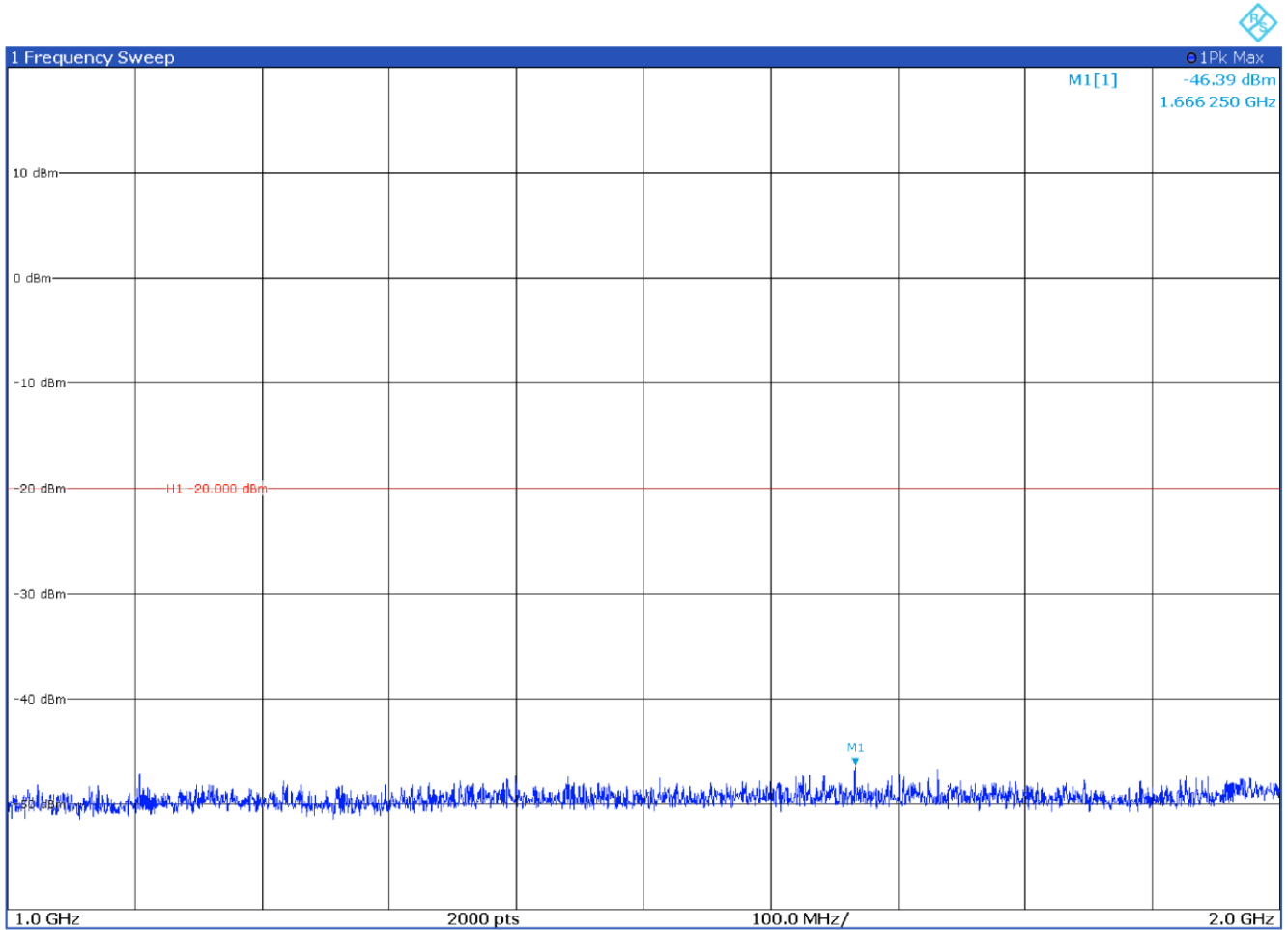
Test data, continued



Conducted spurious emissions with modulation P25 C4FM at 173.9 MHz

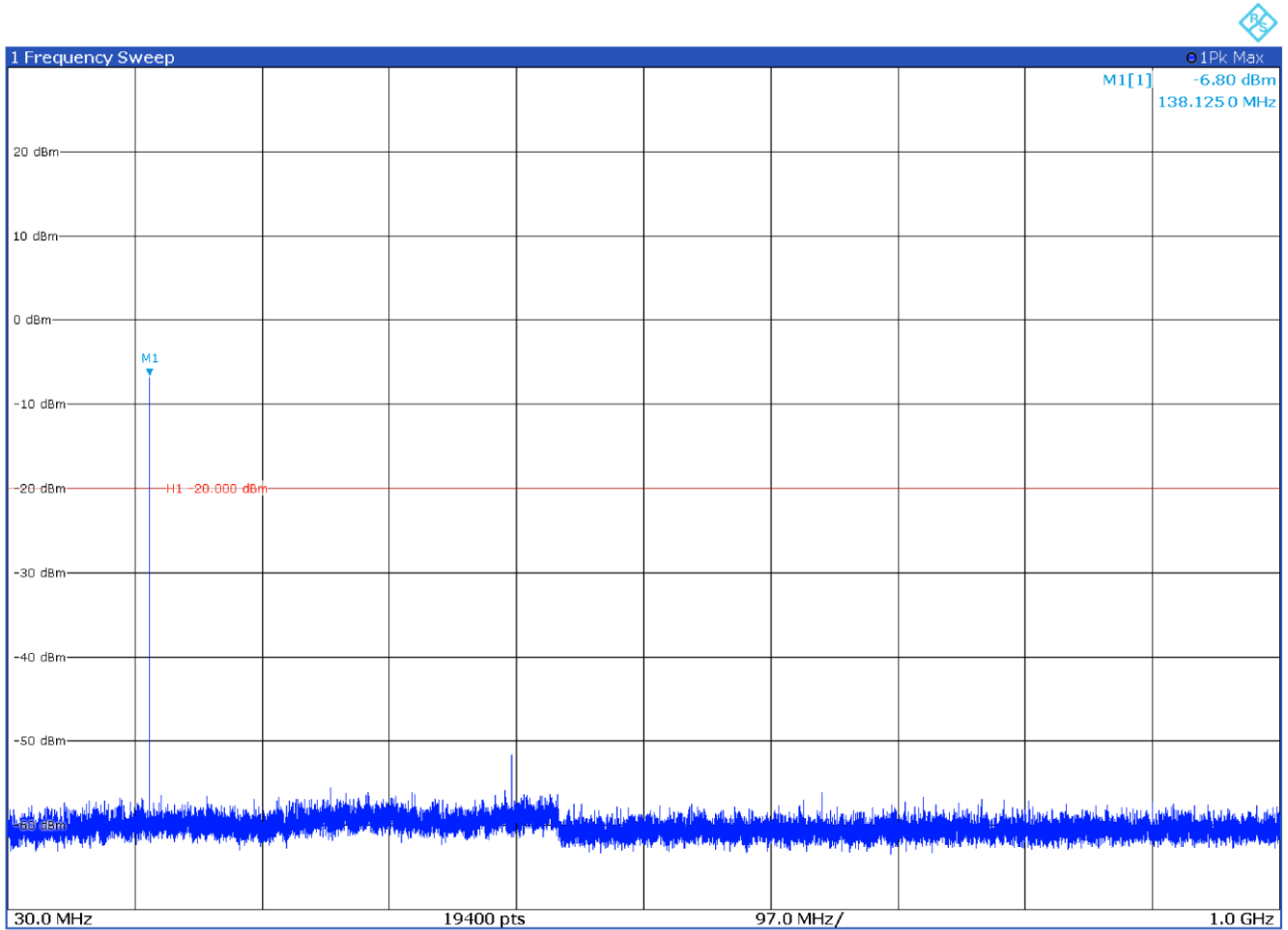
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation P25 C4FM at 173.9 MHz

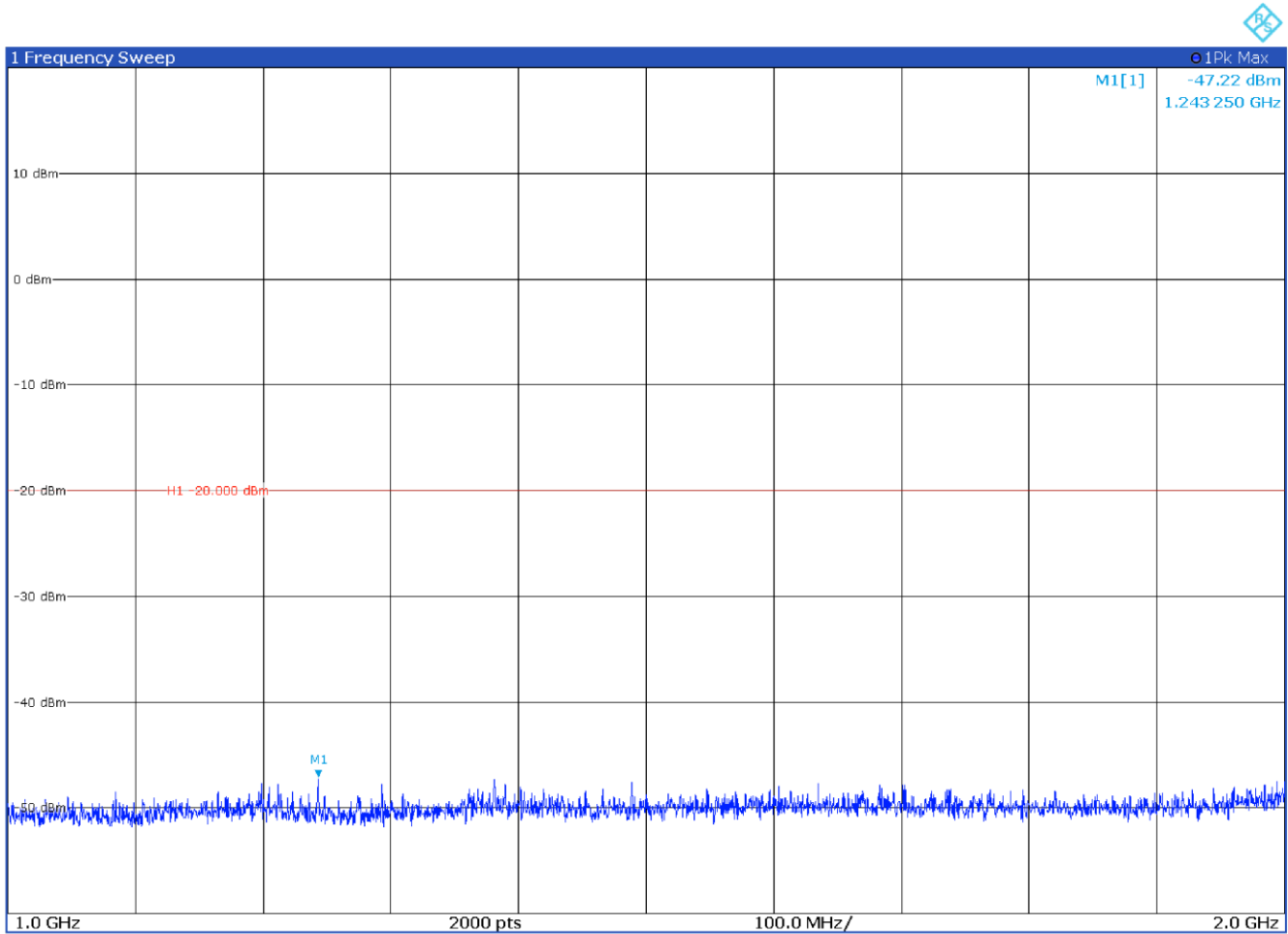
Test data, continued



Conducted spurious emissions with modulation CST 4FSK at 138.1 MHz

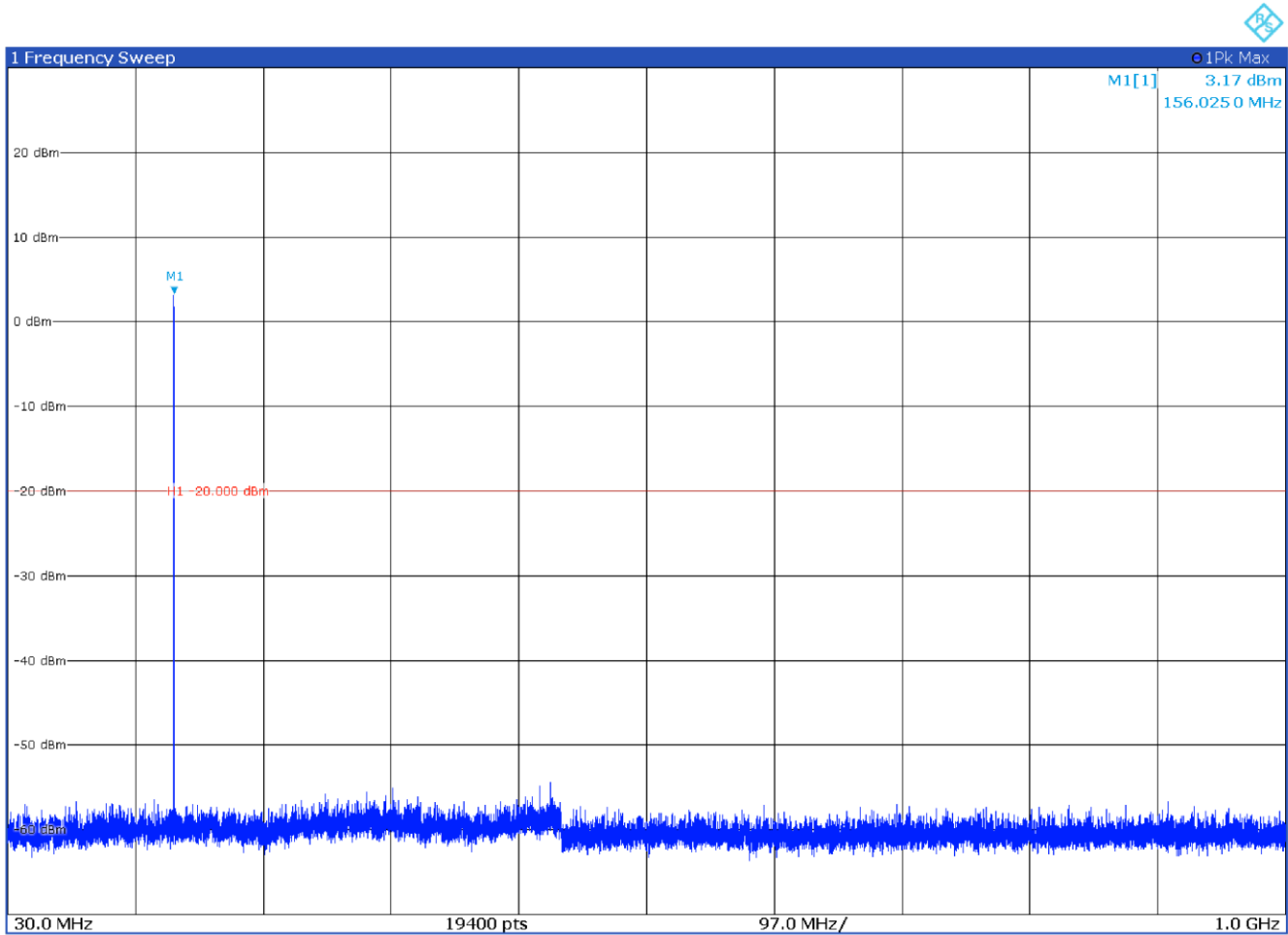
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation CST 4FSK at 138.1 MHz

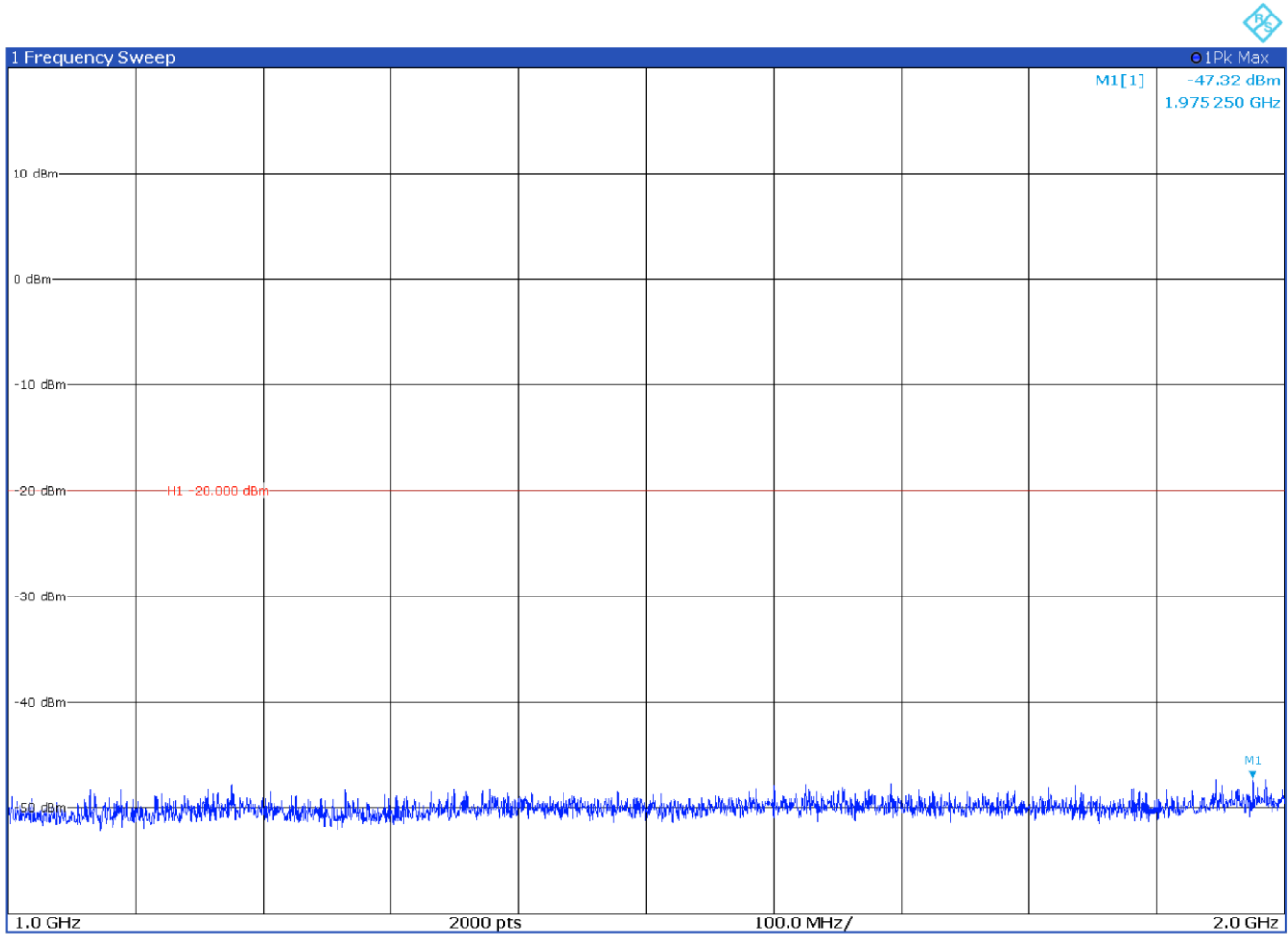
Test data, continued



Conducted spurious emissions with modulation CST 4FSK at 156.0 MHz

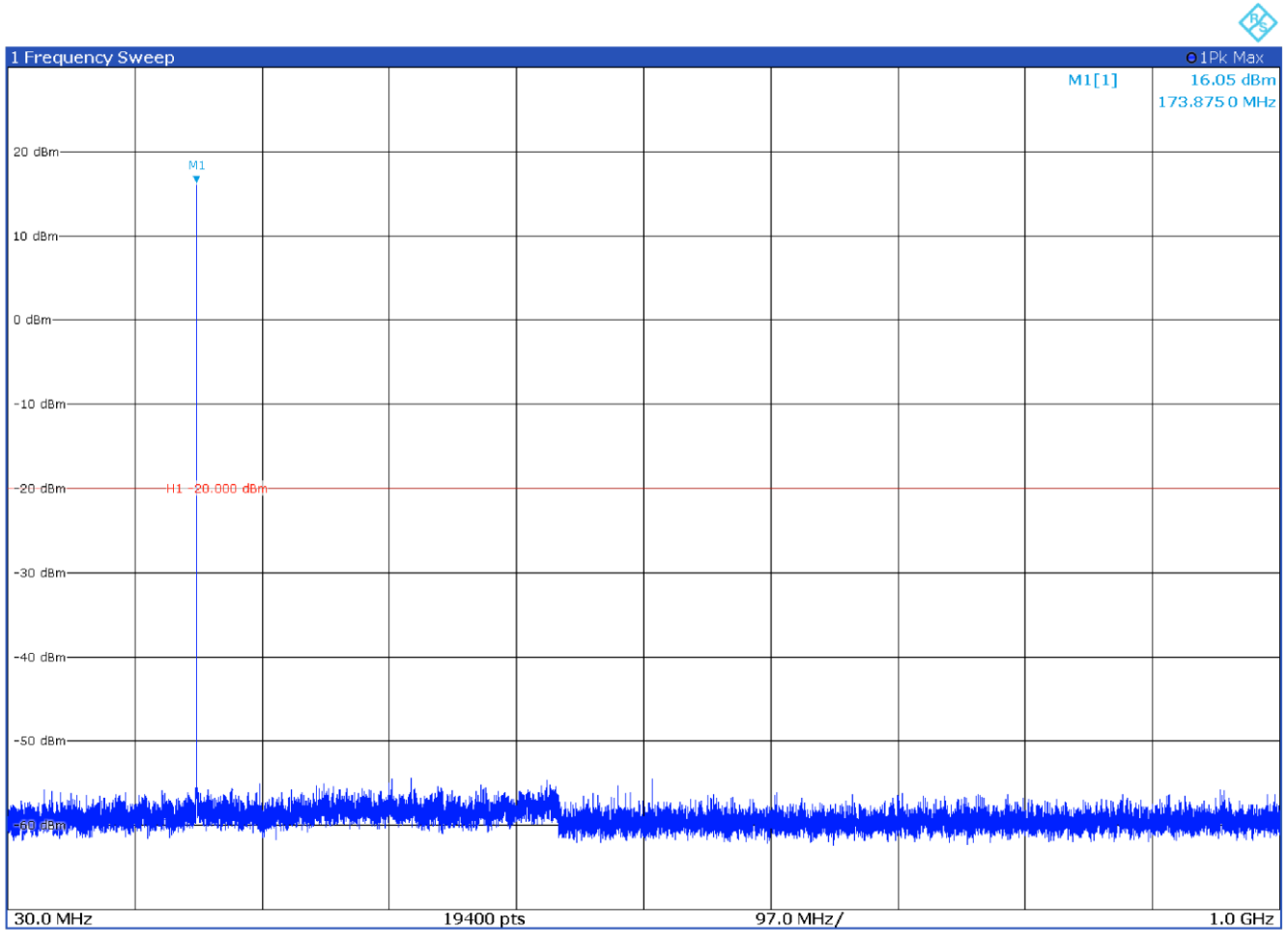
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation CST 4FSK at 156.0 MHz

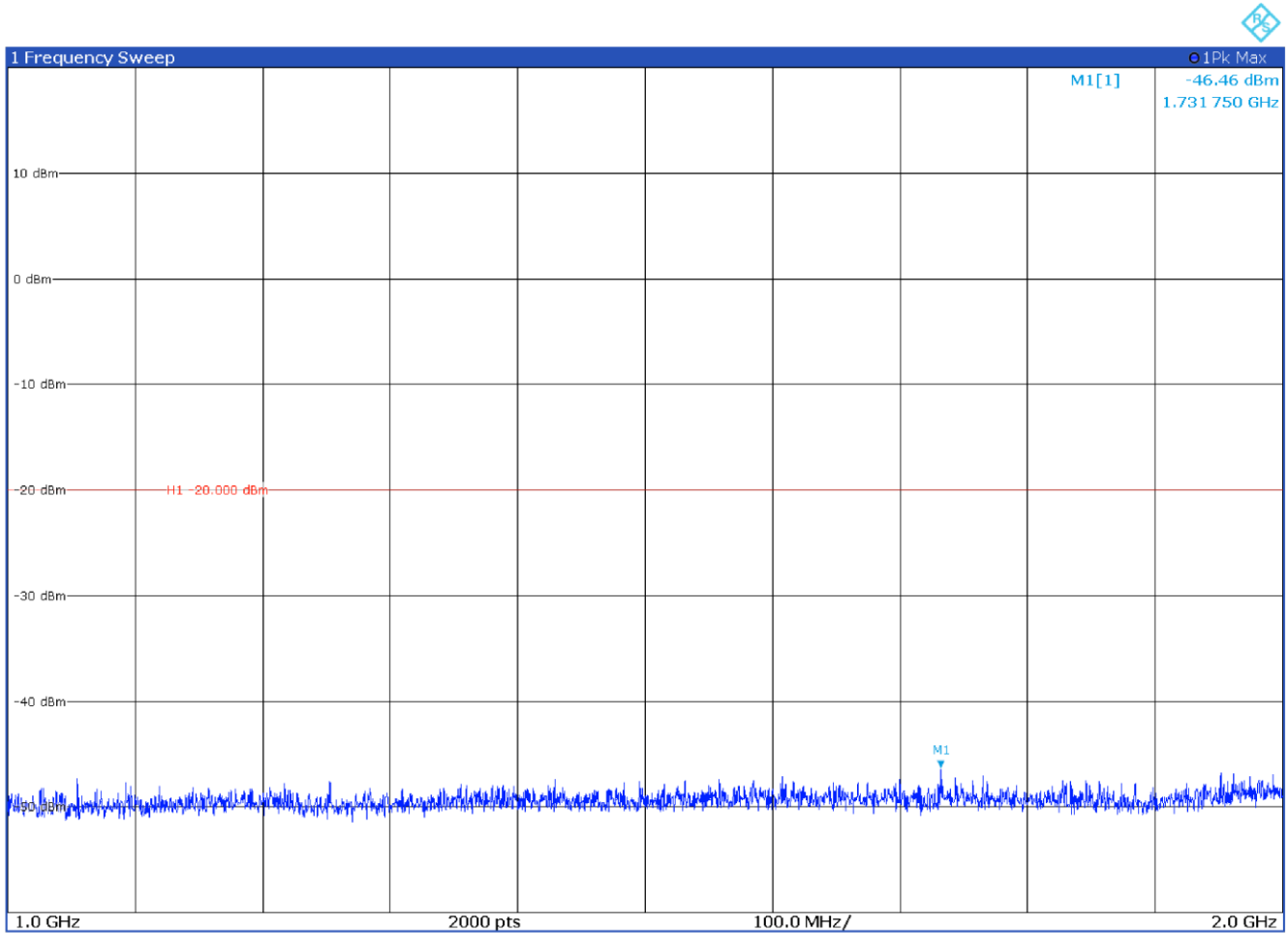
Test data, continued



Conducted spurious emissions with modulation CST 4FSK at 173.9 MHz

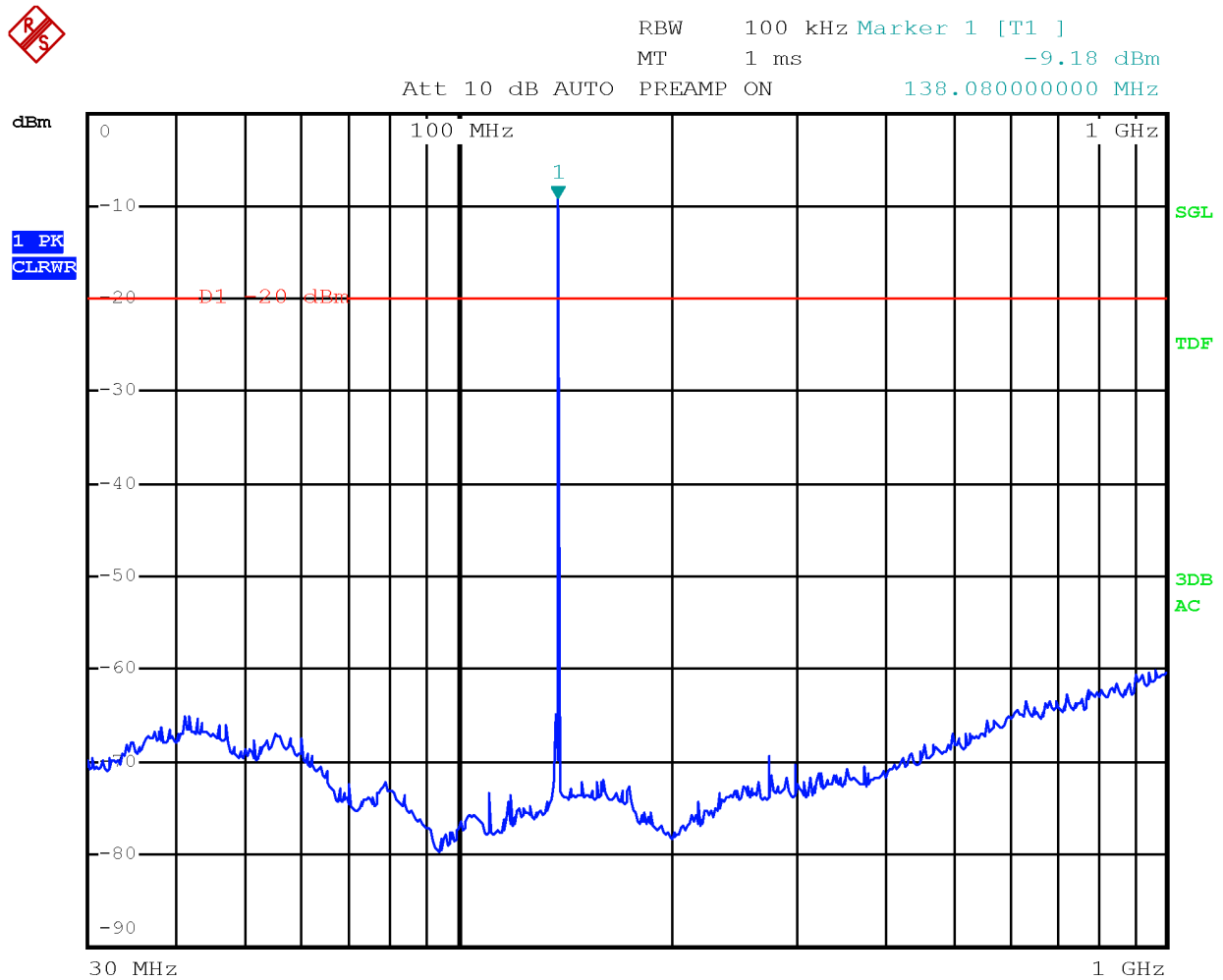
Limit exceeded by the carrier

Test data, continued



Conducted spurious emissions with modulation CST 4FSK at 173.9 MHz

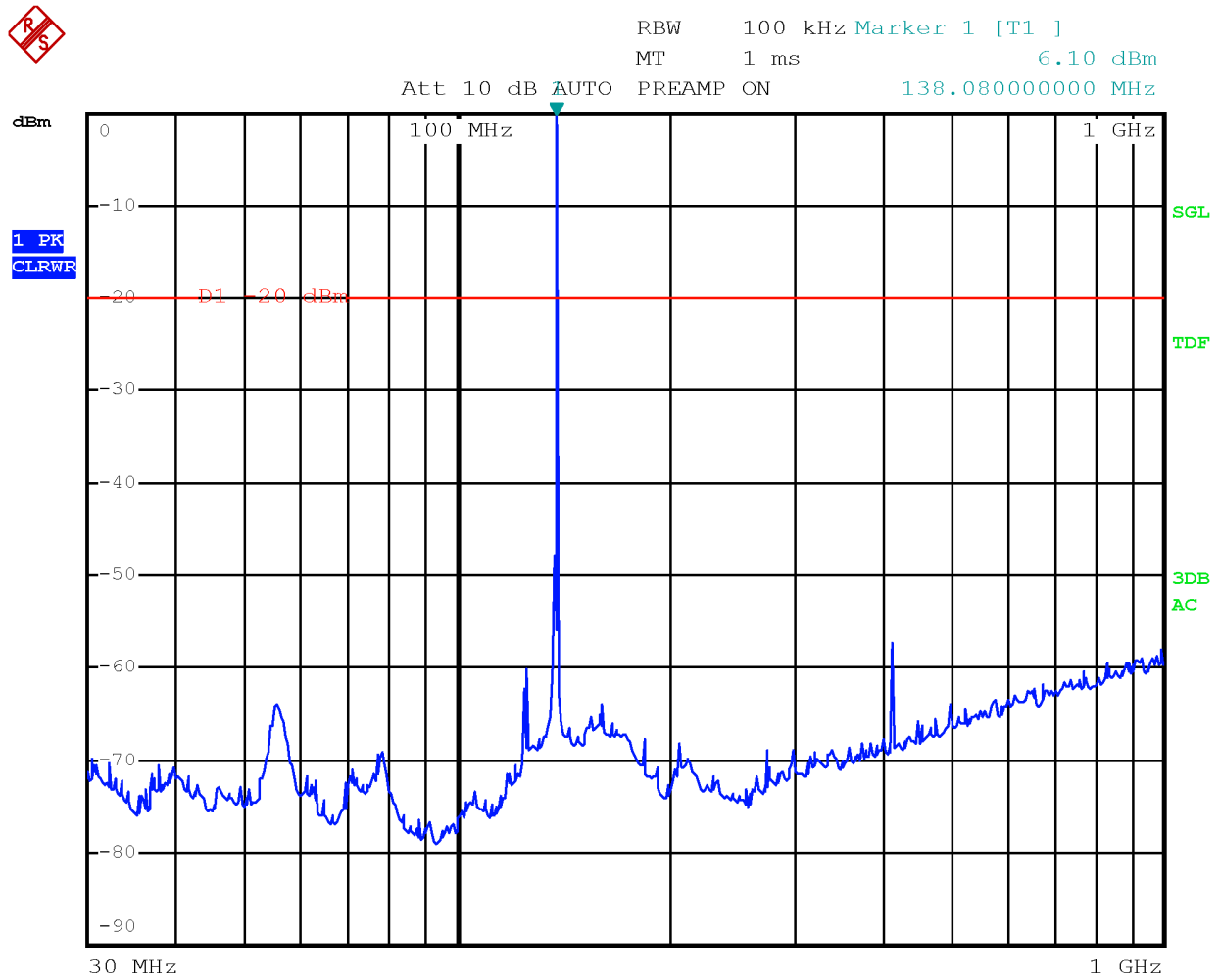
Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 138.1 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

