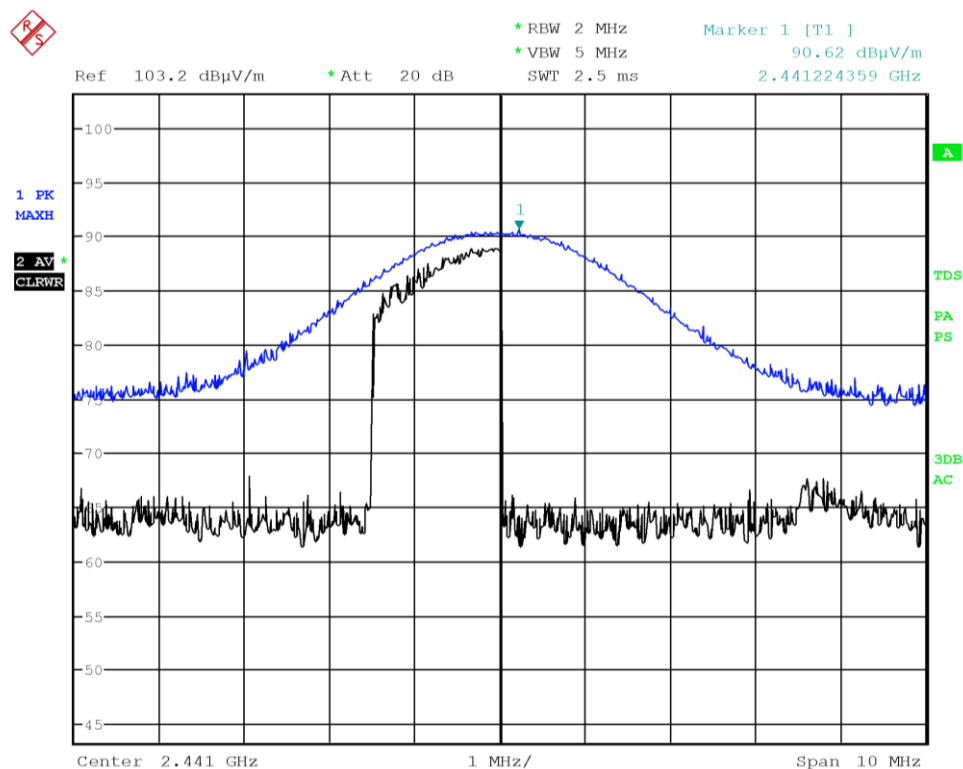


Test data, continued



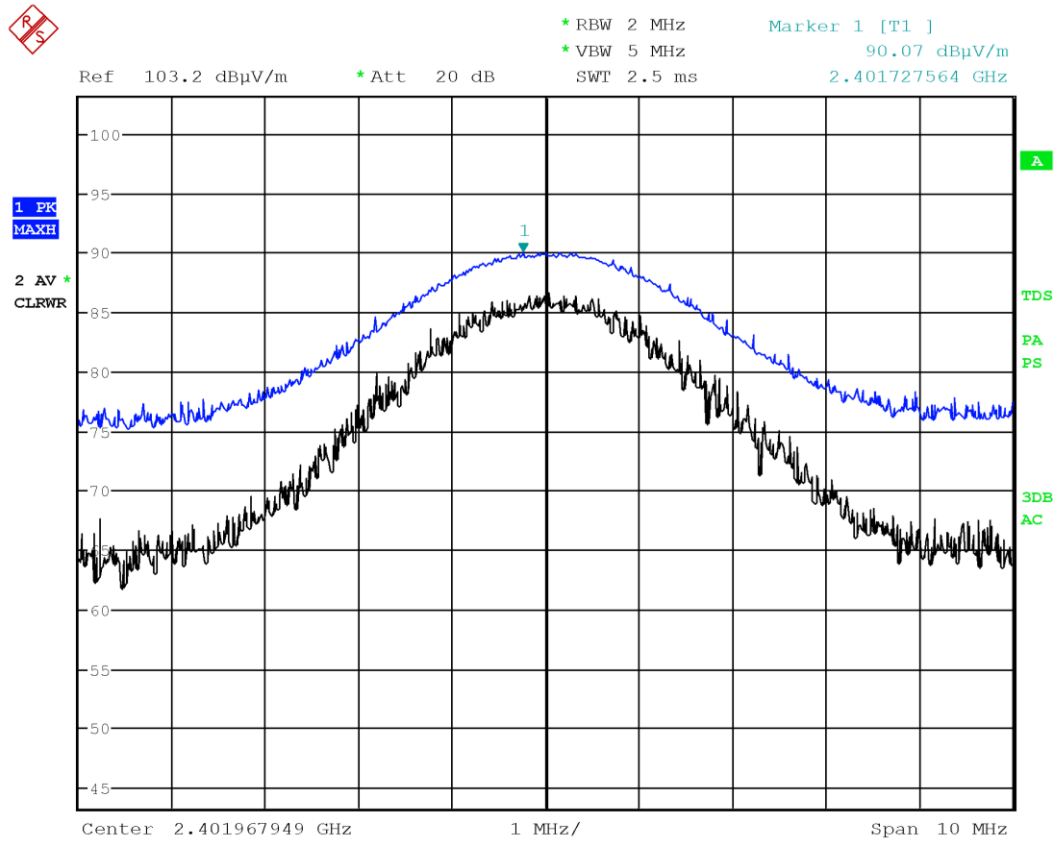
Date: 23.MAR.2023 18:24:13

Figure 8.4 2: Output power on mid channel for GFSK modulation



Figure 8.4-3: Output power on high channel for GFSK modulation

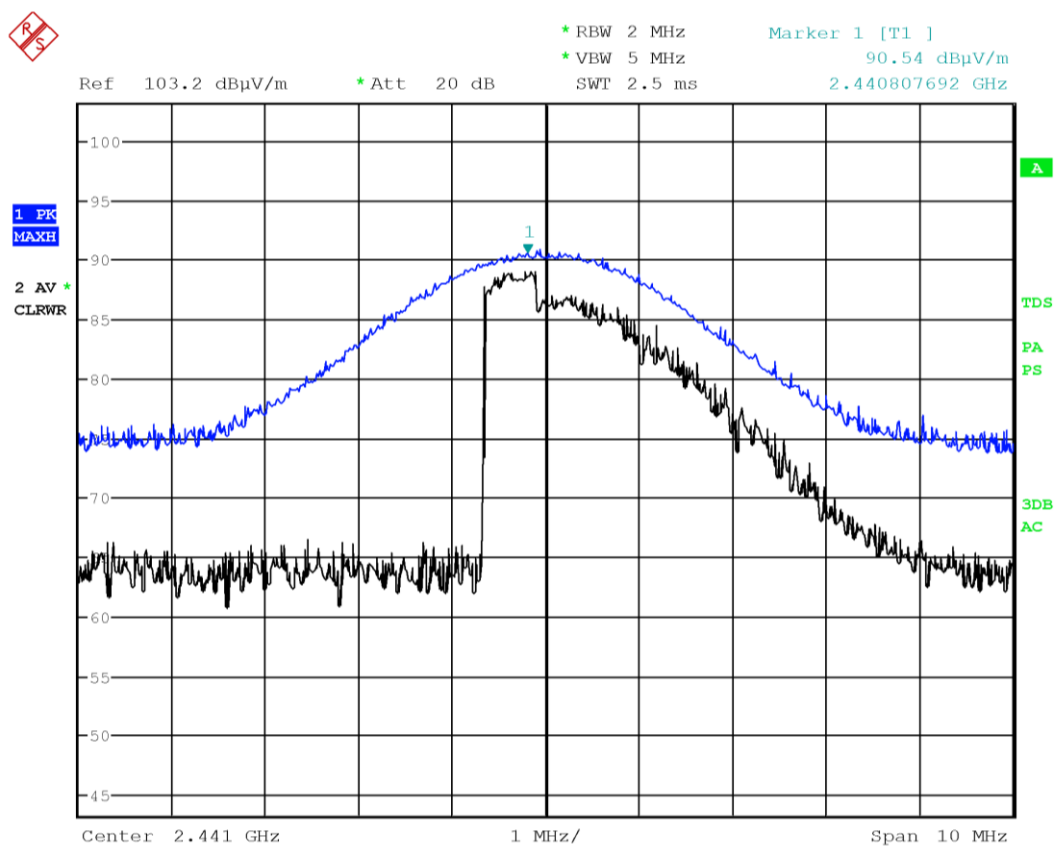
Test data, continued



Date: 23.MAR.2023 18:15:52

Figure 8.4-4: Output power on low channel $\pi/4$ -DQPSK modulation

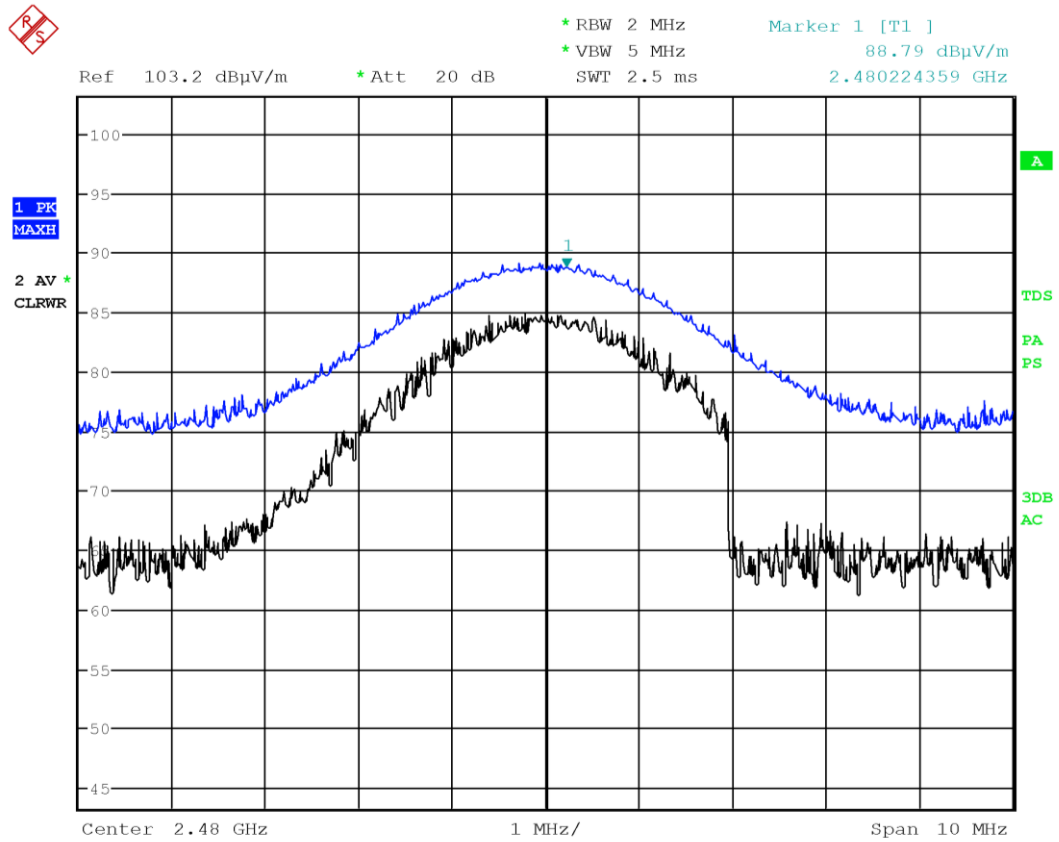
Test data, continued



Date: 23.MAR.2023 18:33:22

Figure 8.4-5: Output power on mid channel for $\pi/4$ -DQPSK modulation

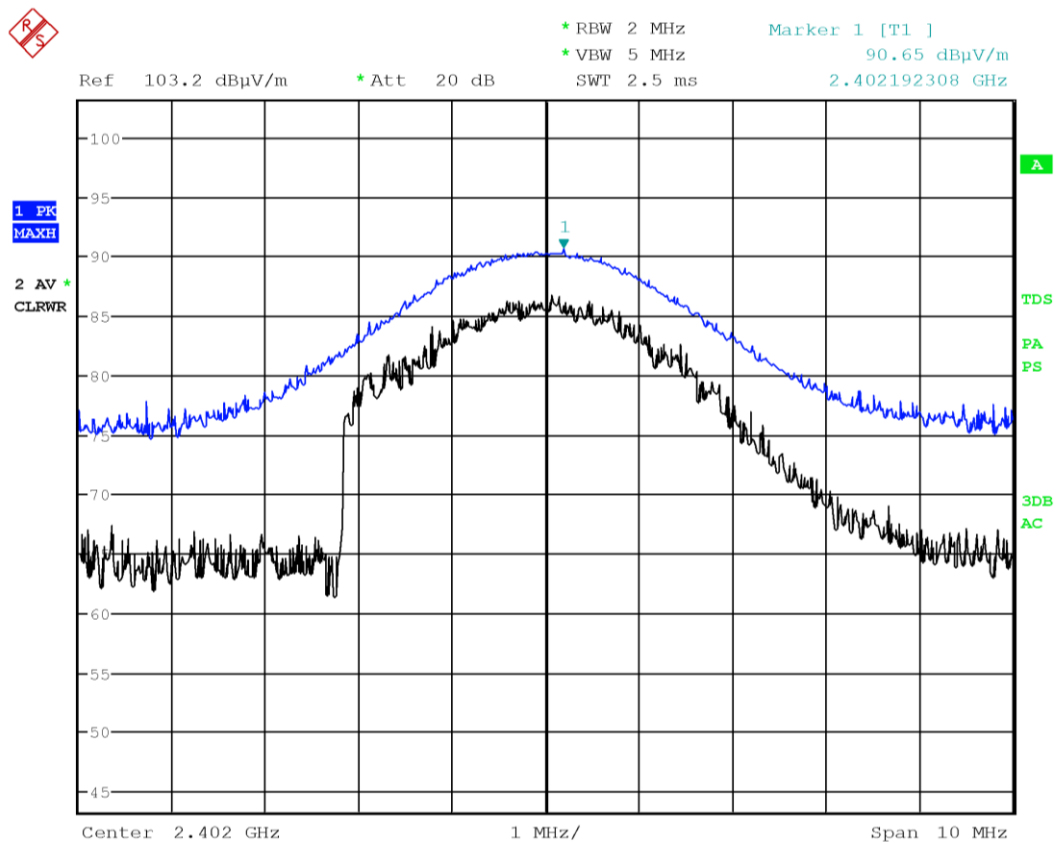
Test data, continued



Date: 23.MAR.2023 18:35:52

Figure 8.4-6: Output power on high channel for $\pi/4$ -DQPSK modulation

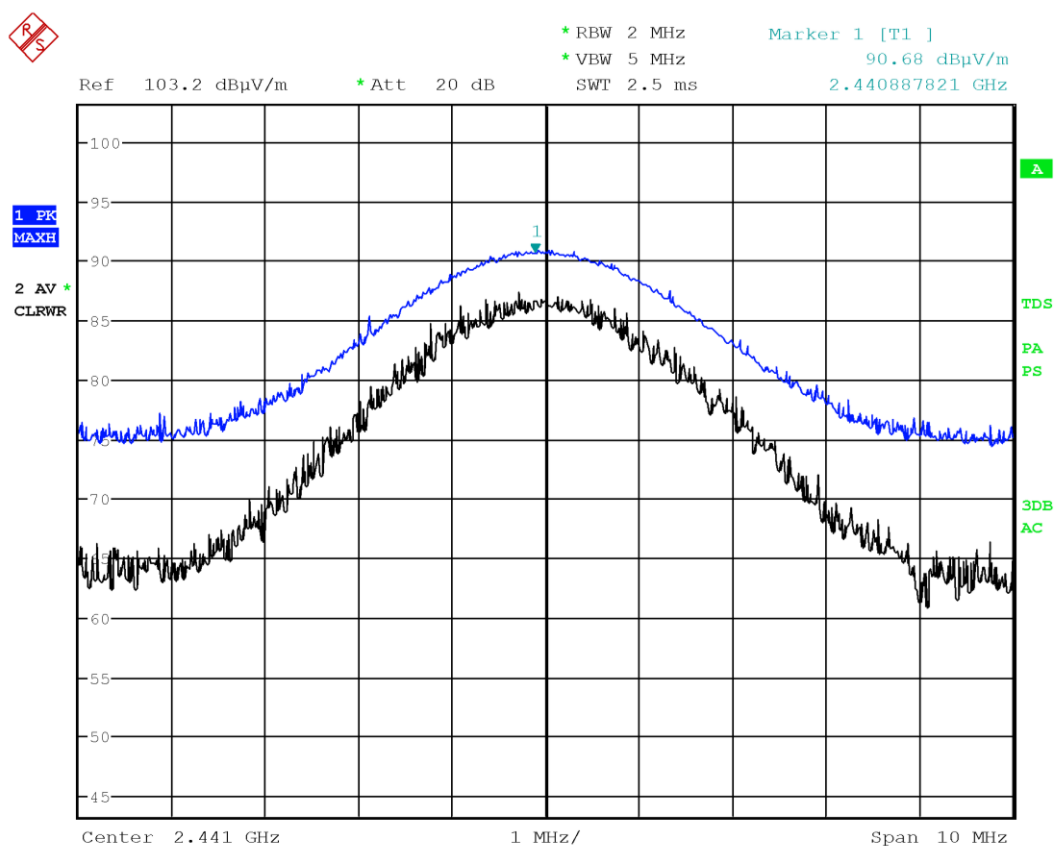
Test data, continued



Date: 23.MAR.2023 18:38:35

Figure 8.4-7: Output power on low channel for 8-DPSK modulation

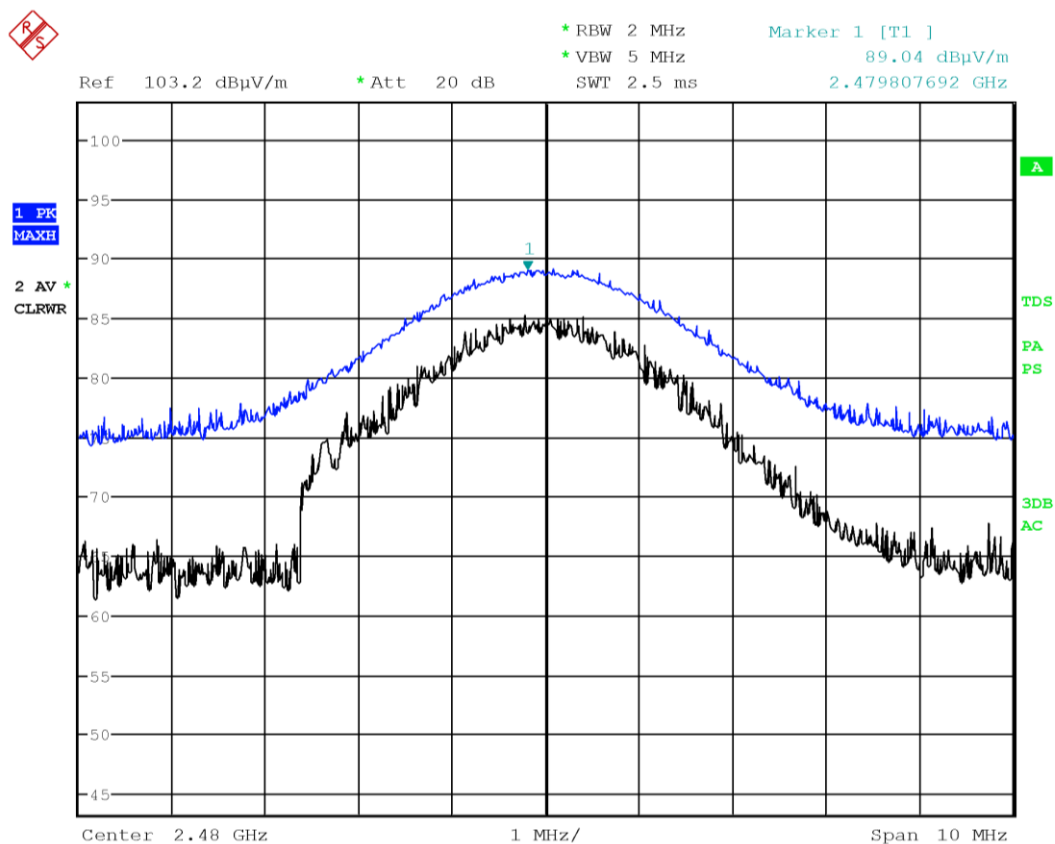
Test data, continued



Date: 23.MAR.2023 18:41:03

Figure 8.4-8: Output power on mid channel for 8-DPSK modulation

Test data, continued



Date: 23.MAR.2023 18:43:08

Figure 8.4-2: Output power on high channel for 8-DPSK modulation

8.5 Spurious (out-of-band) unwanted emissions

8.5.1 References, definitions and limits

RSS-247, Clause 5.5:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Table 8.5-1: RSS-Gen – Radiated emission limits

