ONE WORLD o OUR APPROVAL

Wireless test report – 397261-2TRFWL

Applicant:

Eurotech SpA

Product name:

Dynagate 10-06

Model:

Dygate-10-06-35

Model variant:

Dygate-10-06-34

FCC ID:

UKMMRG1012

IC Registration number:

21442-MRG1012

Specifications:

- FCC 47 CFR Part 15 Subpart C, §15.407

  Operation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz

- RSS-247, Issue 2, Feb 2017, Section 5

  Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs)
  and Licence-Exempt Local Area Network (LE-LAN) Devices
  5) Standard specifications for frequency hopping systems and digital transmission systems operating in the bands 902–928 MHz, 2400–2483.5 MHz and 5725–5850 MHz

Date of issue: June 05, 2020

Tested by (name, function and signature)	D. Guarnone	(project handler)	Signature:
Reviewed by (name, function and signature)	R. Giampaglia	(verifier)	Signature:

Test location

Company name	Nemko Spa
Address	Via del Carroccio, 4
City	Biassono
Province	MB
Postal code	20853
Country	Italy
Telephone	+39 039 220 12 01
Facsimile	+39 039 220 12 21
Website	www.nemko.com
Site number	FCC: 682159; IC: 9109A (10 m semi anechoic chamber)

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Spa ISO/IEC 17025 accreditation.

Copyright notification

Table of contents

Section 1. Report summary

1.1 Applicant and manufacturer

Company name	TechSigno S.r.l. Unipersonale
Address	Via dei Boschi, 2/13 33040 Pradamano UD - Italy

1.2 Test specifications

FCC 47 CFR Part 15, Subpart E, Clause 15.407 RSS-247, Issue 2, February 2017	Unlicensed National Information Infrastructure Devises Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

1.3 Test methods

789033 D02 General UNII Test Procedures New Rules v02r01 (Dec 14, 2017)	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
ANSI C63.10 v2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Exclusions

None

1.6 Test report revision history

Revision #	Date of issue	Details of changes made to test report
397261-2TRFWL	June 05, 2020	Original report issued

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C, general requirements test results

Part	Test description	Verdict
§15.31(e)	Variation of power source	Pass[1]
§15.31(m)	Number of tested frequencies	Pass
§15.203	Antenna requirement	Pass[2]

Notes: [1]Measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, was performed with the supply voltage varied between 85 % and 115 % of the nominal rated supply voltage. No noticeable output power variation was observed

[2]The Antennas uses a unique coupling to the intentional radiator.

2.2 FCC Part 15 Subpart E, test results

Part	Test description	Verdict
§15.403(i)	Emission bandwidth	Pass
§15.407(a)(1)	Power and density limits within 5.15–5.25 GHz band	Pass
§15.407(a)(2)	Power and density limits within 5.25–5.35 GHz and 5.47–5.725 GHz bands	Pass
§15.407(a)(3)	Power and density limits within 5.725–5.85 GHz band	Pass
§15.407(b)(1)	Undesirable emission limits for 5.15–5.25 GHz band	Pass
§15.407(b)(2)	Undesirable emission limits for 5.25–5.35 GHz band	Pass
§15.407(b)(3)	Undesirable emission limits for 5.47–5.725 GHz bands	Pass
§15.407(b)(4)	Undesirable emission limits for 5.725–5.85 GHz band	Pass
§15.407(b)(6)	Conducted limits for U-NII devices using an AC power line	Pass
§15.407(e)	Minimum 6 dB bandwidth of U-NII devices within the 5.725-5.85 GHz band	Not applicable
§15.407(g)	Frequency stability	Not performed
§15.407(h)(1)[1]	Transmit power control (TPC)	Not performed
§15.407(h)(2)[1]	Dynamic Frequency Selection (DFS)	Not performed

Note: [1]DFS and TPC requirements are only applicable to 5.25–5.35 GHz and 5.47–5.725 GHz bands

2.3 IC RSS-Gen, Issue 5, Mar 2019, Amendment 1, test results

Part	Test description	Verdict
6.6	Occupied Bandwidth	Pass
6.9	Operating bands and selection of test frequencies	Pass
7.1.2[1]	Receiver radiated emission limits	Not applicable
7.1.3[1]	Receiver conducted emission limits	Not applicable
8.8	Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus	Pass
8.11[2]	Frequency stability	Not performed

Notes: [1]According to sections 5.2 and 5.3 of RSS-Gen, Issue 5, Amendment 1: if EUT does not have a stand-alone receiver neither scanner receiver, then it exempt from receiver requirements.