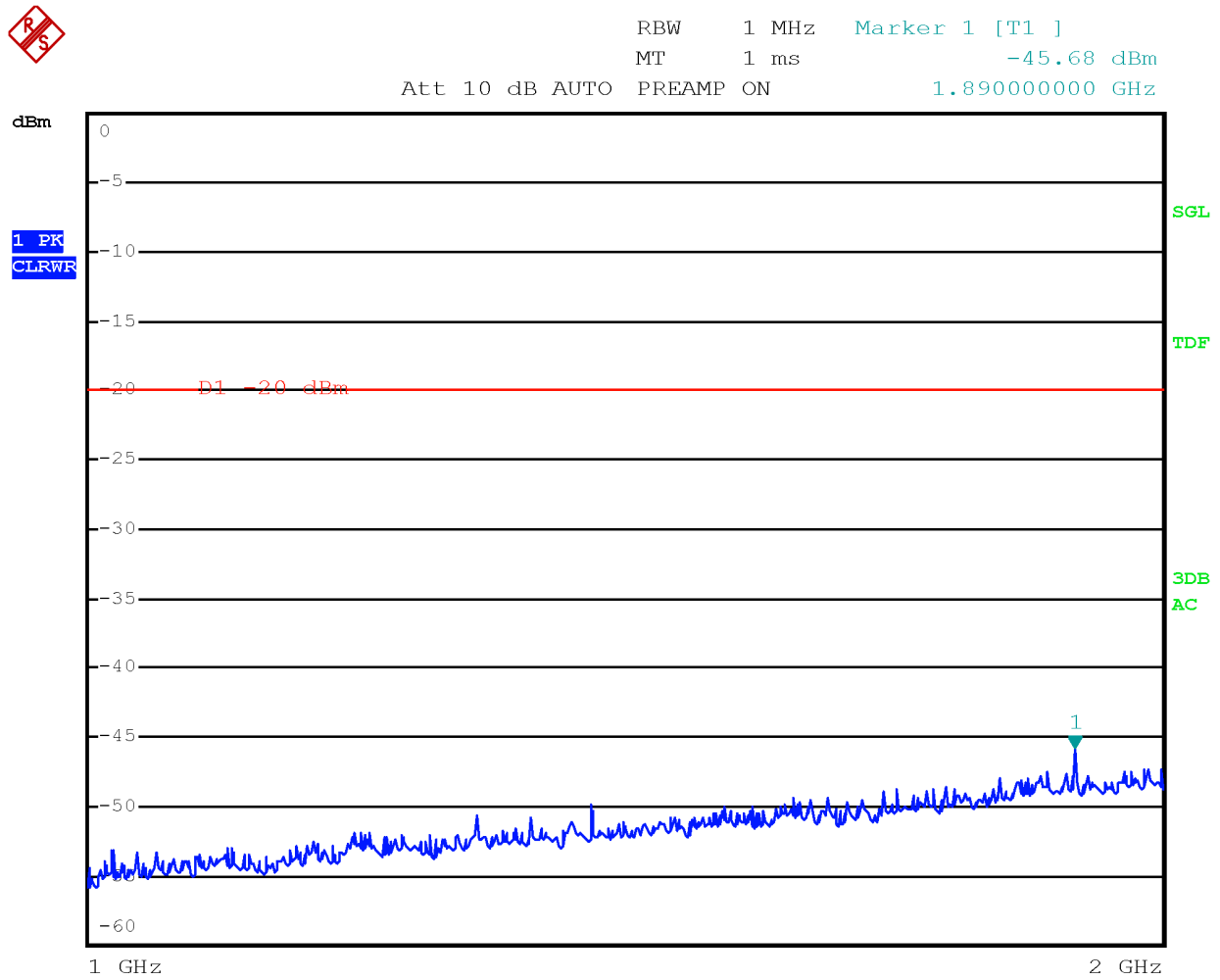
Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 138.1 MHz – Antenna in vertical polarization

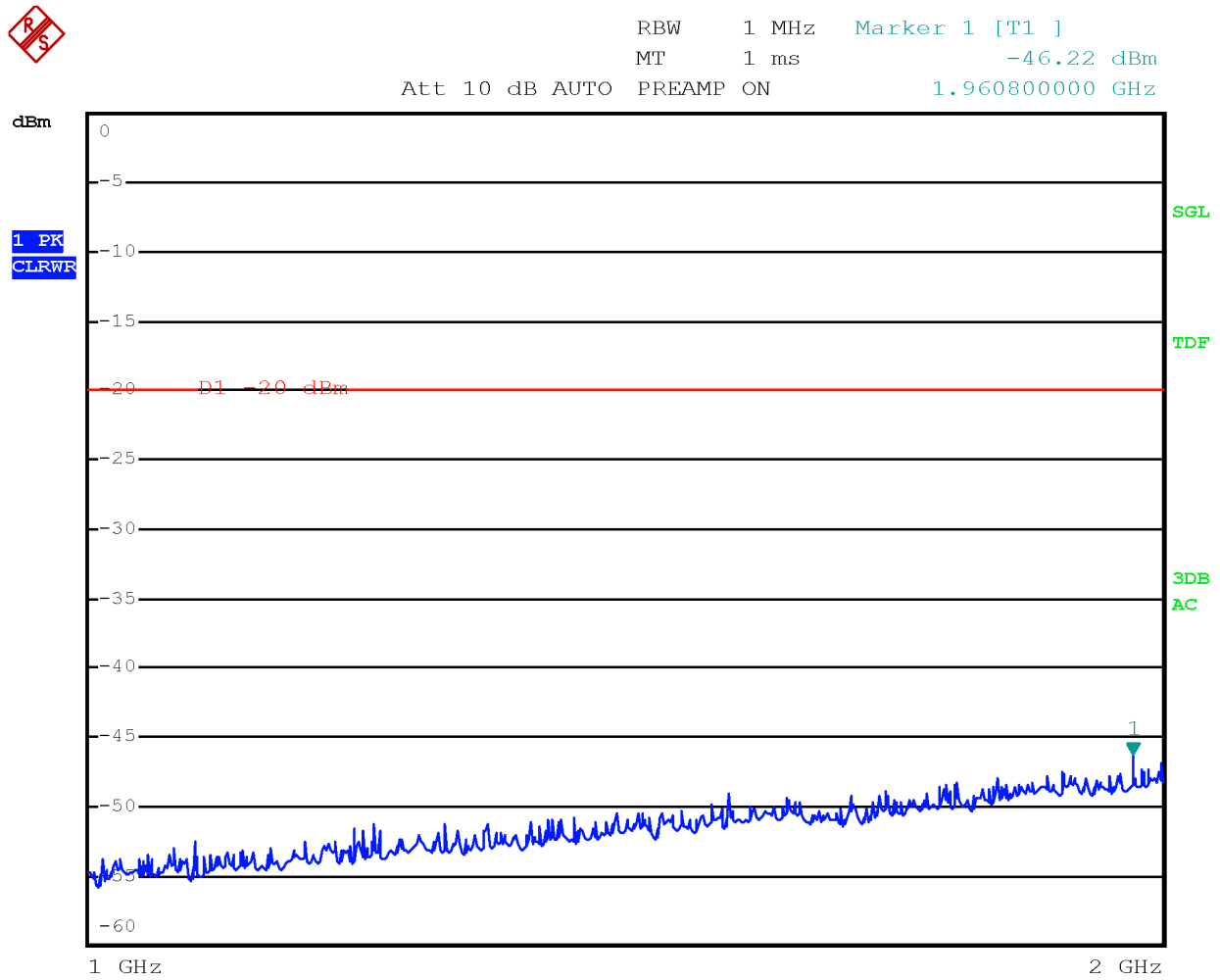
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Test data, continued



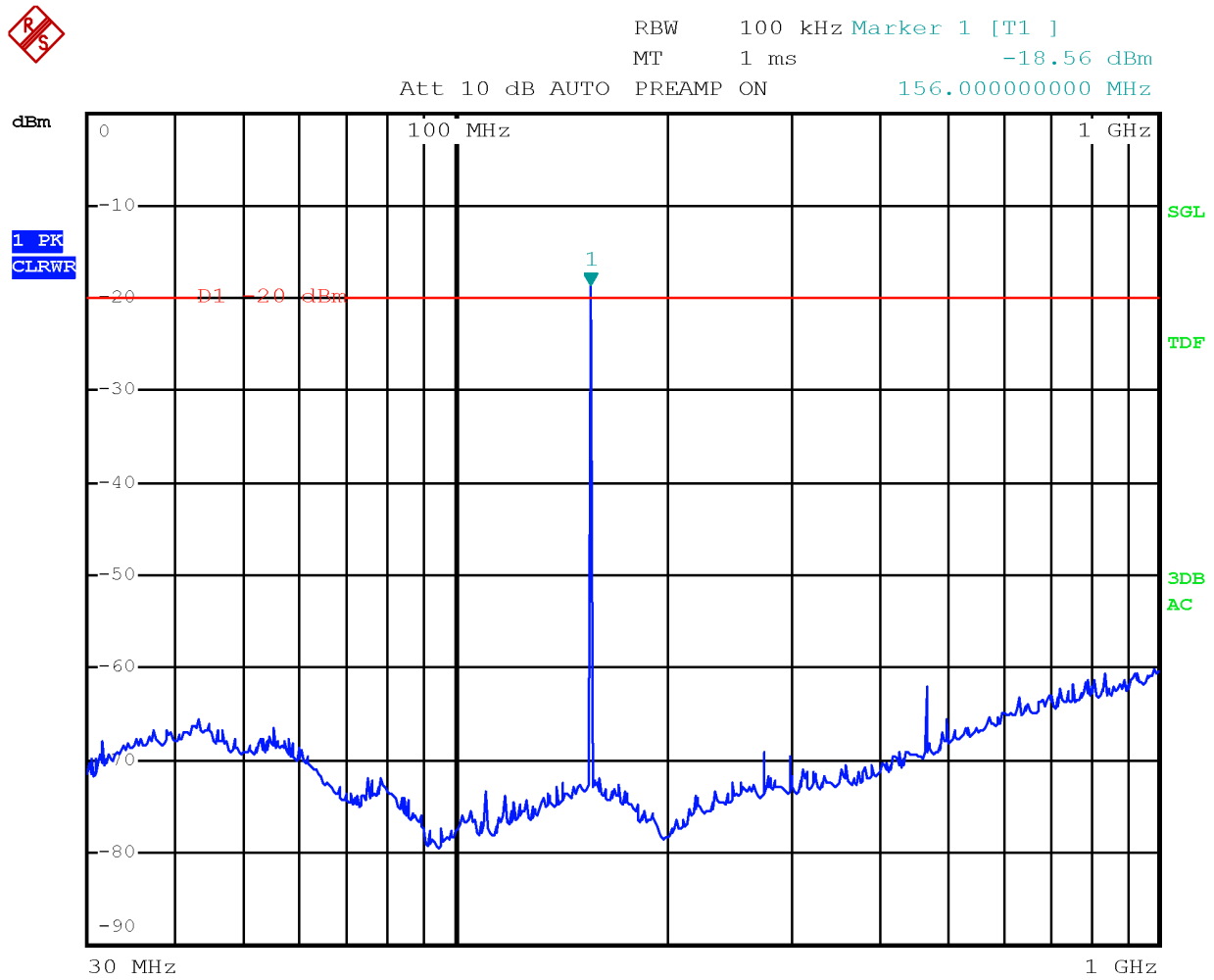
Radiated spurious emissions with modulation DMR 4FSK at 138.1 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 138.1 MHz – Antenna in vertical polarization

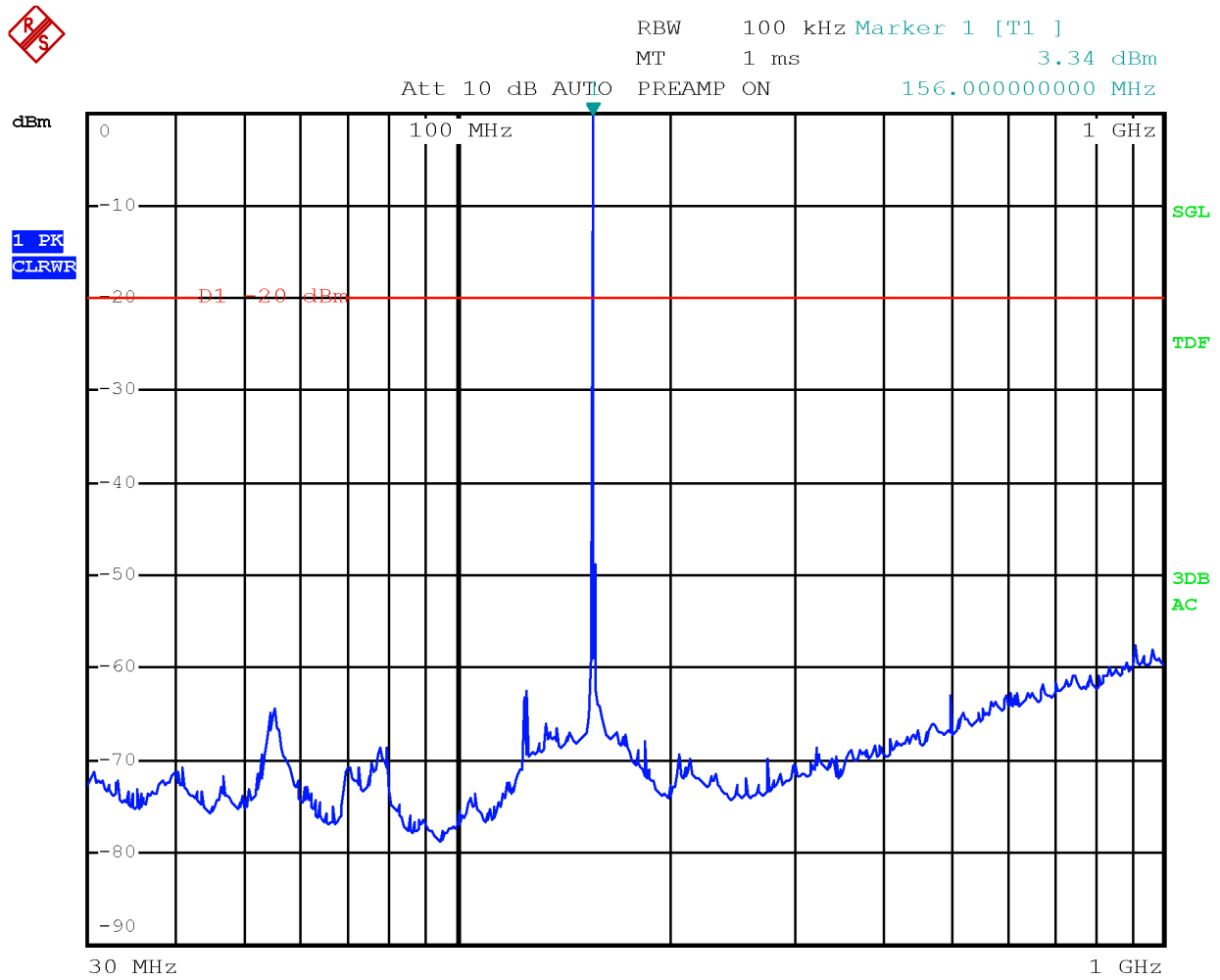
Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 156.0 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

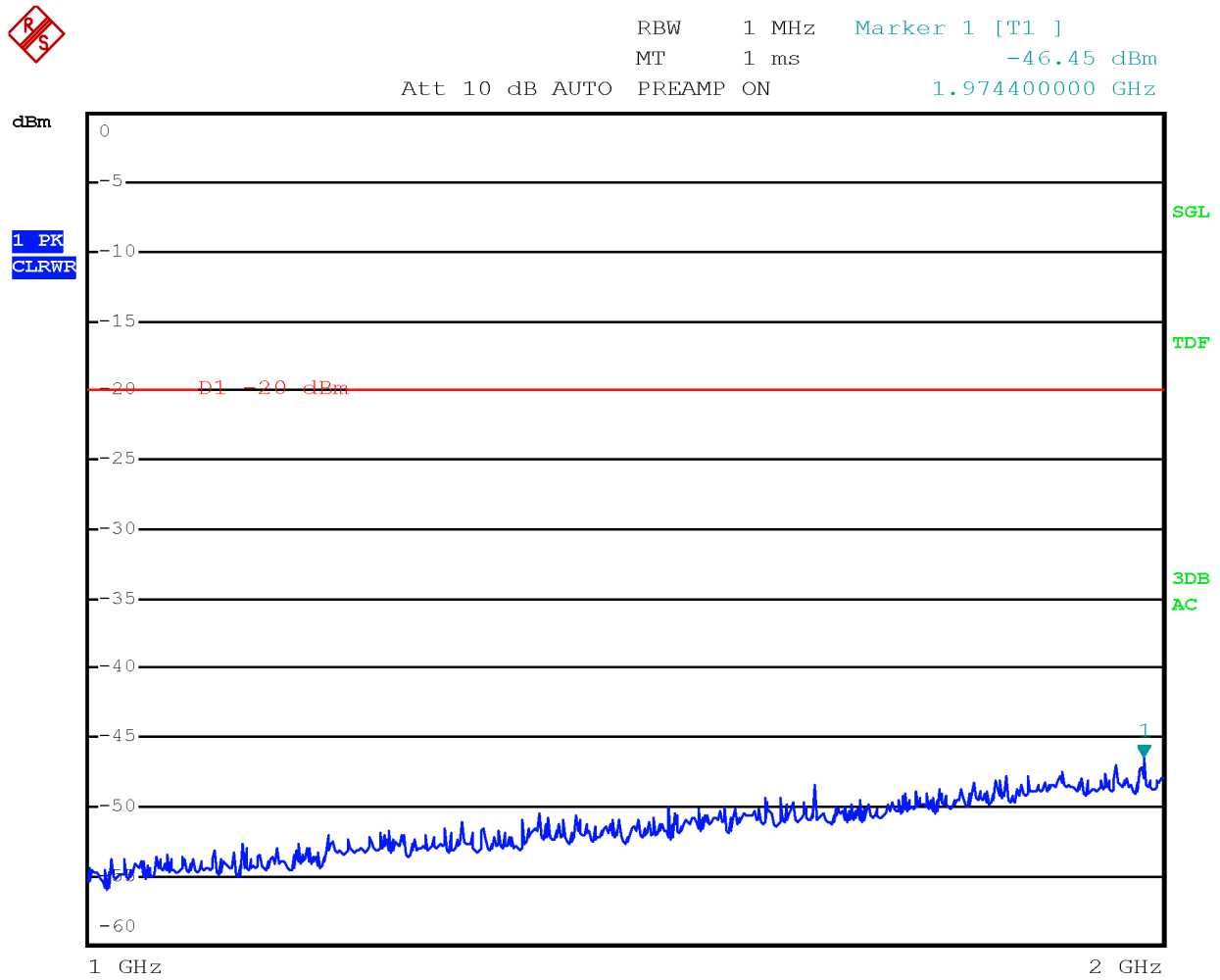
Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 156.0 MHz – Antenna in vertical polarization

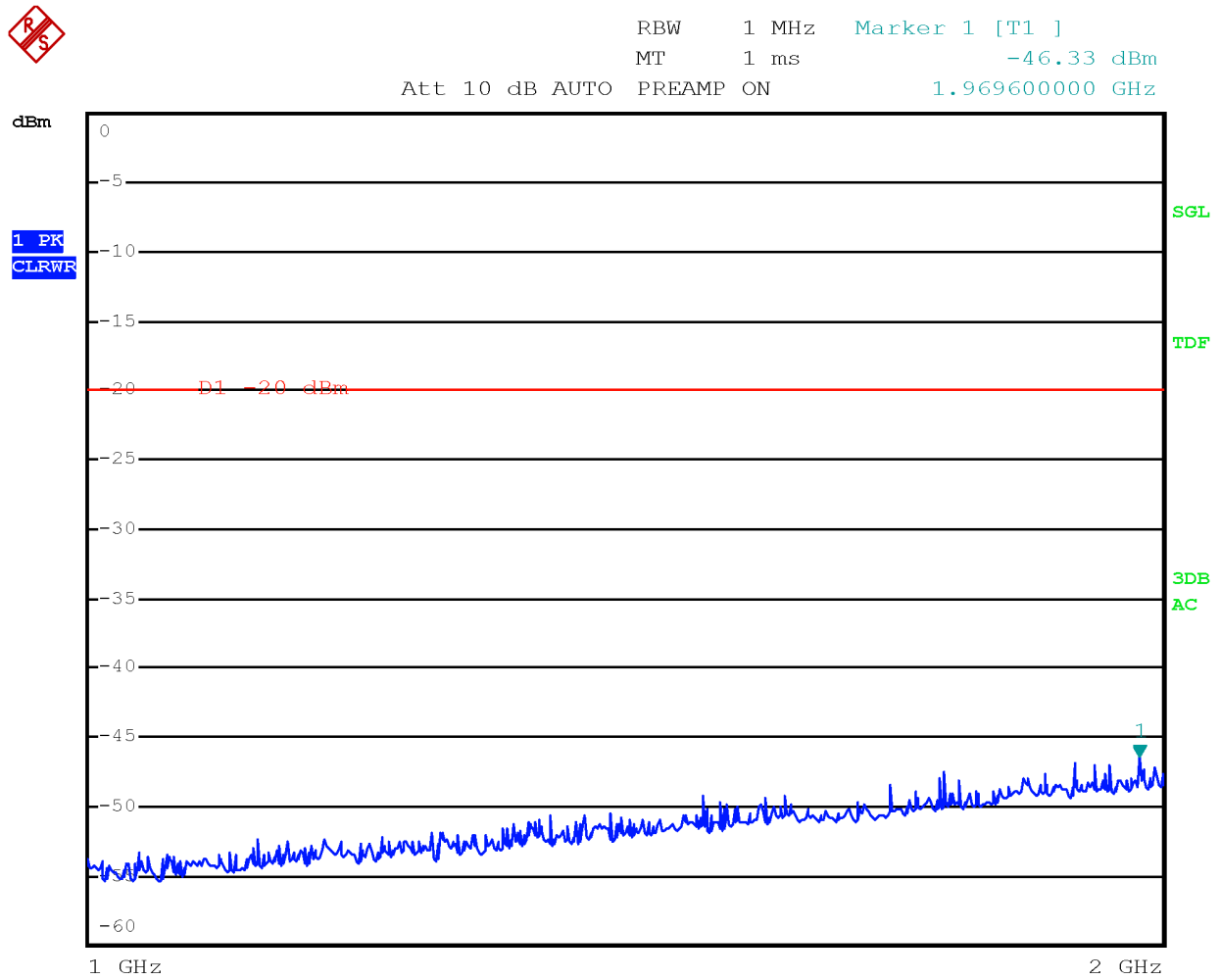
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Test data, continued



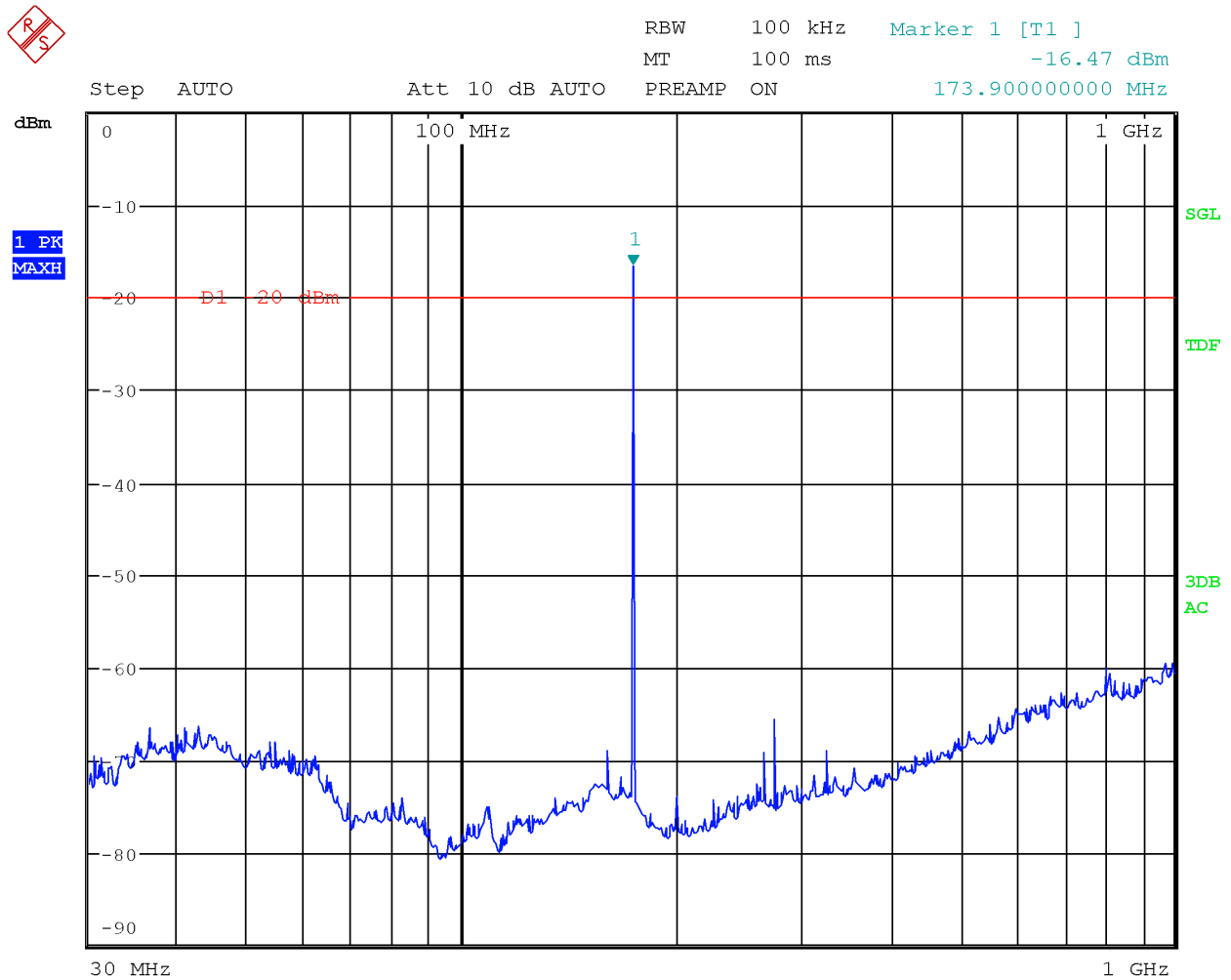
Radiated spurious emissions with modulation DMR 4FSK at 156.0 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 156.0 MHz – Antenna in vertical polarization

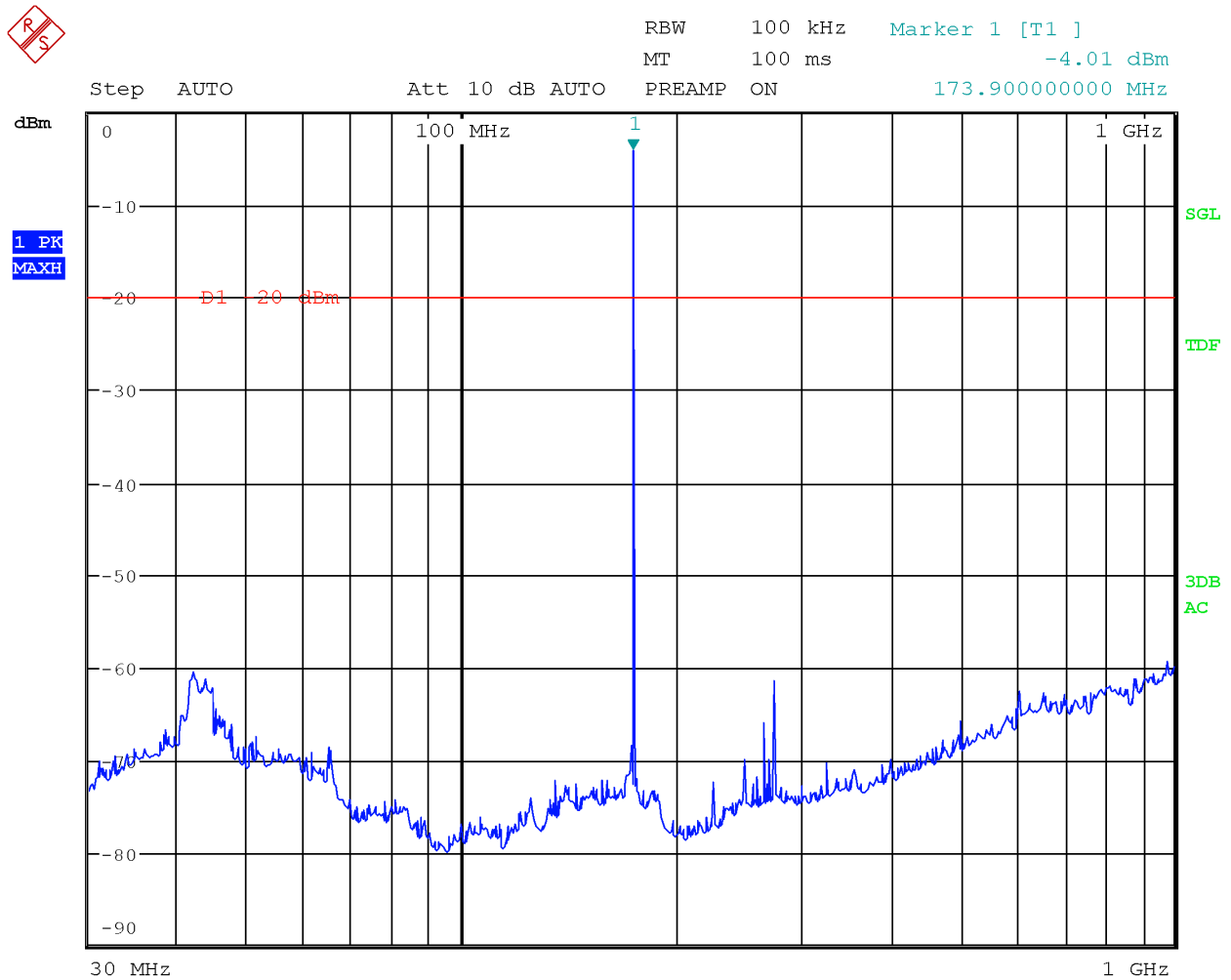
Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 173.9 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

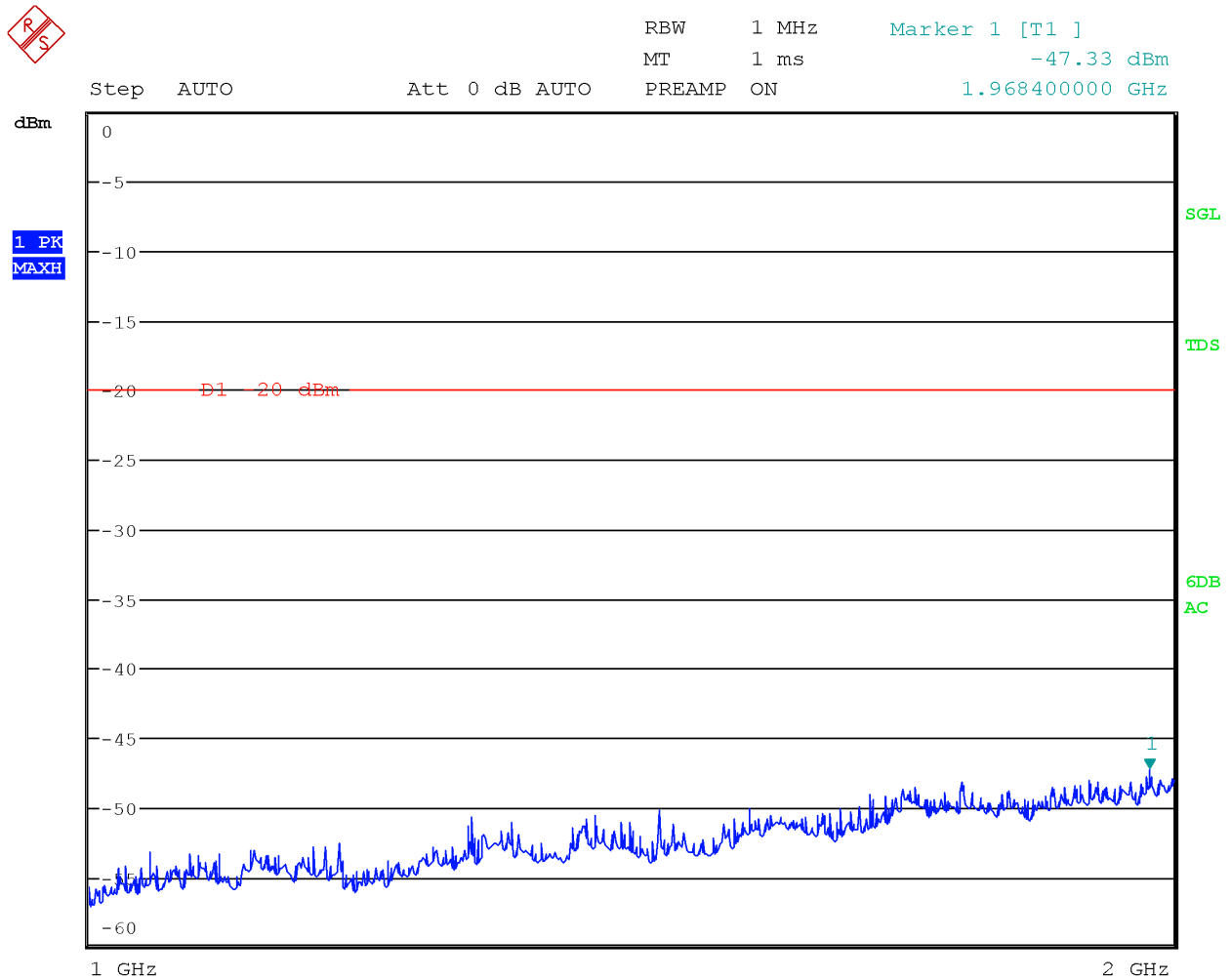
Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 173.9 MHz – Antenna in vertical polarization