Frequency, MHz	Field strength of emissions		Measurement distance, m
	μV/m	dBμV/m	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Table 8.5-2: ISSED restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	12.57675–12.57725	399.9–410	7.25–7.75
0.495–0.505	13.36–13.41	608–614	8.025–8.5
2.1735–2.1905	16.42–16.423	960–1427	9.0–9.2
3.020–3.026	16.69475–16.69525	1435–1626.5	9.3–9.5
4.125–4.128	16.80425–16.80475	1645.5–1646.5	10.6–12.7
4.17725–4.17775	25.5–25.67	1660–1710	13.25–13.4
4.20725–4.20775	37.5–38.25	1718.8–1722.2	14.47–14.5
5.677–5.683	73–74.6	2200–2300	15.35–16.2
6.215–6.218	74.8–75.2	2310–2390	17.7–21.4
6.26775–6.26825	108–138	2483.5–2500	22.01–23.12
6.31175–6.31225	149.9–150.05	2655–2900	23.6–24.0
8.291–8.294	156.52475–156.52525	3260–3267	31.2–31.8
8.362–8.366	156.7–156.9	3332–3339	36.43–36.5
8.37625–8.38675	162.0125–167.17	3345.8–3358	
8.41425–8.41475	167.72–173.2	3500–4400	Above 38.6
12.29–12.293	240–285	4500–5150	
12.51975–12.52025	322–335.4	5350–5460	

Note: Certain frequency bands listed in Table 8.5-2 and above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

8.5.2 Test summary

Verdict	Pass		
Tested by	D. Guarnone	Test date	March 29, 2023

8.5.3 Observations, settings and special notes

- As part of the current assessment, the test range of 9 kHz to 10th harmonic has been fully considered and compared to the actual frequencies utilized within the EUT. Since the EUT contains a transmitter in the GHz range, the EUT has been deemed compliant without formal testing in the 9 kHz to 30 MHz test range, therefore formal test results (tabular data and/or plots) are not provided within this test report.
- EUT was set to transmit with 100 % duty cycle.
- Radiated measurements were performed at a distance of 3 m.
- Since fundamental power was tested using the maximum peak conducted output power procedure to demonstrate compliance, the spurious emissions limit is –20 dBc/100 kHz.
- Same result found for the three modulations. Sample plot reported for the three modulation.

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for average radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	10 Hz
Detector mode:	Peak
Trace mode:	Max Hold

8.5.4 Test equipment used

Equipment	Manufacturer	Model no.	Asset no.
EMI Receiver	Rohde & Schwarz	ESW44	101620
Antenna Trilog 25MHz - 8GHz	Schwarzbeck Mess-Elektronik	VULB9162	9162-025
Antenna 1 - 18 GHz	Schwarzbeck Mess-Elektronik	STLP9148	STLP 9148-152
Double Ridge Horn Antenna	RFSpin	DRH40	061106A40
Broadband Amplifier	Schwarzbeck Mess-Elektronik	BBV9718C	00121
Broadband Bench Top Amplifier	Sage	STB-1834034030-KFKF-L1	18490-01
Controller	Maturo	FCU3.0	10041
Tilt antenna mast	Maturo	TAM4.0-E	10042
Turntable	Maturo	TT4.0-5T	2.527
Semi-anechoic chamber	Nemko S.p.a.	10m semi-anechoic chamber	530

8.5.5 Test data

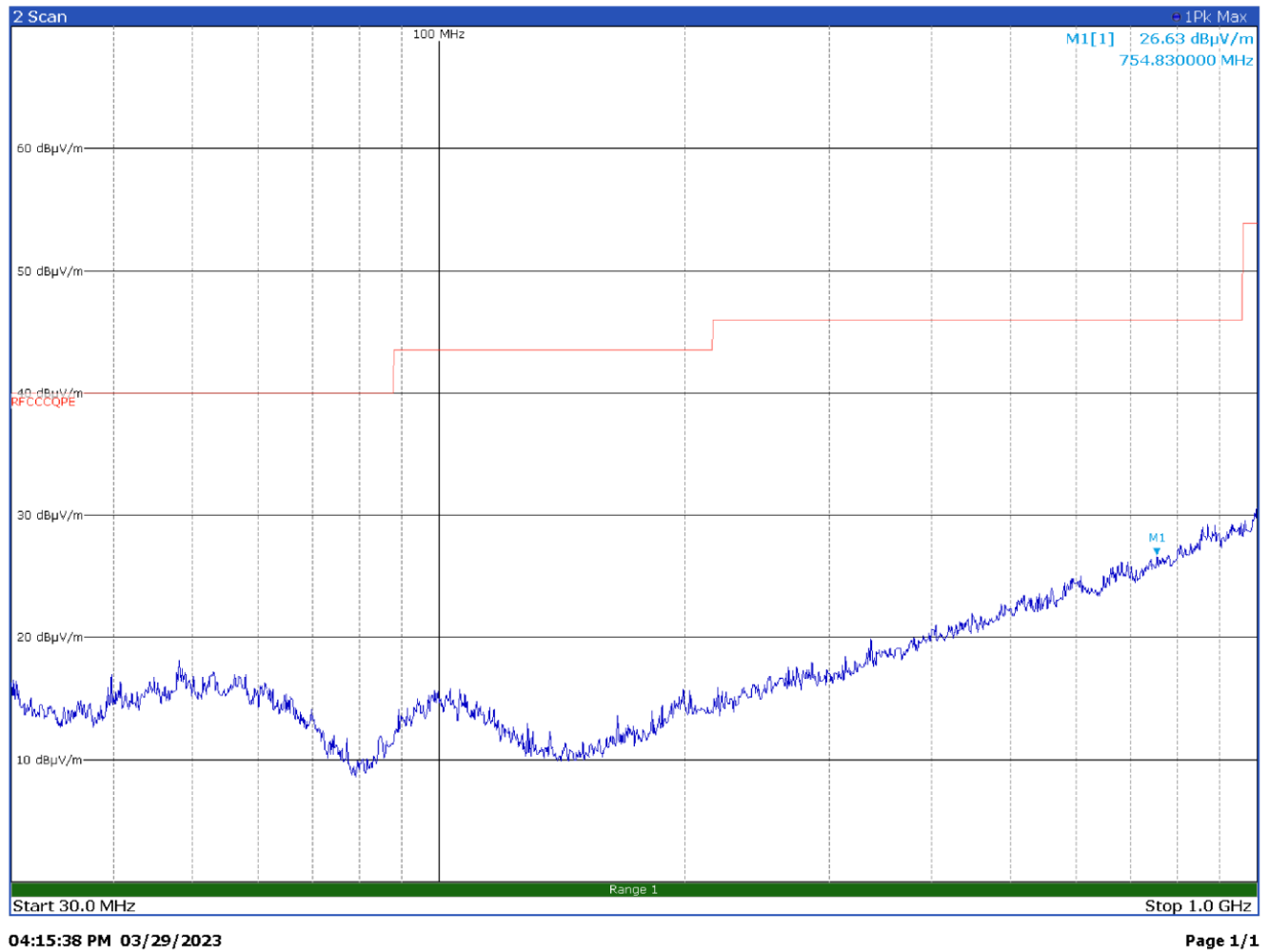


Figure 8.5-1: Radiated spurious emissions on low channel with EUT in horizontal position - antenna in horizontal polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

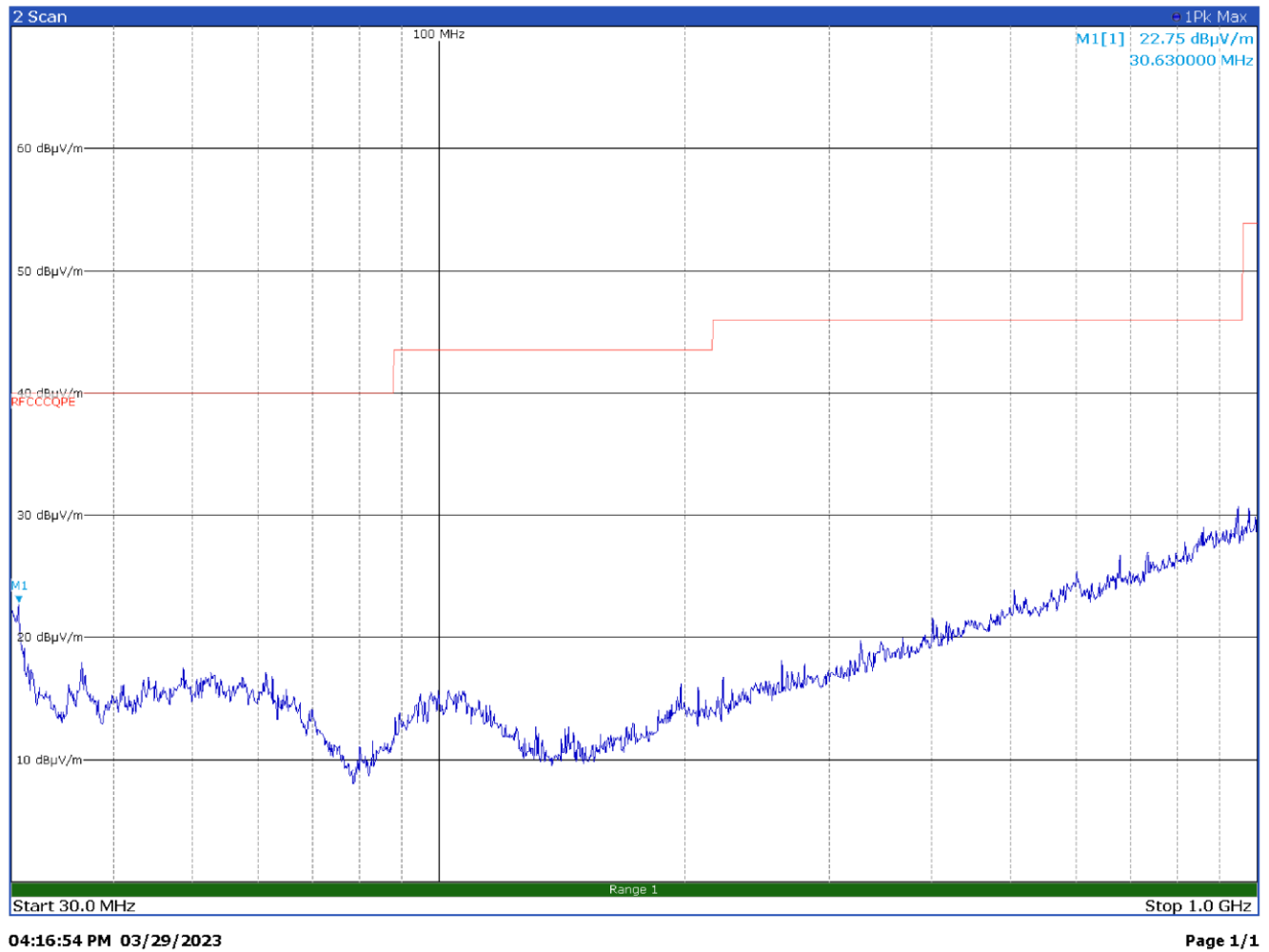
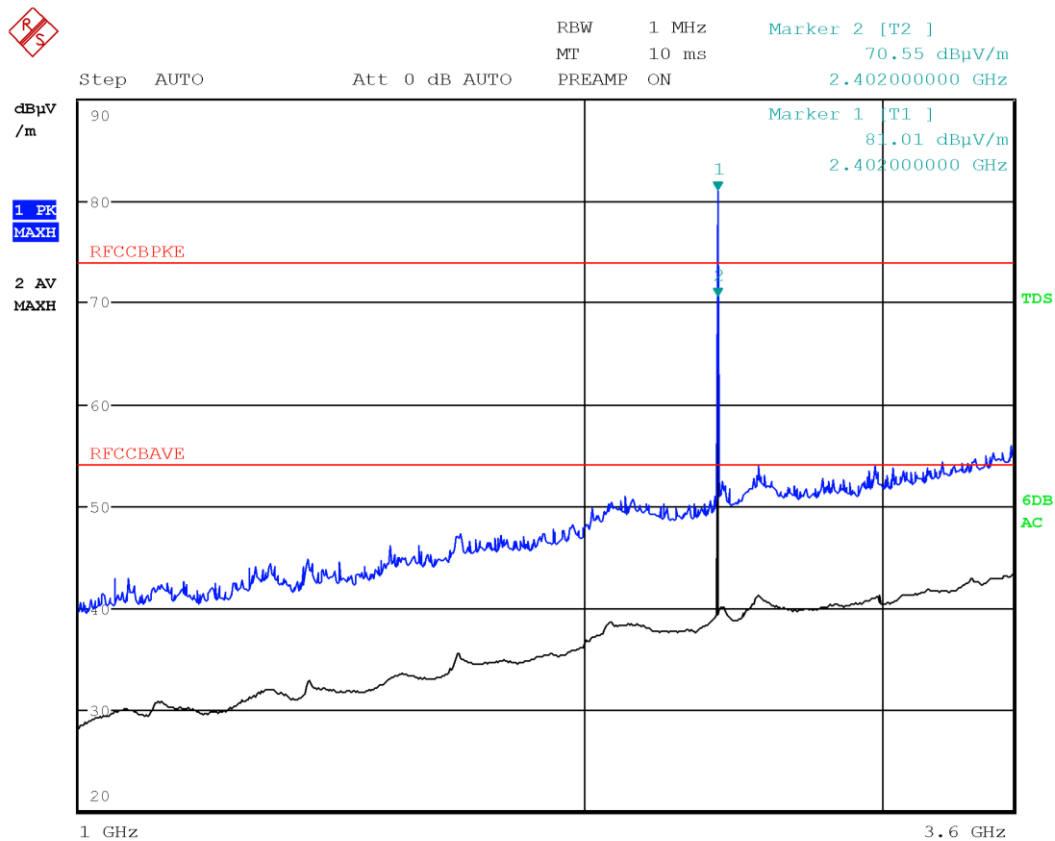


Figure 8.5-2: Radiated spurious emissions on low channel with EUT in horizontal position - antenna in vertical polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
--	--	--	--	--

Test data, continued

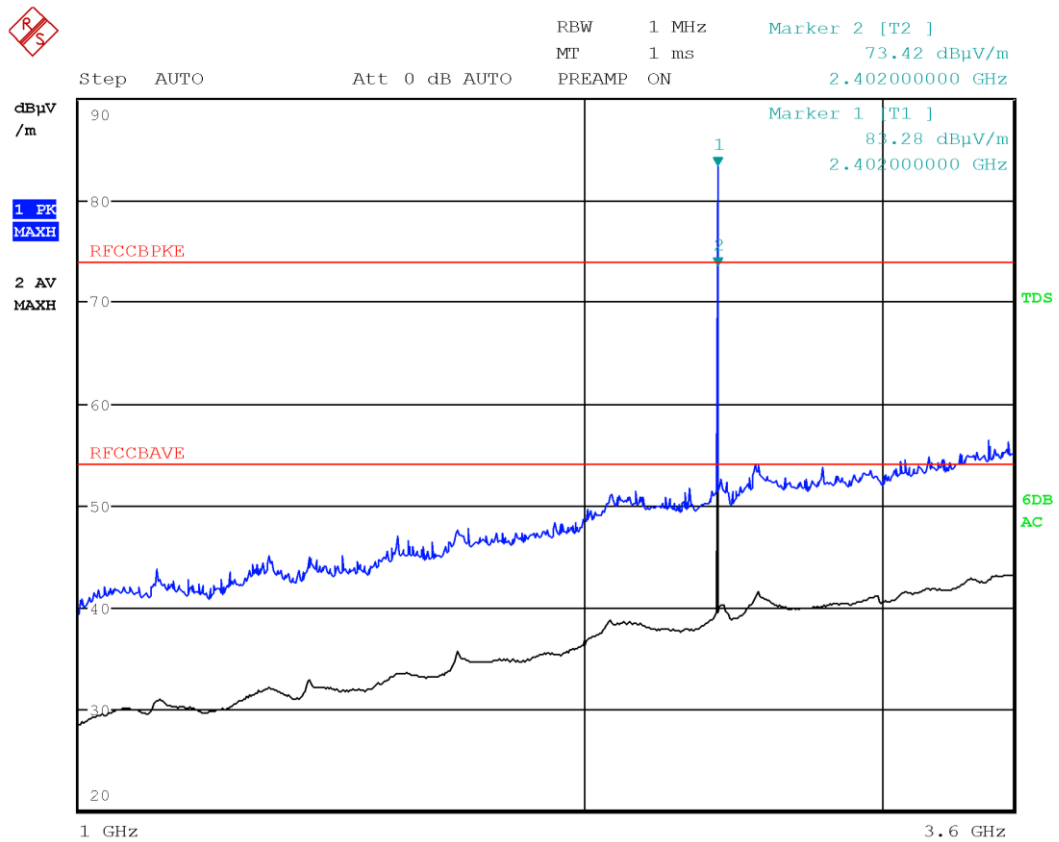


Date: 24.MAR.2023 16:36:05

Figure 8.5-3: Radiated spurious emissions on low channel antenna in horizontal polarization DM1