[2]According to section 8.11 of RSS-Gen, Issue 5, Amendment 1: if the frequency stability of the licence-exempt radio apparatus is not specified in the applicable standard (RSS), measurement of the frequency stability is not required

2.4 IC RSS-247, Issue 1, test results

Section	Test description	Verdict
6.1[1]	Types of Modulation	Pass
6.2.1.1	Power limits for 5150–5250 MHz band	Pass
6.2.2.1	Power limits for 5250–5350 MHz band	Pass
6.2.3.1	Power limits for 5470–5600 MHz and 5650–5725 MHz bands	Pass
6.2.4.1	Power limits for 5725–5850 MHz band	Pass
6.2.4.1	Minimum 6 dB bandwidth	Not performed
6.2.1.2	Unwanted emission limits for 5150–5250 MHz band	Pass
6.2.2.2	Unwanted emission limits for 5250–5350 MHz band	Pass
6.2.2.2	TPC requirements for devices with a maximum e.i.r.p. greater than 500 mW	Not performed
6.2.2.3	e.i.r.p. at different elevations restrictions for 5250–5350 MHz band	Not performed
6.2.3.2	Unwanted emission limits for 5470–5600 MHz and 5650–5725 MHz bands	Pass
6.2.4.2	Unwanted emission limits for 5725–5850 MHz band	Pass
6.3	Dynamic Frequency Selection (DFS) for devices operating in the bands 5250–5350 MHz, 5470–5600 MHz and 5650–5725 MHz	Not performed

Notes: [1] The EUT employs digital modulation: 802.11a/n

2.5 Sample information

Receipt date	May 18, 2020
Nemko sample ID number	397261 sample 1/12 and sample 1/1

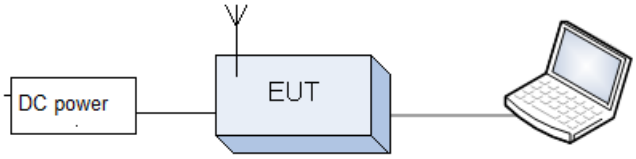
2.6 EUT information

Product name	Dynagate 10-06
Model	Dygate 10-06-35
Model variant	Dygate 10-06-34
Serial number	H120CRA0003, H120CRA0005

2.7 Technical information

RSS number and Issue number	RSS-247 Issue 2, Section 6, February 2017
Frequency band	5150–5250 MHz, 5.725–5.85 GHz, 5.25-5.35 GHz and 5.470-5.725 GHz
Frequency Min (MHz)	5180
Frequency Max (MHz)	5850
RF power Max (W), Conducted	0.03 W (15.2 dBm for 5300 MHz
Measured BW (MHz) (26 dB)	22.2 MHz
Measured BW (MHz) (99%)	17.5 MHz
Type of modulation	802.11a/n
Emission classification (F1D, G1D, D1D)	17M9W7D
Transmitter spurious, Units @ distance	43.1 dBµV/m @ 3 m (@ 201.960 MHz)
Power requirements	24 $V_{DC,}$ via 120 V_{AC} adapter or battery
Antenna information	The EUT uses a unique antenna coupling