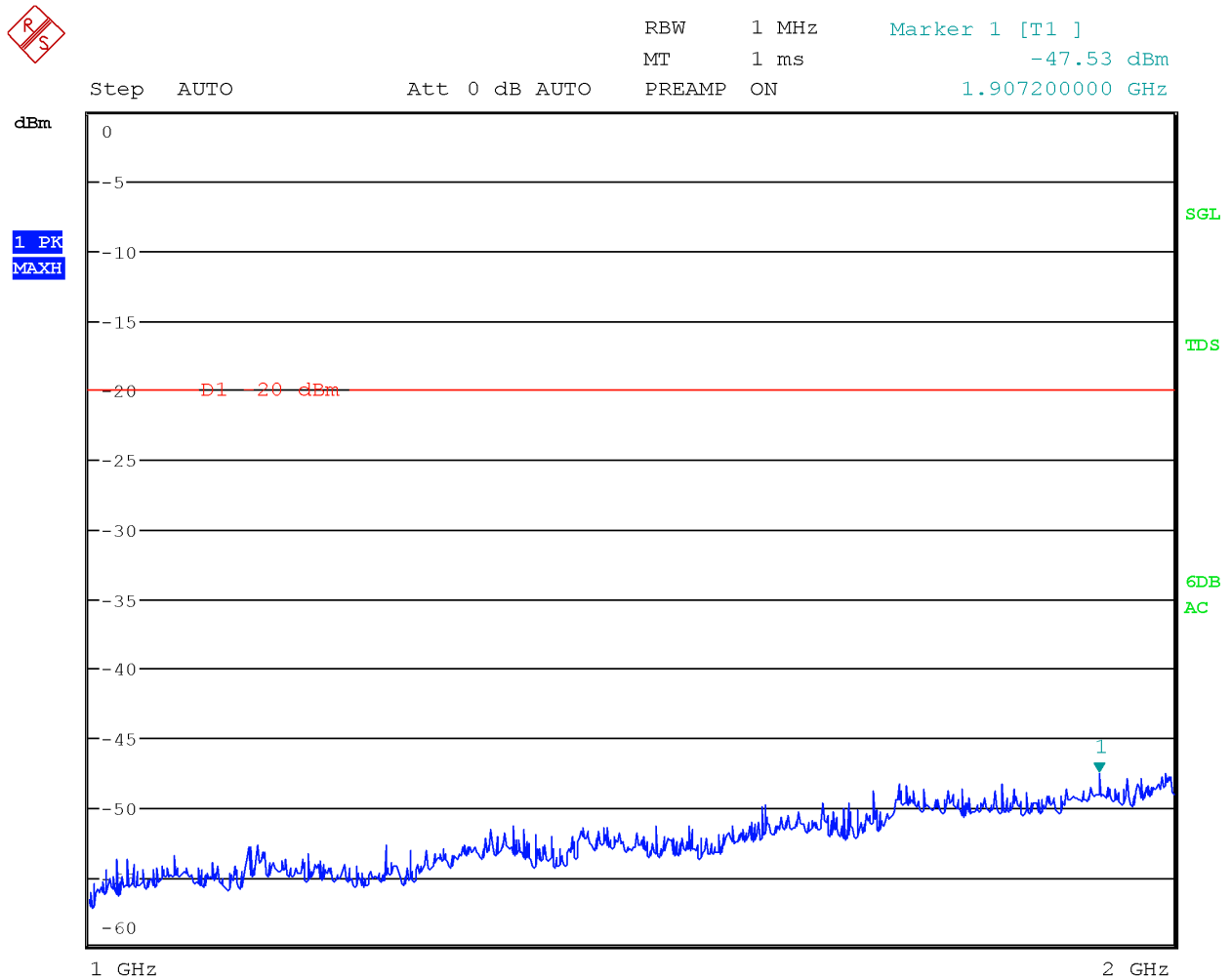
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Test data, continued



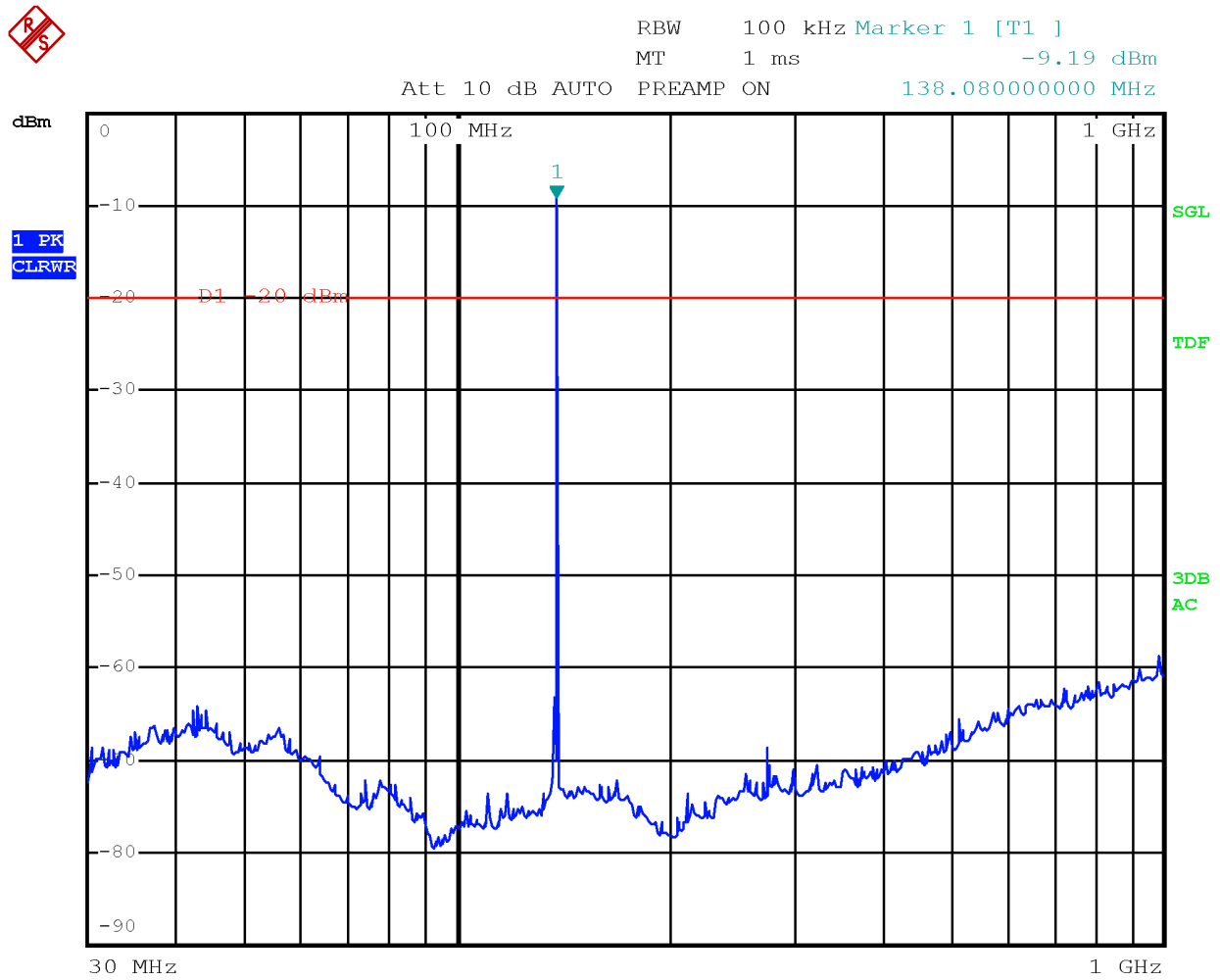
Radiated spurious emissions with modulation DMR 4FSK at 173.9 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation DMR 4FSK at 173.9 MHz – Antenna in vertical polarization

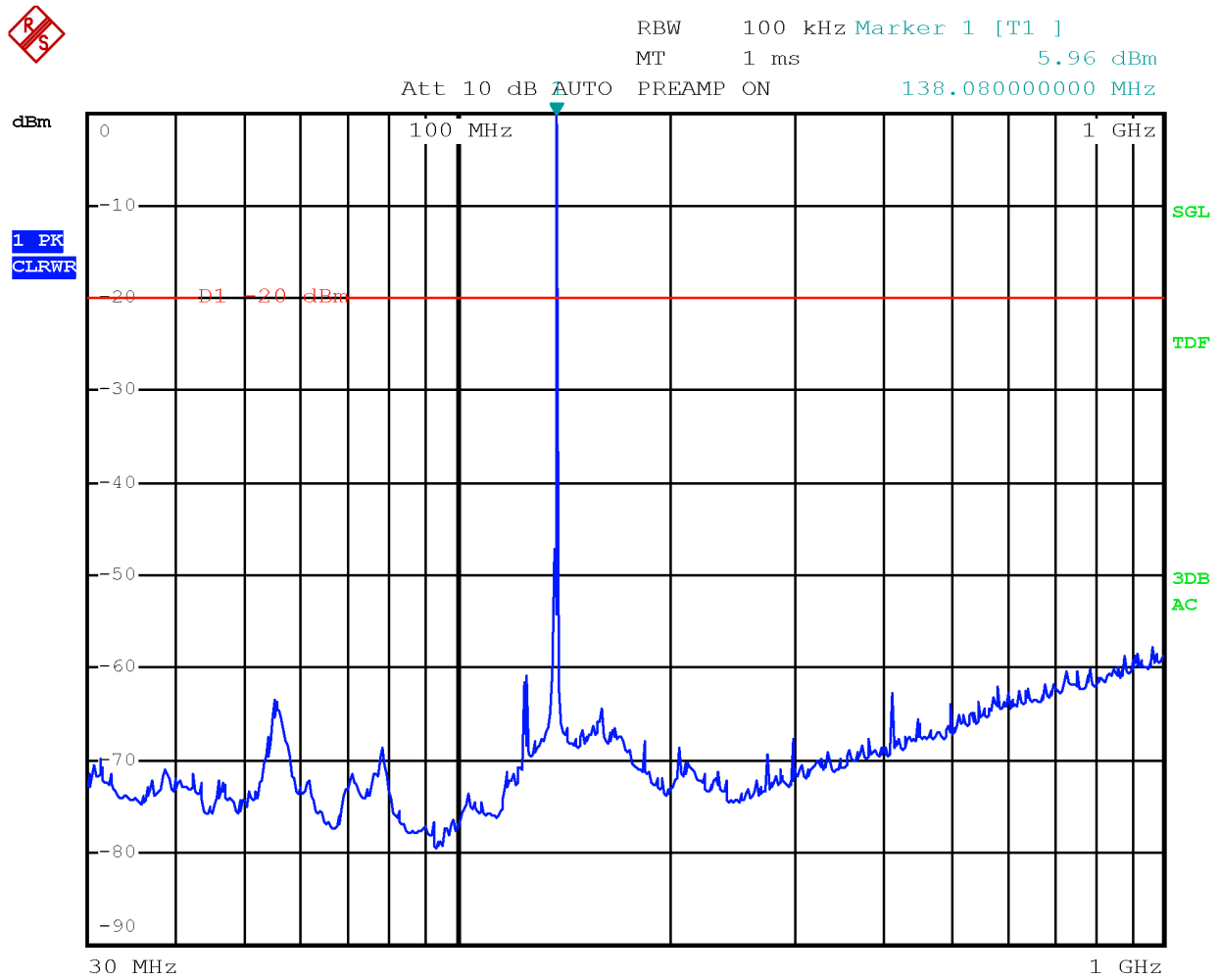
Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 138.1 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

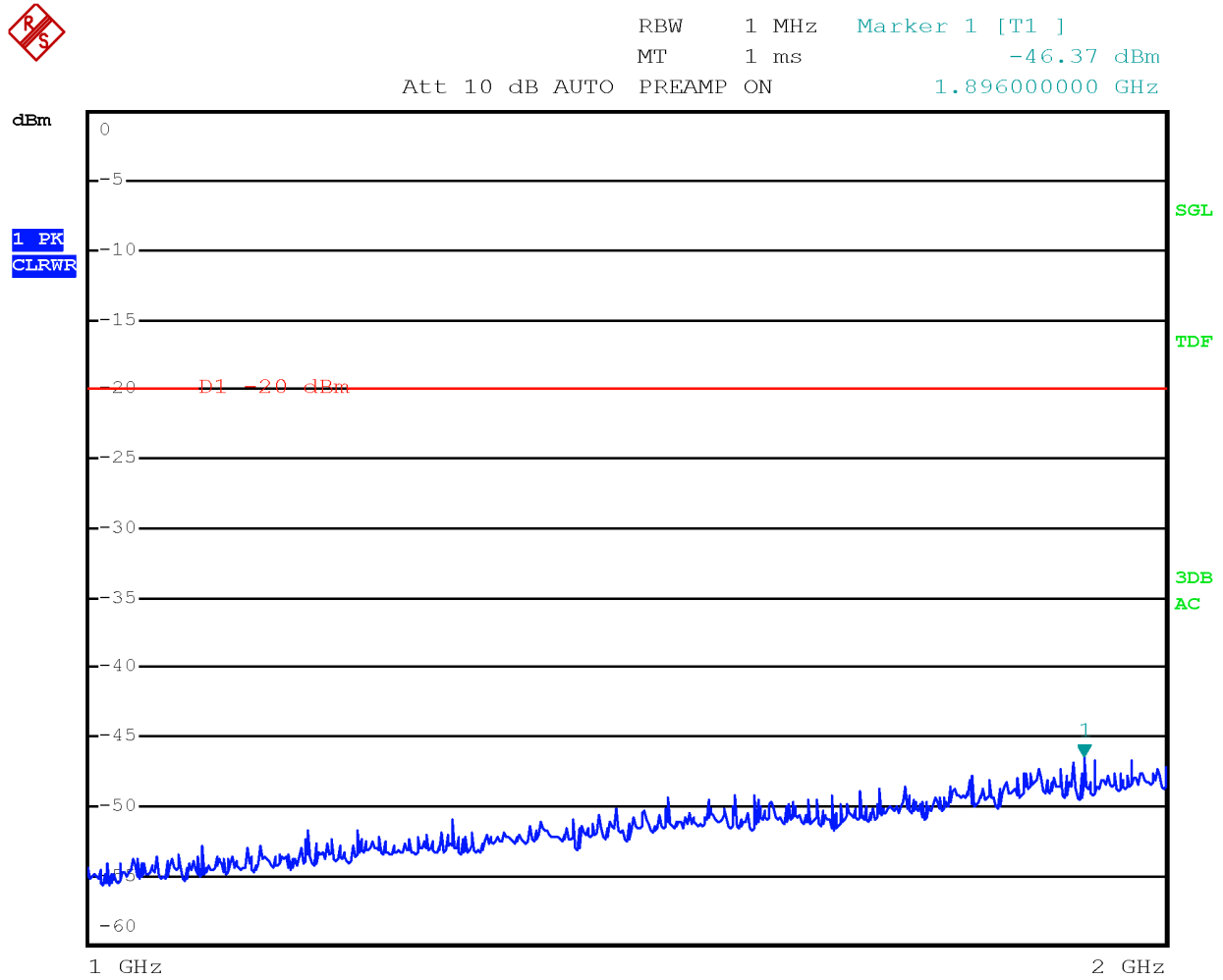
Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 138.1 MHz – Antenna in vertical polarization

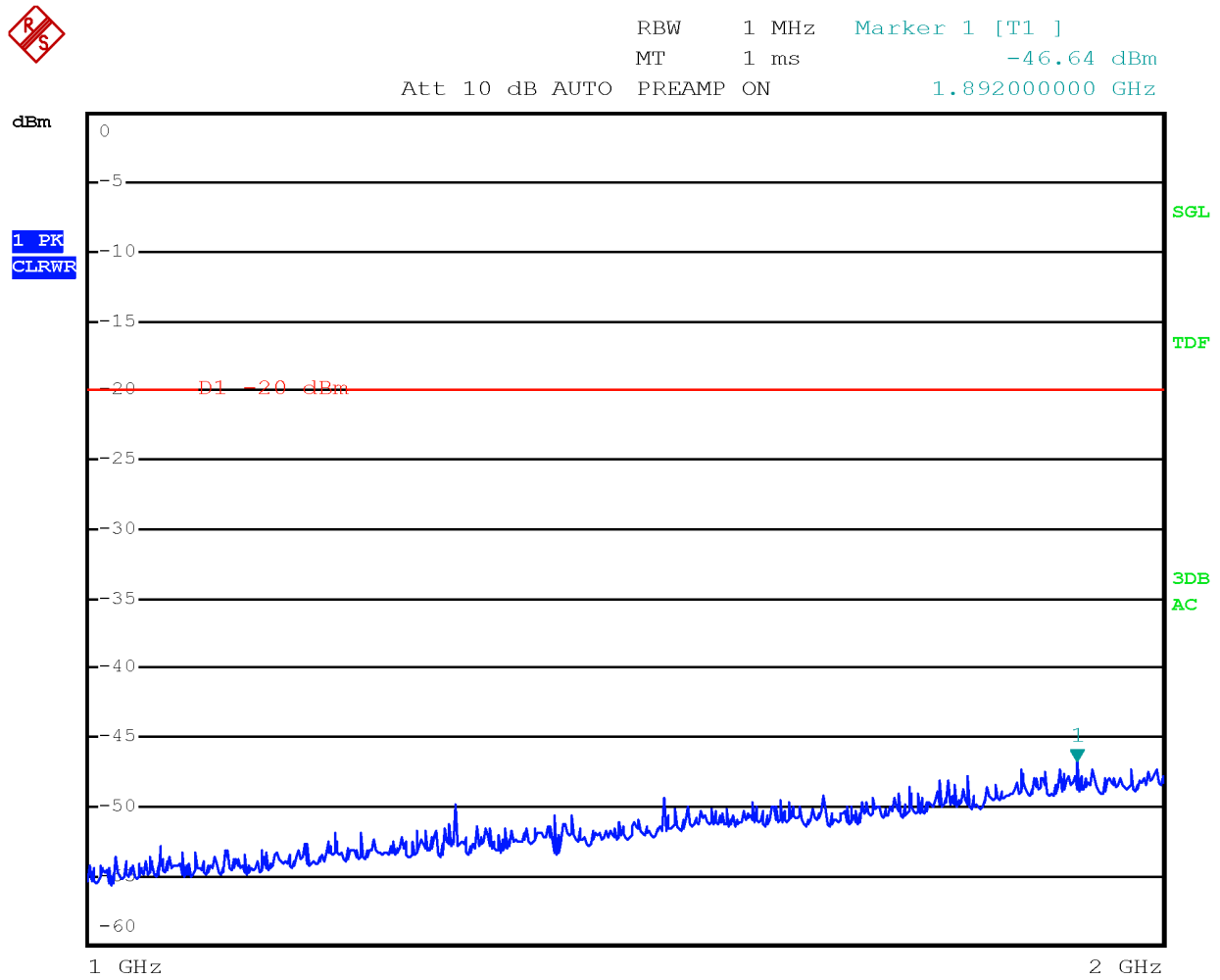
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Test data, continued



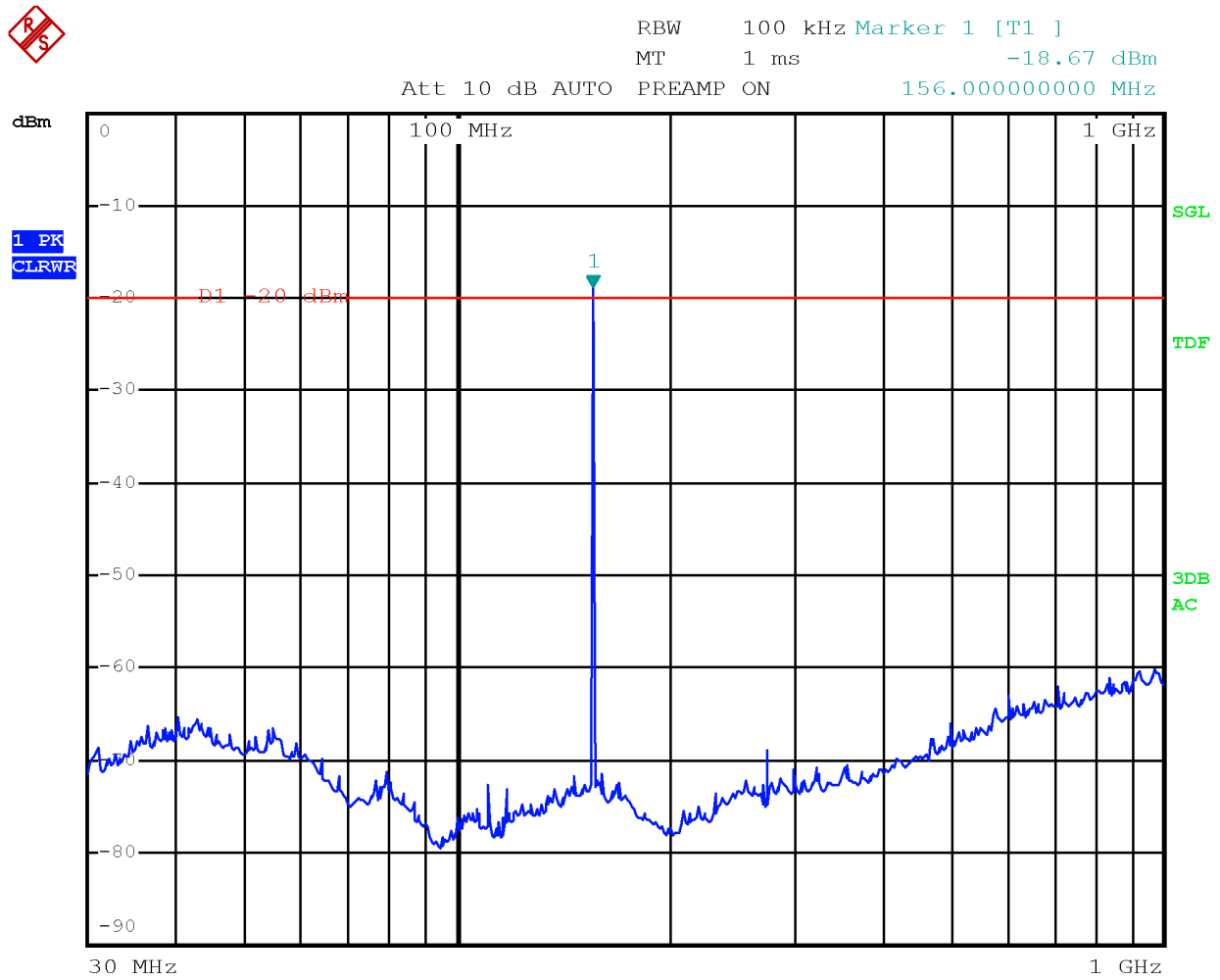
Radiated spurious emissions with modulation FM 12.5 kHz at 138.1 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 138.1 MHz – Antenna in vertical polarization

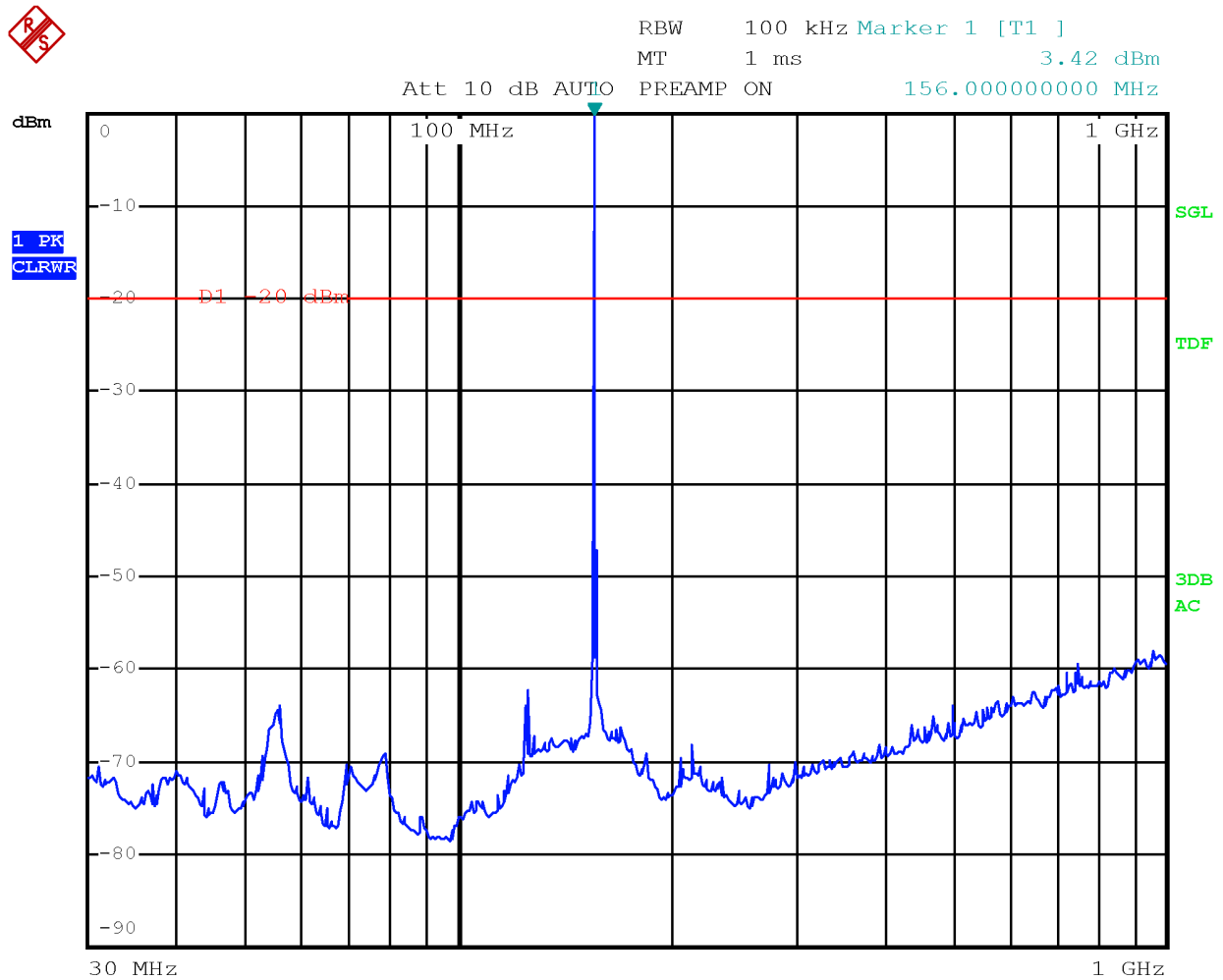
Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 156.0 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

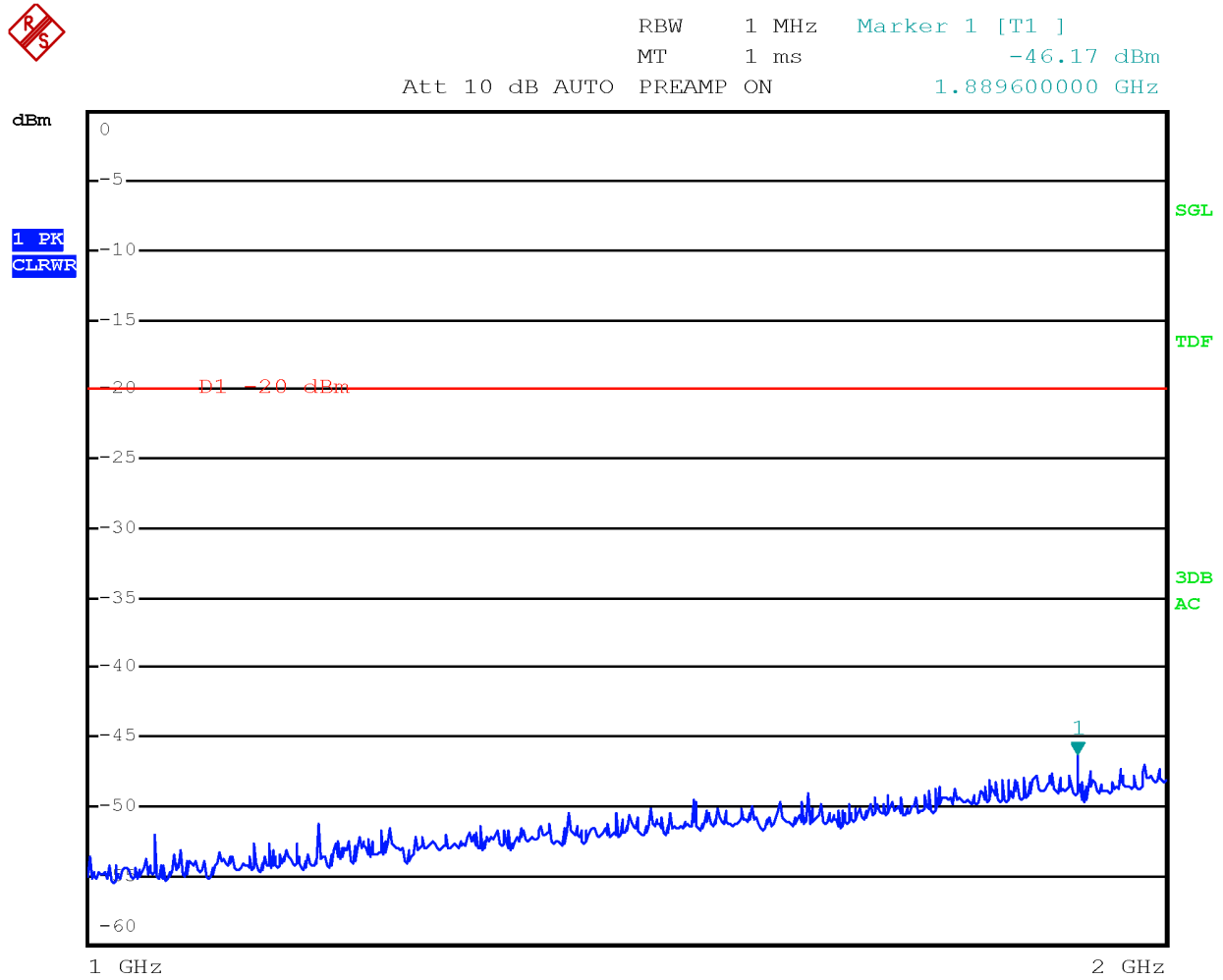
Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 156.0 MHz – Antenna in vertical polarization

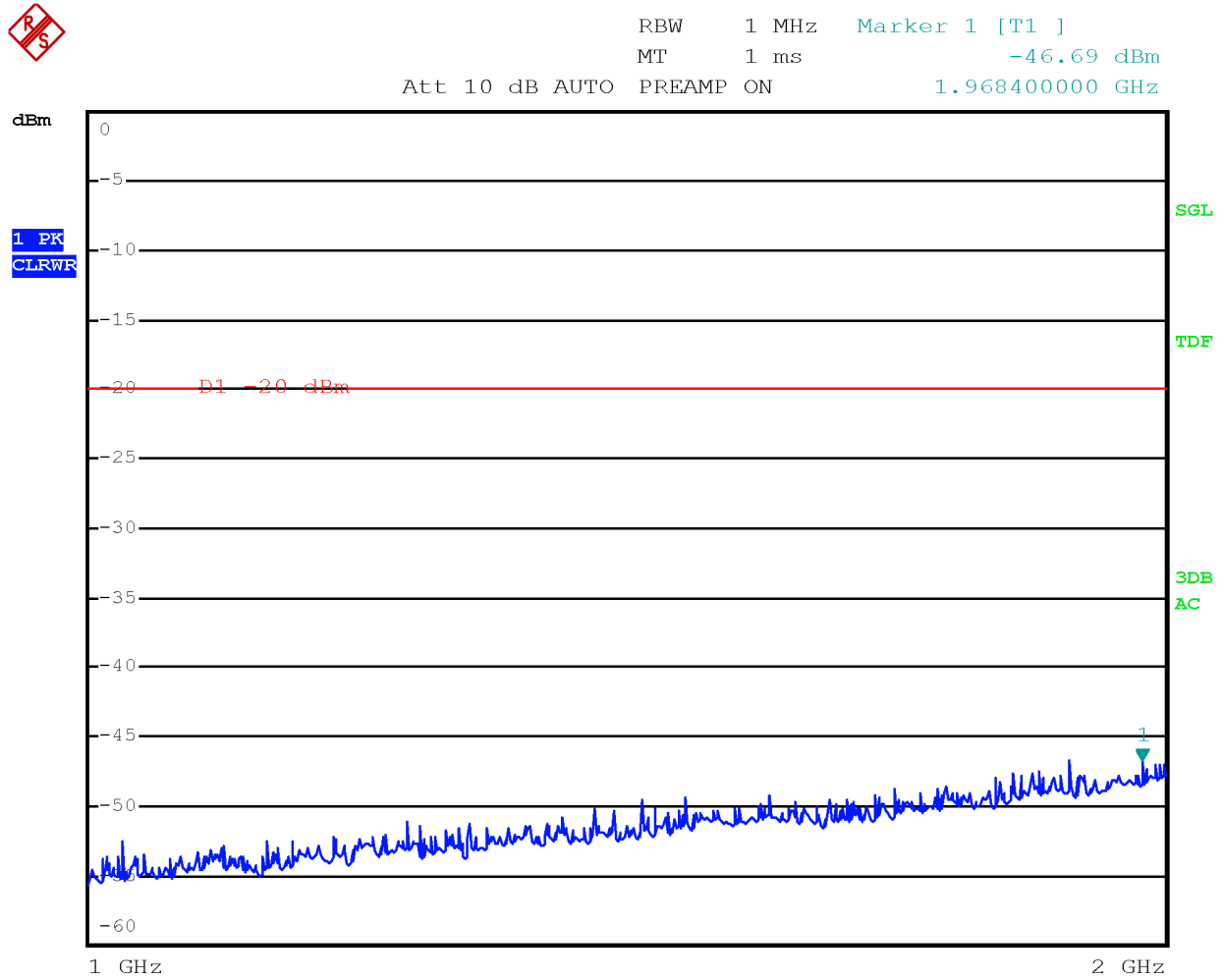
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Test data, continued