Limit exceeded by the carrier

Test data, continued



Date: 24.MAR.2023 16:39:15

Figure 8.5-4: Radiated spurious emissions on low channel antenna in vertical polarization DM1

Limit exceeded by the carrier

Test data, continued

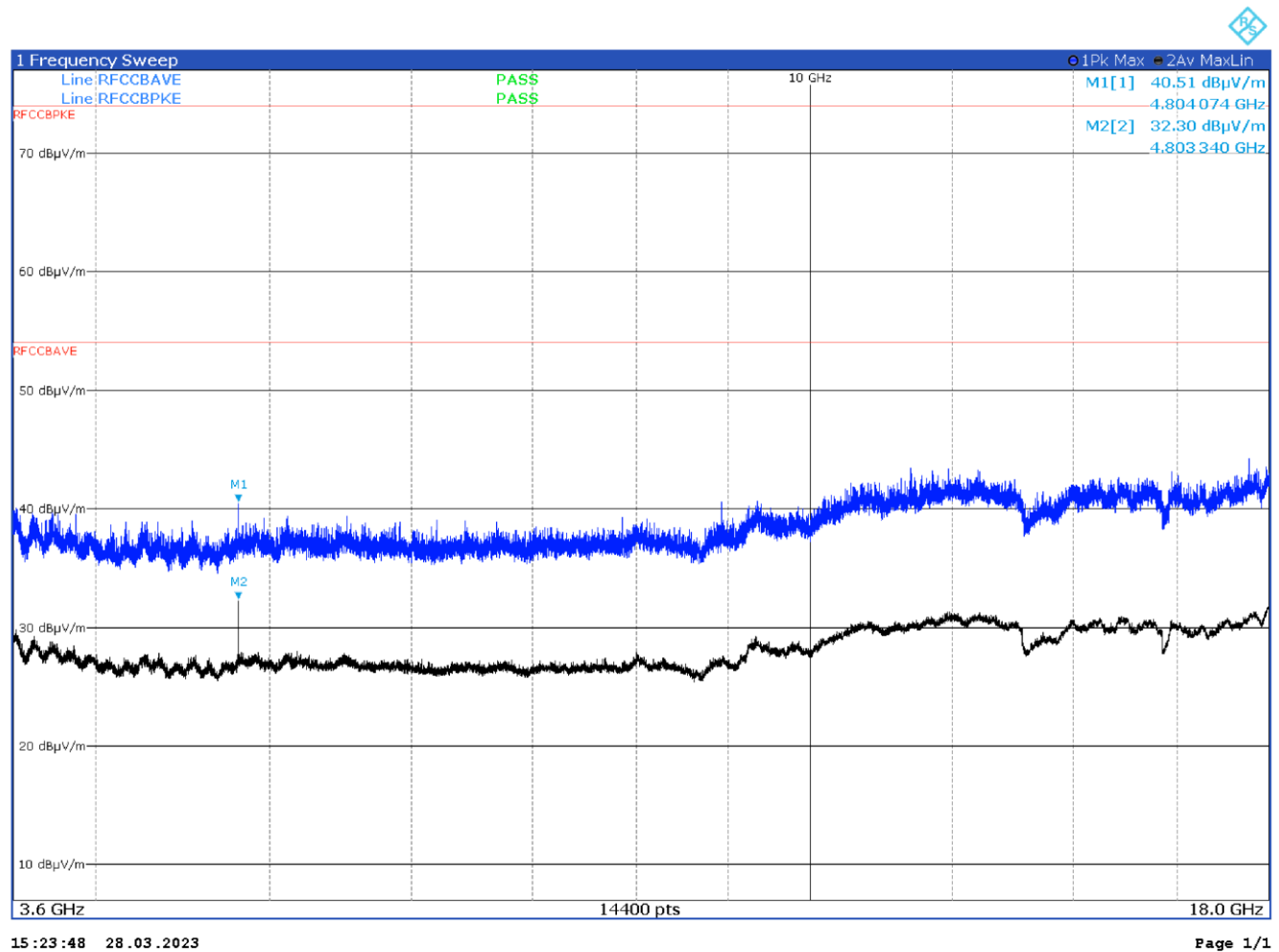


Figure 8.5-5: Radiated spurious emissions on low channel with EUT in horizontal position - antenna in horizontal polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

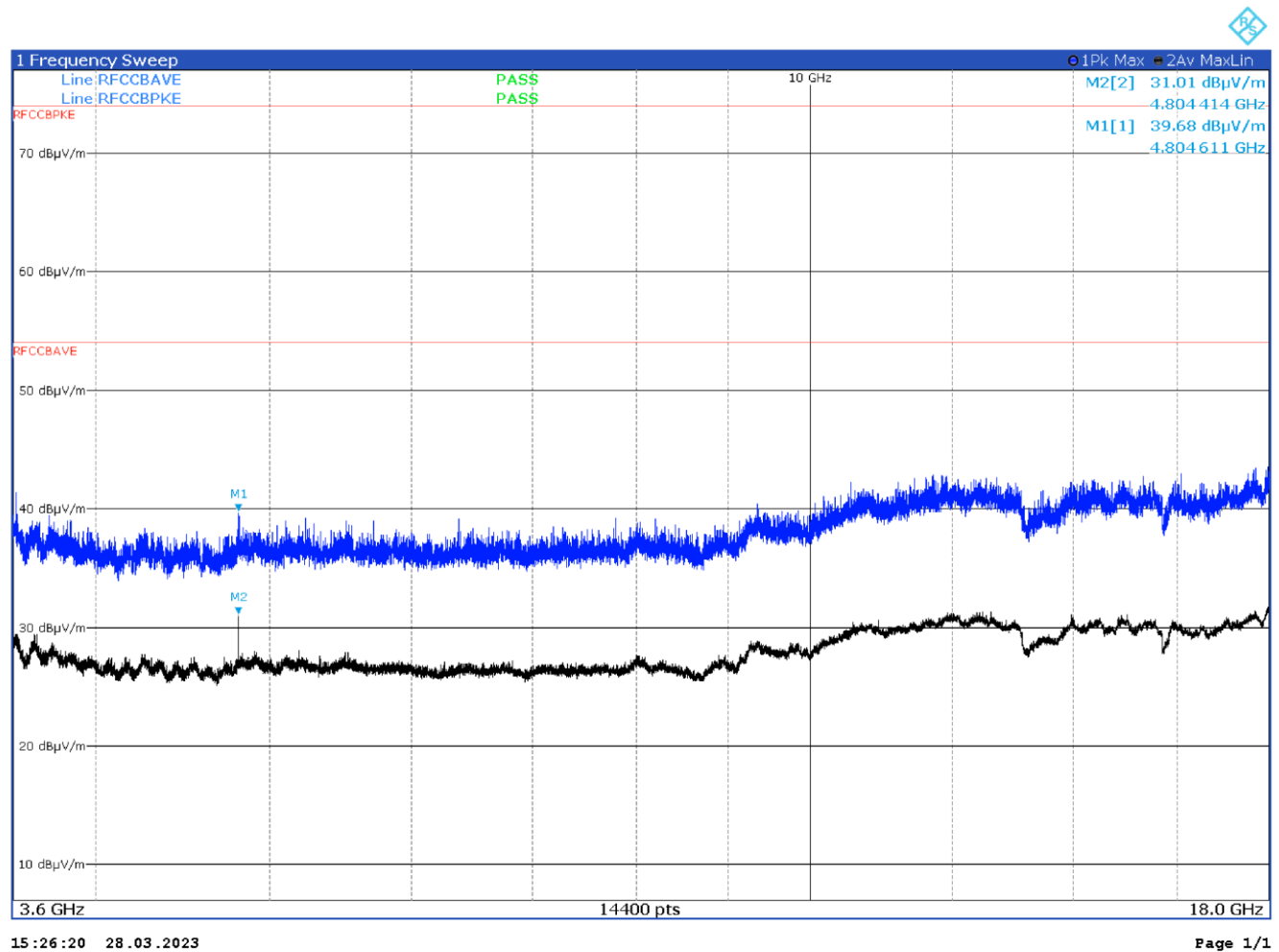


Figure 8.5-6: Radiated spurious emissions on low channel with EUT in horizontal position - antenna in vertical polarization

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

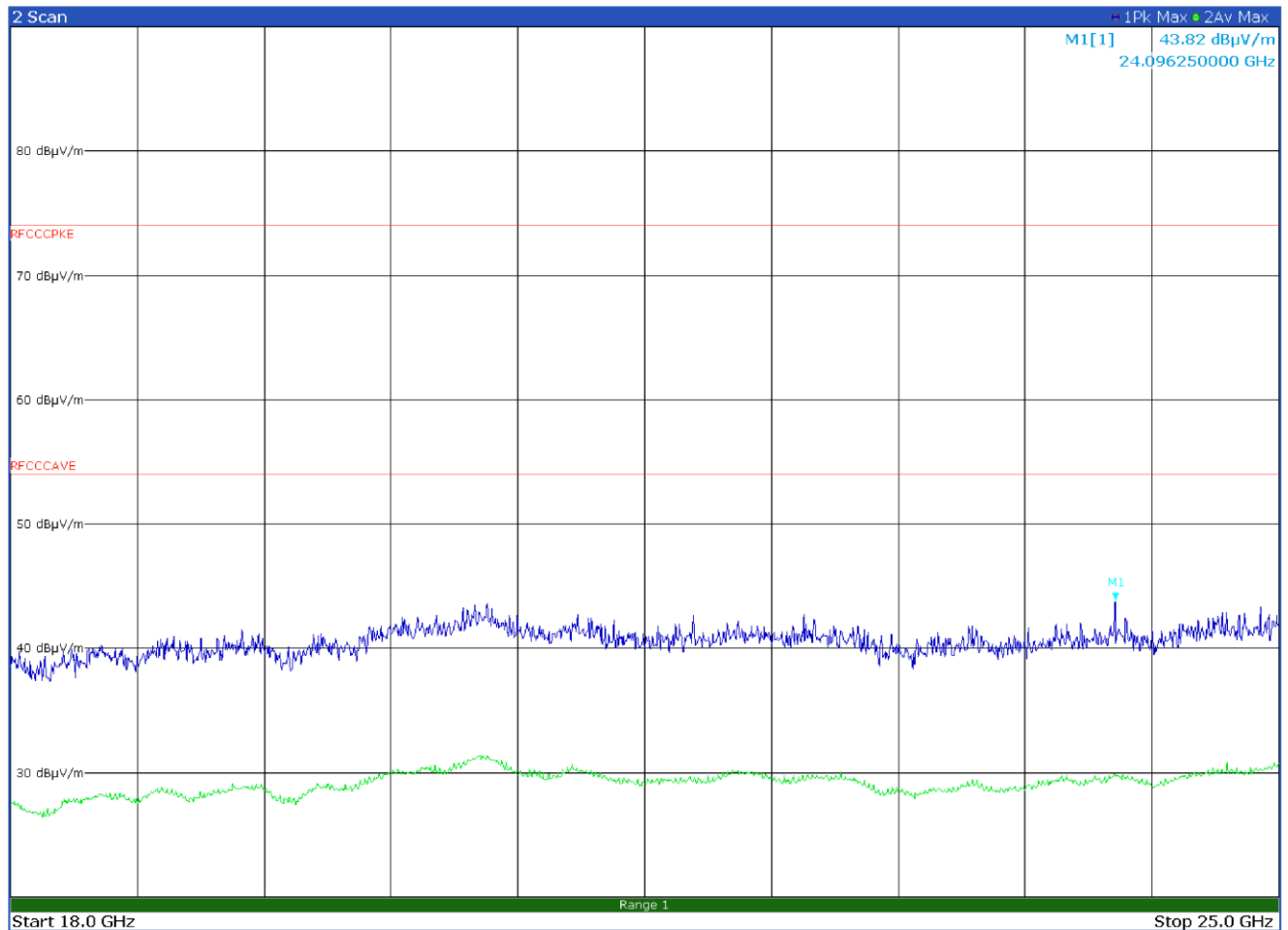


Figure 8.5-7: Radiated spurious emissions on low channel with EUT in horizontal position - antenna in horizontal polarization

No spurious emissions found

Test data, continued

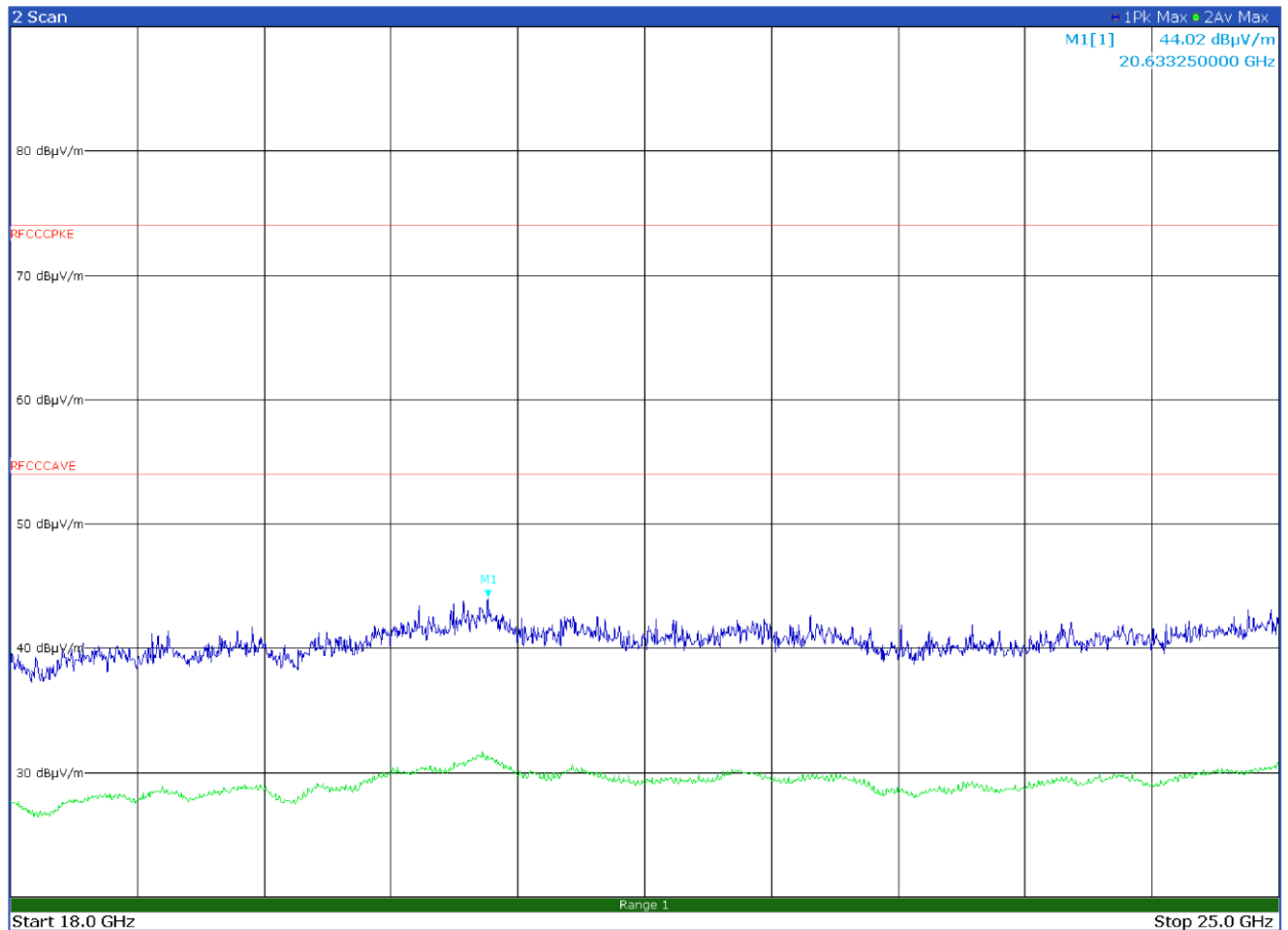


Figure 8.5-8: Radiated spurious emissions on low channel with EUT in horizontal position - antenna in vertical polarization