2.8 EUT setup diagram



2.9 Product description and theory of operation

The DynaGATE 10-06 is a Multi-service IoT Edge Gateway, designed to deliver LTE connectivity with 2G/3G fallback to automotive and lightly rugged applications.
It is based on the NXP i.MX 6UltraLite Cortex-A7 processor family, with 512MB of RAM, 4GB of eMMC, and a user-accessible MicroSD and dual Micro-SIM slots.
The DynaGATE 10-06 offers the following wired connectivity capabilities: 2x Fast Ethernet, 2x CAN bus, 2x USB 2.0 for maintenance, 1x Ignition Key Input (surge protected), 1x Isolated Digital Input, 1x Isolated
Digital Output, 1x Isolated Odometer Input, 1x Isolated Forward Input; it also includes the following serial ports (not isolated, surge protected): 1x RS-485, 1x RS-232.
It also offers a wide range of wireless connectivity capabilities1: it can integrate an internal LTE Cat 1 modem (2G/3G fallback) with dual Micro-SIM support, 802.11 b/g/n Wi-Fi, and Bluetooth 4.2 BLE; and internal 72-channel GNSS provides precise geolocation capabilities.
A rechargeable internal 2000 mA/h battery provides uninterrupted operation for up to 5 minutes in case of power failure and permits a safe shutdown.

2.10 EUT sub assemblies

Table 2.10-1: *EUT sub assemblies*

Description	Brand name	Model/Part number	Serial number

2.11 EUT exercise details

EUT was set to continuously transmit mode during tests, by test software provided by client.
The EUT runs a Linux operating system which allows for the testing to be performed using engineering test tools and scripts. Communication with the EUT is via a serial console or Ethernet connection which provides a Linux command line interface for execution of the test tools/scripts. These tools/scripts configure the radio modules to enable continuous transmission with the ability to adjust modulation, frequency and output power as required.

Section 3. Engineering considerations

3.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

3.2 Technical judgment

The EUT has two WIFI standard and two channel bandwidths; 802.11a with 20 MHz bandwidth standard is chosen to be the representative worst-case due to higher output power.

3.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 4. Test conditions

4.1 Atmospheric conditions

In the laboratory, the following ambient conditions are respected for each test reported below:

Temperature	18 – 33 °C
Relative humidity	25 – 70 %
Air pressure	860 – 1060 mbar

The following instruments are used to monitor the environmental conditions:

Equipment	Manufacturer	Model no.	Asset no.	Cal date	Next cal.
Thermo-hygrometer data loggers	Testo	175-H2	20012380/305	2019-01	2021-01
Thermo-hygrometer data loggers	Testo	175-H2	38203337/703	2019-01	2021-01
Barometer	Castle	GPB 3300	072015	2019-12	2020-12

4.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 5. Measurement uncertainty

5.1 Uncertainty of measurement

The measurement uncertainty was calculated for each test and quantity listed in this test report, according to CISPR 16-4-2 and other specific test standard and is documented in Nemko Spa working manual WML1002.

The assessment of conformity for each test performed on the equipment is performed not taking into account the measurement uncertainty. The two following possible verdicts are stated in the report:

P (Pass) - The measured values of the equipment respect the specification limit at the points tested. The specific risk of false accept is up to 50% when the measured result is close to the limit.

F (Fail) - One or more measured values of the equipment do not respect the specification limit at the points tested. The specific risk of false reject is up to 50% when the measured result is close to the limit.

Hereafter Nemko's measurement uncertainties are reported:

EUT	Type	Test	Range	Measurement Uncertainty	Notes
Transmitter	Conducted	Frequency error	0.001 MHz ÷ 40 GHz	0.08 ppm	(1)
		Carrier power RF Output Power	0.009 MHz ÷ 30 MHz	1.1 dB	(1)
			30 MHz ÷ 18 GHz	1.5 dB	(1)
			18 MHz ÷ 40 GHz	3.0 dB	(1)
			40 MHz ÷ 140 GHz	5.0 dB	(1)
		Adjacent channel power	1 MHz ÷ 18 GHz	1.4 dB	(1)
		Conducted spurious emissions	0.009 MHz ÷ 18 GHz	3.0 dB	(1)
			18 GHz ÷ 40 GHz	4.2 dB	(1)
			40 GHz ÷ 220 GHz	6.0 dB	(1)
		Intermodulation attenuation	1 MHz ÷ 18 GHz	2.2 dB	(1)
		Attack time – frequency behaviour	1 MHz ÷ 18 GHz	2.0 ms	(1)
		Attack time – power behaviour	1 MHz ÷ 18 GHz	2.5 ms	(1)
		Release time – frequency behaviour	1 MHz ÷ 18 GHz	2.0 ms	(1)
		Release time – power behaviour	1 MHz ÷ 18 GHz	2.5 ms	(1)
		Transient behaviour of the transmitter– Transient frequency behaviour	1 MHz ÷ 18 GHz	0.2 kHz	(1)
		Transient behaviour of the transmitter – Power level slope	1 MHz ÷ 18 GHz	9%	(1)
		Frequency deviation - Maximum permissible frequency deviation	0.001 MHz ÷ 18 GHz	1.3%	(1)
		Frequency deviation - Response of the transmitter to modulation frequencies above 3 kHz	0.001 MHz ÷ 18 GHz	0.5 dB	(1)
		Dwell time	-	3%	(1)
		Hopping Frequency Separation	0.01 MHz ÷ 18 GHz	1%	(1)
		Occupied Channel Bandwidth	0.01 MHz ÷ 18 GHz	2%	(1)
		Modulation Bandwidth	0.01 MHz ÷ 18 GHz	2%	(1)
	Radiated	Radiated spurious emissions	0.009 MHz ÷ 26.5 GHz	6.0 dB	(1)
			26.5 GHz ÷ 66 GHz	8.0 dB	(1)
			66 GHz ÷ 220 GHz	10 dB	(1)
		Effective radiated power transmitter	10 kHz ÷ 26.5 GHz	6.0 dB	(1)
			26.5 GHz ÷ 66 GHz	8.0 dB	(1)
			66 GHz ÷ 220 GHz	10 dB	(1)