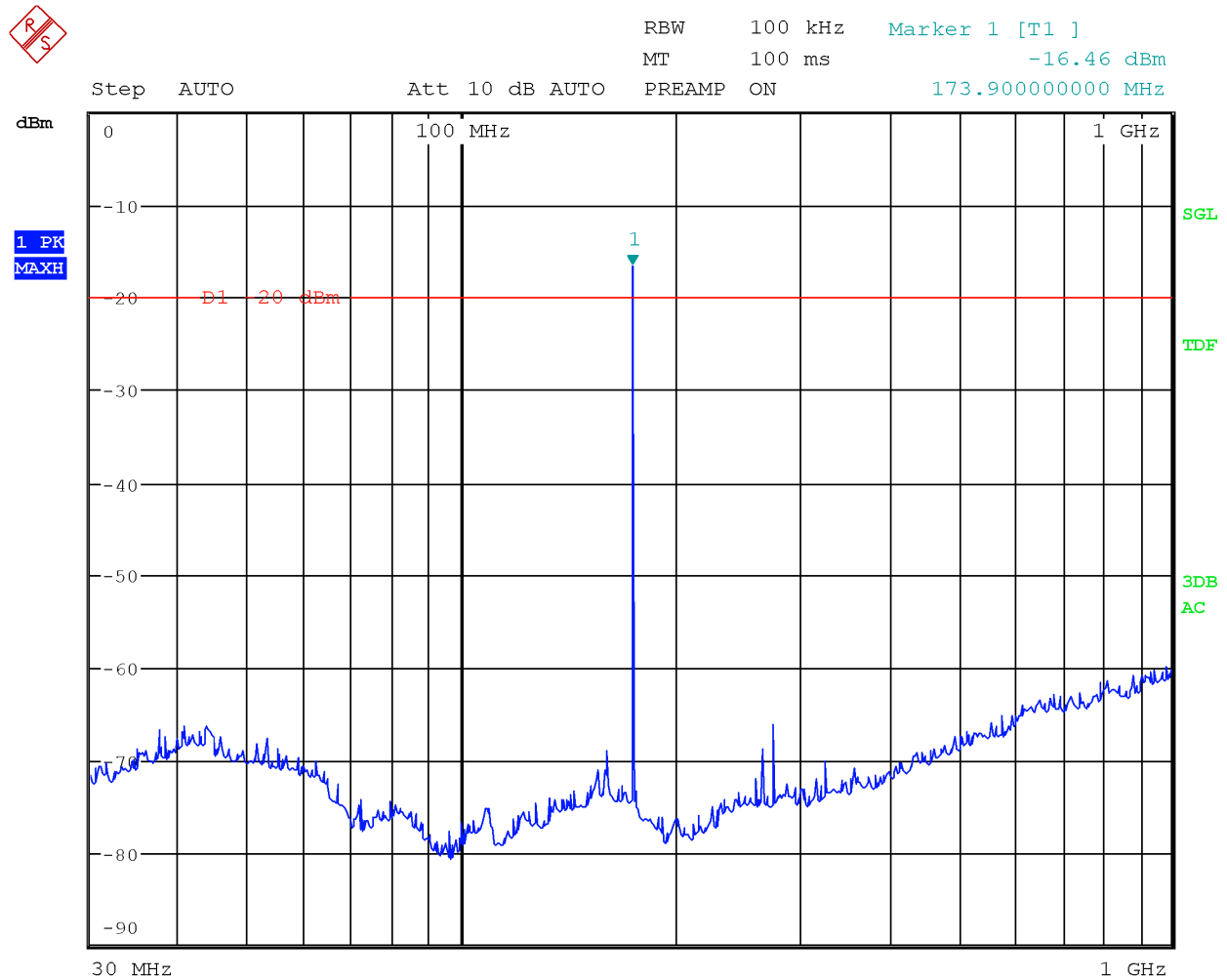
Radiated spurious emissions with modulation FM 12.5 kHz at 156.0 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 156.0 MHz – Antenna in vertical polarization

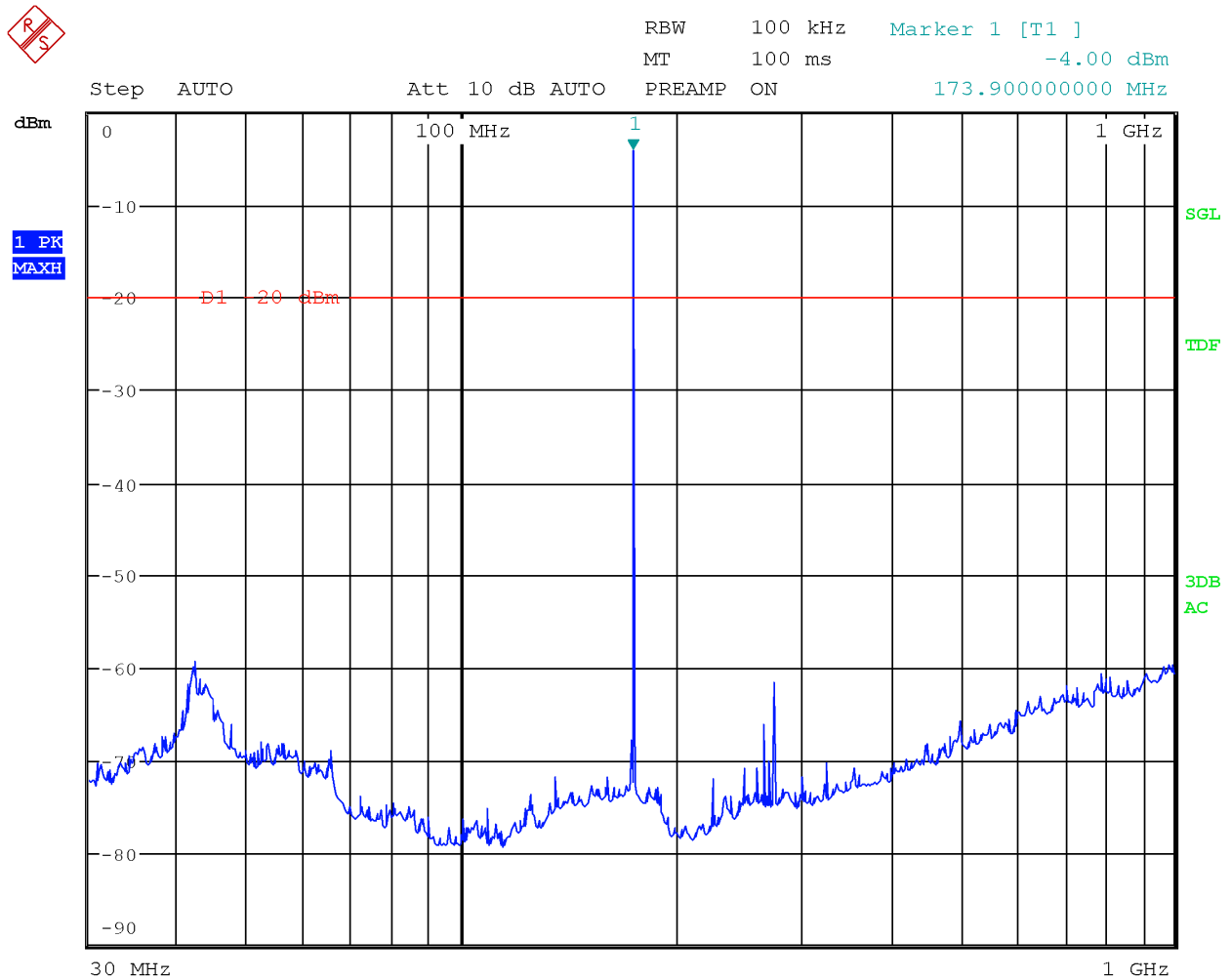
Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 173.9 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

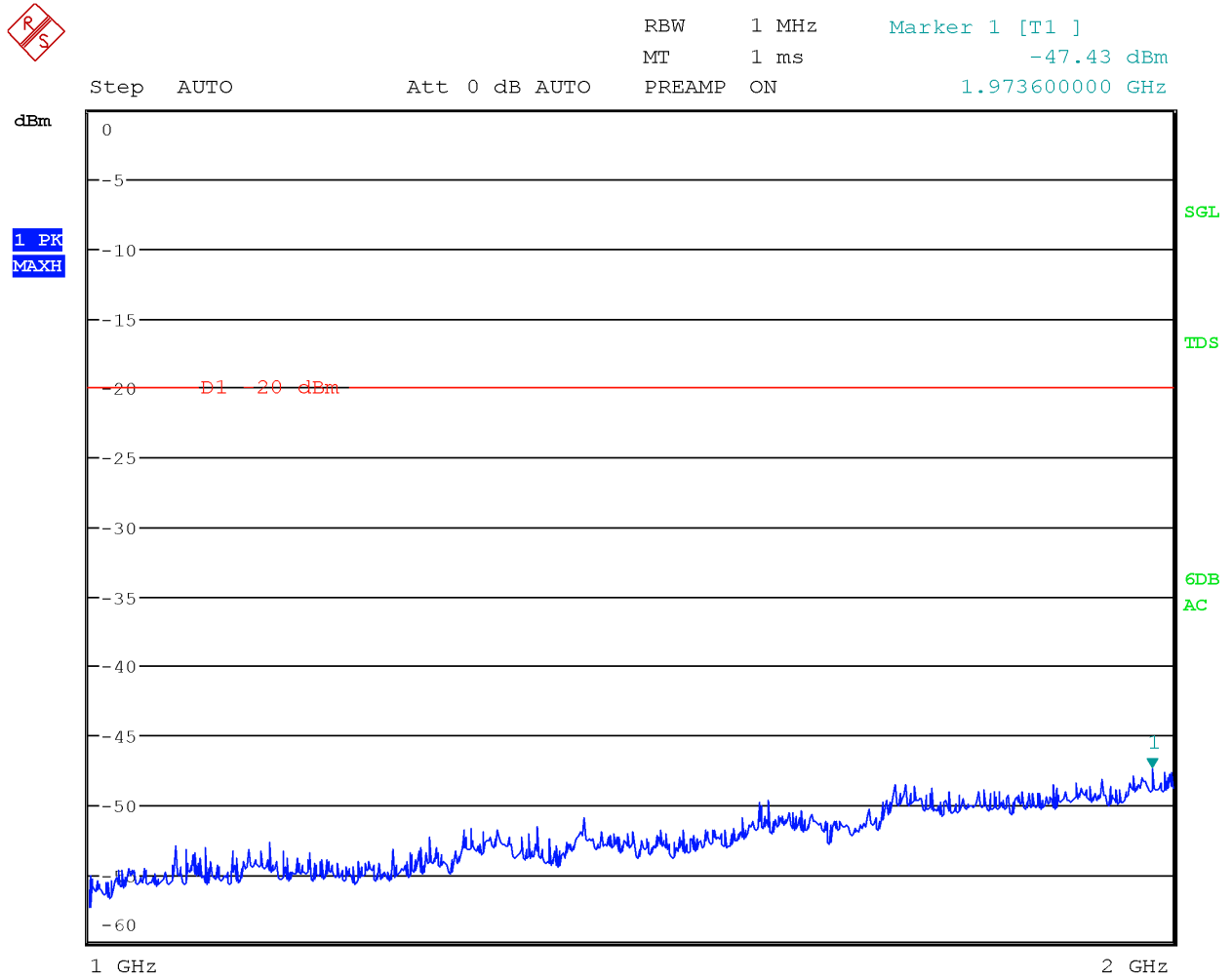
Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 173.9 MHz – Antenna in vertical polarization

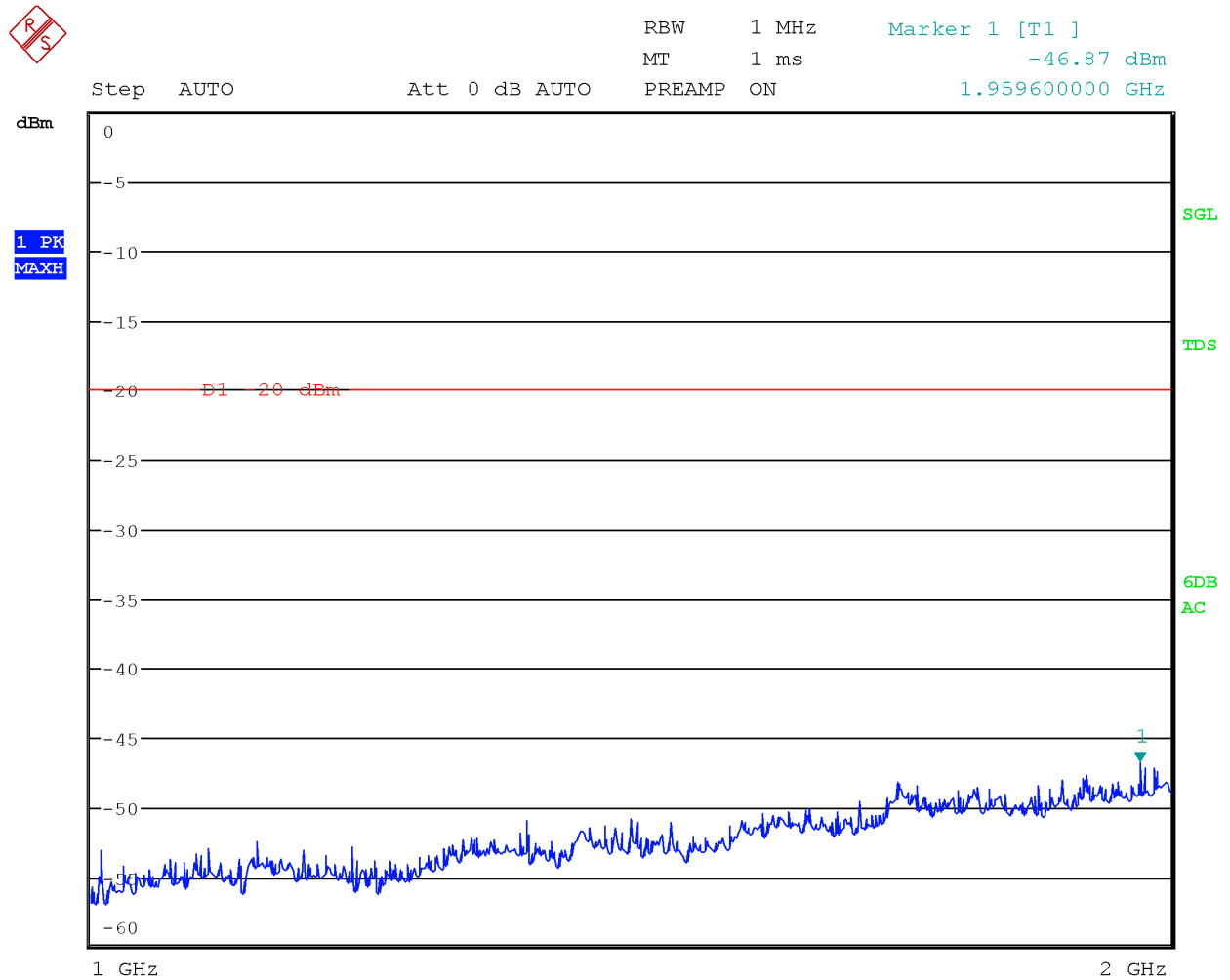
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Test data, continued



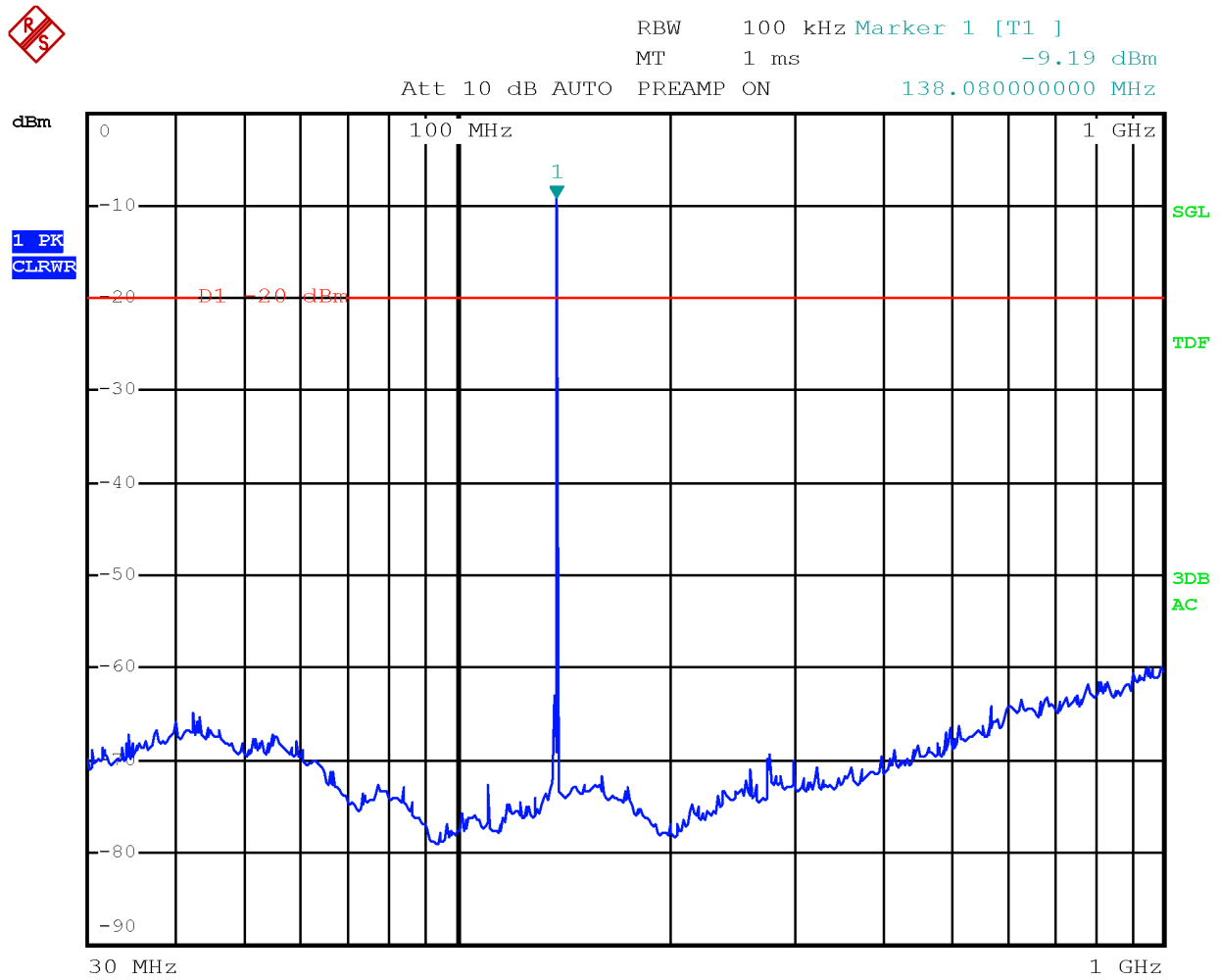
Radiated spurious emissions with modulation FM 12.5 kHz at 173.9 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation FM 12.5 kHz at 173.9 MHz – Antenna in vertical polarization

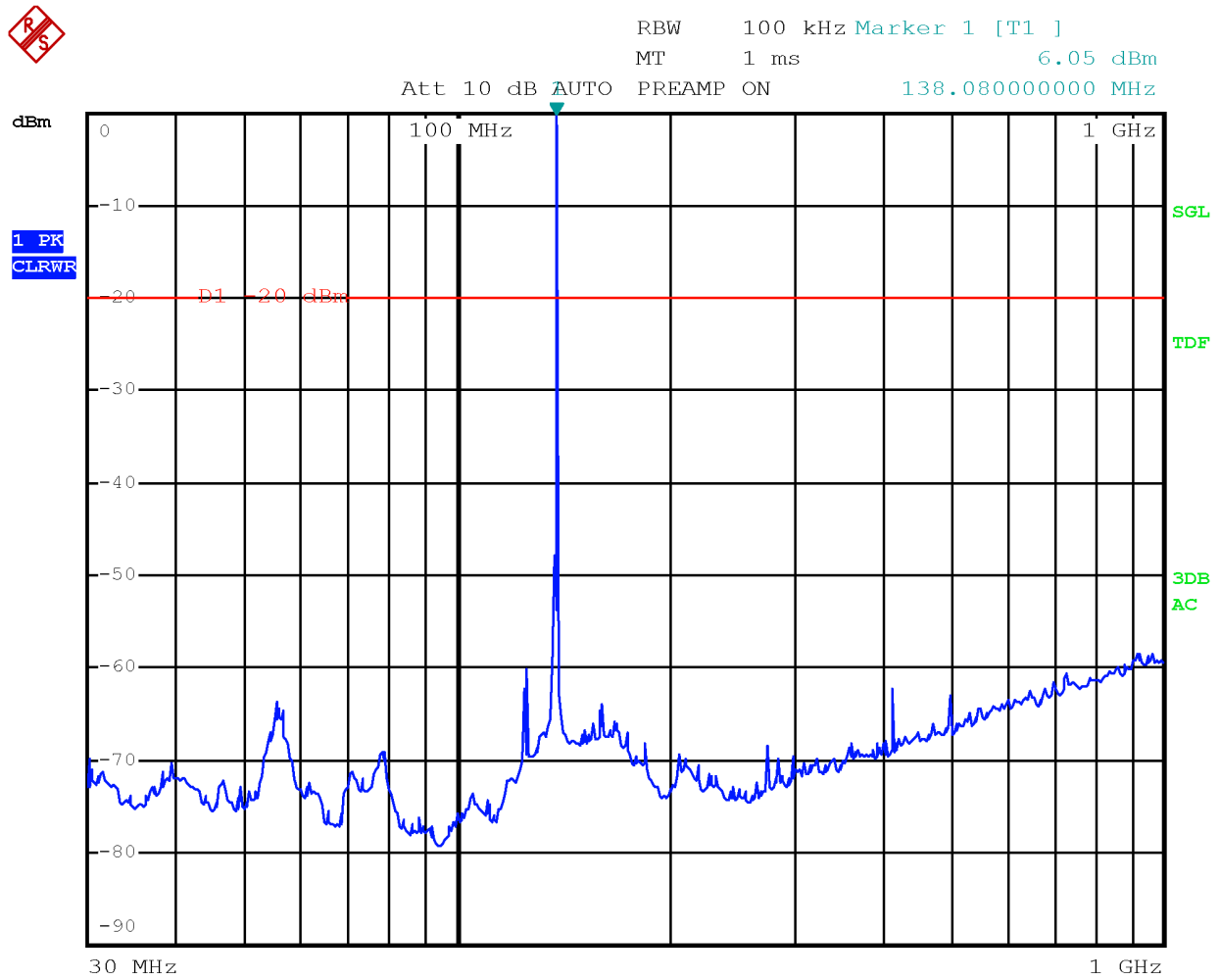
Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 138.1 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

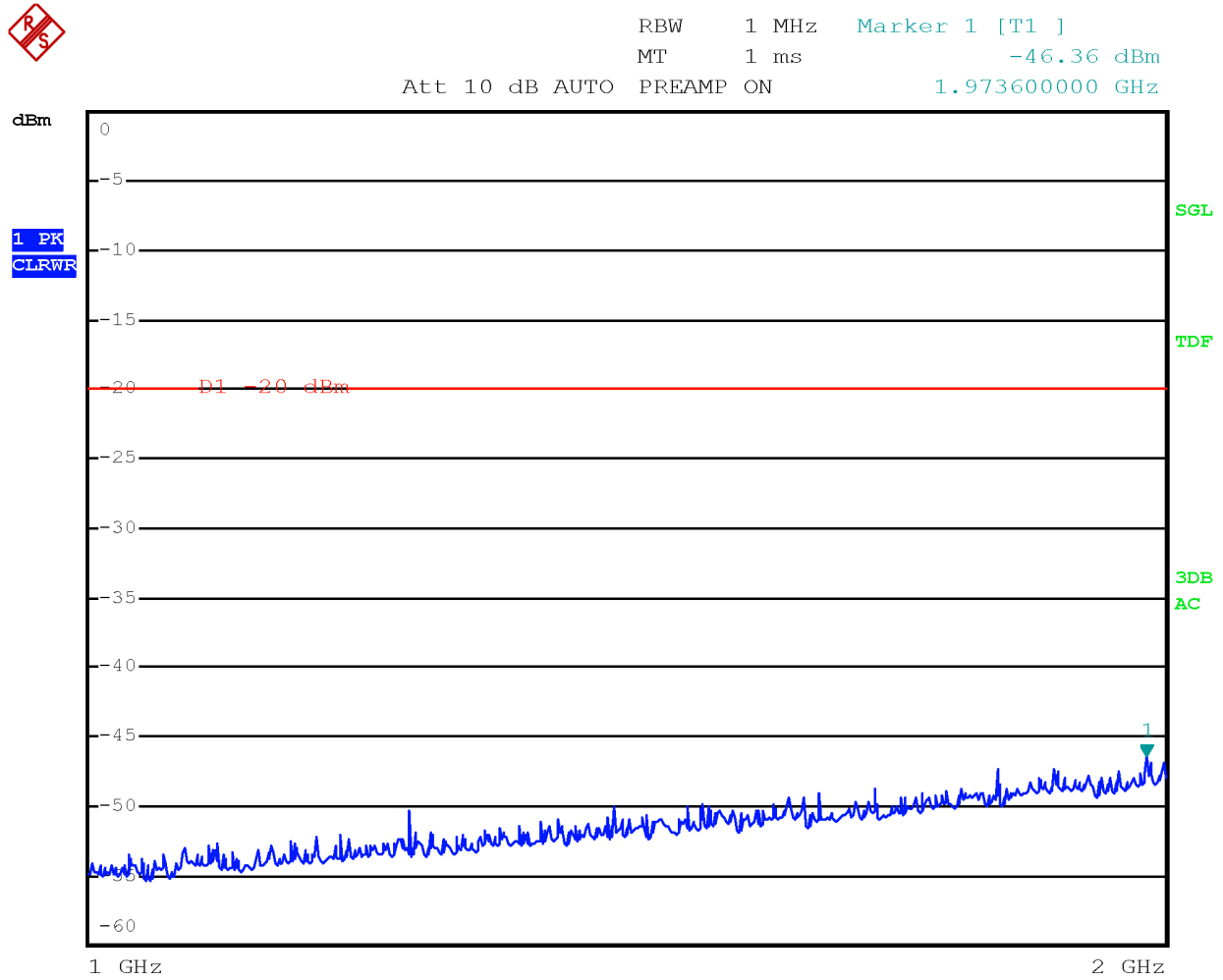
Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 138.1 MHz – Antenna in vertical polarization

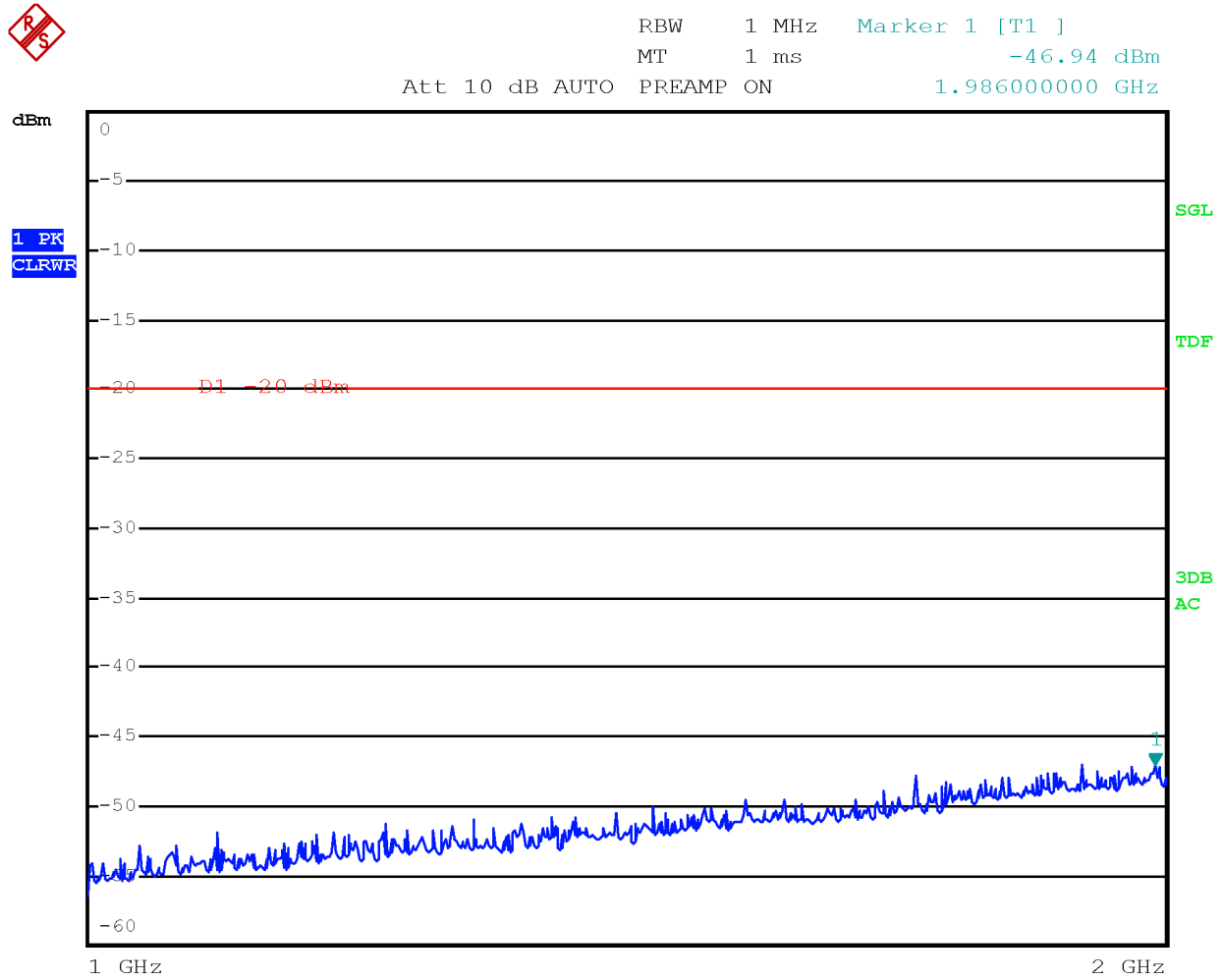
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Test data, continued



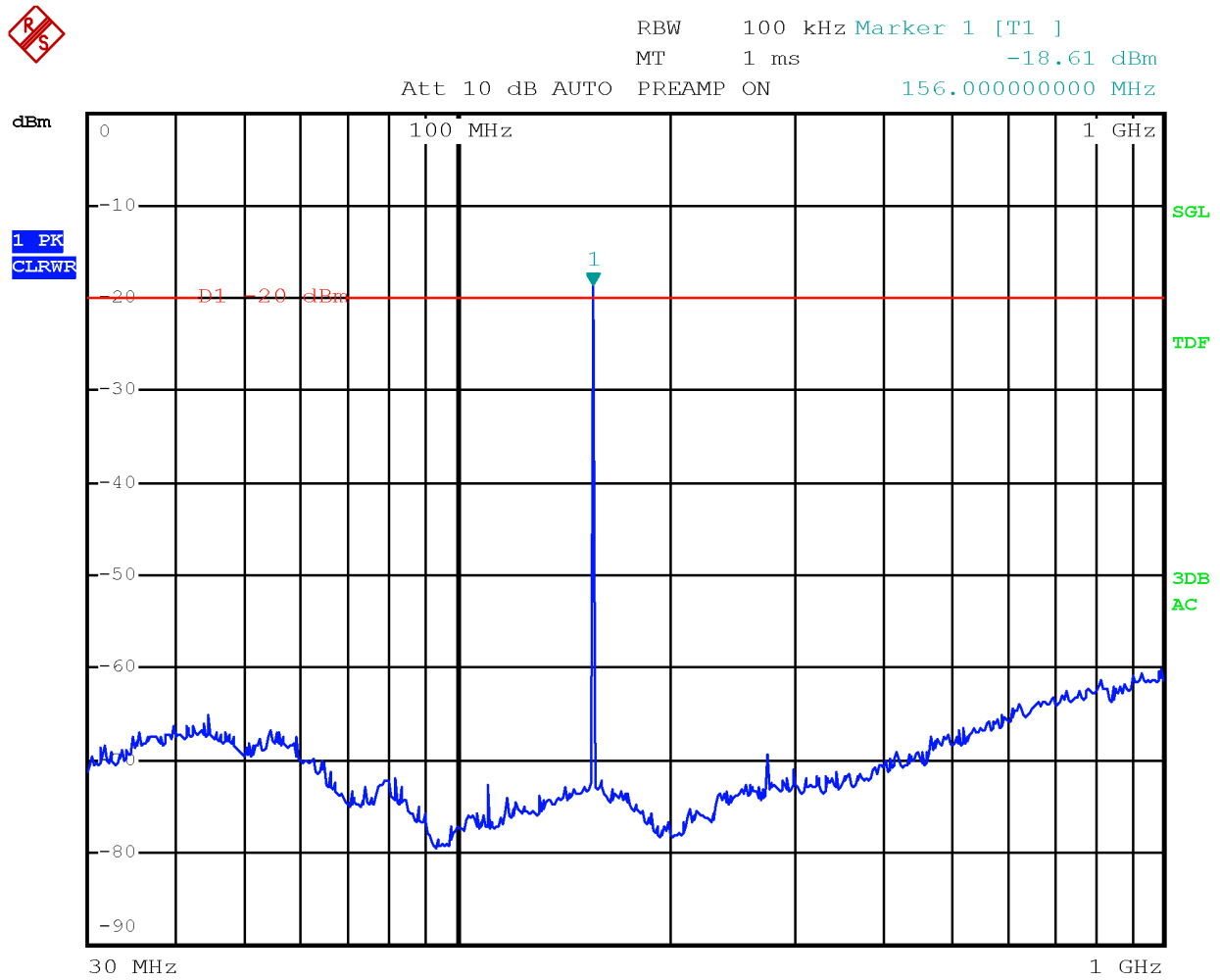
Radiated spurious emissions with modulation FM 25.0 kHz at 138.1 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 138.1 MHz – Antenna in vertical polarization