No spurious emissions found

Test data, continued

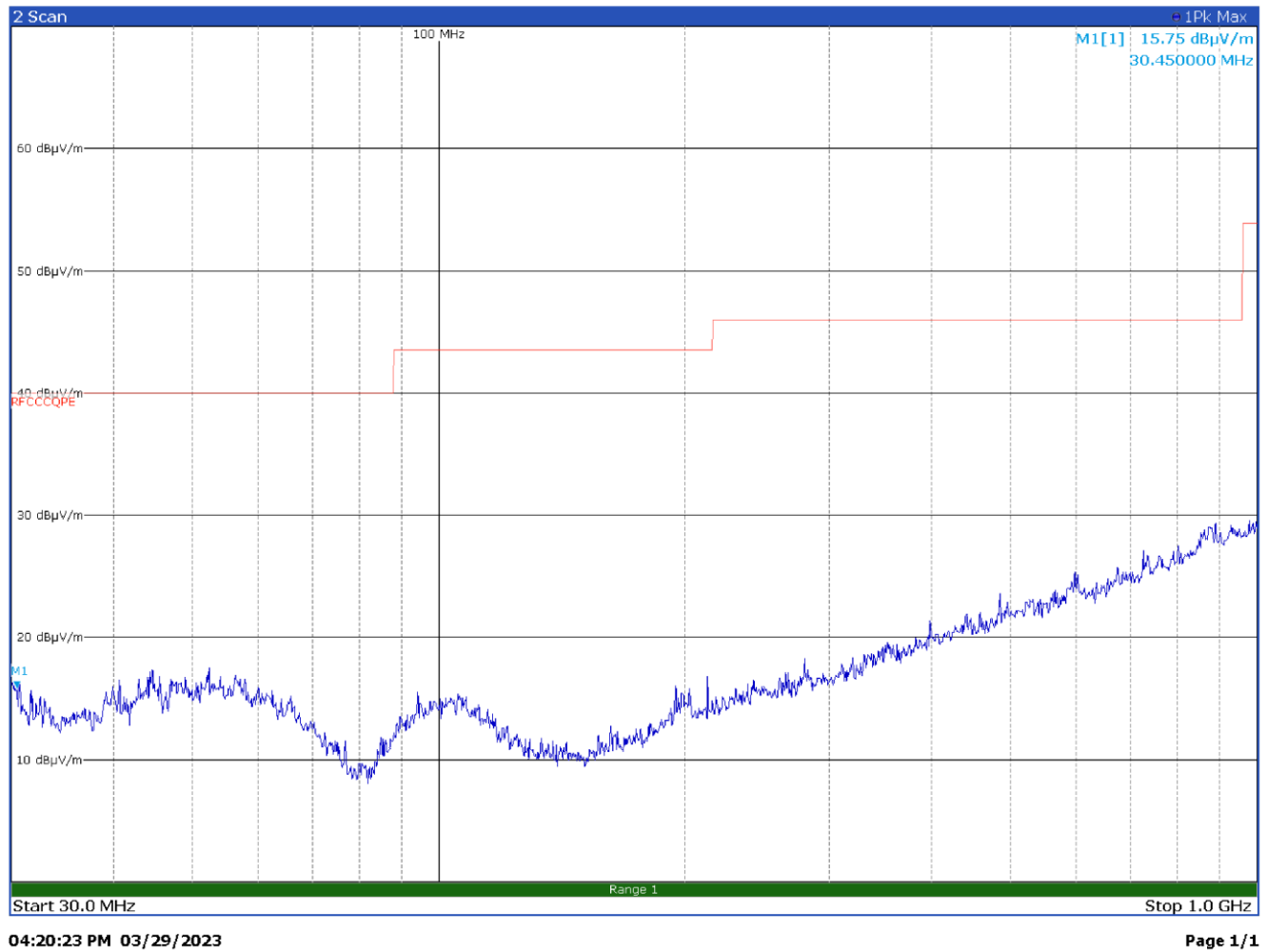


Figure 8.5-9: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in horizontal polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

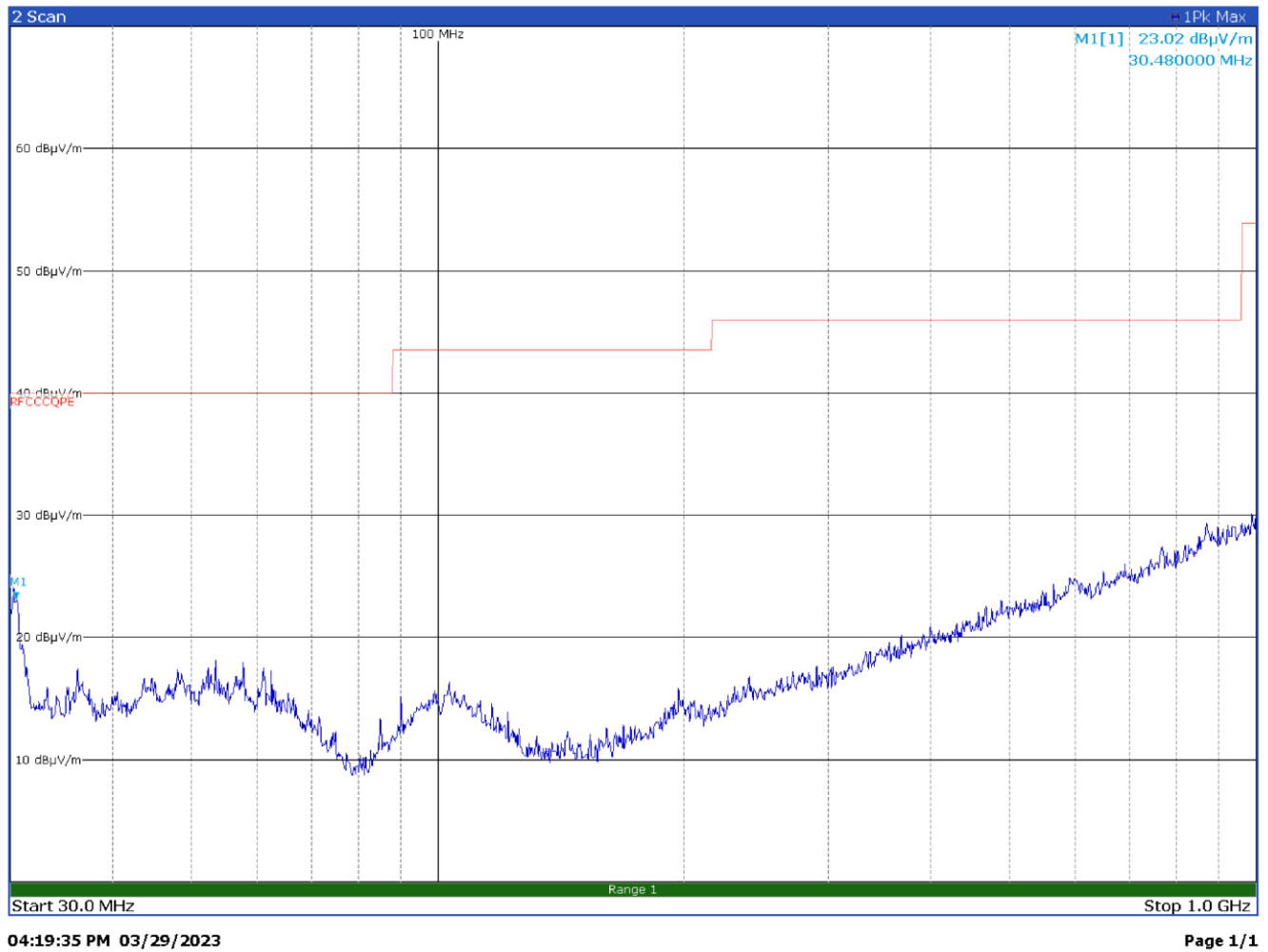
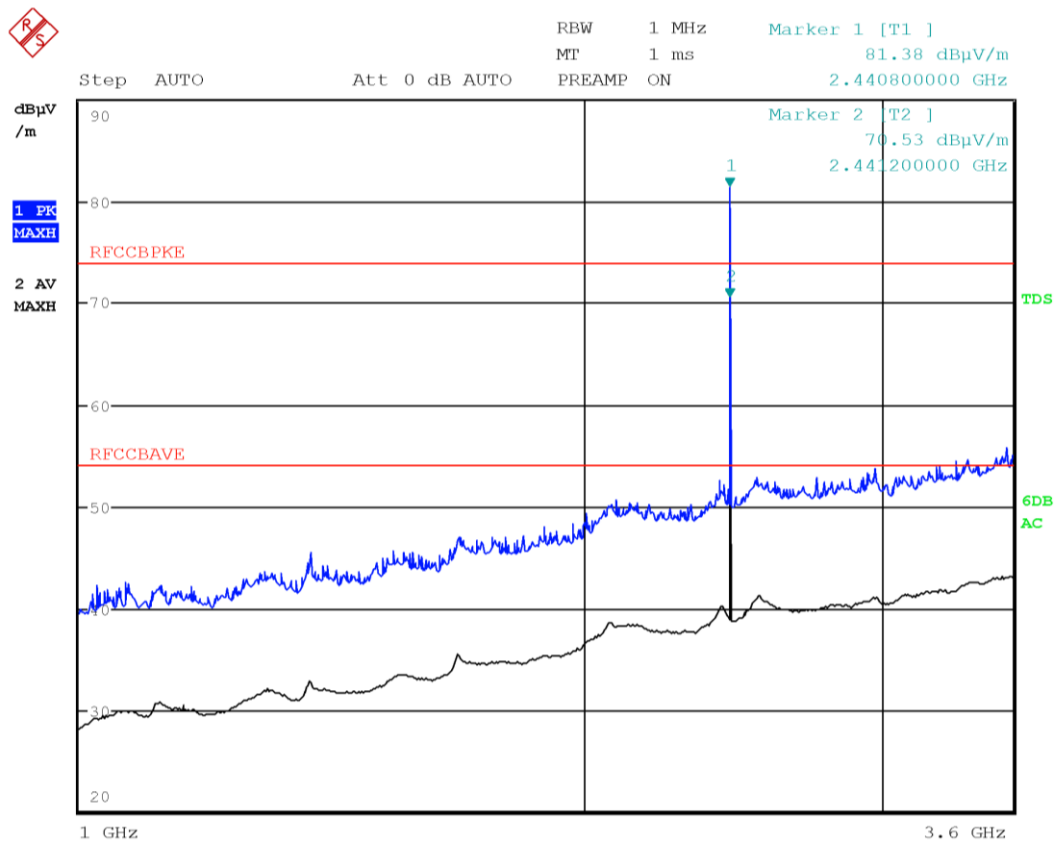


Figure 8.5-10: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in vertical polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

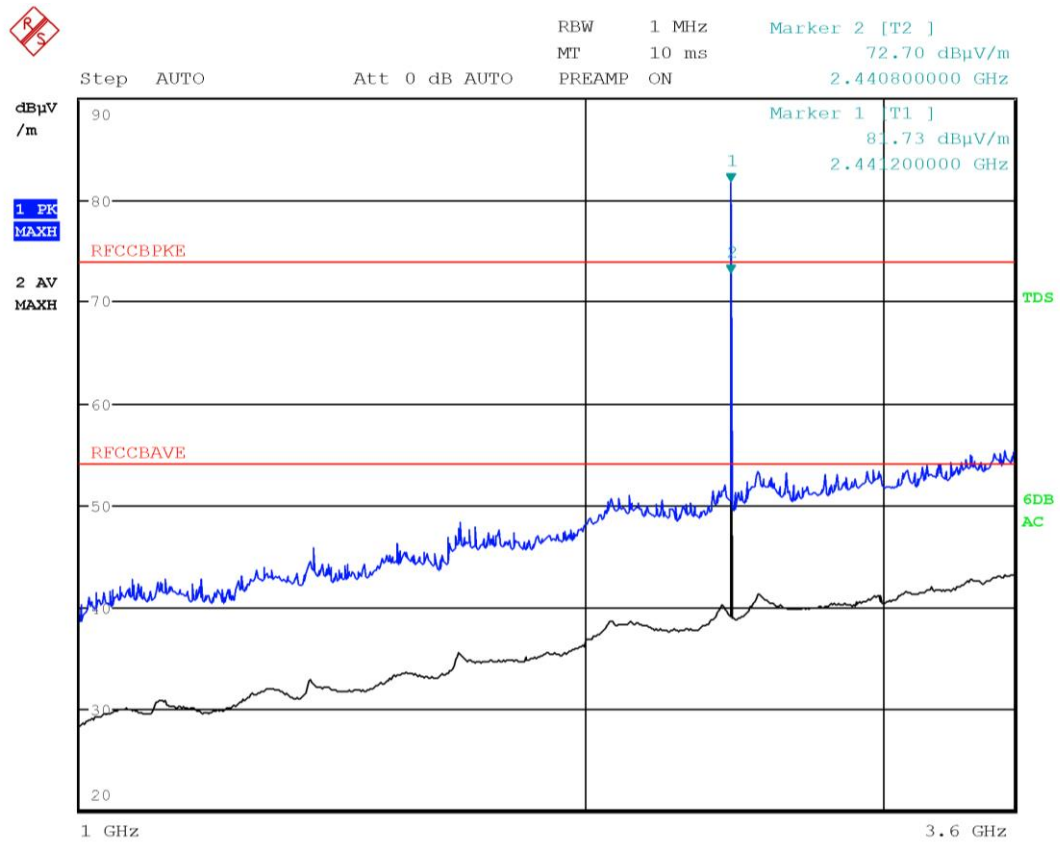


Date: 24.MAR.2023 16:57:31

Figure 8.5-11: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in horizontal polarization DM1

Limit exceeded by the carrier

Test data, continued



Date: 24.MAR.2023 16:56:04

Figure 8.5-12: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in vertical polarization DM1

Limit exceeded by the carrier

Test data, continued

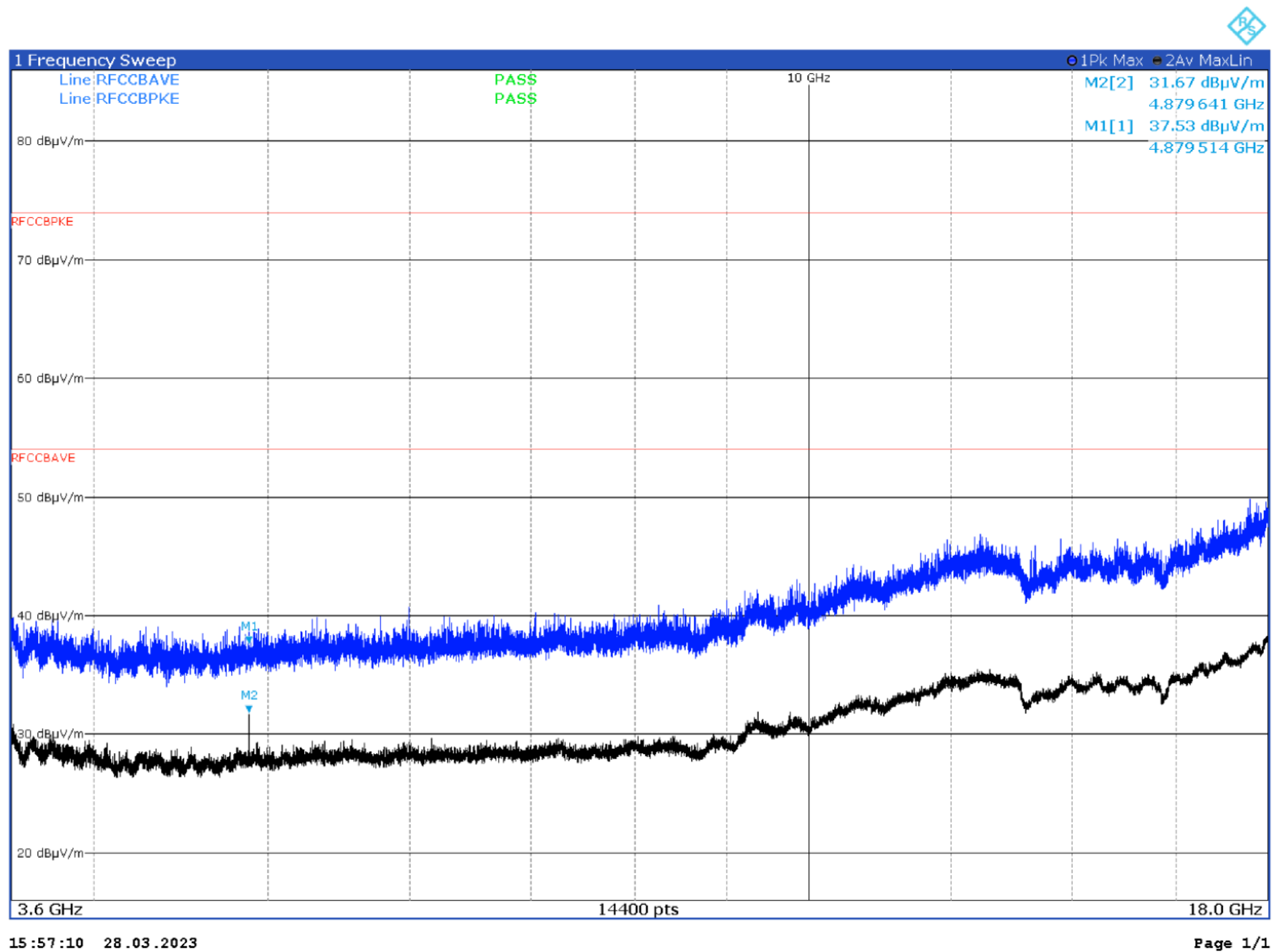


Figure 8.5-13: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in horizontal polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