EUT	Type	Test	Range	Measurement Uncertainty	Notes
Receiver	Radiated	Radiated spurious emissions	0.009 MHz ÷ 26.5 GHz	6.0 dB	(1)
			26.5 GHz ÷ 66 GHz	8.0 dB	(1)
			66 GHz ÷ 220 GHz	10 dB	(1)
		Sensitivity measurement	1 MHz ÷ 18 GHz	6.0 dB	(1)
	Conducted	Conducted spurious emissions	0.009 MHz ÷ 18 GHz	3.0 dB	(1)
			18 GHz ÷ 40 GHz	4.2 dB	(1)
			40 GHz ÷ 220 GHz	6.0 dB	(1)

NOTES:
(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 %

Section 6. Test equipment

6.1 Test equipment list

Table 6.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI receiver (20 Hz ÷ 8 GHz)	Rohde & Schwarz	ESU8	100202	2020-01	2021-01
EMI receiver (20 Hz ÷ 8 GHz)	Rohde & Schwarz	ESW44	101620	2019-08	2020-08
Trilog Antenna (30 MHz ÷ 7 GHz)	Schwarzbeck	VULB 9162	9162-025	2018-07	2021-07
Bilog antenna (1 ÷ 18 GHz)	Schwarzbeck	STLP 9148	9148-123	2018-07	2021-07
Preamplifier (1 ÷ 18 GHz)	Schwarzbeck	BBV 9718	9718-137	2019-09	2020-09
Horn antenna (18 ÷ 40 GHz)	A.H. System	SAS-574	558	2020-01	2023-01
Preamplifier (18 ÷ 40 GHz)	Miteq	JS44-18004000-35-8P-R	1.627	2019-09	2020-09
Controller	Maturo	FCU3.0	10041	NCR	NCR
Tilt antenna mast	Maturo	TAM4.0-E	10042	NCR	NCR
Turntable	Maturo	TT4.0-5T	2.527	NCR	NCR
Semi-anechoic chamber	Nemko	10m semi-anechoic chamber	530	2019-09	2021-09
Shielded room	Siemens	10m control room	1947	NCR	NCR
LISN three phase (9 kHz ÷30 MHz)	Rohde & Schwarz	ESH2-Z5	872 460/041	2019-09	2020-09
Shielded room	Siemens	Conducted emission test room	1862	NCR	NCR

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

Section 7. Testing data

7.1 FCC 15.403(i) Emission bandwidth

7.1.1 Definitions and limits

15.403(i) For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

7.1.2 Test summary

Test start date	

7.1.3 Observations, settings and special notes

Spectrum analyzer settings:

Resolution bandwidth	approximately 1% of EBW
Video bandwidth	> RBW
Detector mode	Peak
Trace mode	Max Hold