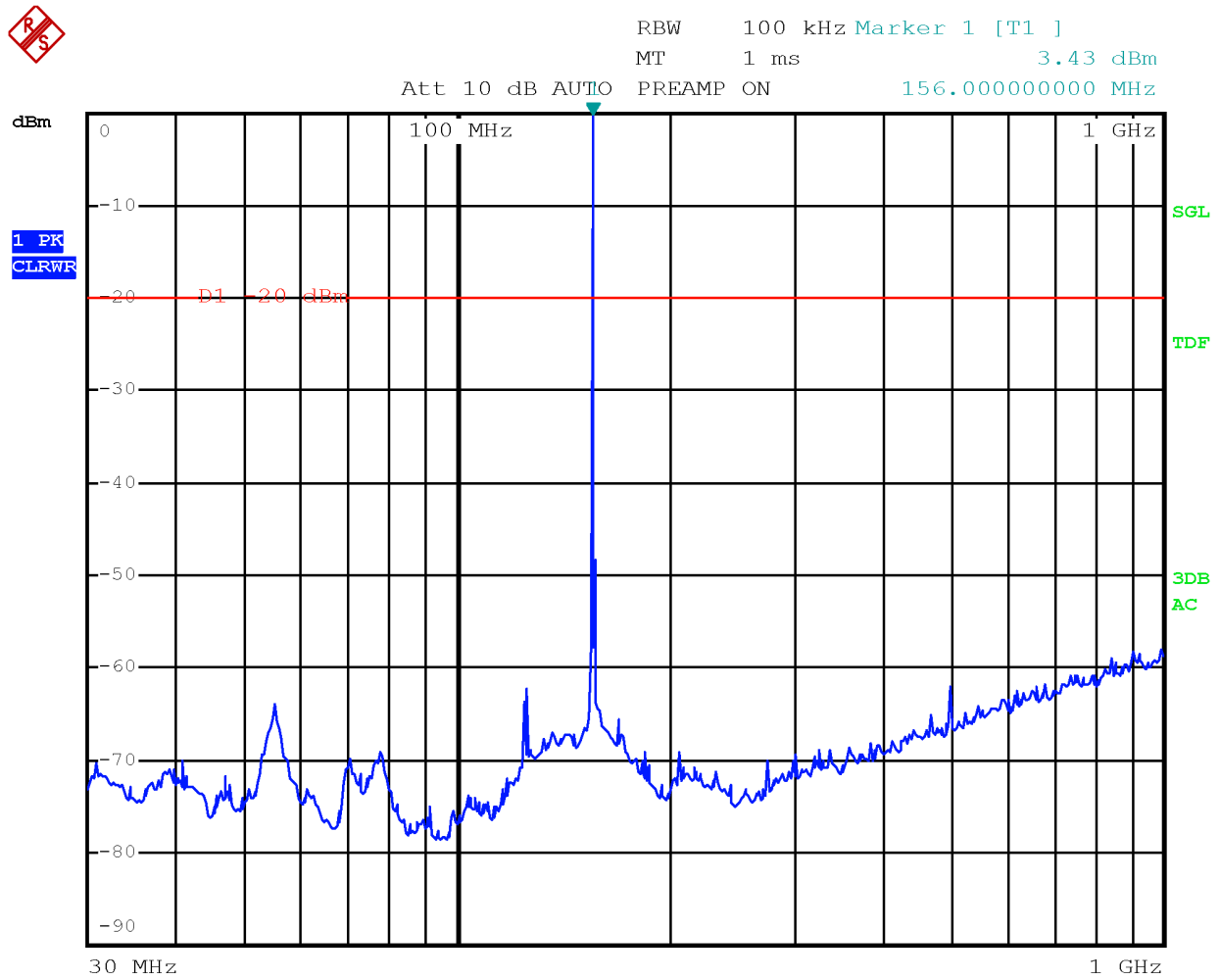
Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 156.0 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

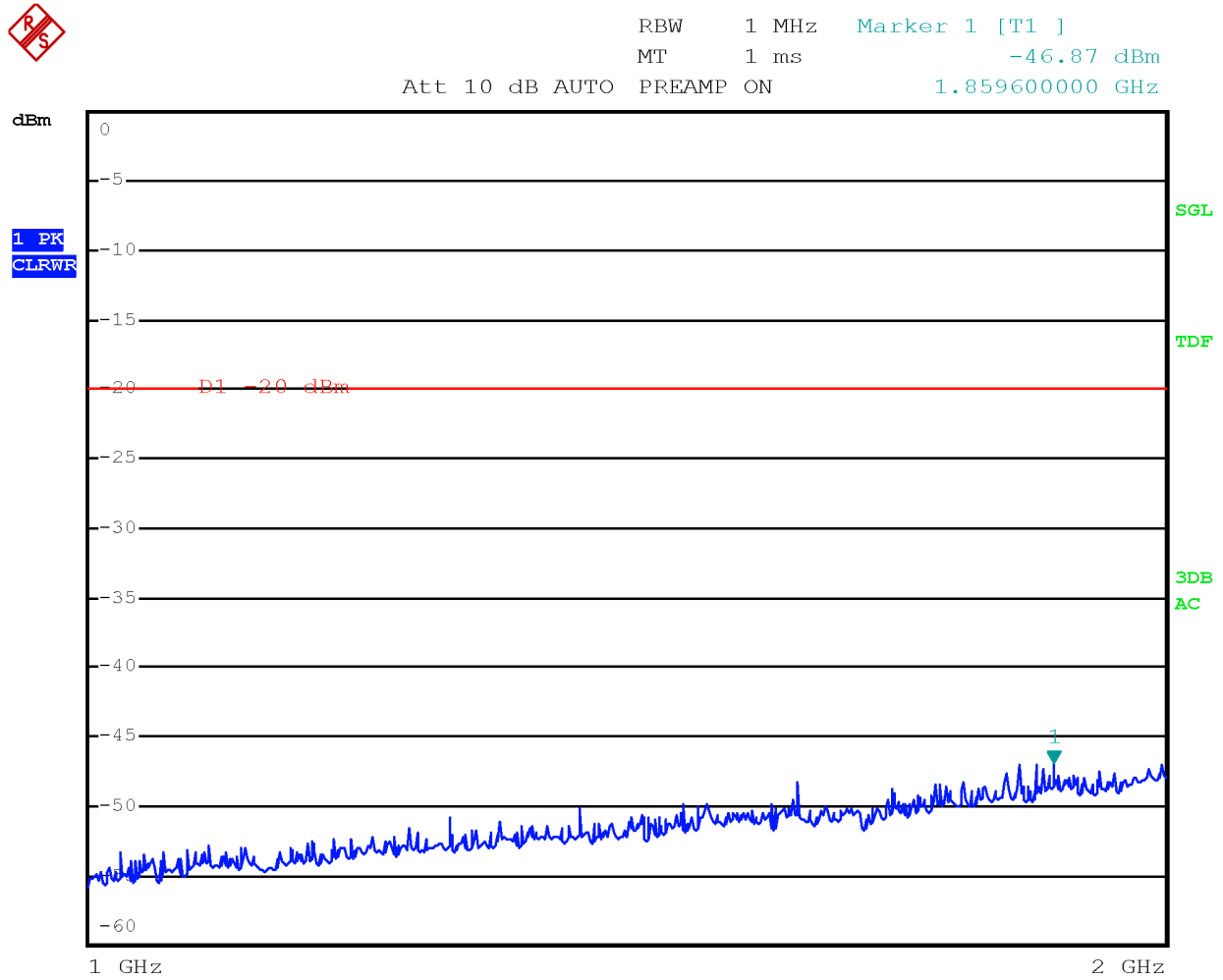
Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 156.0 MHz – Antenna in vertical polarization

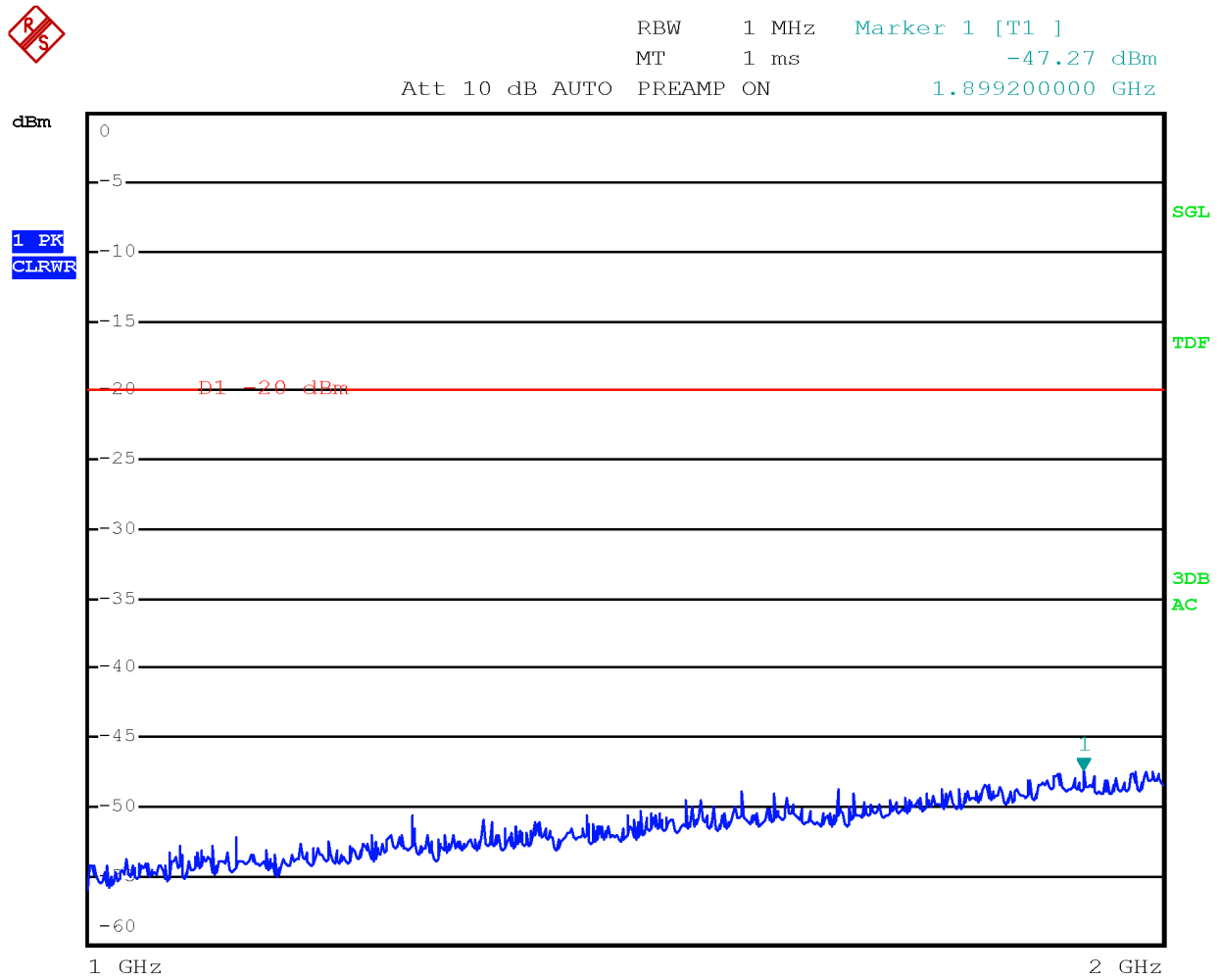
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Test data, continued



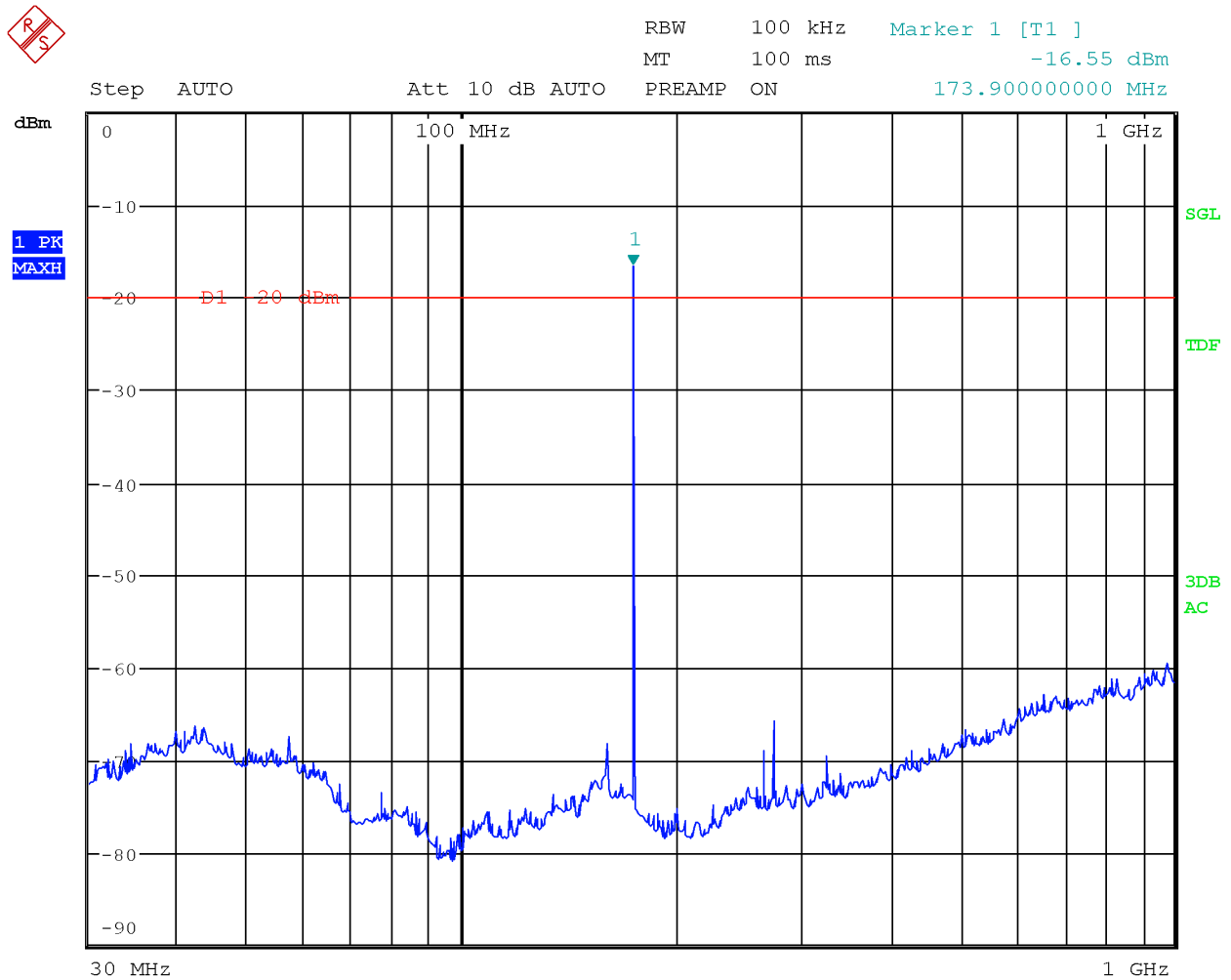
Radiated spurious emissions with modulation FM 25.0 kHz at 156.0 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 156.0 MHz – Antenna in vertical polarization

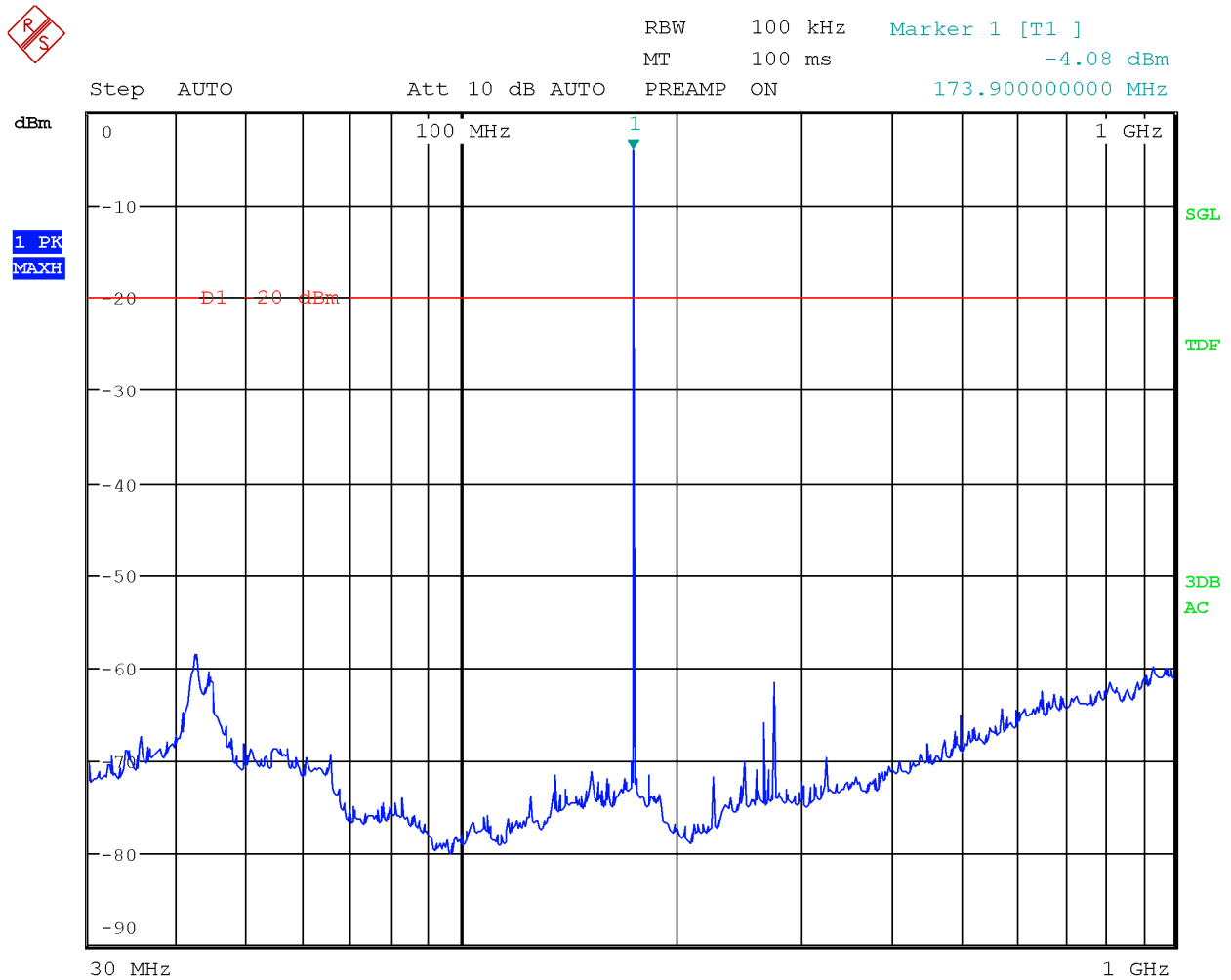
Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 173.9 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

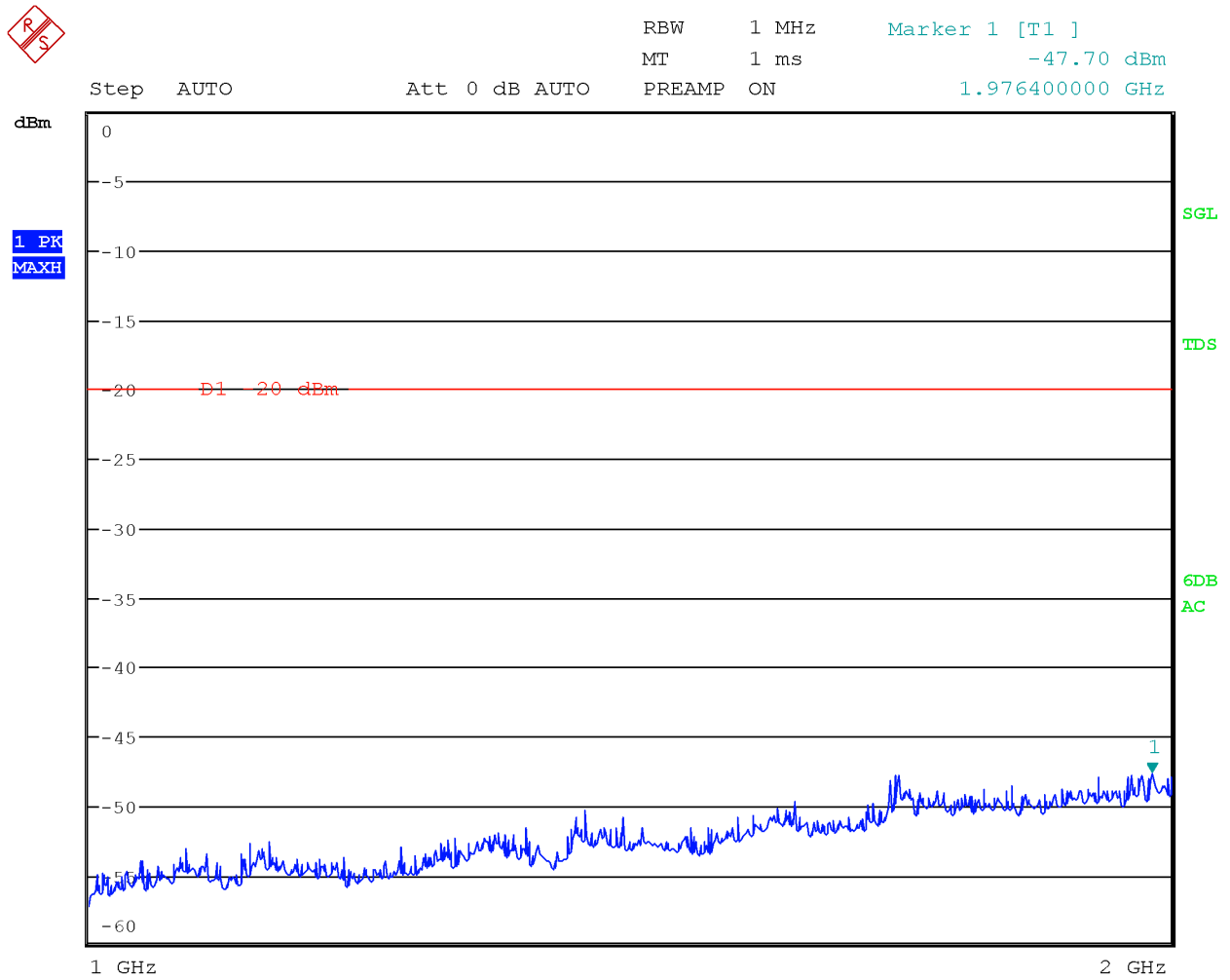
Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 173.9 MHz – Antenna in vertical polarization

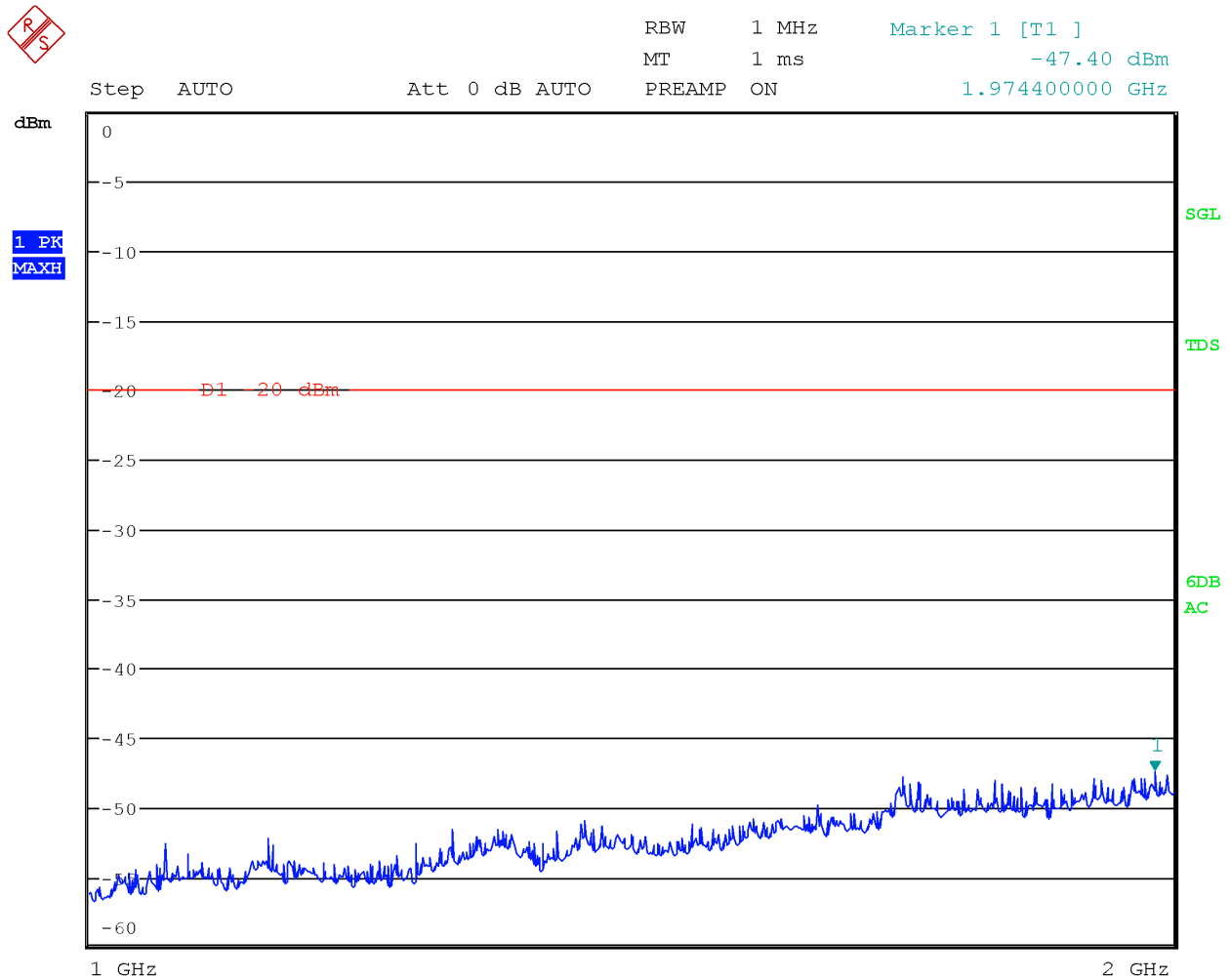
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Test data, continued



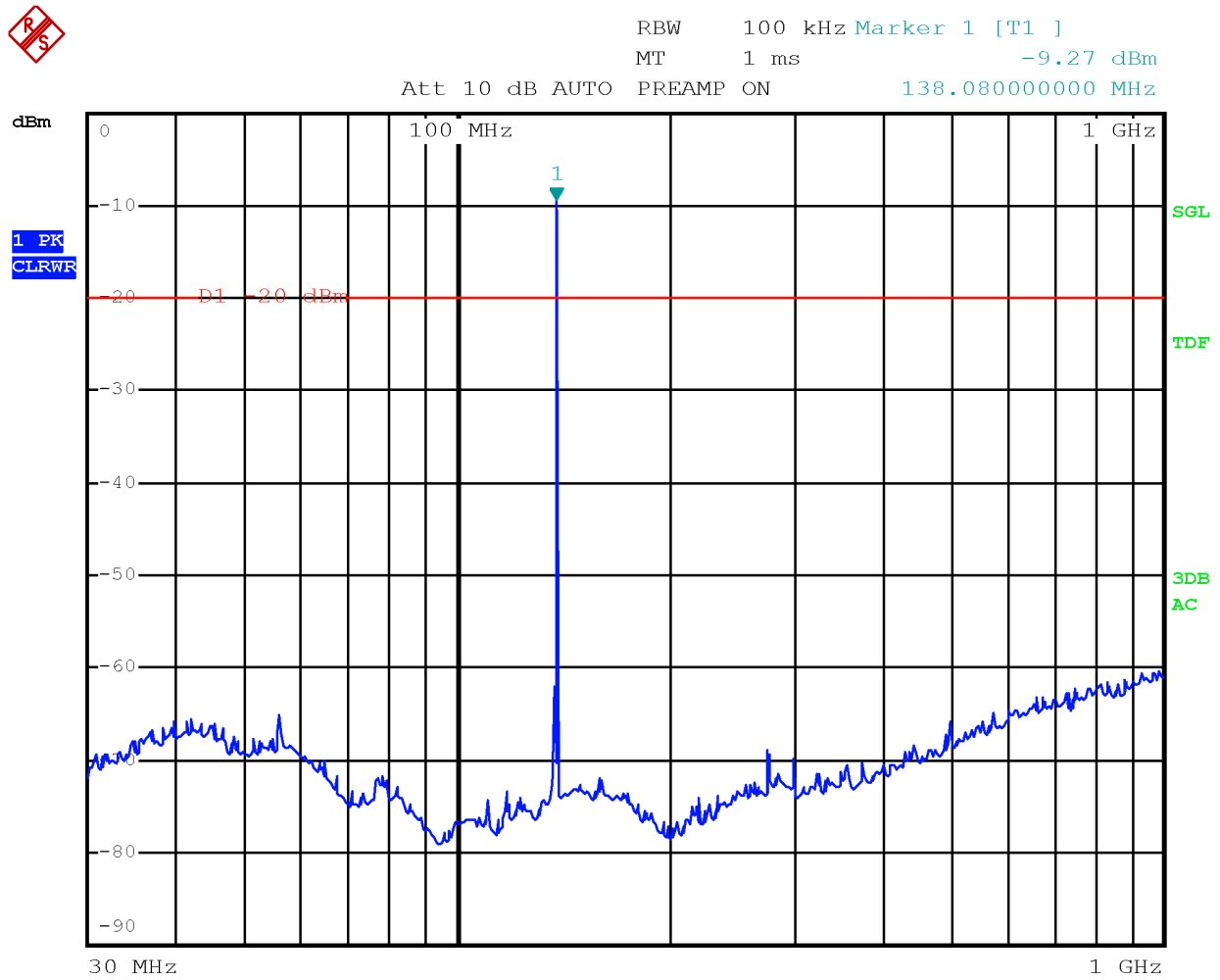
Radiated spurious emissions with modulation FM 25.0 kHz at 173.9 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation FM 25.0 kHz at 173.9 MHz – Antenna in vertical polarization

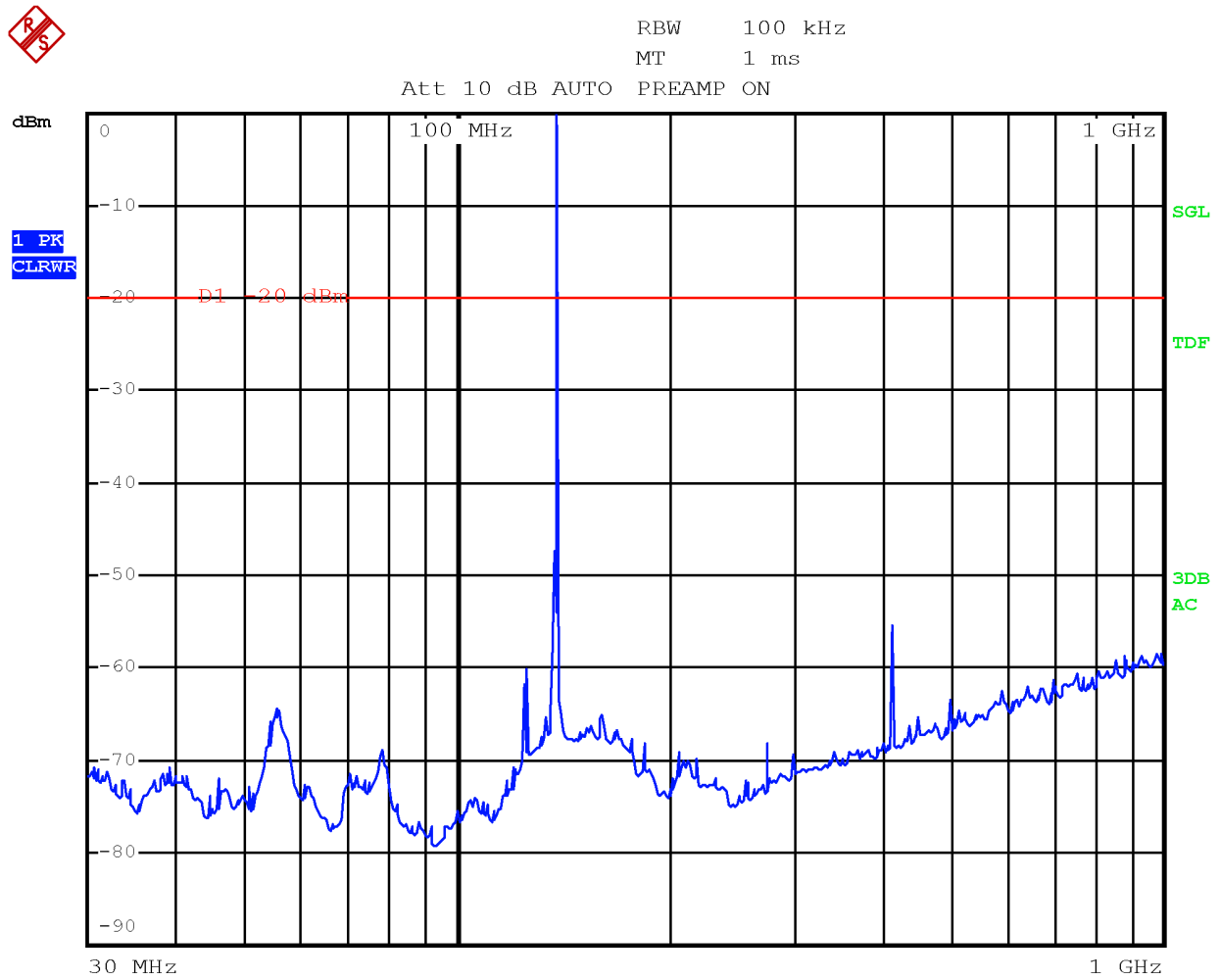
Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 138.1 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