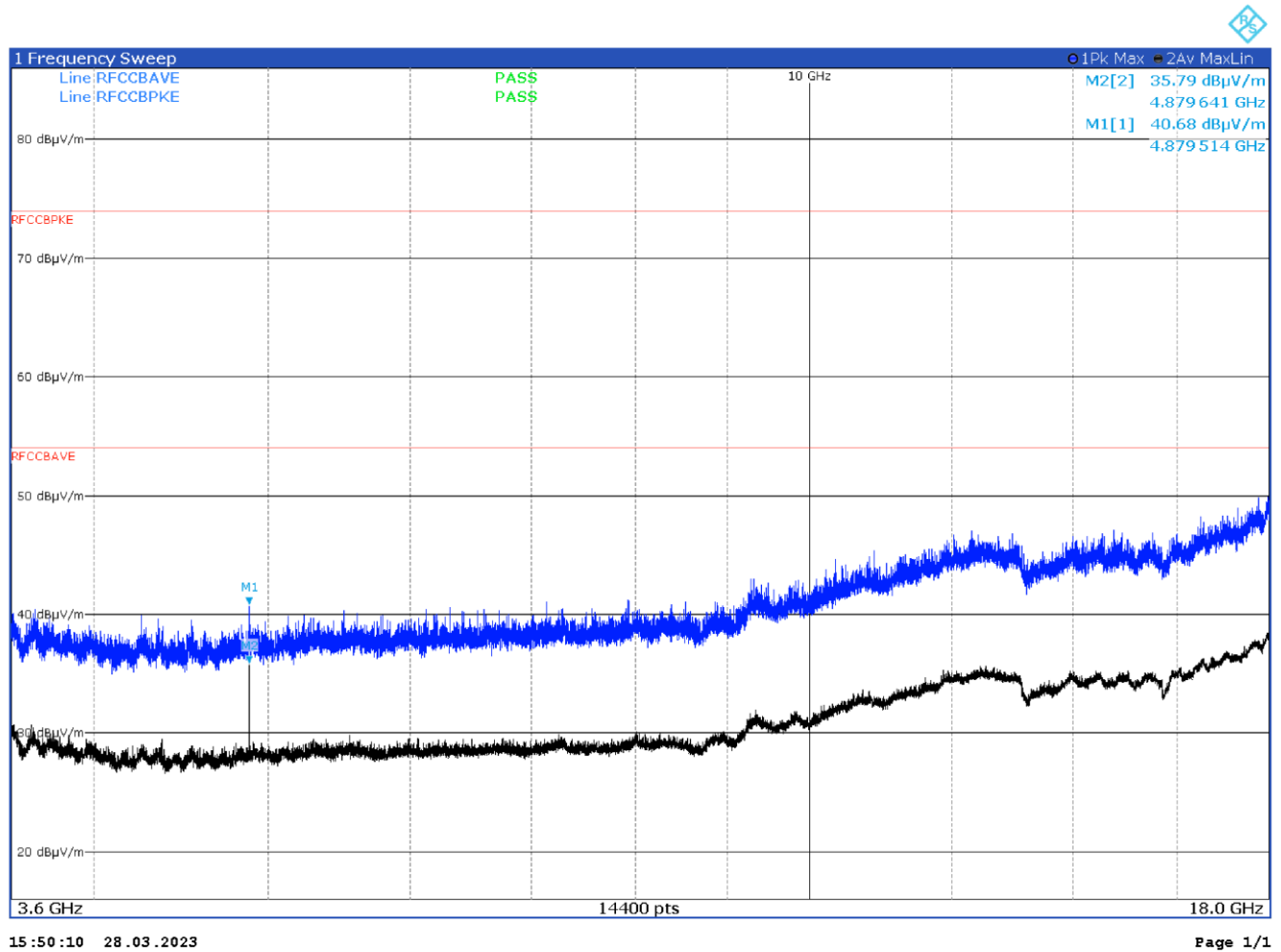


Figure 8.5-14: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in vertical polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

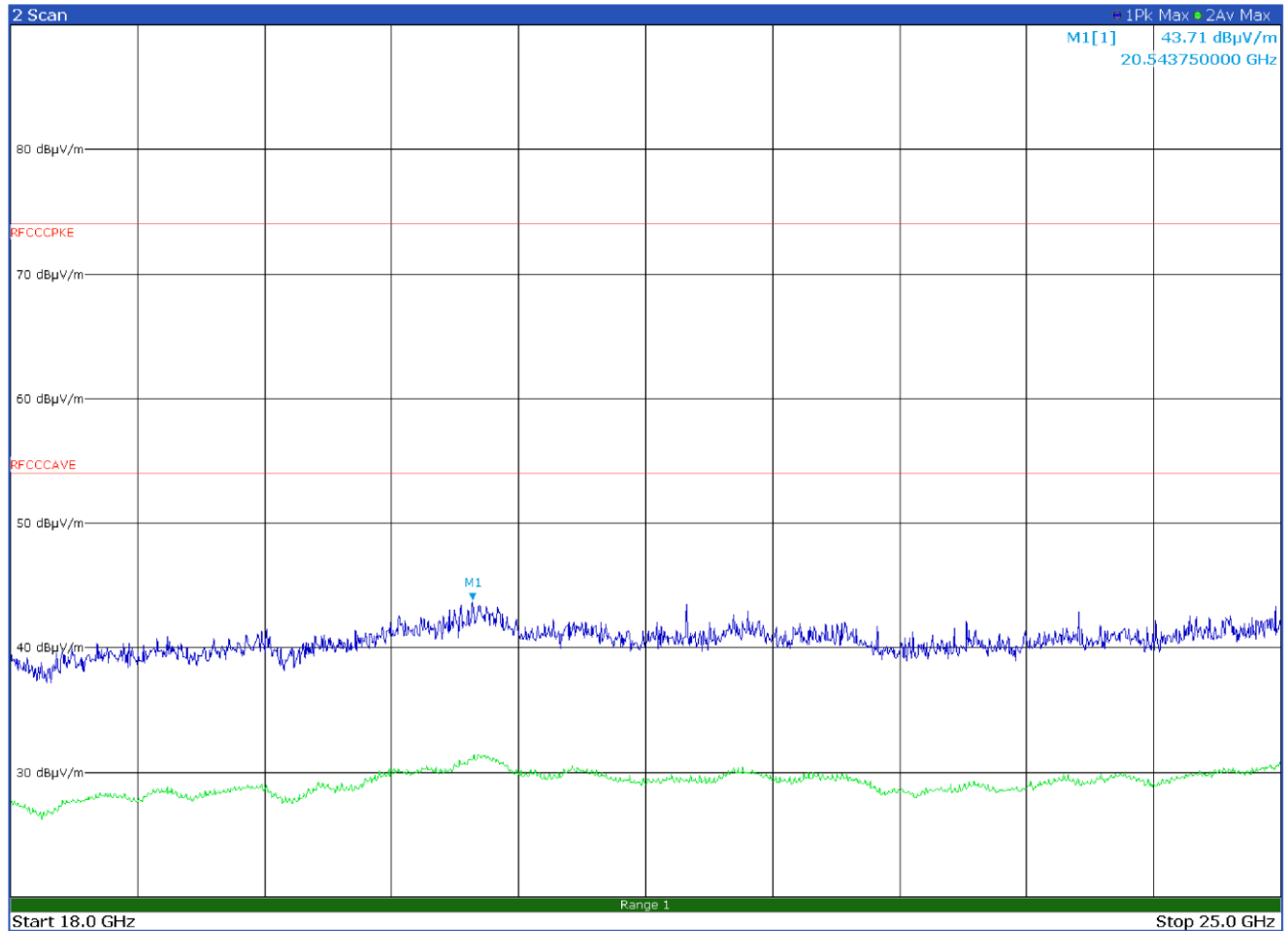


Figure 8.5-15: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in horizontal polarization, DM1

No spurious emissions found

Test data, continued

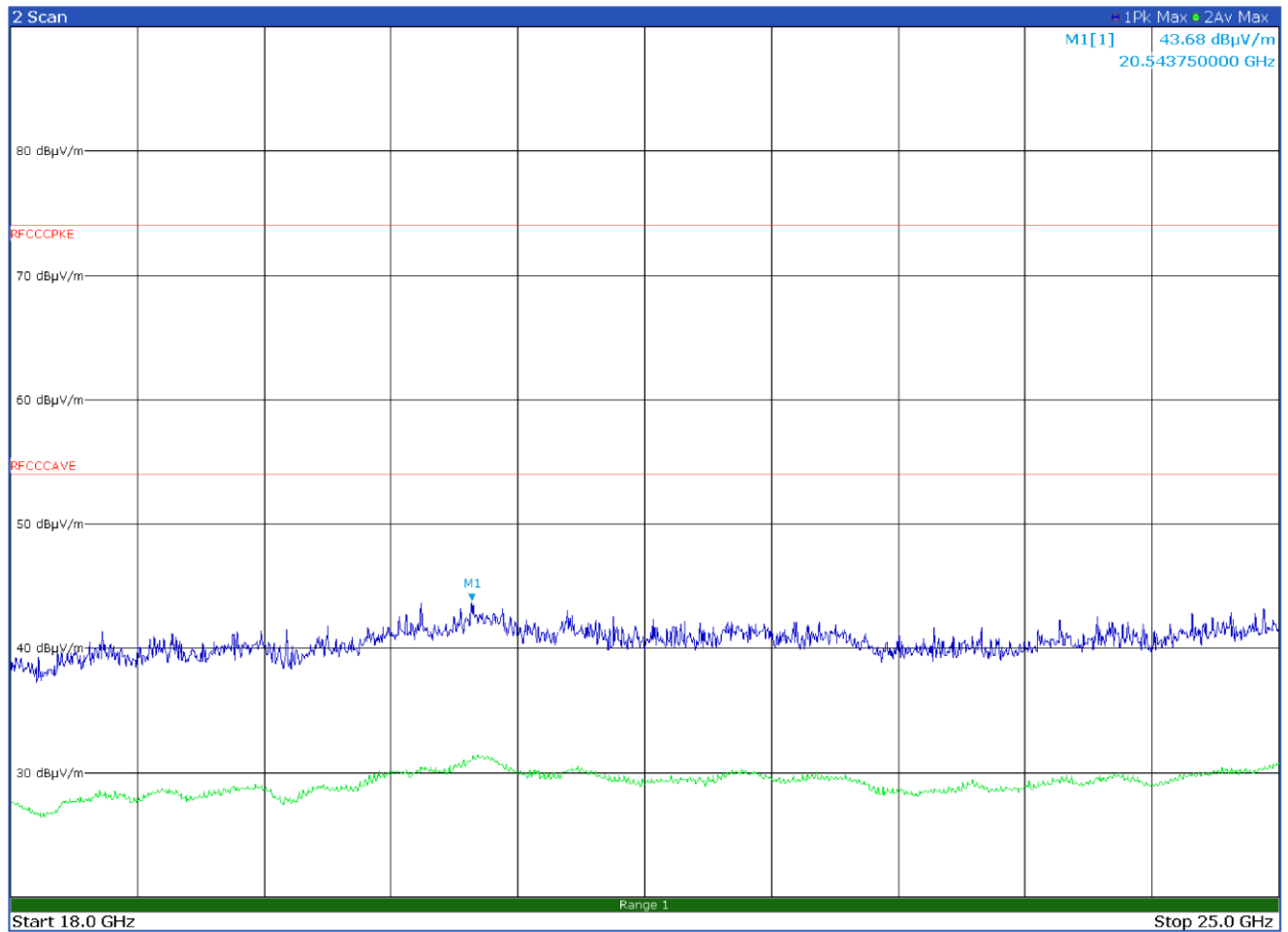


Figure 8.5-16: Radiated spurious emissions on mid channel with EUT in horizontal position - antenna in vertical polarization DM1

No spurious emissions found

Test data, continued

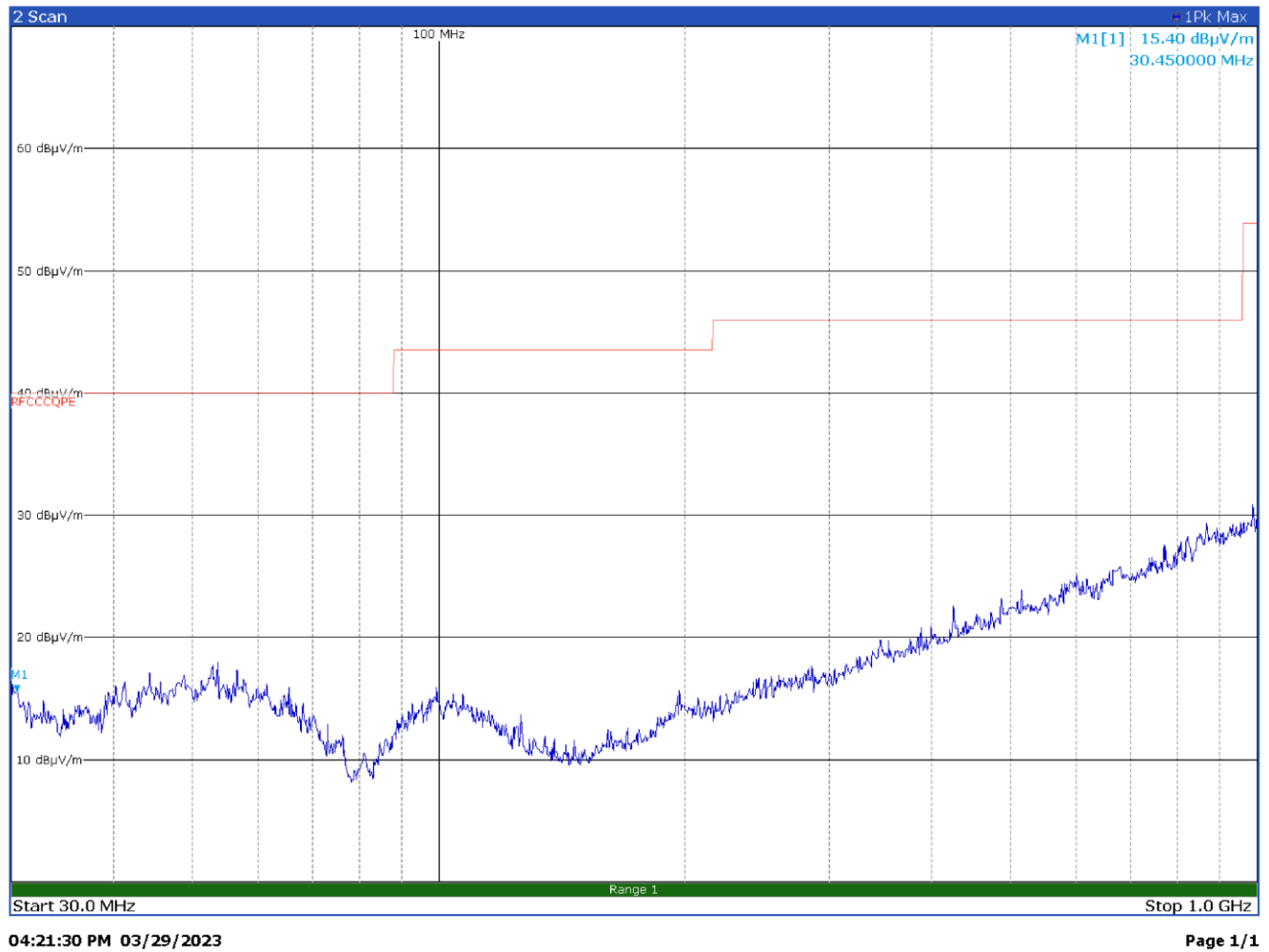


Figure 8.5-17: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in horizontal polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

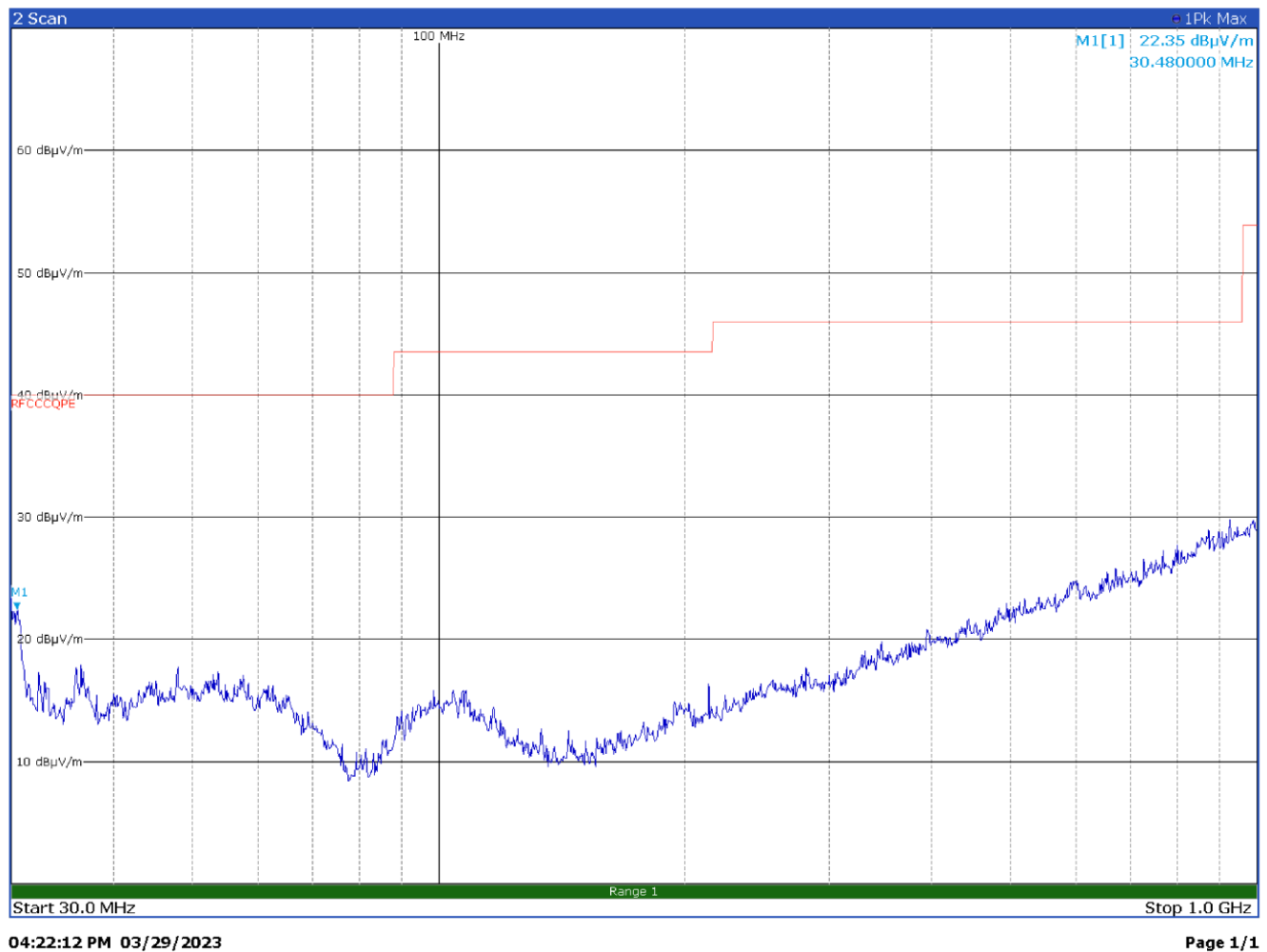
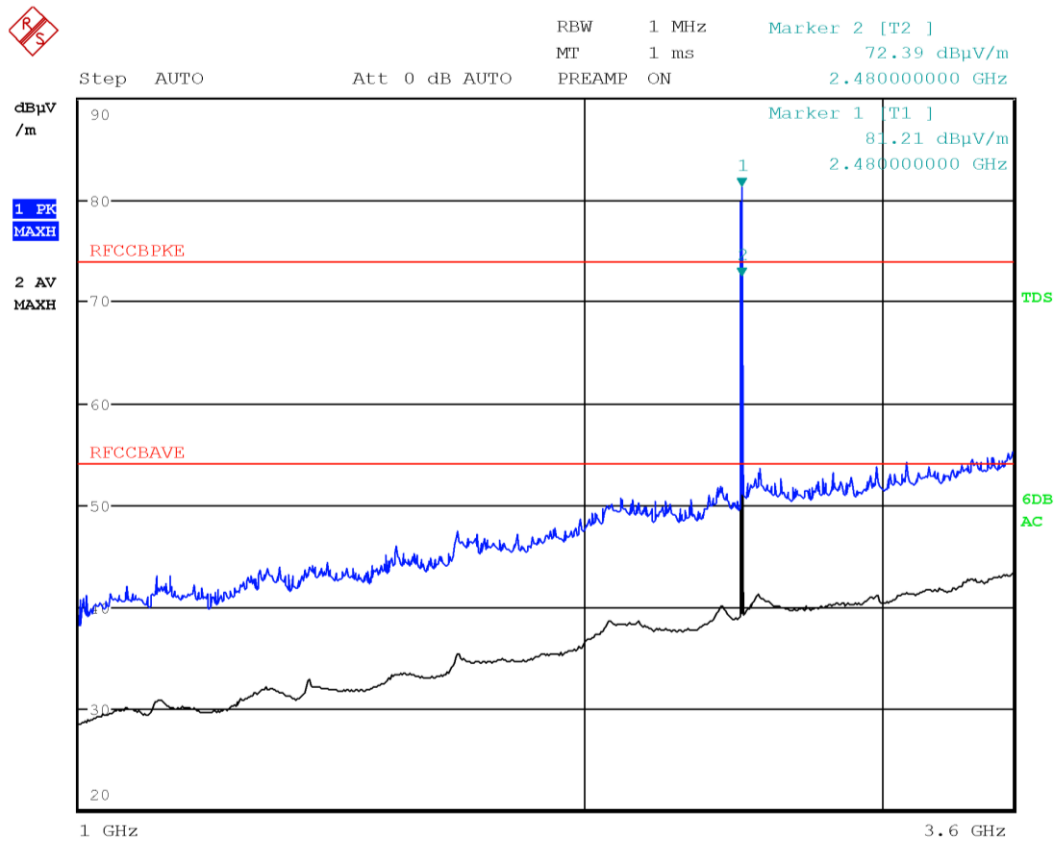