7.1.4 Test data

Table 7.1-1: *26 dB bandwidth results*

Modulation	Frequency, MHz	26 dB bandwidth, MHz
802.11a	5180	20.35
	5220	20.82
	5240	20.34

Modulation	Frequency, MHz	26 dB bandwidth, MHz
802.11a	5745	20.18
	5785	19.58
	5825	20.22

Modulation	Frequency, MHz	26 dB bandwidth, MHz
802.11a	5260	20.18
	5300	22.22
	5320	21.10

Modulation	Frequency, MHz	26 dB bandwidth, MHz
802.11a	5500	20.18
	5580	20.26
	5700	20.22

Table 7.1-2: *99% bandwidth results*

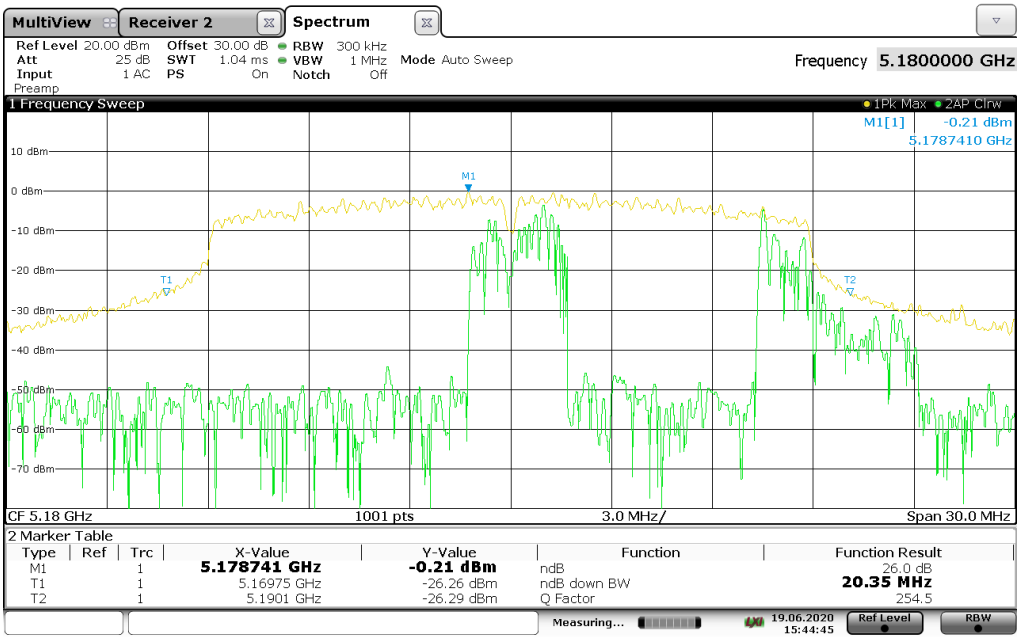
Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5180	17.52
	5220	17.52
	5240	17.48

Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5745	17.52
	5785	17.47
	5825	17.51

Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5260	17.53
	5300	17.85
	5320	17.85

Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5500	17.52
	5580	17.52
	5700	17.49