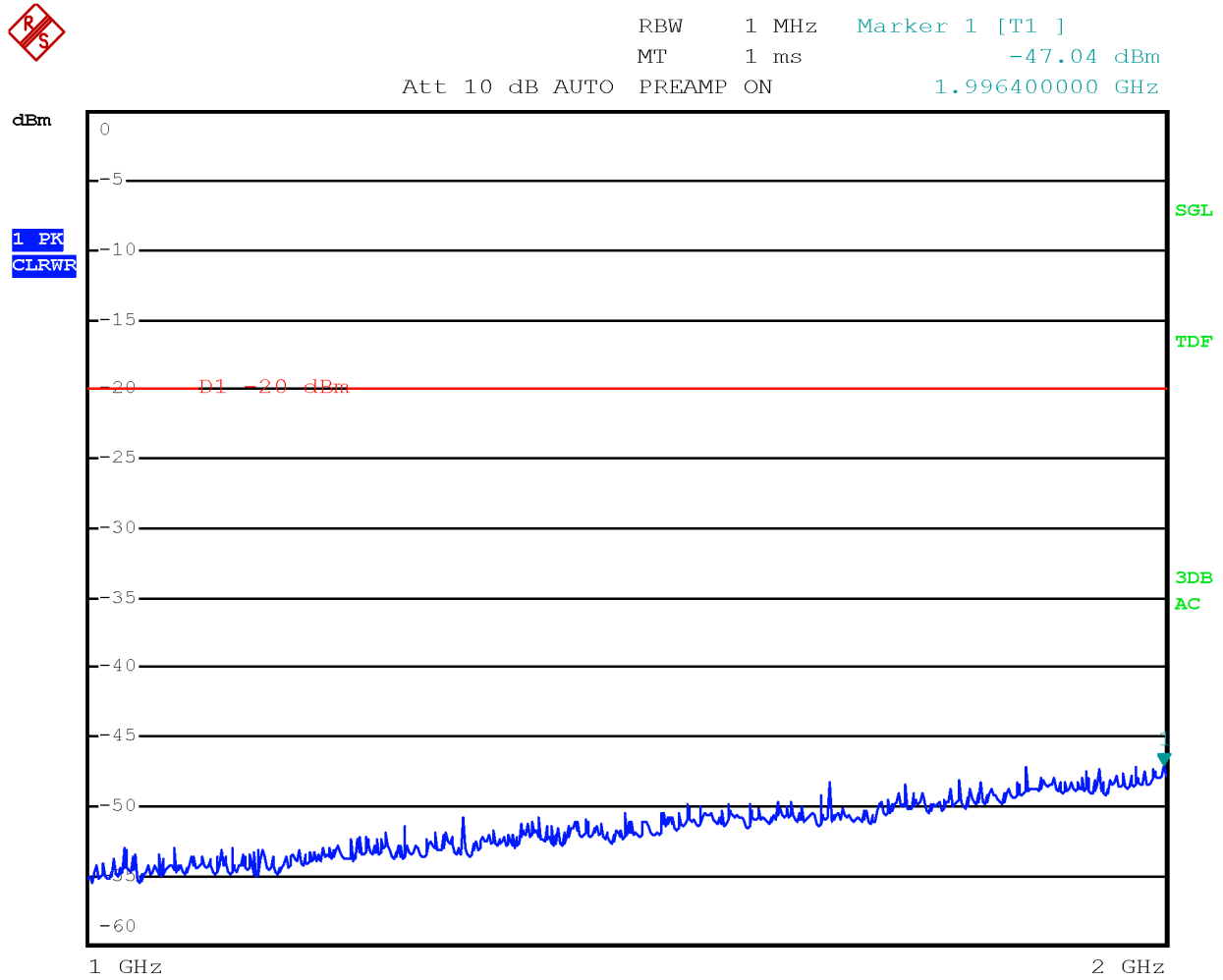
Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 138.1 MHz – Antenna in vertical polarization

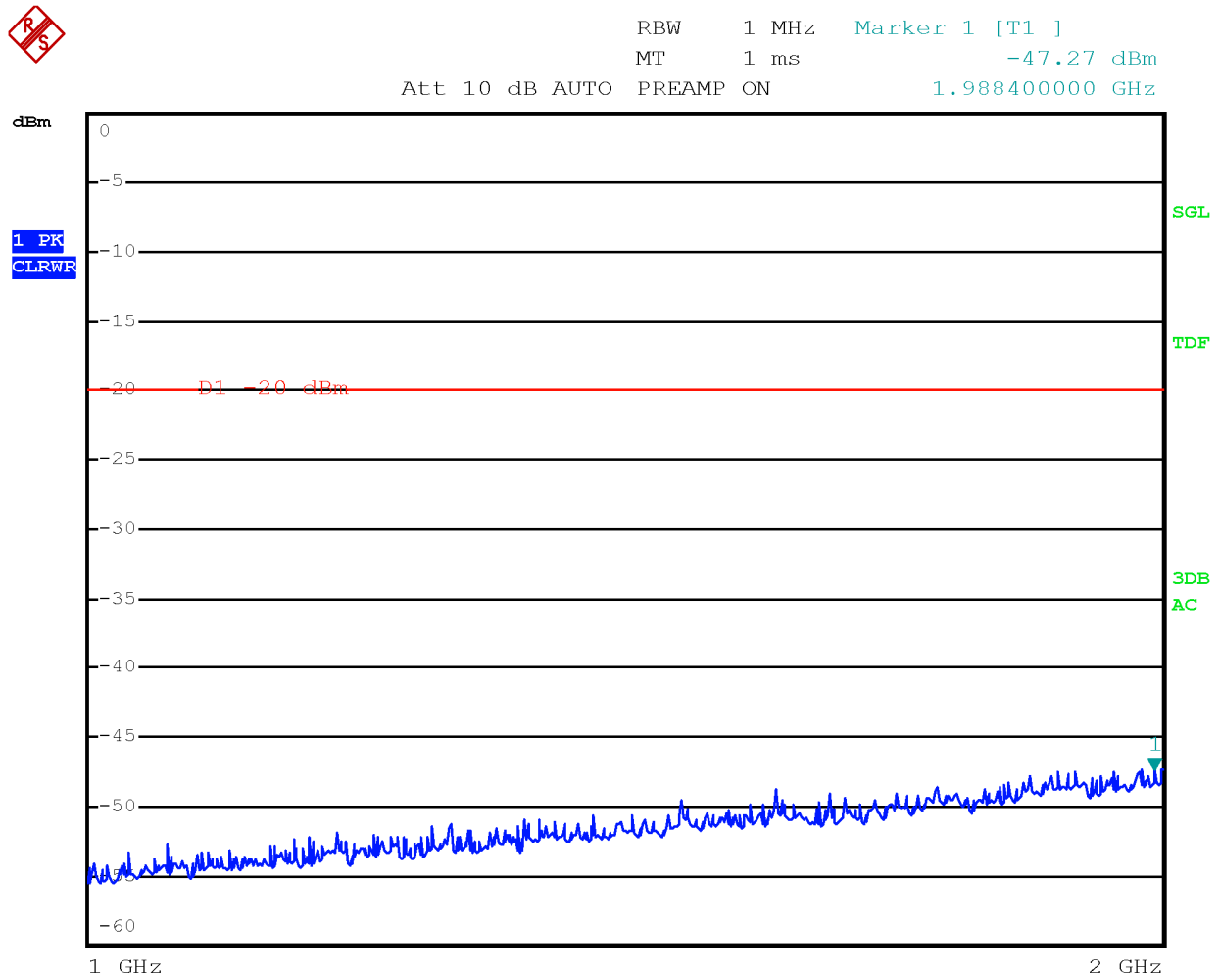
Limit exceeded by the carrier

Test data, continued



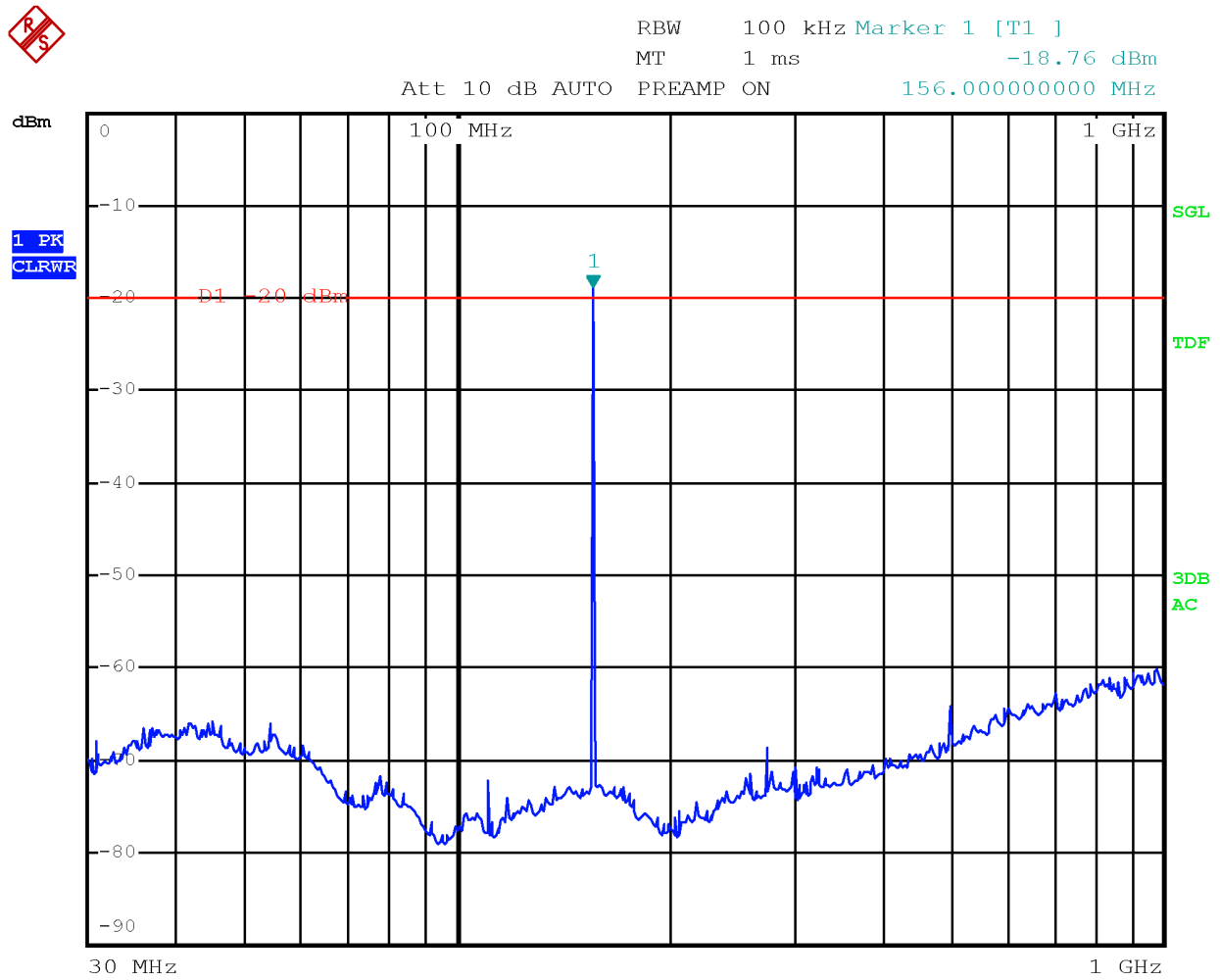
Radiated spurious emissions with modulation CST 4FSK at 138.1 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 138.1 MHz – Antenna in vertical polarization

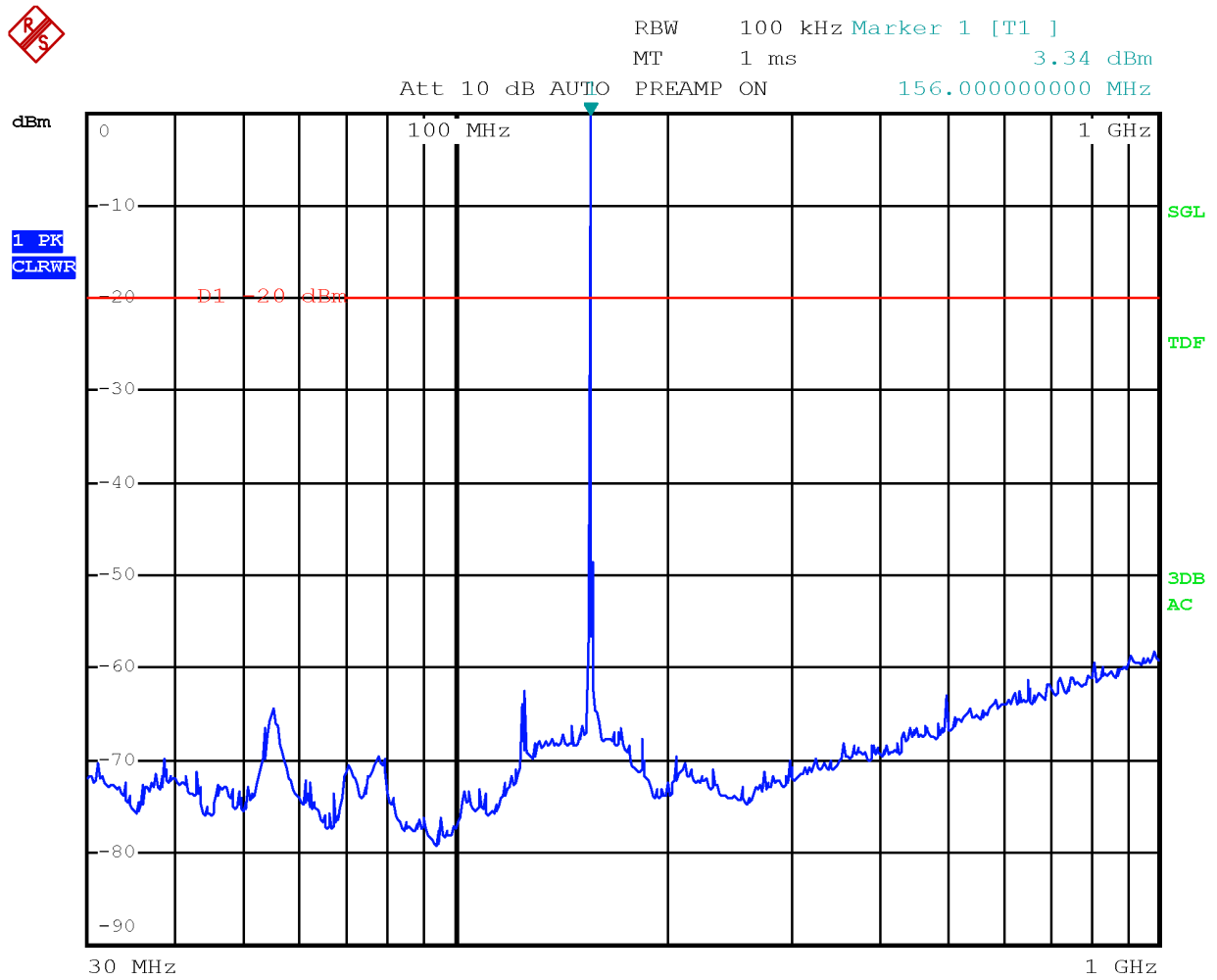
Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 156.0 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 156.0 MHz – Antenna in vertical polarization

Limit exceeded by the carrier

Att 10 dB AUTO PREAMP ON

1.858800000 GHz



Radiated spurious emissions with modulation CST 4FSK at 156.0 MHz – Antenna in horizontal polarization

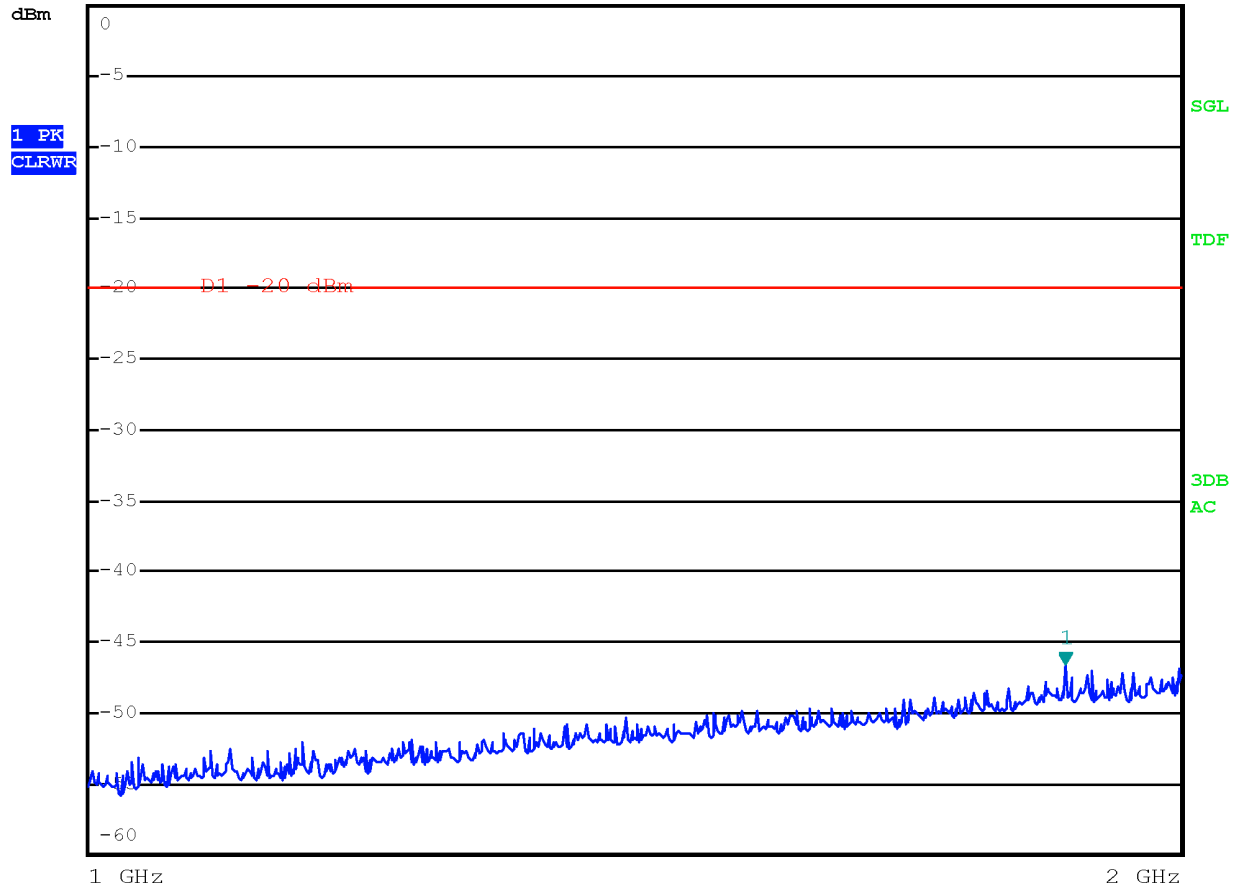
Test data, continued



RBW 1 MHz Marker 1 [T1]

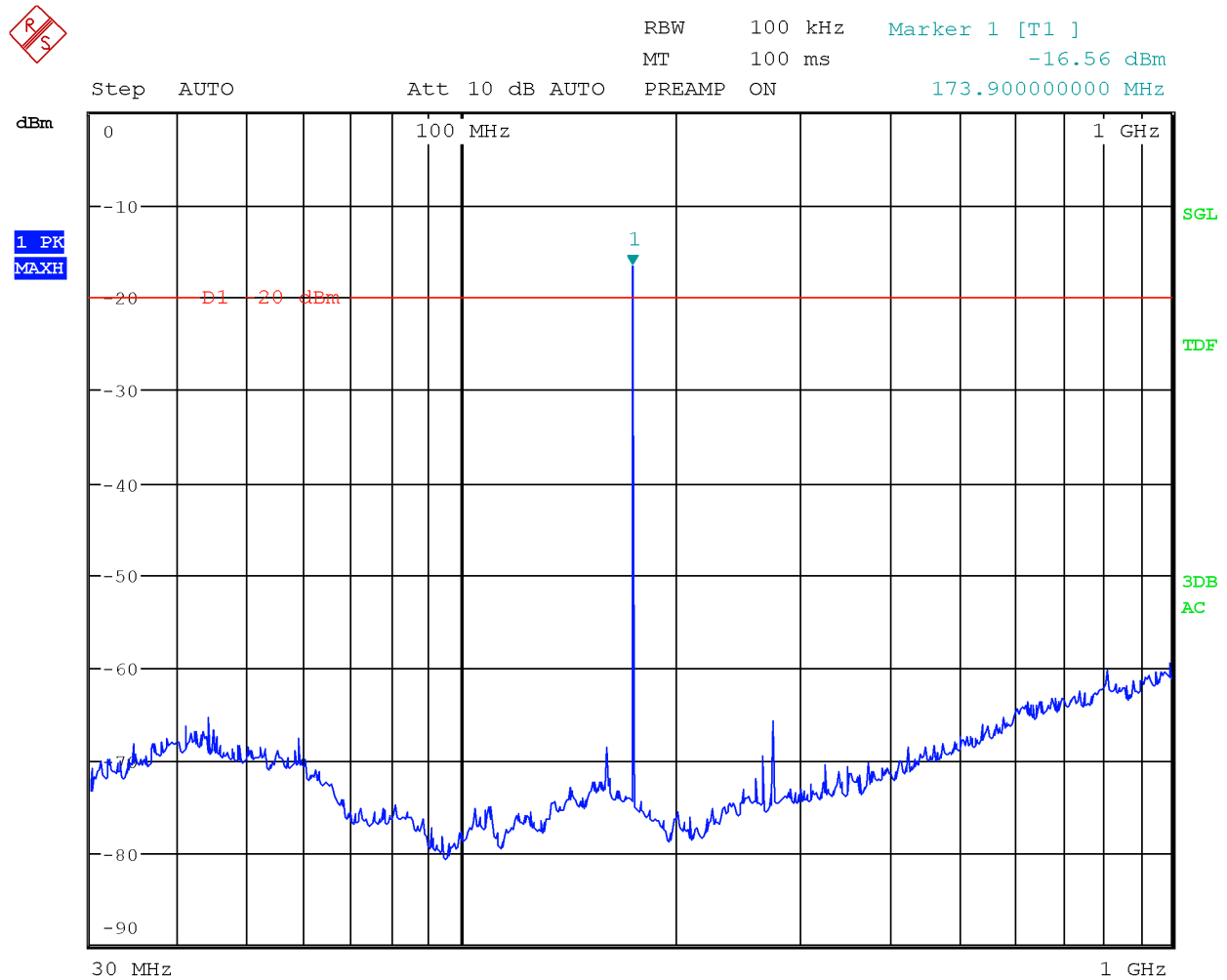
MT 1 ms -46.58 dBm

Att 10 dB AUTO PREAMP ON 1.857600000 GHz



Radiated spurious emissions with modulation CST 4FSK at 156.0 MHz – Antenna in vertical polarization

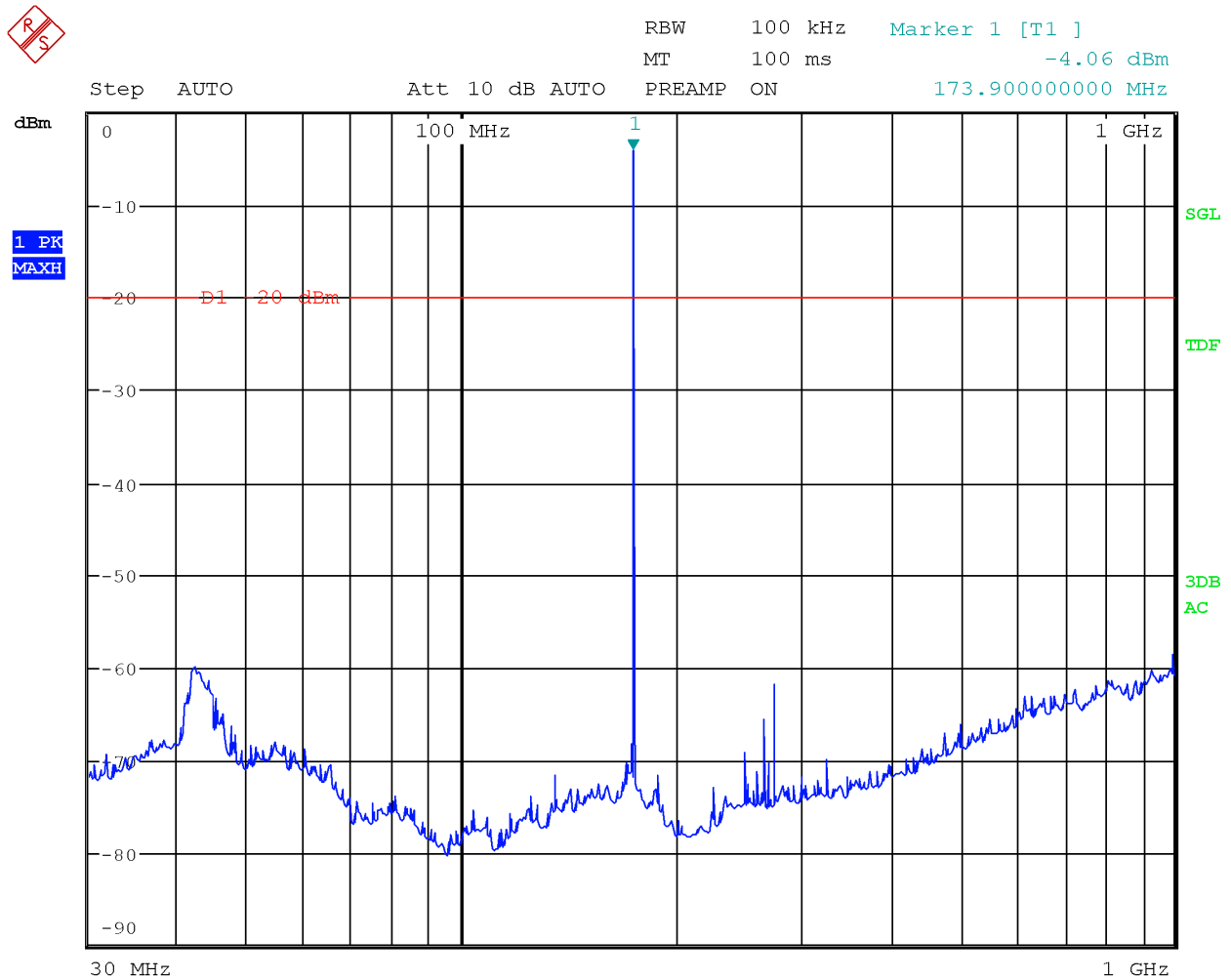
Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 173.9 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

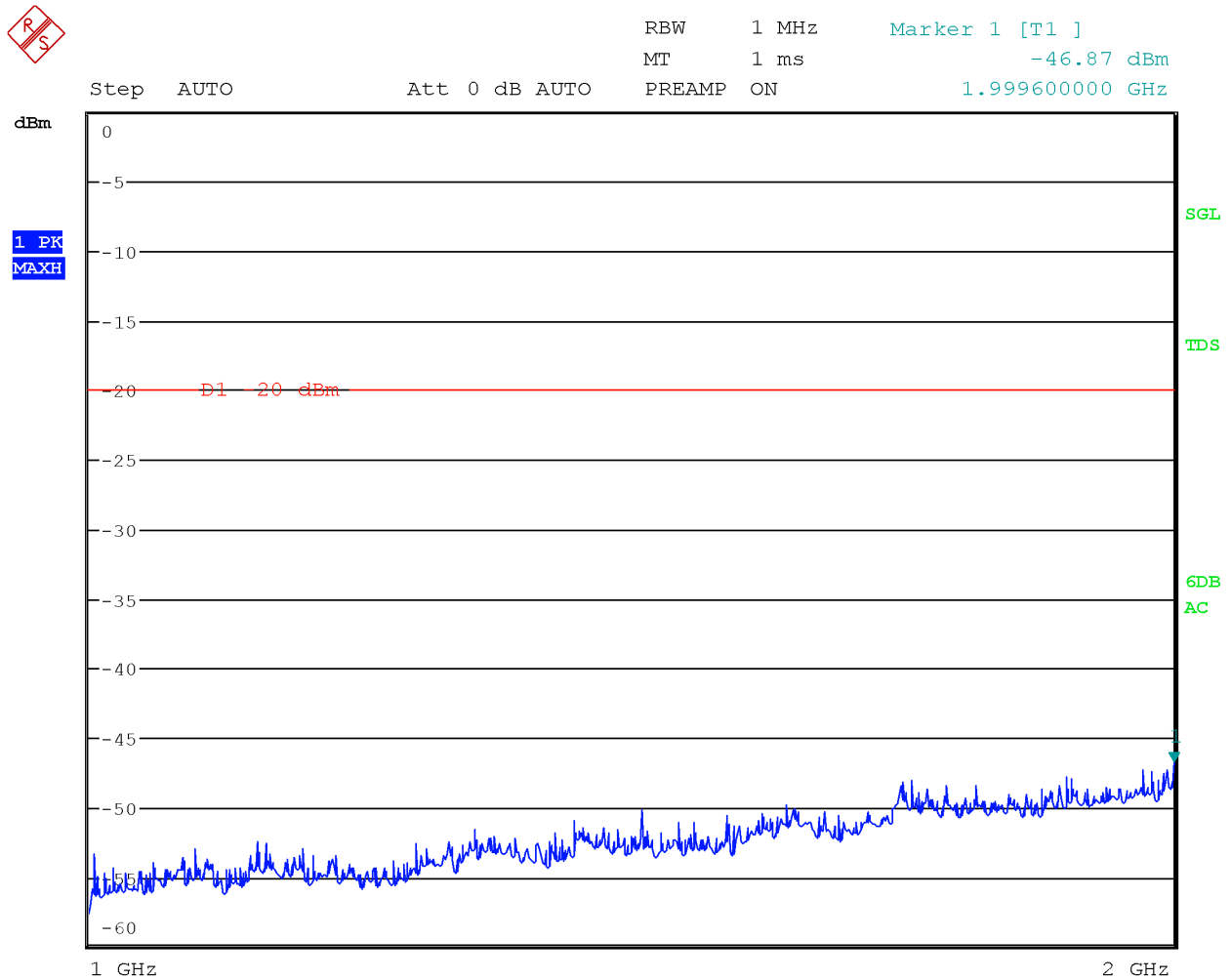
Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 173.9 MHz – Antenna in vertical polarization