Figure 8.5-18: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in vertical polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

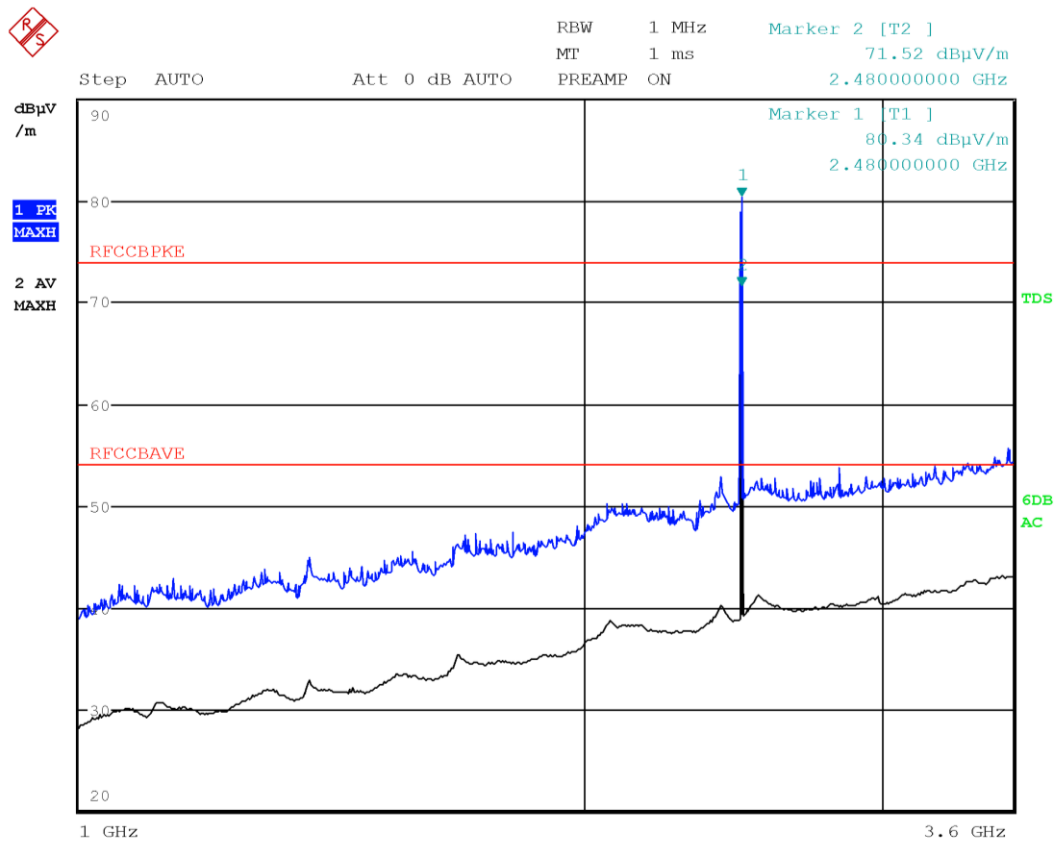


Date: 24.MAR.2023 16:59:31

Figure 8.5-19: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in horizontal polarization DM1

Limit exceeded by the carrier

Test data, continued



Date: 24.MAR.2023 17:00:22

Figure 8.5-20: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in vertical polarization DM1

Limit exceeded by the carrier

Test data, continued

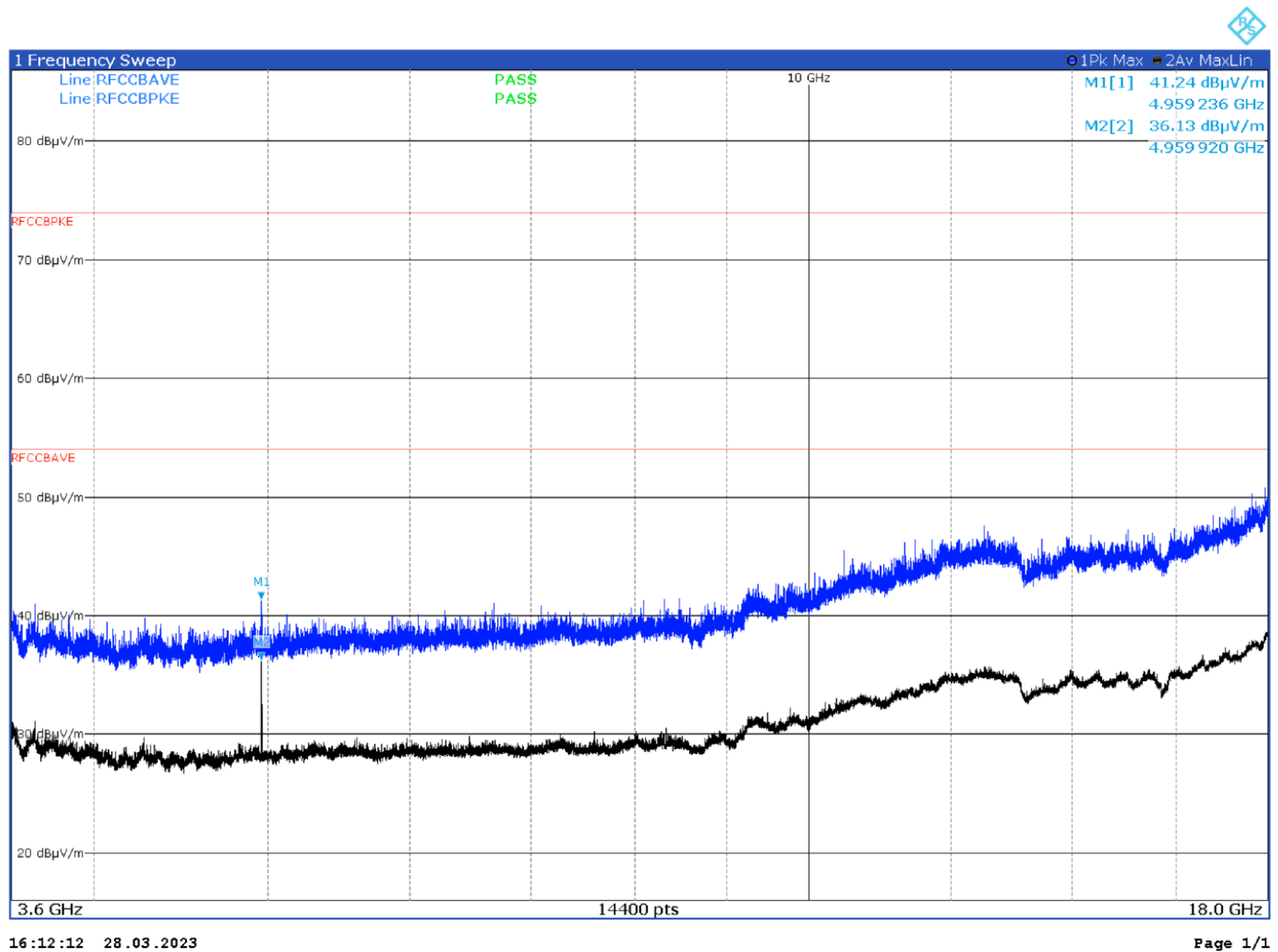


Figure 8.5-21: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in horizontal polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

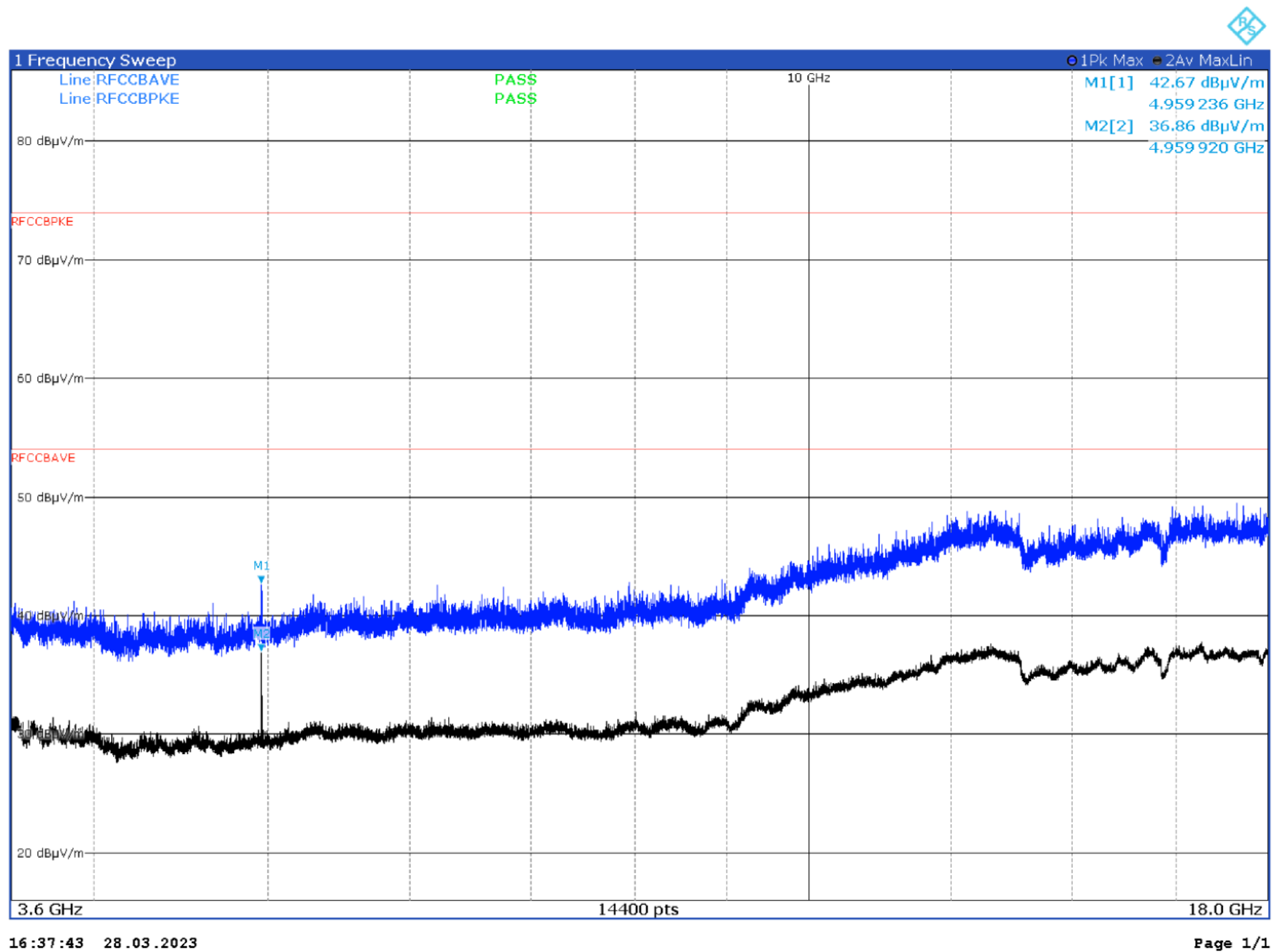


Figure 8.5-22: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in vertical polarization DM1

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

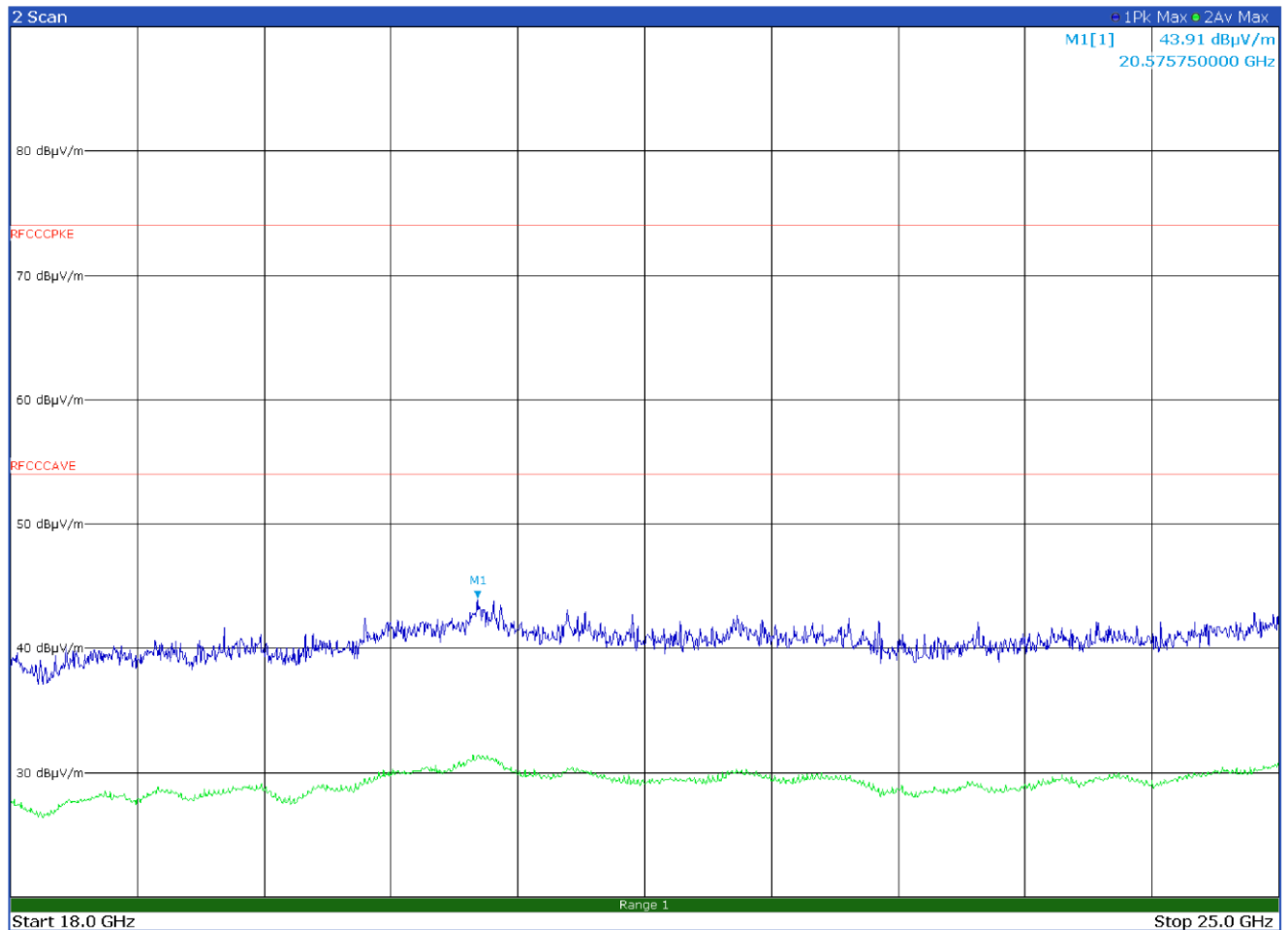


Figure 8.5-23: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in horizontal polarization DM1