Test data, continued



15:44:46 19.06.2020

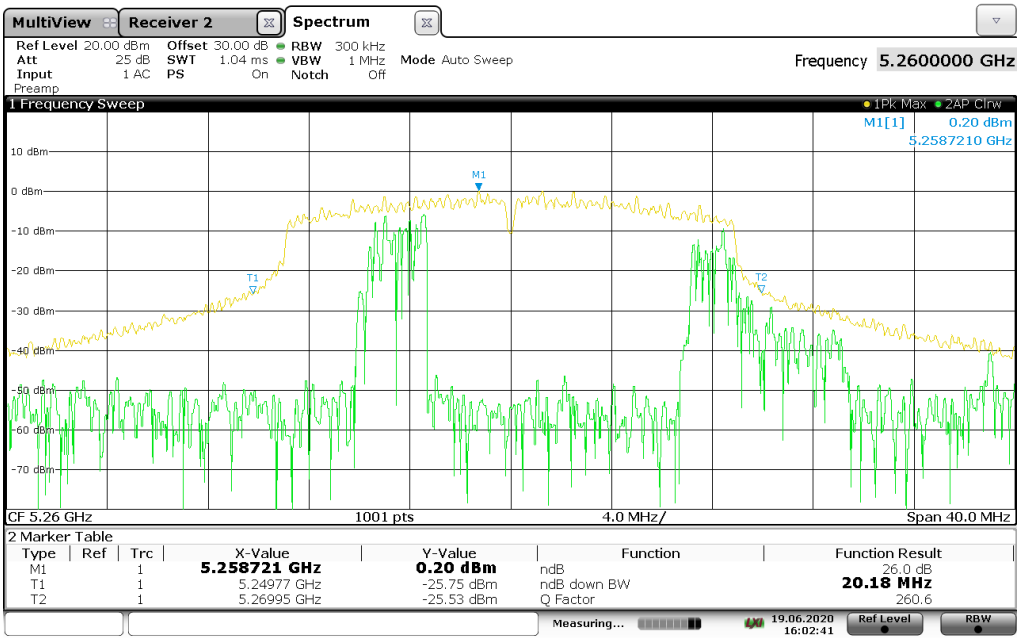
26 dB bandwidth on 802.11a, 5180 MHz

15:54:59 19.06.2020

: 26 dB bandwidth on 802.11a, 5220 MHz

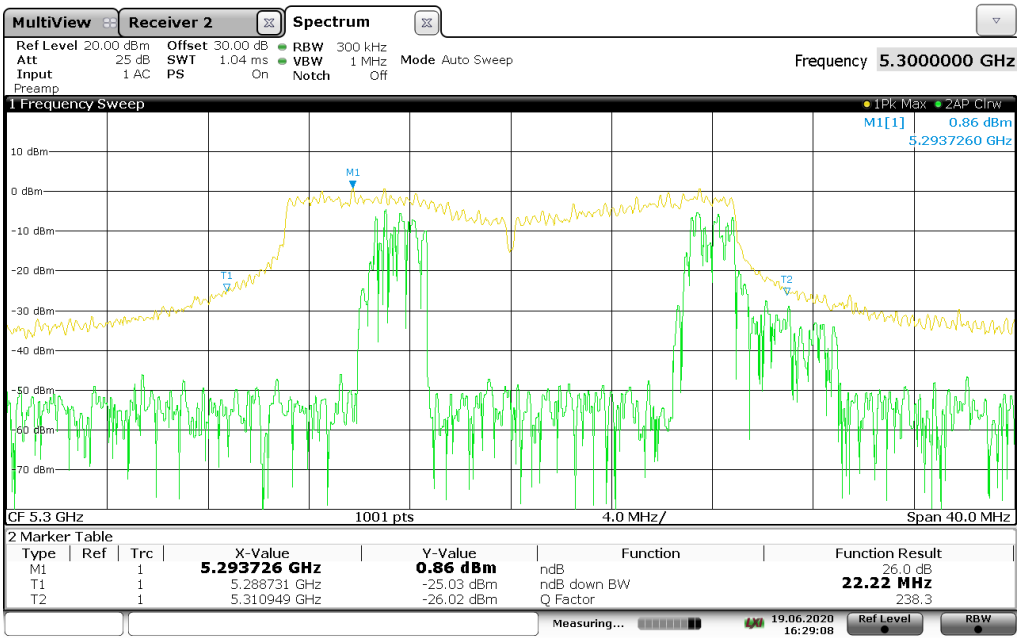
16:00:23 19.06.2020

: 26 dB bandwidth on 802.11a, 5240 MHz high channel



16:02:41 19.06.2020

26 dB bandwidth on 802.11a, 5260 MHz