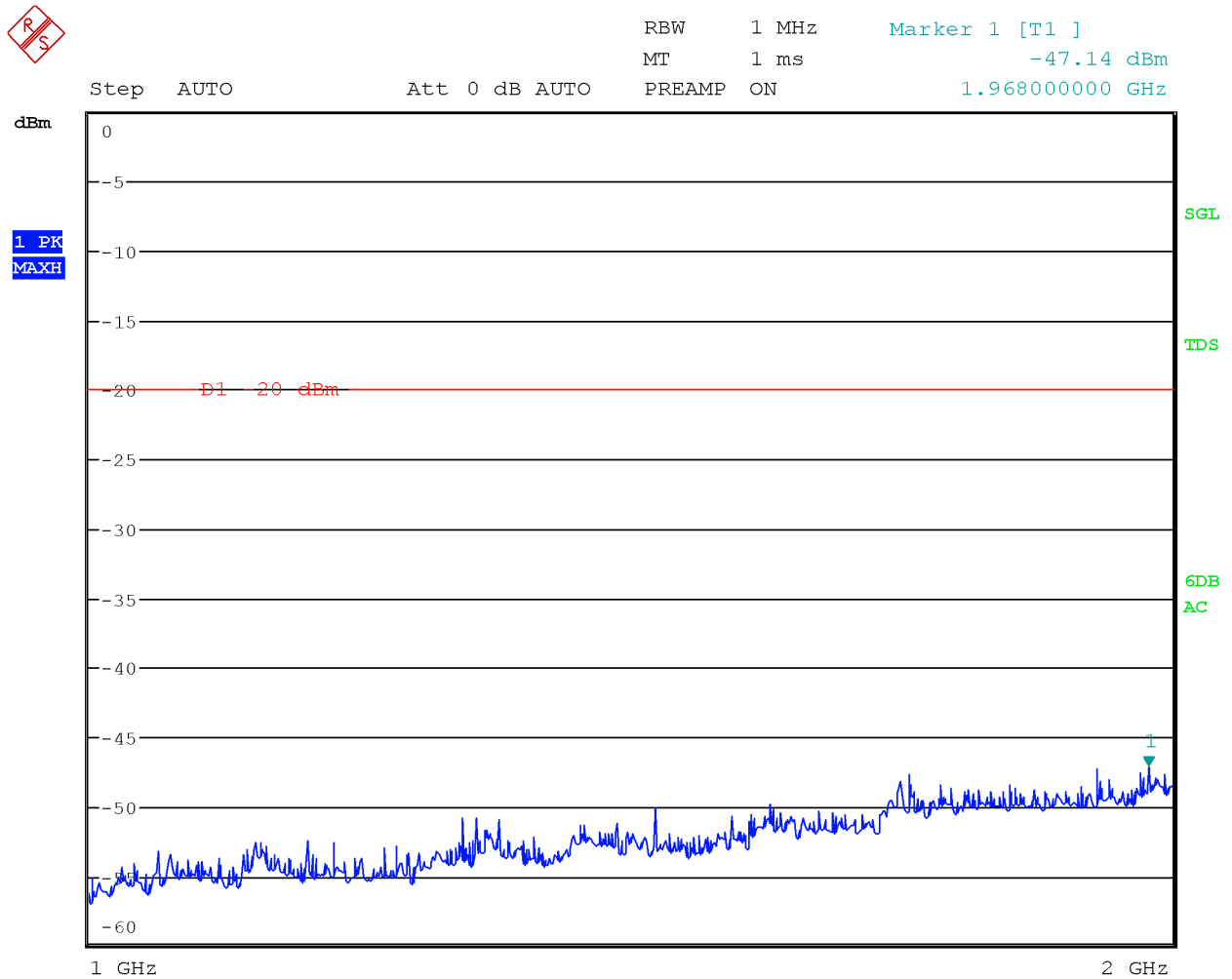
Limit exceeded by the carrier

Test data, continued



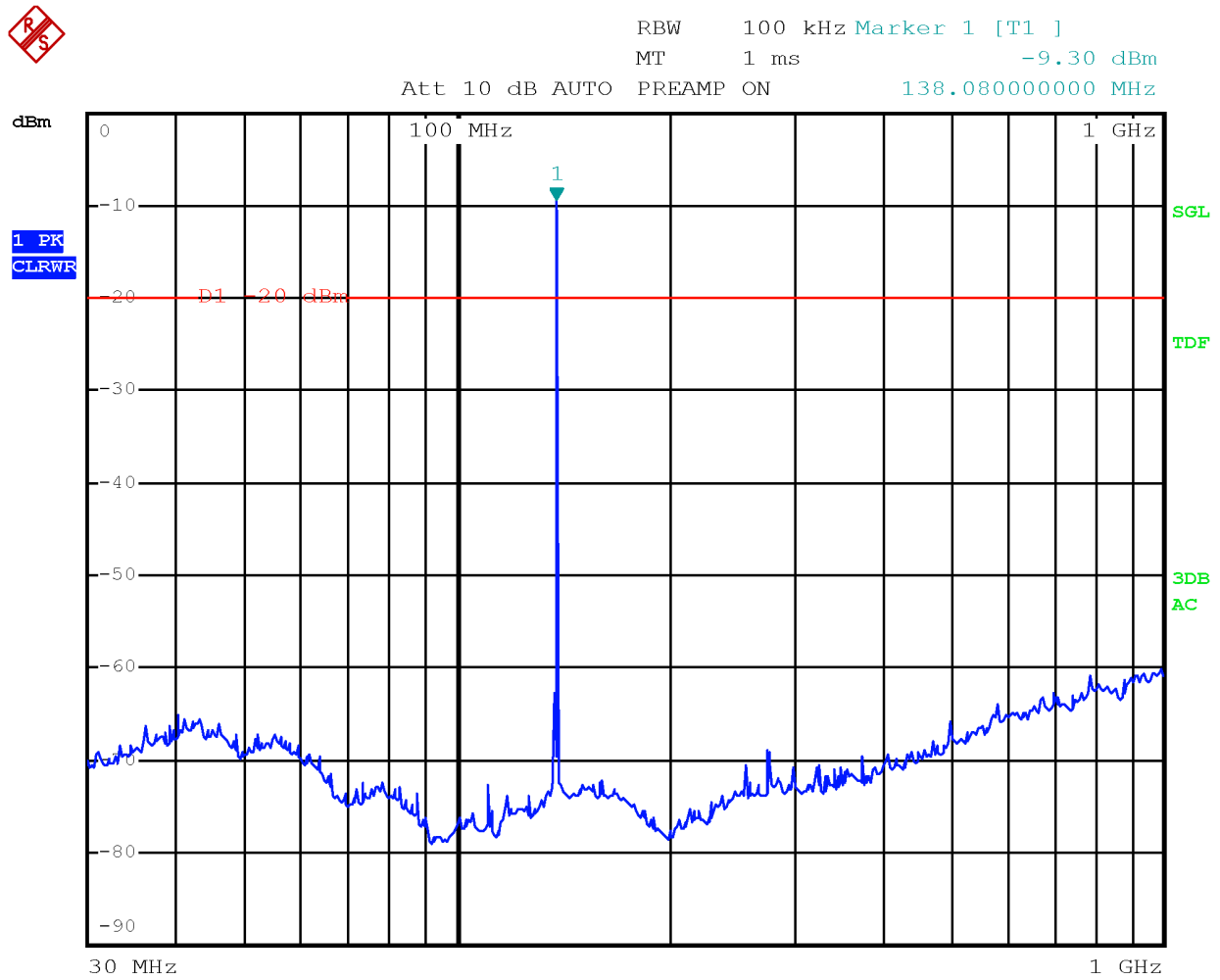
Radiated spurious emissions with modulation CST 4FSK at 173.9 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation CST 4FSK at 173.9 MHz – Antenna in vertical polarization

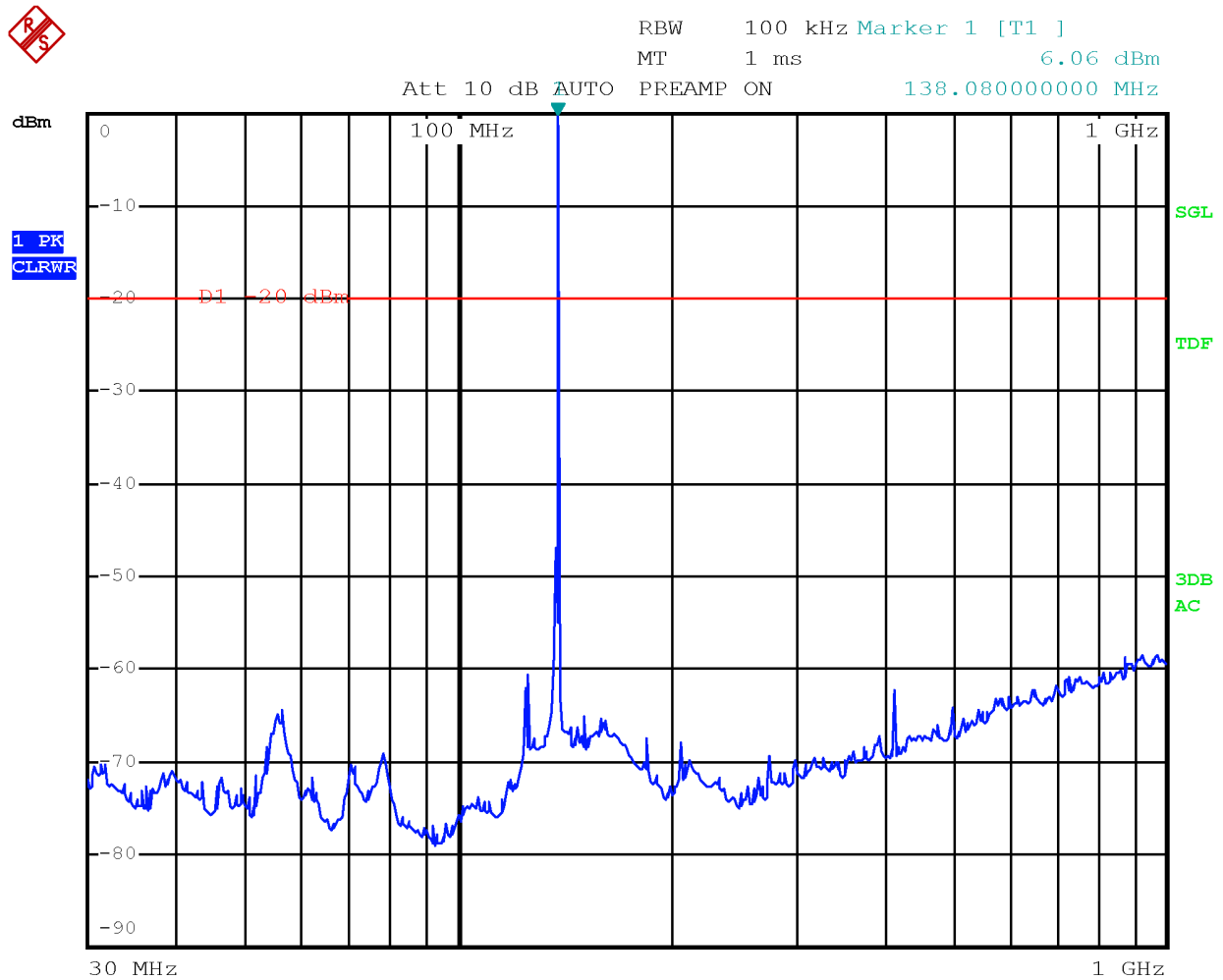
Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 138.1 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

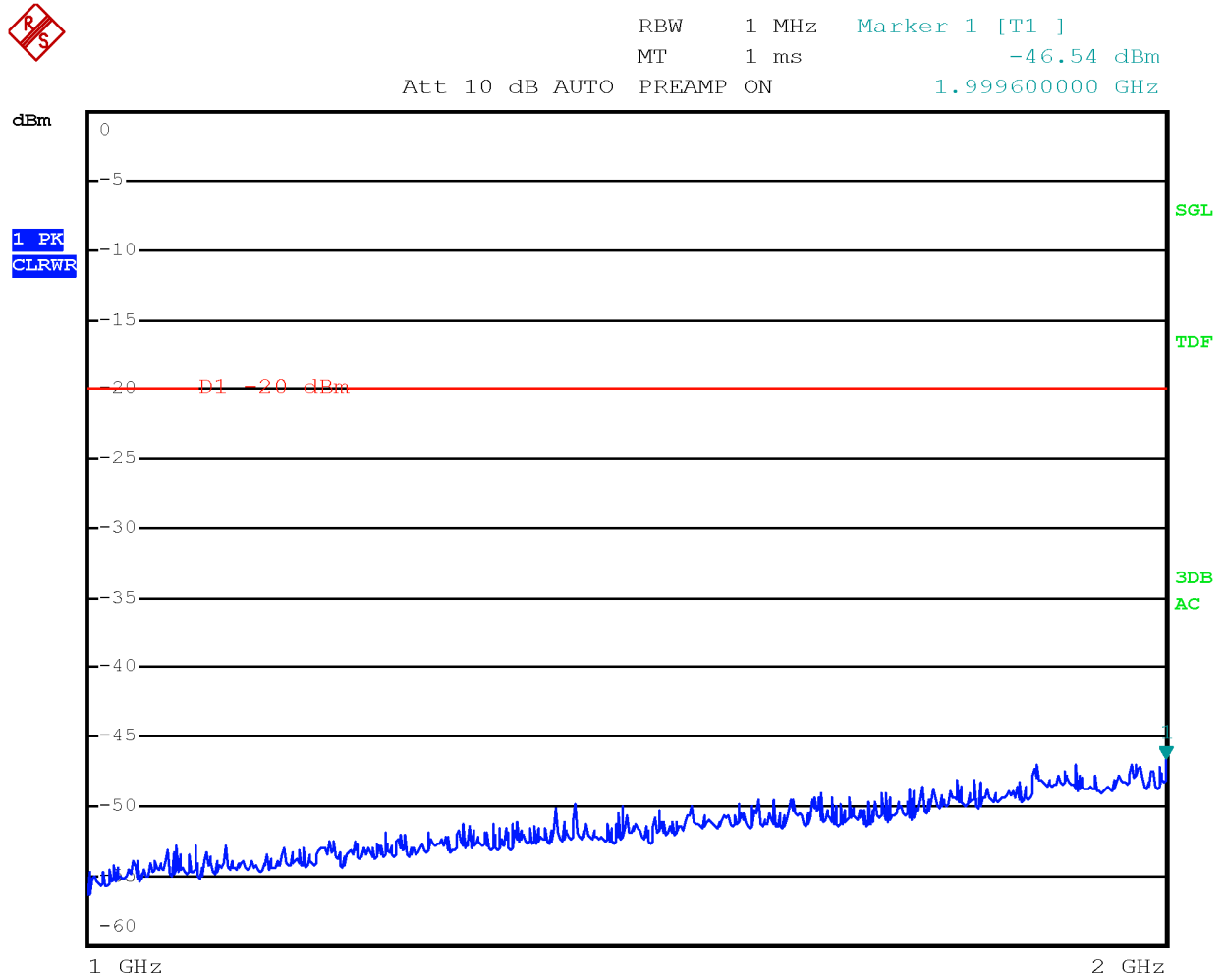
Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 138.1 MHz – Antenna in vertical polarization

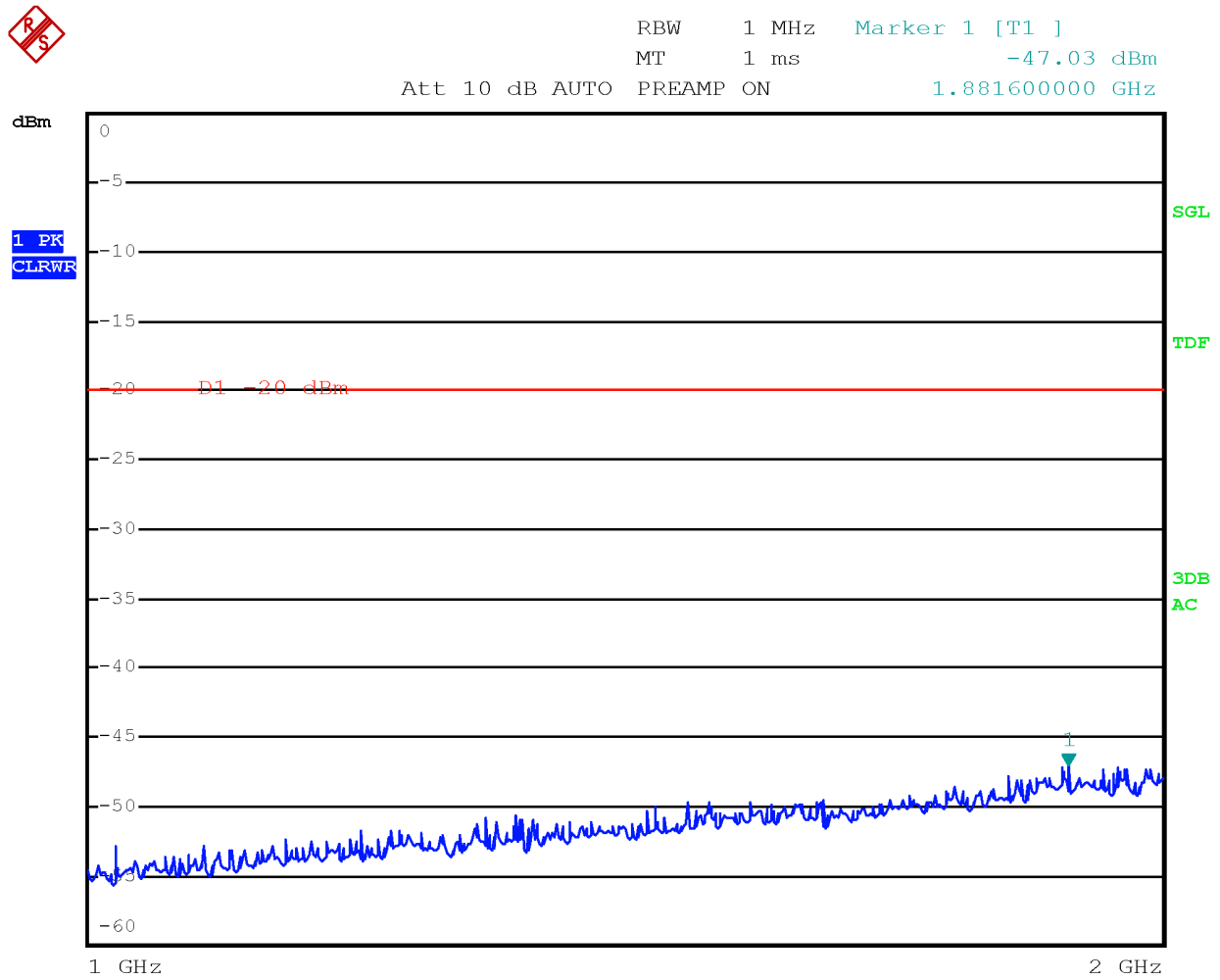
Limit exceeded by the carrier

Test data, continued



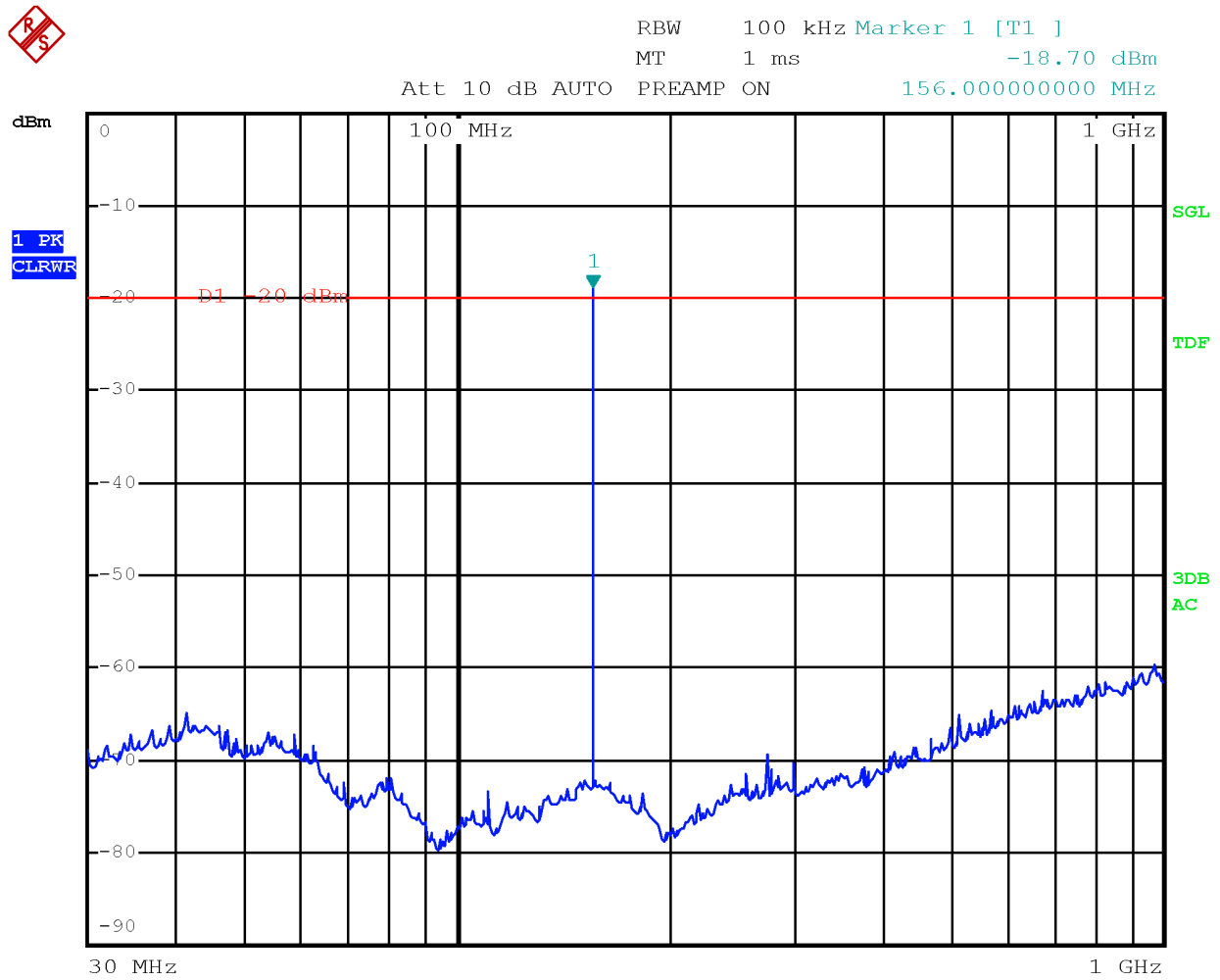
Radiated spurious emissions with modulation P25 C4FM at 138.1 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 138.1 MHz – Antenna in vertical polarization

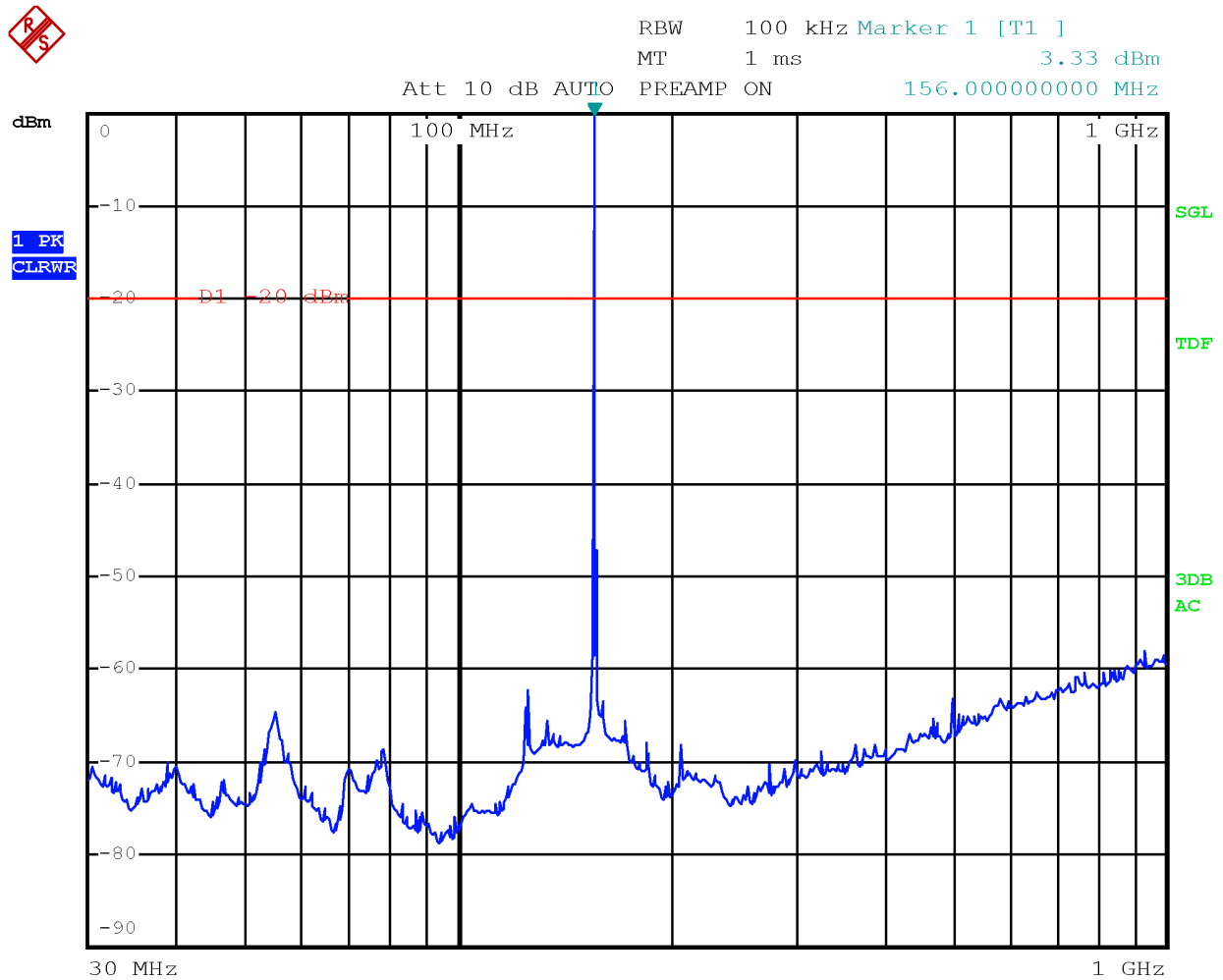
Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 156.0 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

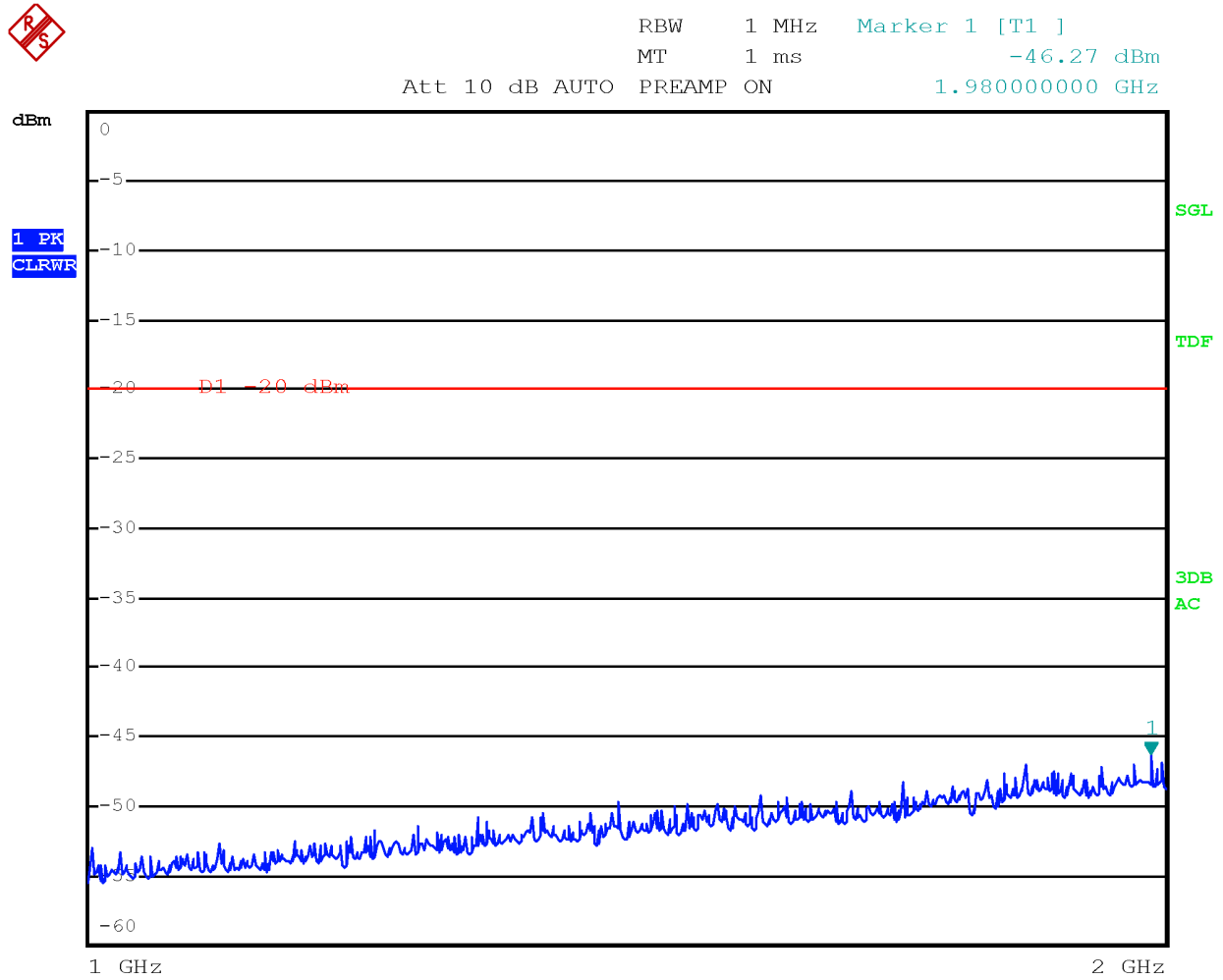
Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 156.0 MHz – Antenna in vertical polarization

Limit exceeded by the carrier

Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 156.0 MHz – Antenna in horizontal polarization

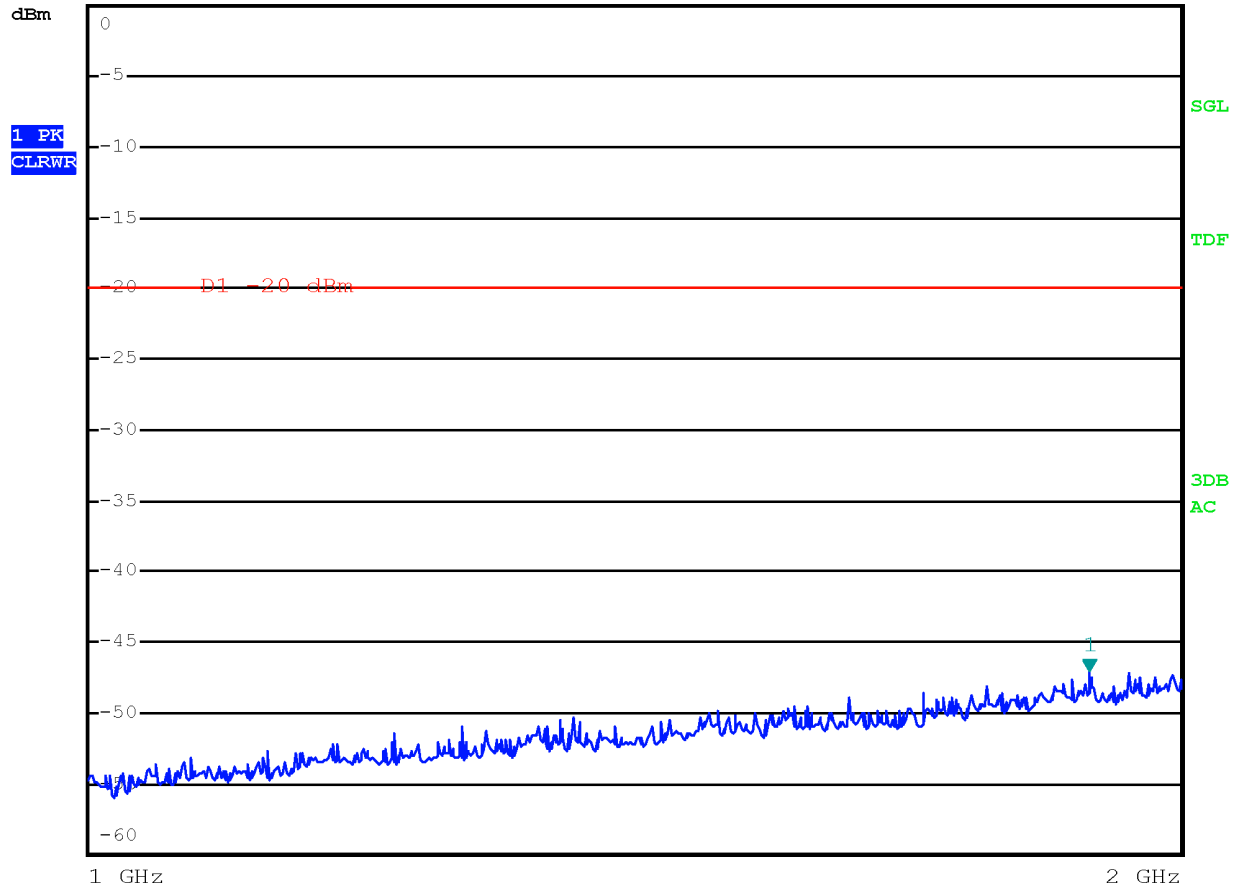
Test data, continued



RBW 1 MHz Marker 1 [T1]

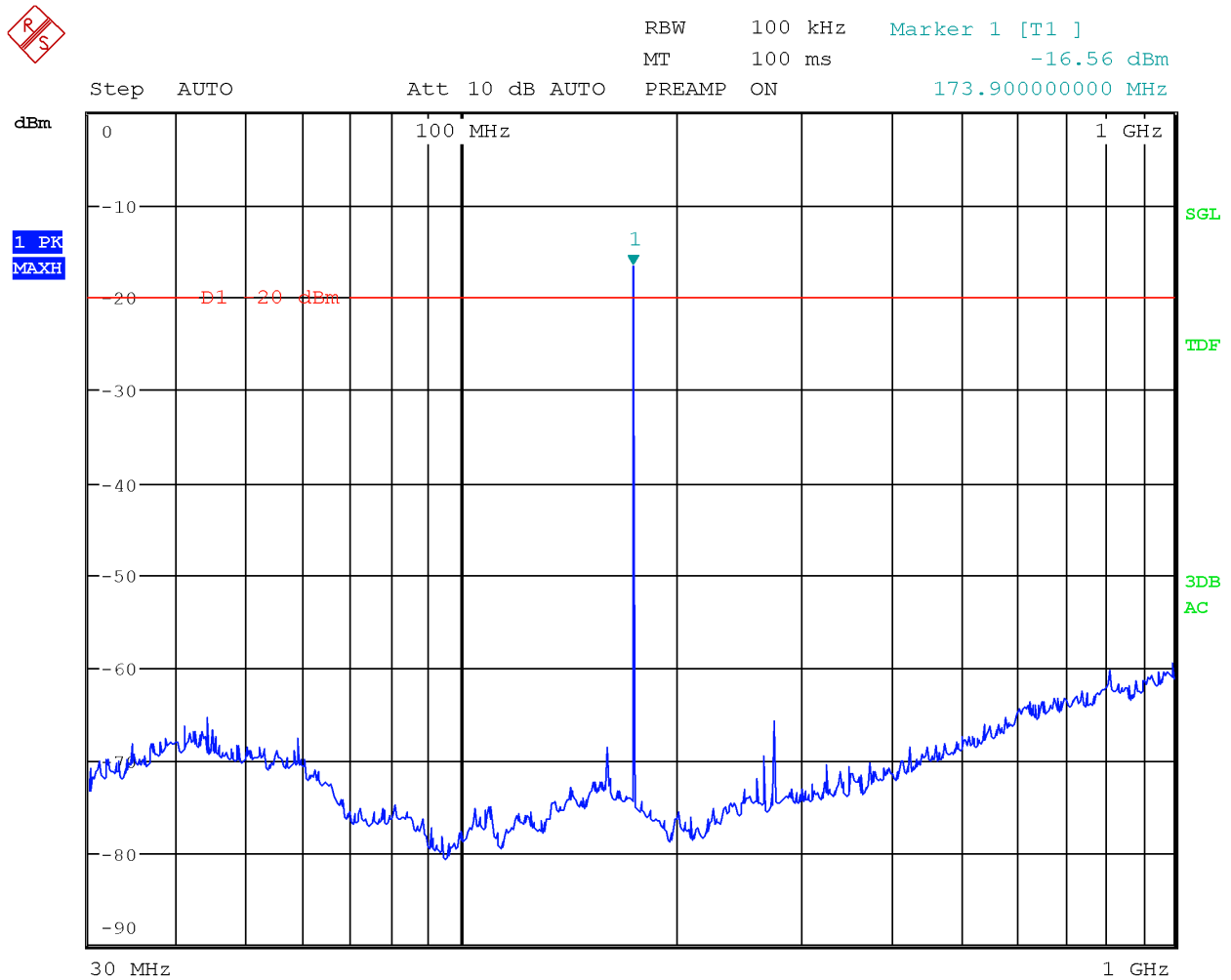
MT 1 ms -47.03 dBm

Att 10 dB AUTO PREAMP ON 1.885200000 GHz



Radiated spurious emissions with modulation P25 C4FM at 156.0 MHz – Antenna in vertical polarization