No spurious emissions found

Test data, continued

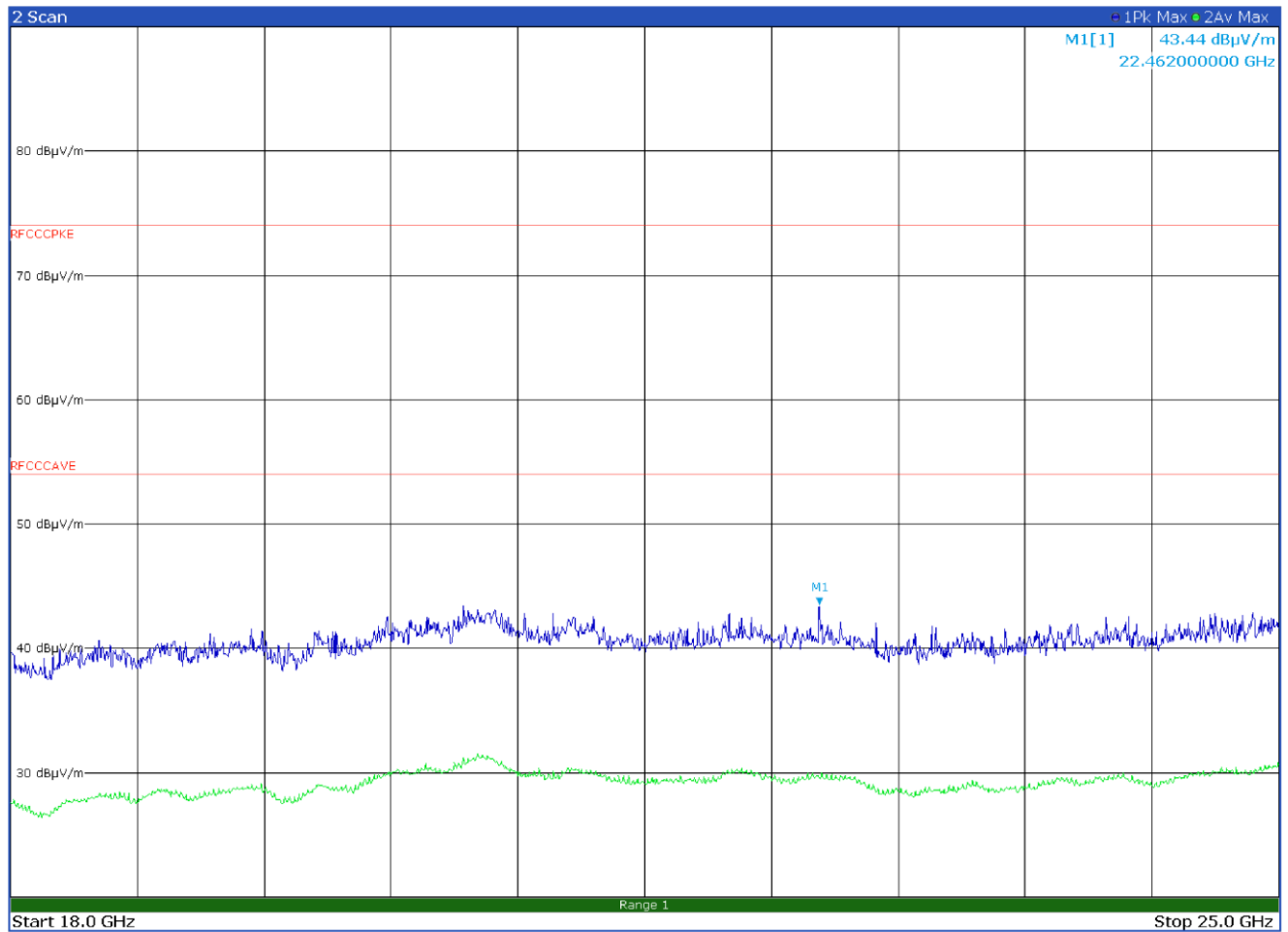


Figure 8.5-24: Radiated spurious emissions on high channel with EUT in horizontal position - antenna in vertical polarization DM1

No spurious emissions found

Test data, continued

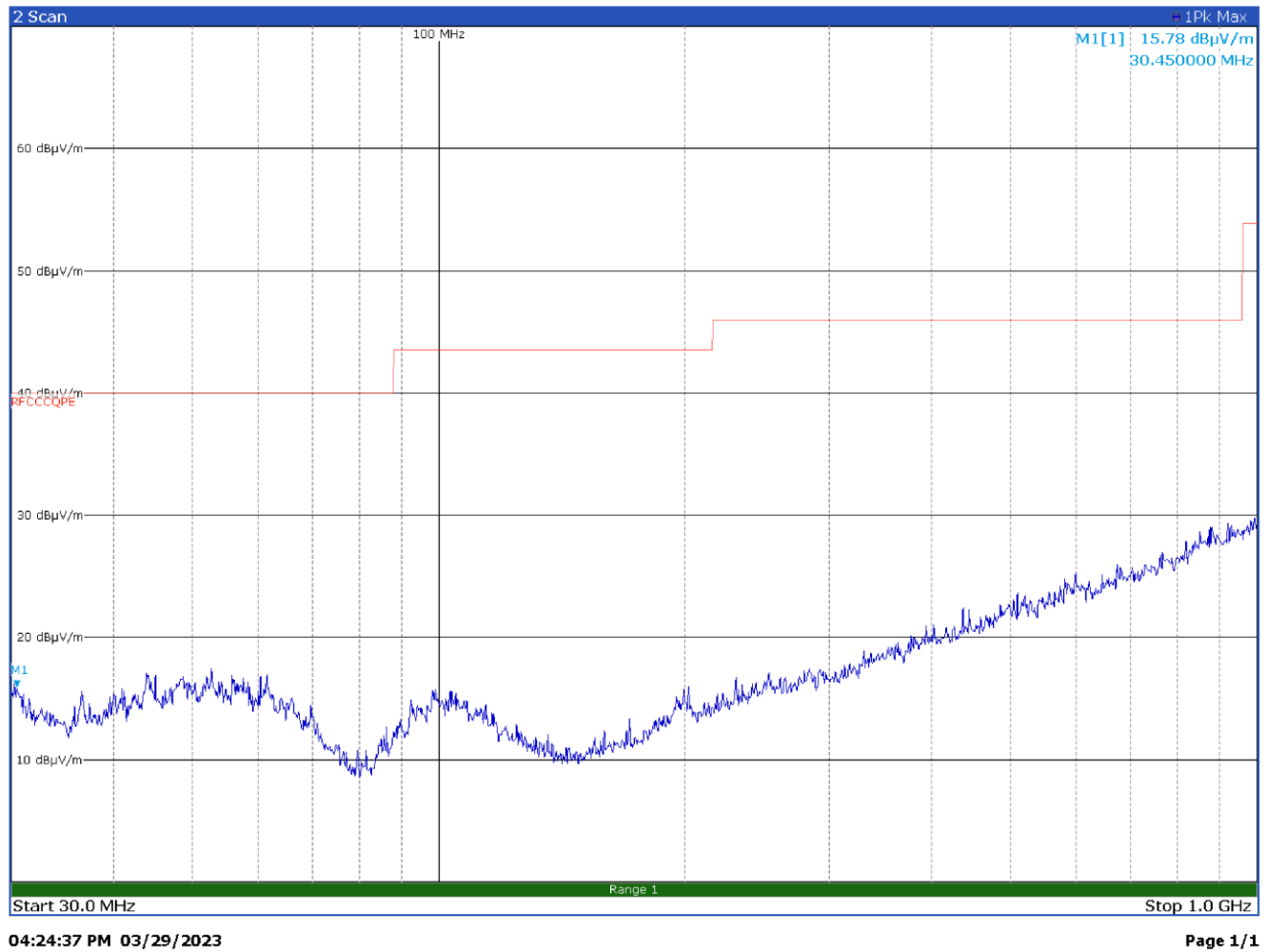


Figure 8.5-25: Radiated spurious emissions on low channel with EUT in vertical position - antenna in horizontal polarization 8dpsk

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

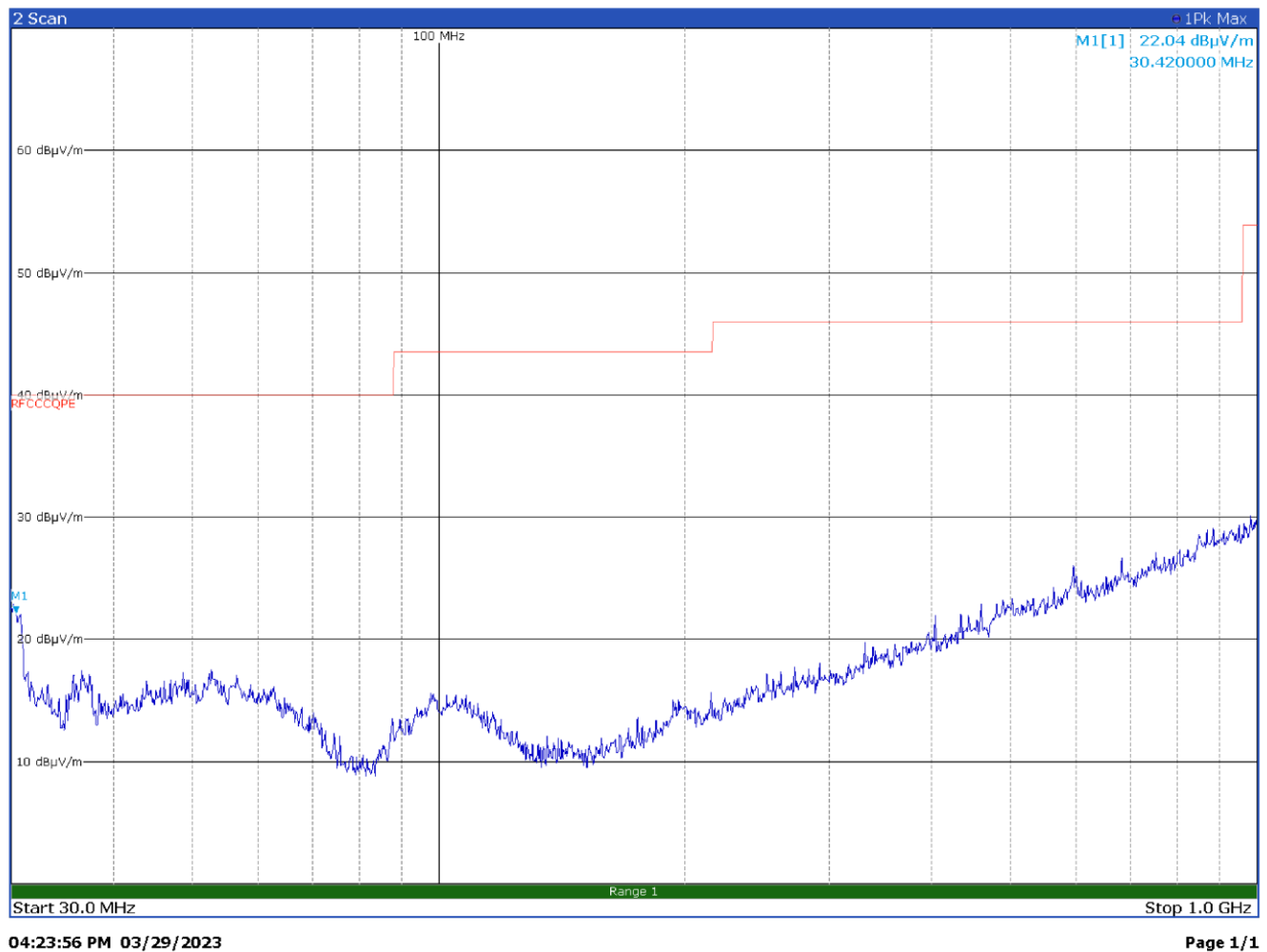
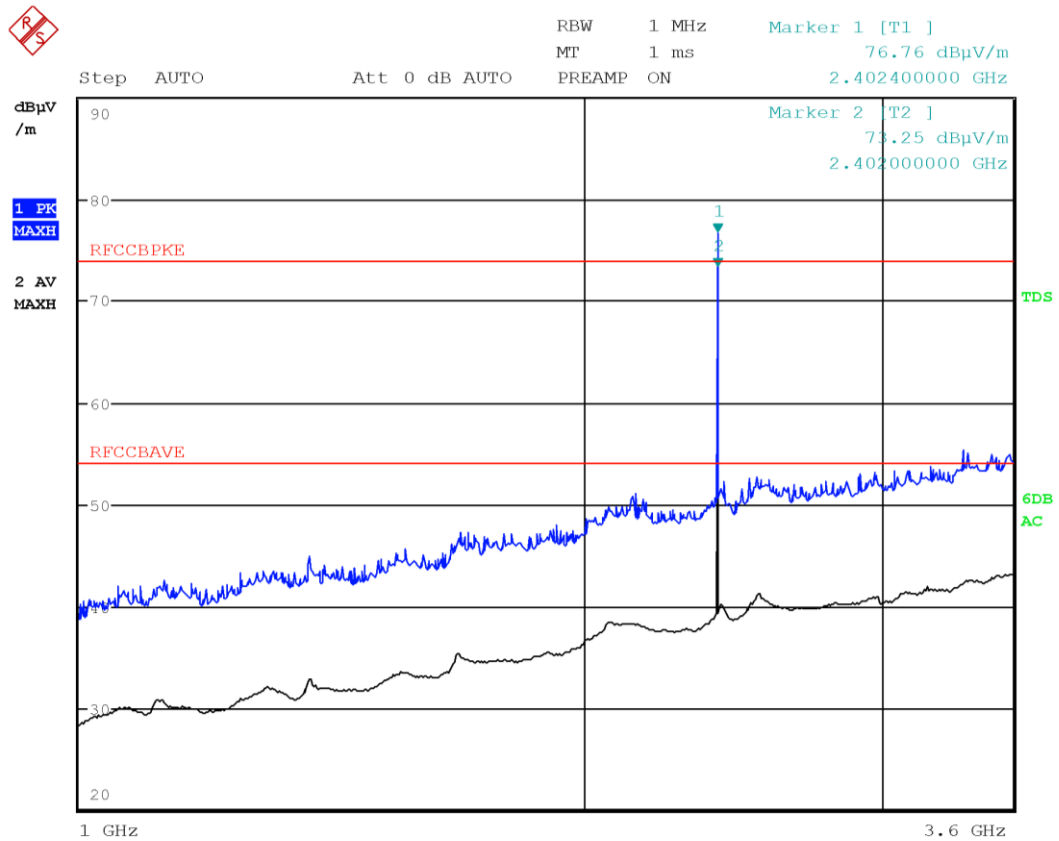


Figure 8.5-26: Radiated spurious emissions on low channel with EUT in vertical position - antenna in vertical polarization 8dpsk

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

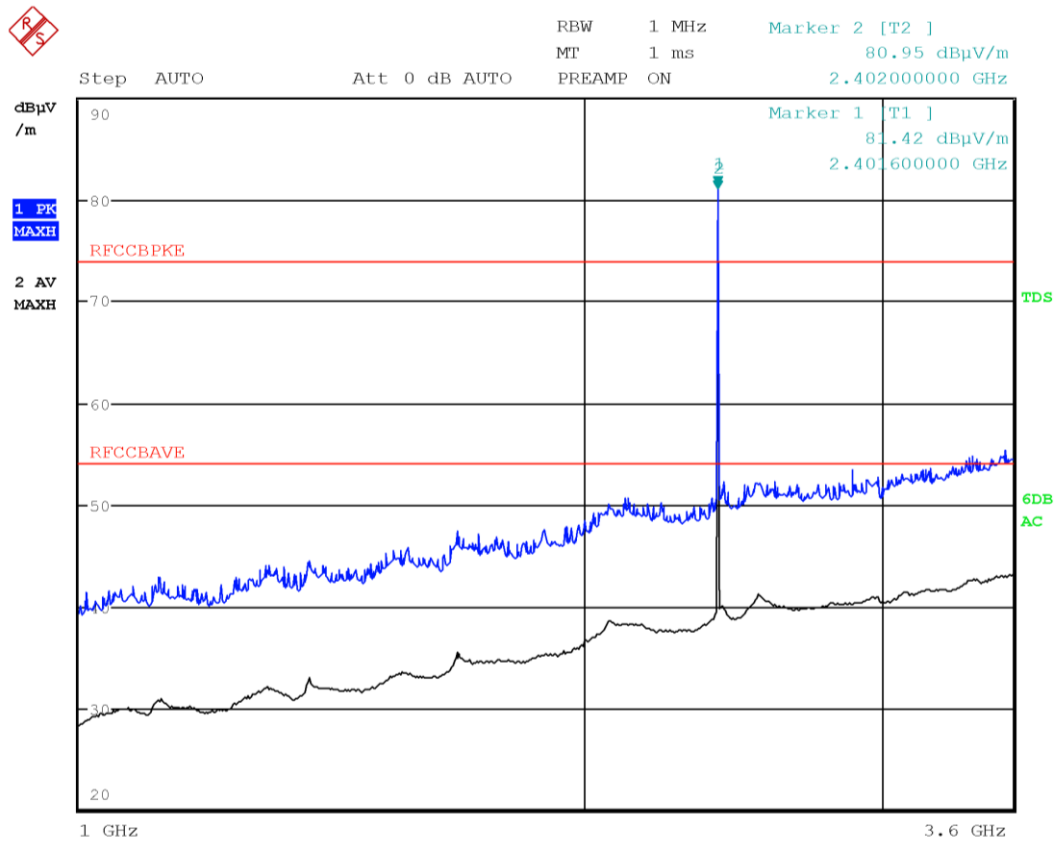


Date: 24.MAR.2023 17:08:00

Figure 8.5-27: Radiated spurious emissions on low channel with EUT in vertical position - antenna in horizontal polarization 8dpsk

Limit exceeded by the carrier

Test data, continued



Date: 24.MAR.2023 17:04:21

Figure 8.5-28: Radiated spurious emissions on low channel with EUT in vertical position - antenna in vertical polarization 8dpsk