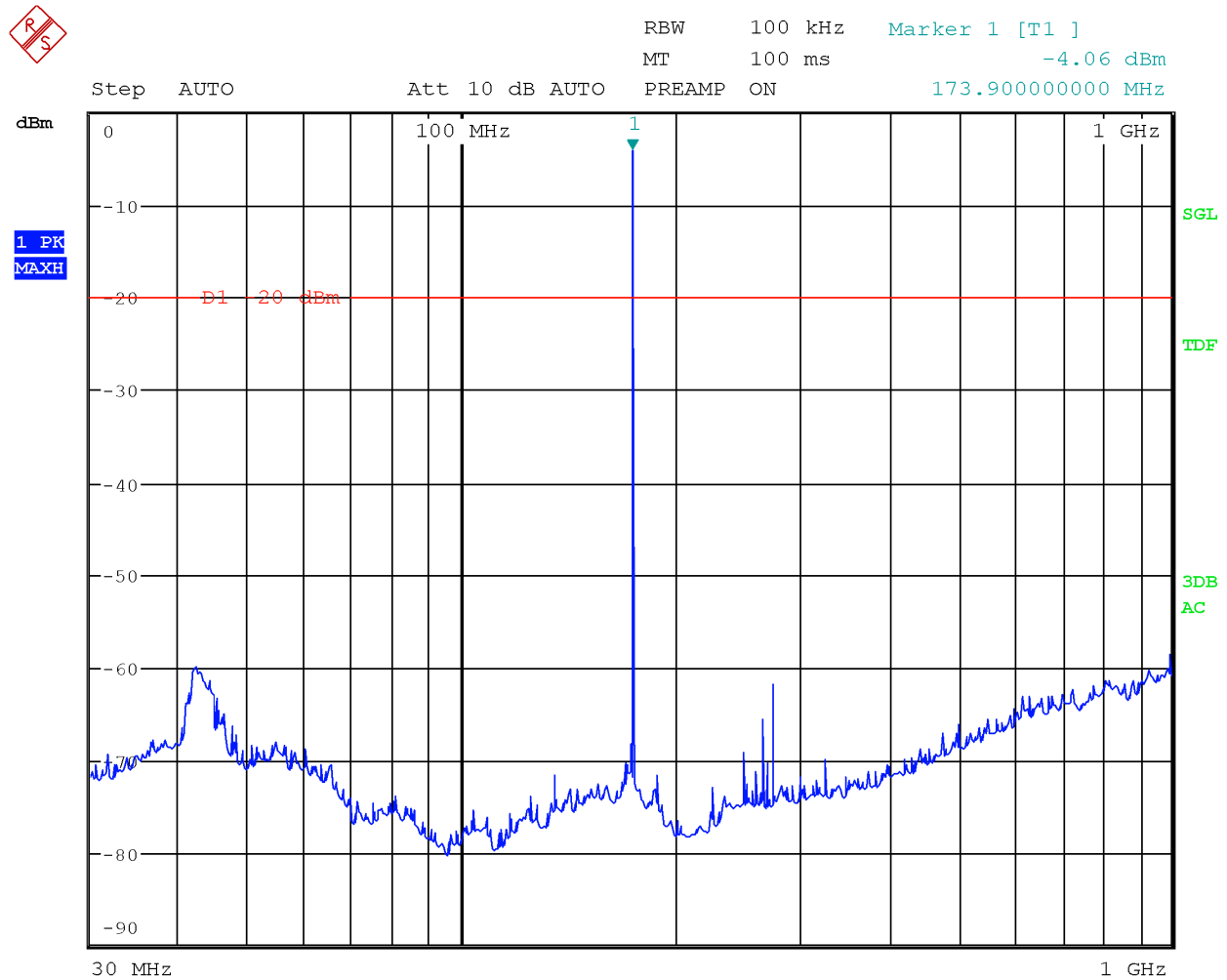
Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 173.9 MHz – Antenna in horizontal polarization

Limit exceeded by the carrier

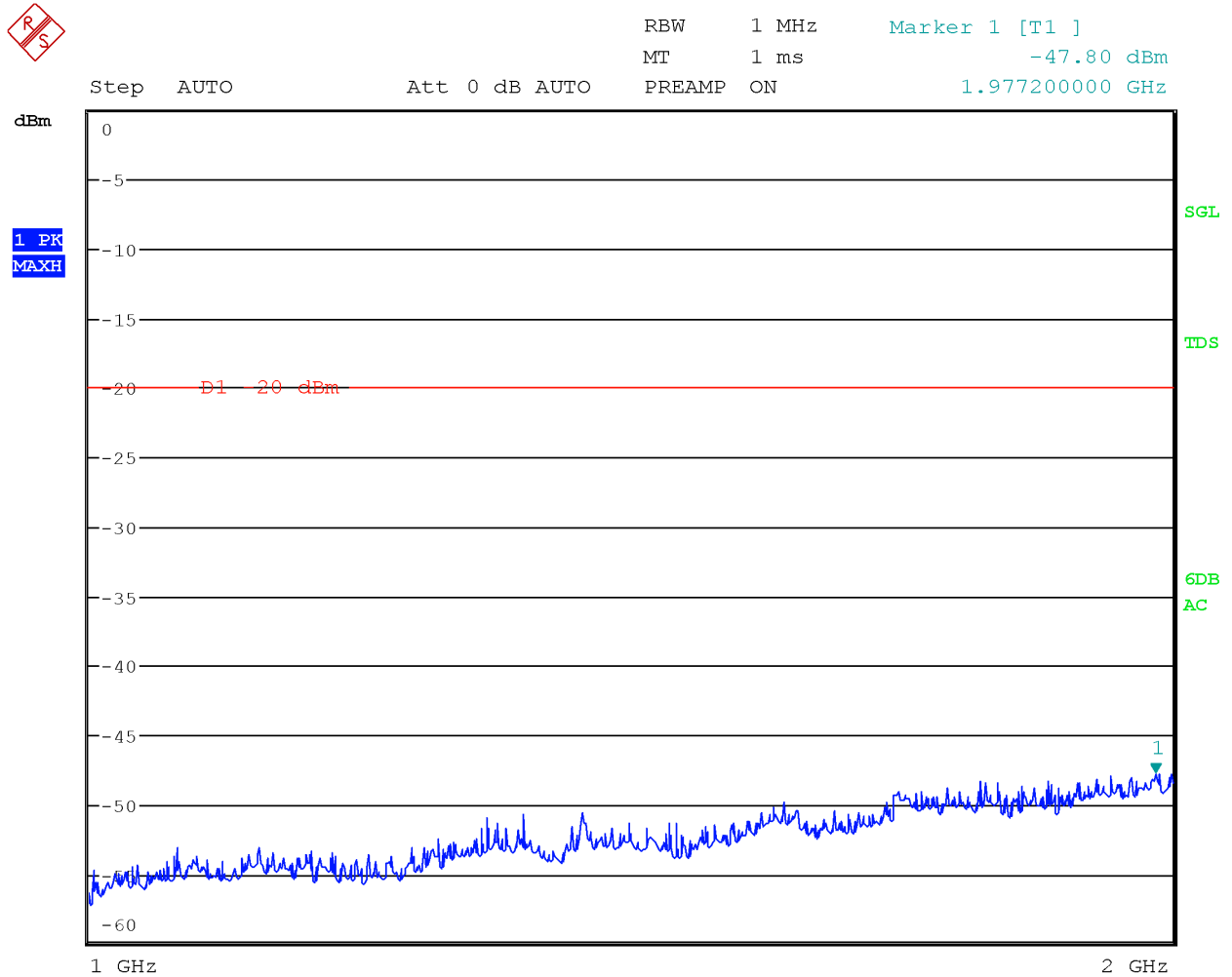
Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 173.9 MHz – Antenna in vertical polarization

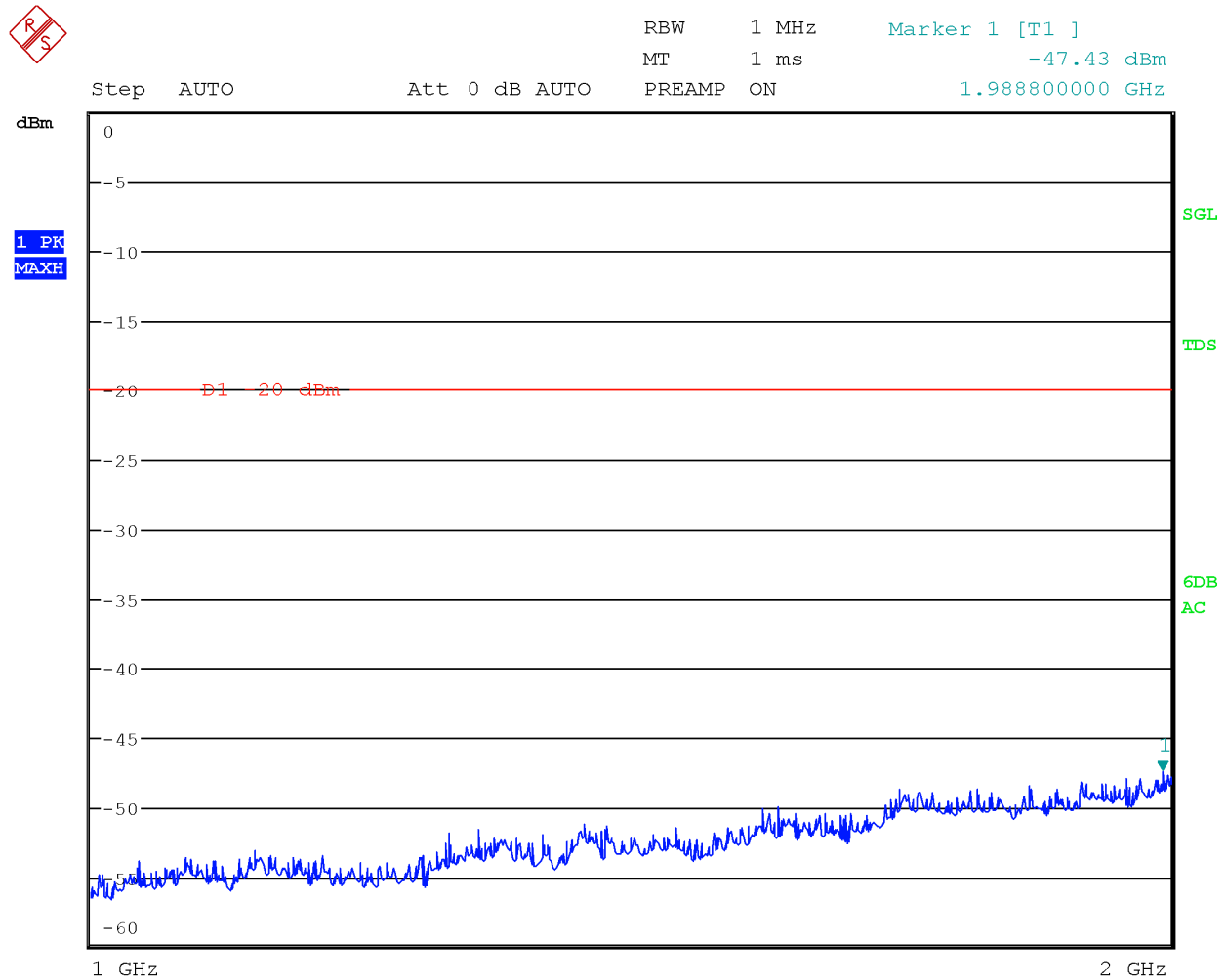
Limit exceeded by the carrier

Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 173.9 MHz – Antenna in horizontal polarization

Test data, continued



Radiated spurious emissions with modulation P25 C4FM at 173.9 MHz – Antenna in vertical polarization

7.6 Transient frequency behavior

7.6.1 References, definitions and limits

FCC §90.214:

Transmitters designed to operate in the 150-174 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

Table 7.6-1: Transient frequency behavior

Time intervals ^{1,2}	Maximum frequency difference ³	Transient duration limit
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels		
t ₁ ⁴	±25.0 kHz	10.0 ms
t ₂	±12.5 kHz	25.0 ms
t ₃ ⁴	±25.0 kHz	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels		
t ₁ ⁴	±12.5 kHz	10.0 ms
t ₂	±6.25 kHz	25.0 ms
t ₃ ⁴	±12.5 kHz	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels		
t ₁ ⁴	±6.25 kHz	10.0 ms
t ₂	±3.125 kHz	25.0 ms
t ₃ ⁴	±6.25 kHz	10.0 ms

Notes: ¹t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t₁ is the time period immediately following t_{on}.

t₂ is the time period immediately following t₁.

t₃ is the time period from the instant when the transmitter is turned off until t_{off}.

t_{off} is the instant when the 1 kHz test signal starts to rise.

²During the time from the end of t₂ to the beginning of t₃, the frequency difference must not exceed the limits specified in §90.213.

³Difference between the actual transmitter frequency and the assigned transmitter frequency.

⁴If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

7.6.2 Test summary

Verdict	Pass		
Tested by	P. Barbieri	Test date	September 14, 2023

7.6.3 Observations, settings and special notes

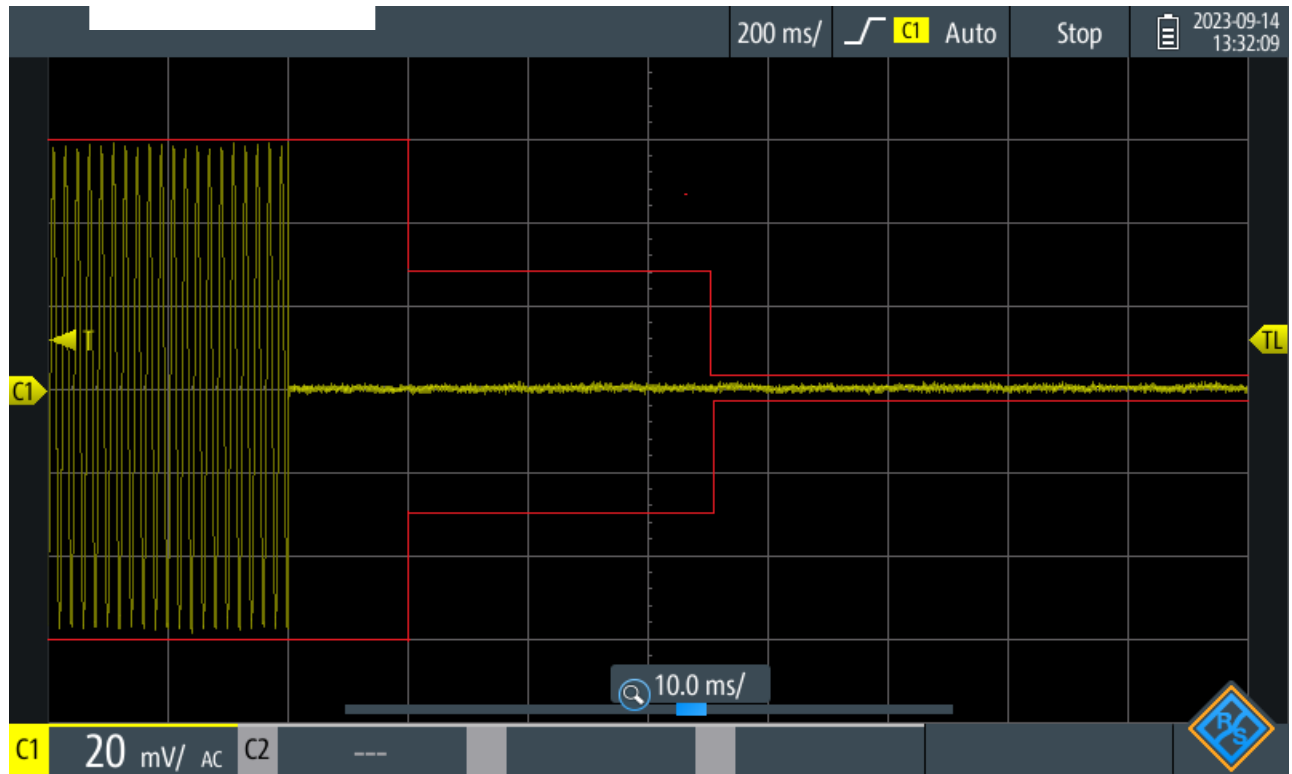
None

7.6.4 Test equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767	2023-01	2024-01
Shielded room	Siemens	10m control room	1947	NCR	NCR
Radio communication tester	Rohde & Schwarz	CMT	883 152/001	2021-01	2024-01
Oscilloscope	Rohde & Schwarz	RTH1002	103815	2021-09	2024-09

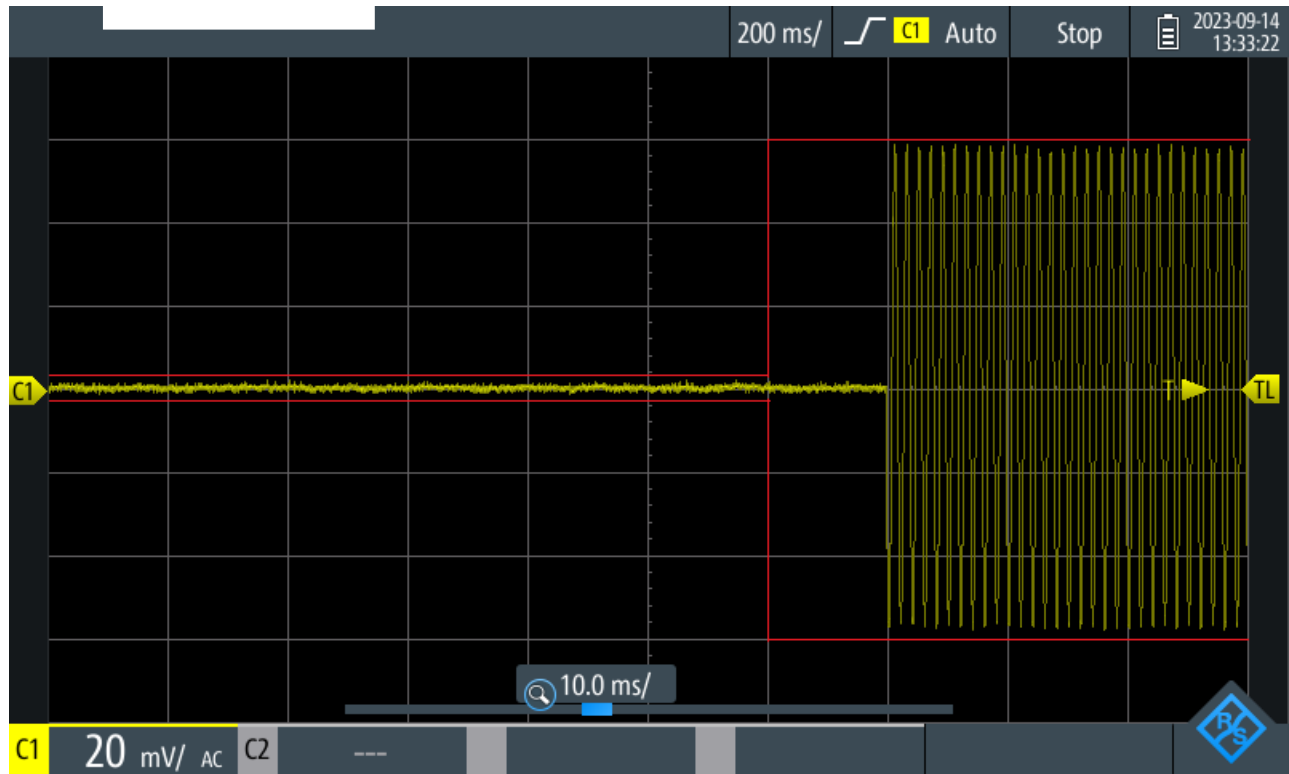
Note: NCR - no calibration required, VOU - verify on use

7.6.5 Test data



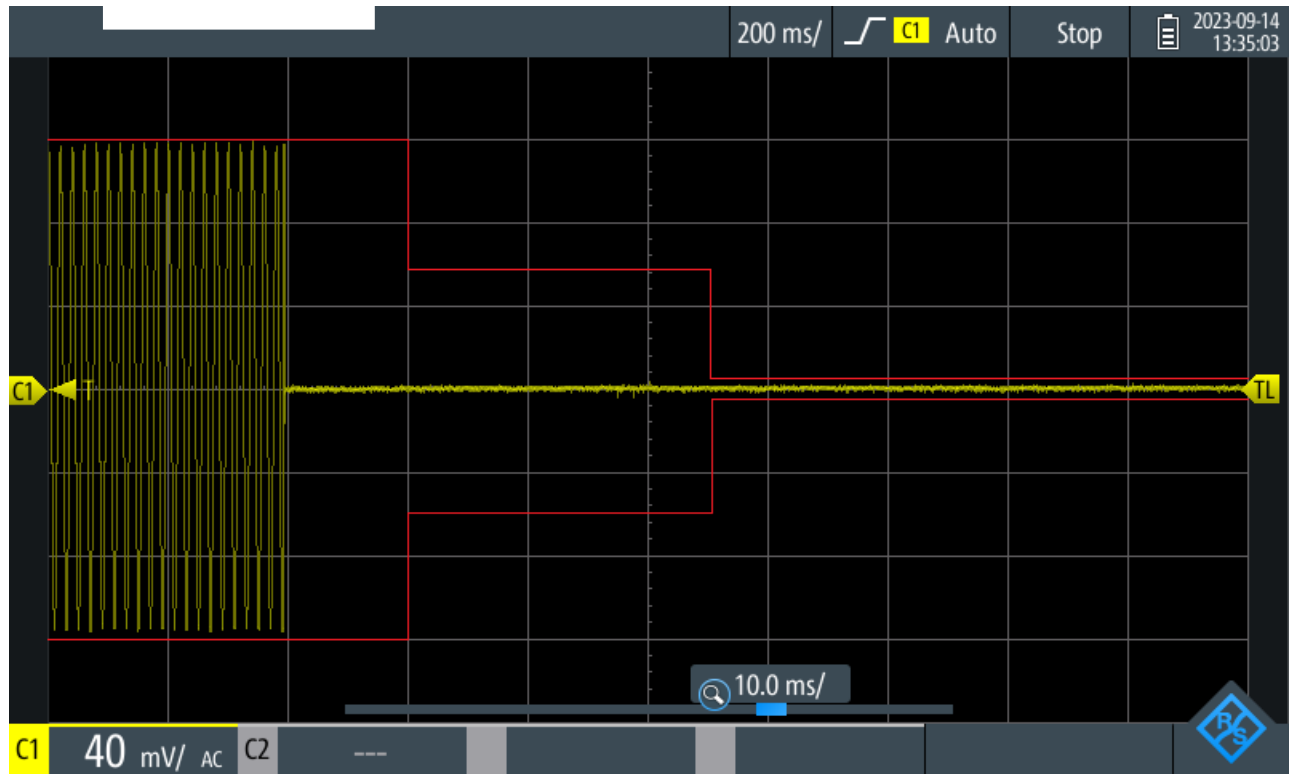
Transient Frequency behavior with modulation FM 12.5 kHz, switch ON

Test data, continued



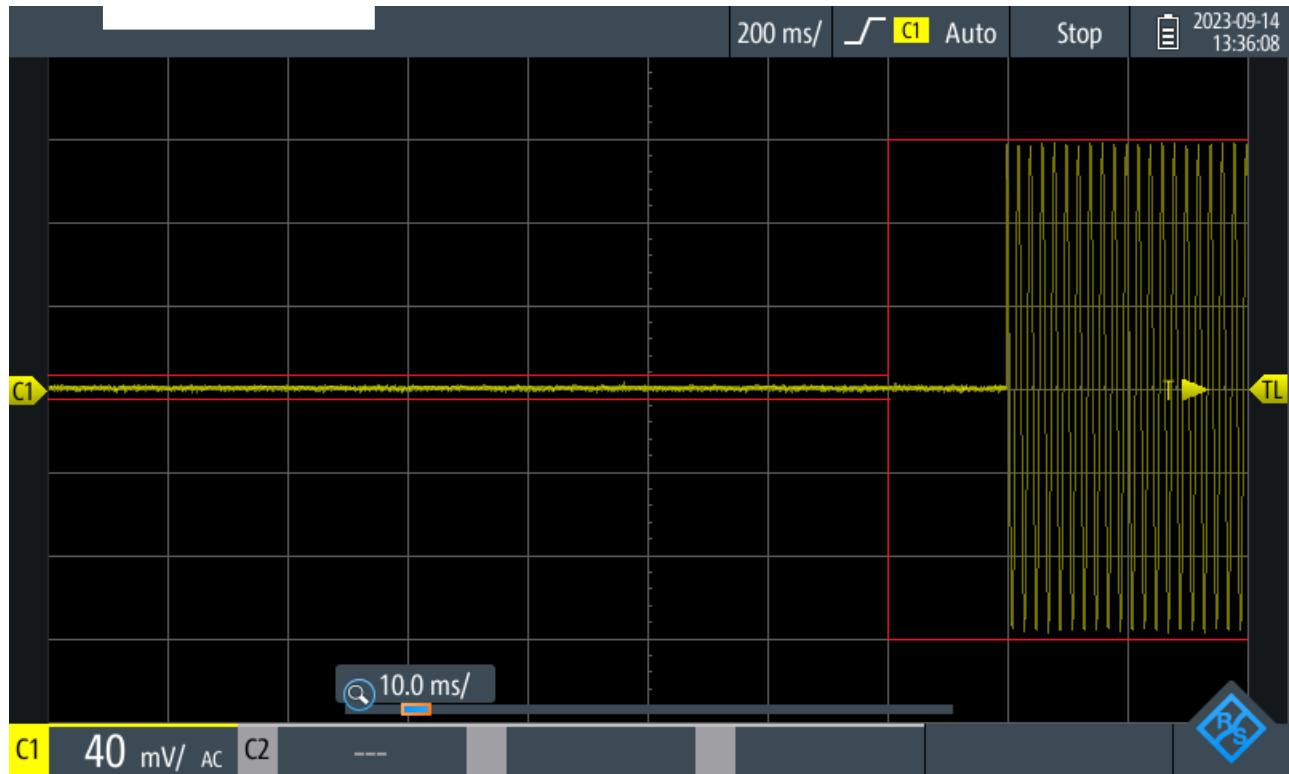
Transient Frequency behavior with modulation FM 12.5 kHz, switch OFF

Test data, continued



Transient Frequency behavior with modulation FM 25.0 kHz, switch ON

Test data, continued



Transient Frequency behavior with modulation FM 25.0 kHz, switch OFF

7.7 Transmitter frequency stability

7.7.1 References, definitions and limits

FCC §90.213:

- (a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

Table 7.7-1: Minimum frequency stability

Frequency range (MHz)	Fixed and base stations	Mobile stations over 2 watts output power	Mobile stations 2 watts or less output power
138-174	± 5 ppm ^{5, 11}	± 5 ppm ⁶	± 50 ppm ^{4, 6}

Notes: ⁴ Stations operating in the 154.45 to 154.49 MHz or the 173.2 to 173.4 MHz bands must have a frequency stability of 5 ppm.

⁵ In the 150-174 MHz band, fixed and base stations with a 25 kHz channel bandwidth must have a frequency stability of 2.5 ppm. Fixed and base stations with a 6.25 kHz channel bandwidth must have a frequency stability of 1.0 ppm.

⁶ In the 150-174 MHz band, mobile stations designed to operate with a 25 kHz channel bandwidth or designed to operate on a frequency specifically designated for itinerant use or designed for low-power operation of two watts or less, must have a frequency stability of 5.0 ppm. Mobile stations designed to operate with a 6.25 kHz channel bandwidth must have a frequency stability of 2.0 ppm.

¹¹ Paging transmitters operating on paging-only frequencies must operate with frequency stability of 5 ppm in the 150-174 MHz band and 2.5 ppm in the 421-512 MHz band.

FCC §22.355:

- (a) Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table 7.7-2: Minimum frequency stability

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
50 to 450	± 5 ppm	± 5 ppm	± 50 ppm

7.7.2 Test summary

Verdict	Pass		
Tested by	P. Barbieri	Test date	September 15, 2023

7.7.3 Observations, settings and special notes

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

7.7.4 Test equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Spectrum Analyzer	Rohde & Schwarz	FSW43	101767	2023-01	2024-01
Climatic Chamber	MSL	EC500DA	15022	2022-02	2024-02

Note: NCR - no calibration required, VOU - verify on use

7.7.5 Test data

Table 7.7-3: Transmitter frequency stability results

Test conditions	Frequency, Hz	Drift, Hz	Drift, ppm	Limit ±ppm	Margin, ±ppm
+50 °C, Nominal	155999985.0	-10.3	-0.066	2.5	-2.434
+40 °C, Nominal	155999987.8	-7.5	-0.048	2.5	-2.452
+30 °C, Nominal	155999992.2	-3.1	-0.020	2.5	-2.480
+20 °C, +15 %	155999995.3	0	0.000	2.5	-2.500
+20 °C, Nominal	155999995.3	Reference	Reference	Reference	Reference
+20 °C, -15 %	155999995.3	0	0.000	2.5	-2.500
+10 °C, Nominal	155999996.2	0.9	0.006	2.5	-2.494
0 °C, Nominal	155999994.8	-0.5	-0.003	2.5	-2.497
-10 °C, Nominal	155999992.7	-2.6	-0.017	2.5	-2.483
-20 °C, Nominal	155999990.0	-5.3	-0.034	2.5	-2.466
-30 °C, Nominal	155999984.4	-10.9	-0.070	2.5	-2.430

Section 8 Photos

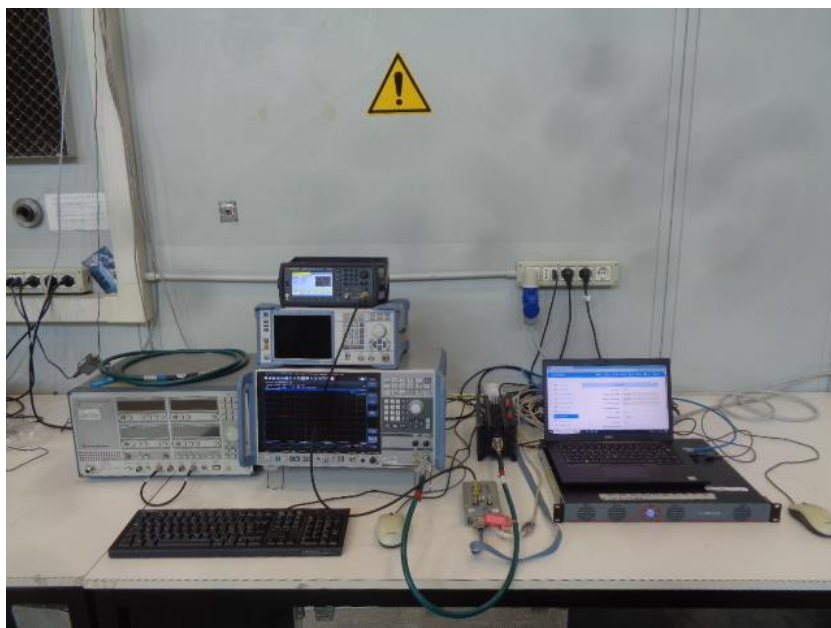
8.1 Photos of the test set-up



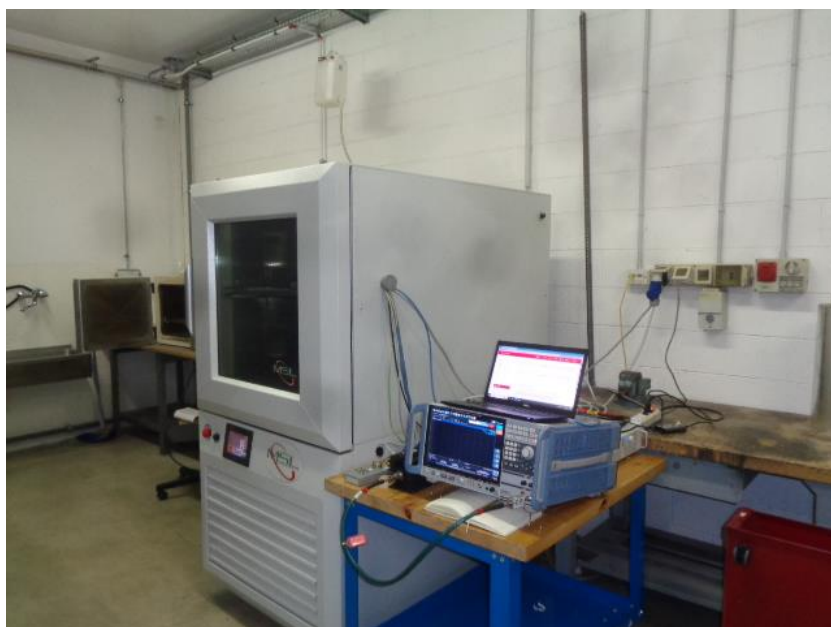
Set-up photo for radiated tests below 1 GHz photo



Set-up photo for radiated tests above 1 GHz photo



Set-up photo for antenna port tests



Set-up photo for frequency error tests

8.2 Photos of the EUT



Front, left and top side photo



Rear, right and bottom side photo



Copy of marking plate

End of the test report