Limit exceeded by the carrier

Test data, continued

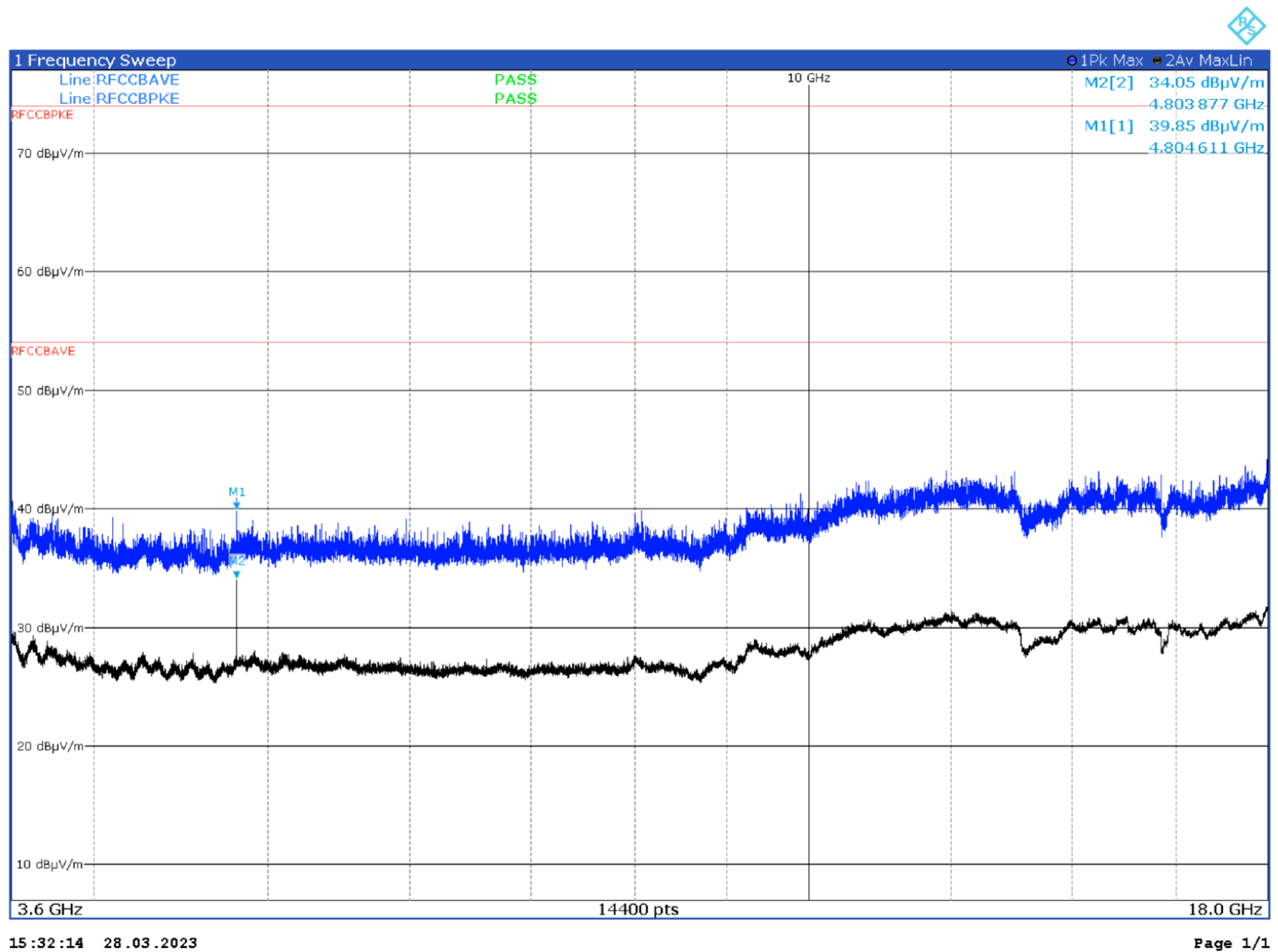


Figure 8.5-29: Radiated spurious emissions on low channel with EUT in vertical position - antenna in horizontal polarization 8dpsk

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
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Test data, continued

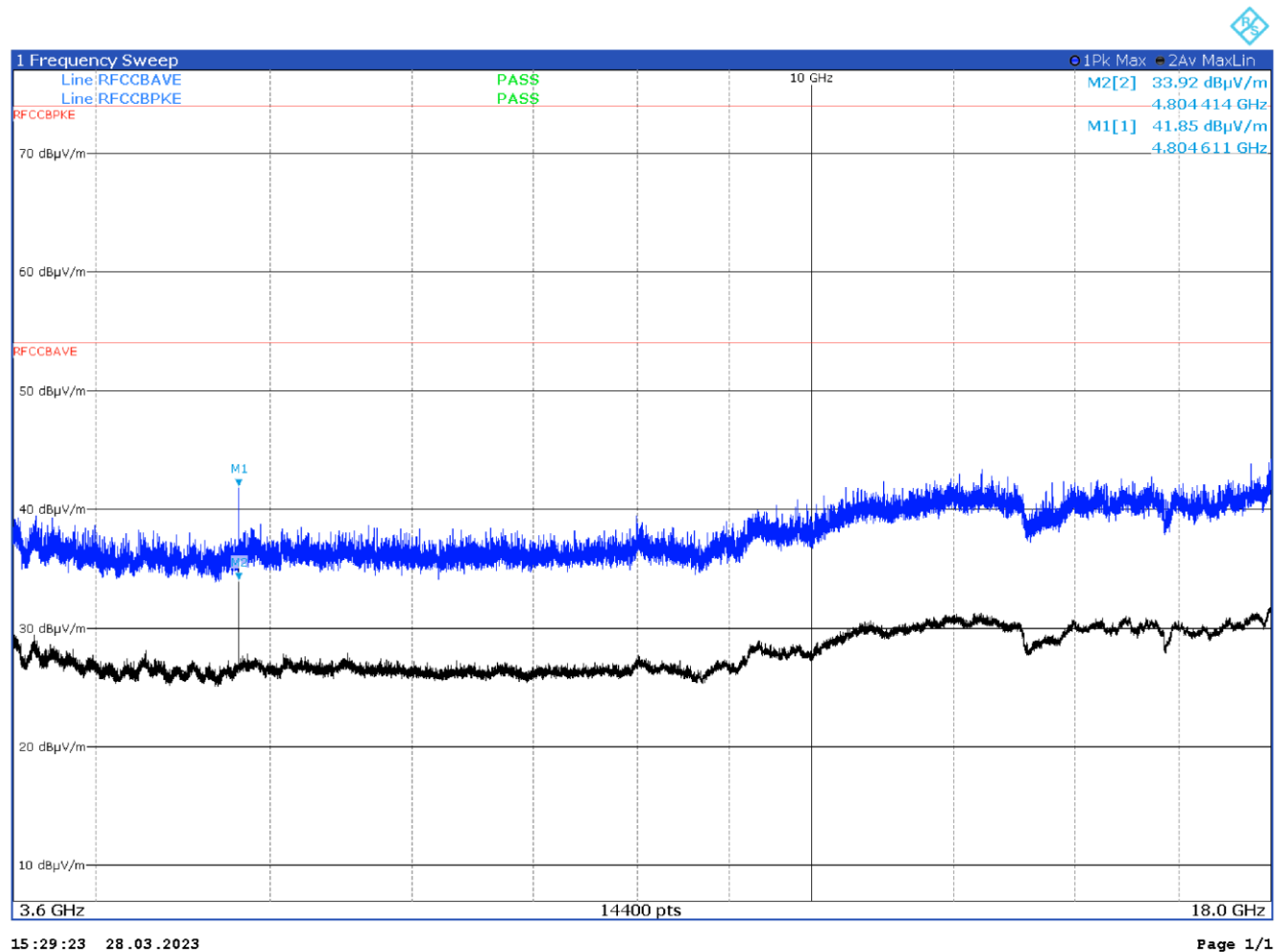


Figure 8.5-30: Radiated spurious emissions on low channel with EUT in vertical position - antenna in vertical polarization 8dpsk

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
--	--	--	--	--

Test data, continued

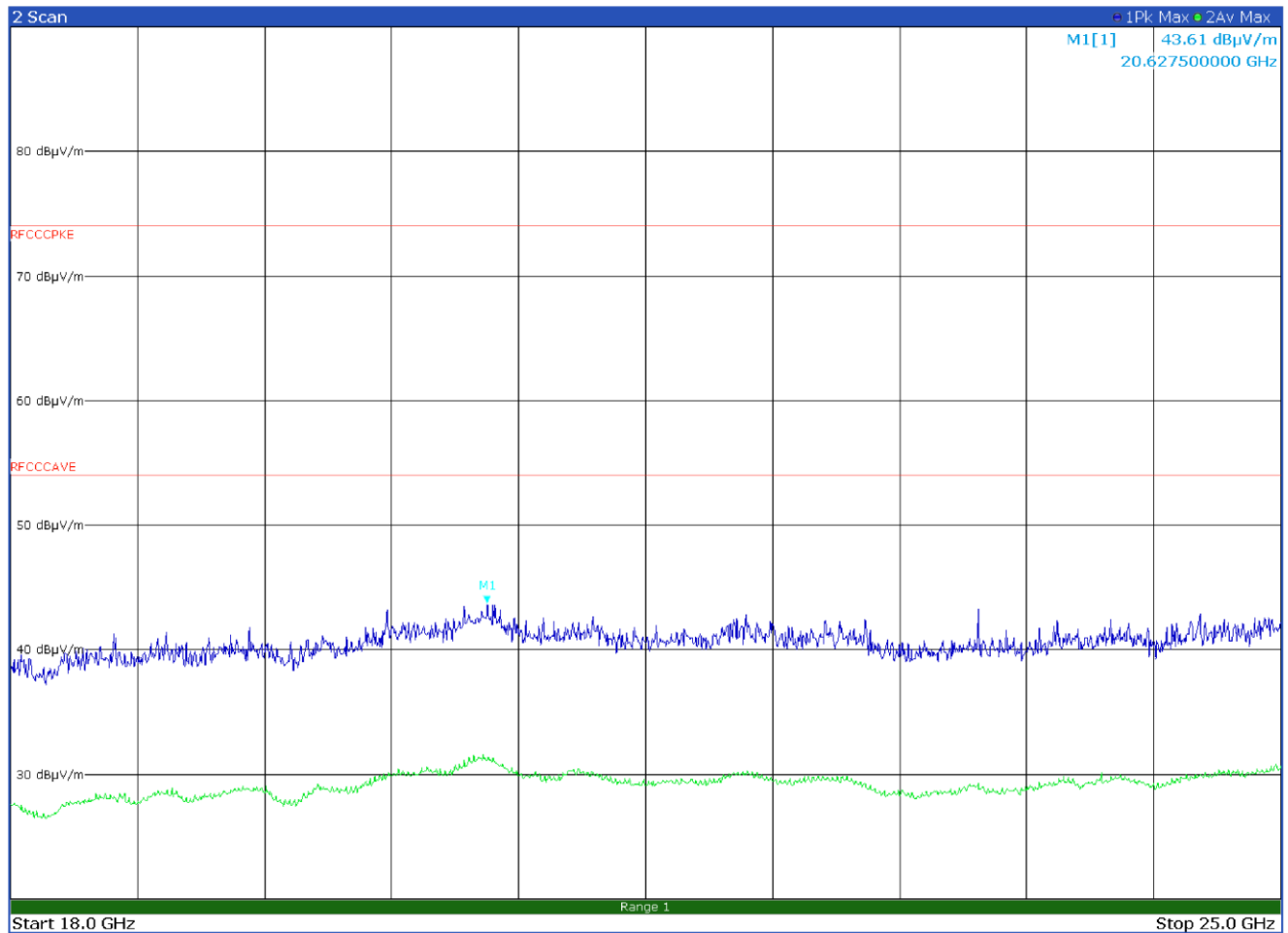


Figure 8.5-31: Radiated spurious emissions on low channel with EUT in vertical position - antenna in horizontal polarization 8dpsk

No spurious emissions found

Test data, continued

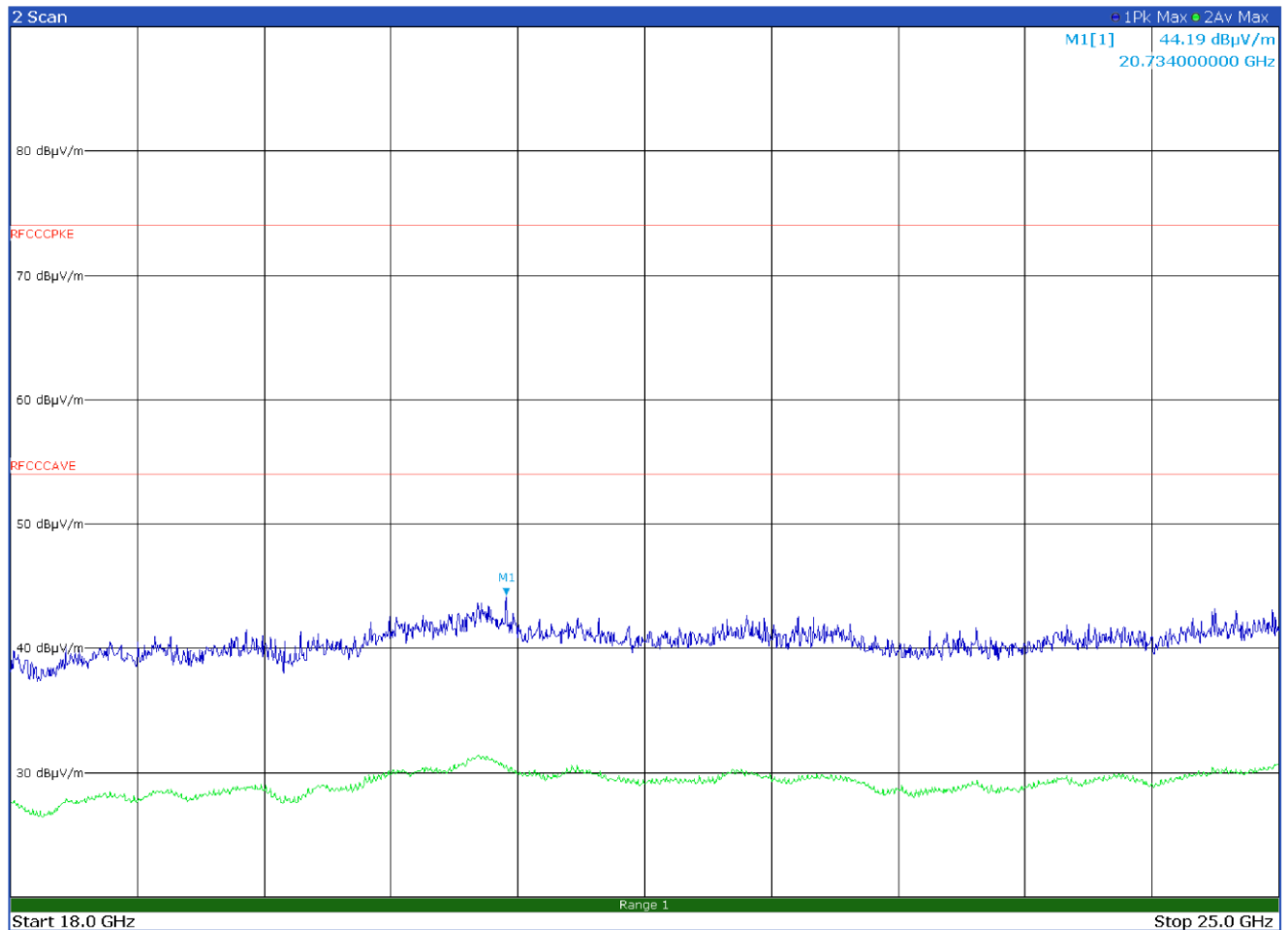


Figure 8.5-32: Radiated spurious emissions on low channel with EUT in vertical position - antenna in vertical polarization 8dpsk

No spurious emissions found

Test data, continued

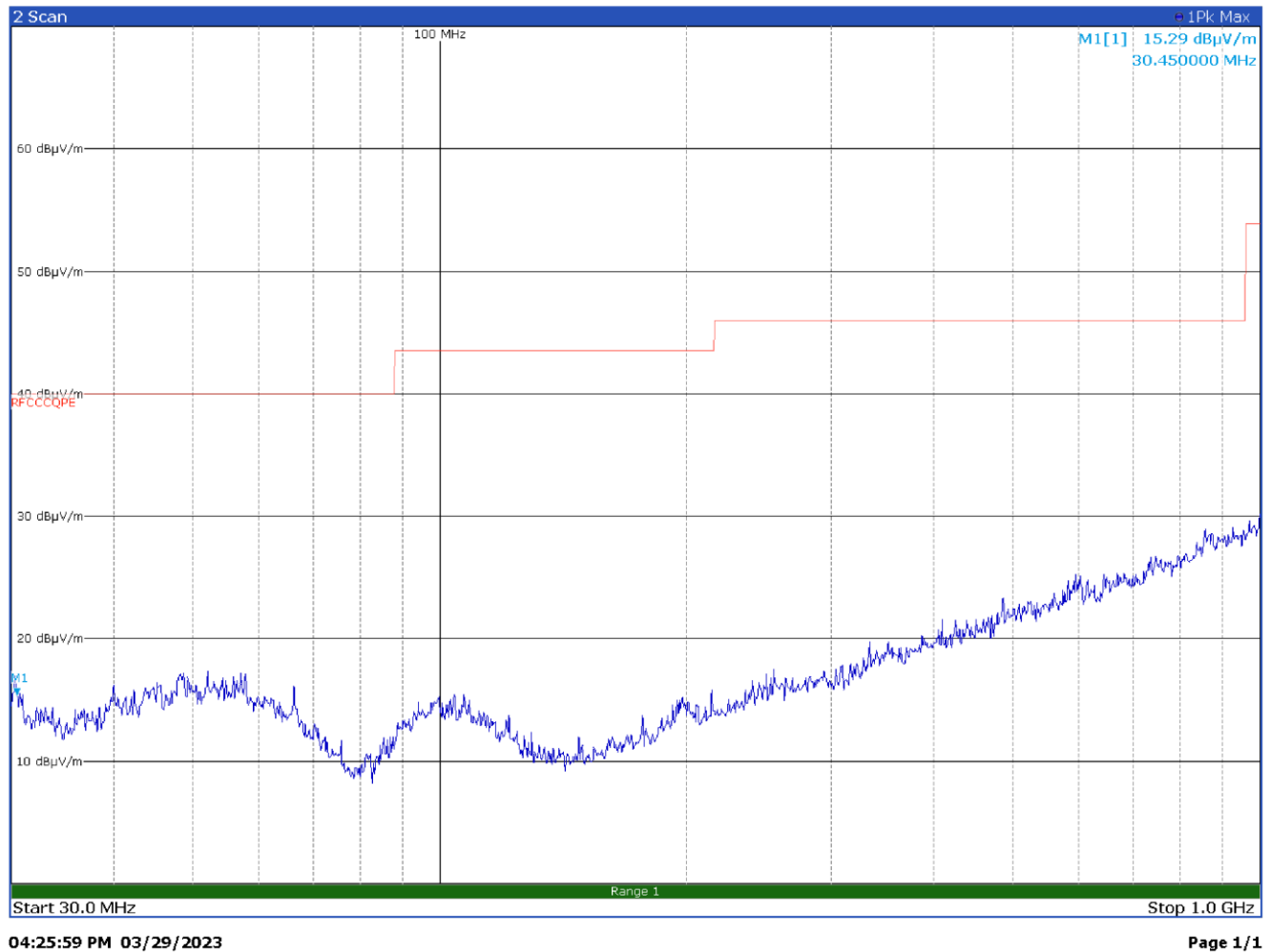


Figure 8.5-33: Radiated spurious emissions on mid channel with EUT in vertical position - antenna in horizontal polarization 8dpsk

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
--	--	--	--	--