16:29:08 19.06.2020

26 dB bandwidth on 802.11a, 5300MHz

16:30:34 19.06.2020

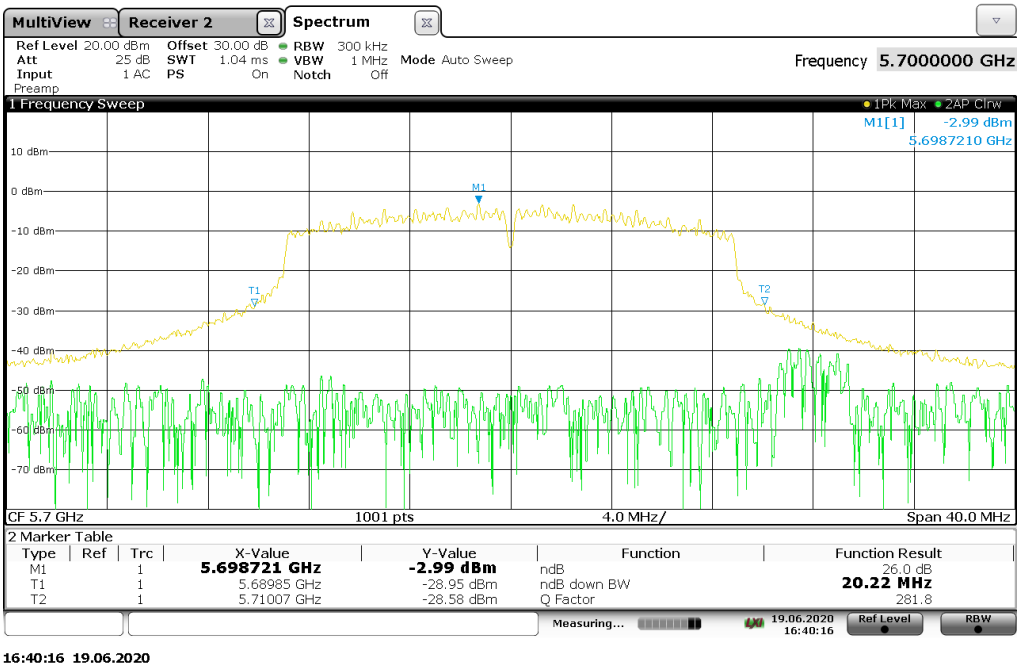
26 dB bandwidth on 802.11a, 5320MHz

16:35:29 19.06.2020

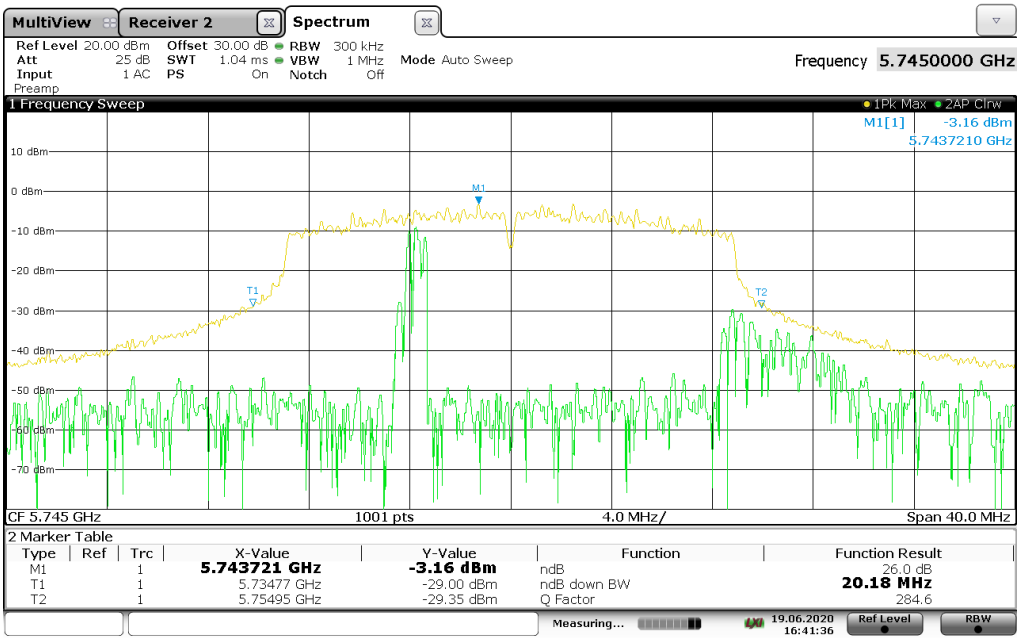
26 dB bandwidth on 802.11a, 5500MHz

16:37:47 19.06.2020

26 dB bandwidth on 802.11a, 5680MHz



26 dB bandwidth on 802.11a, 5700 MHz

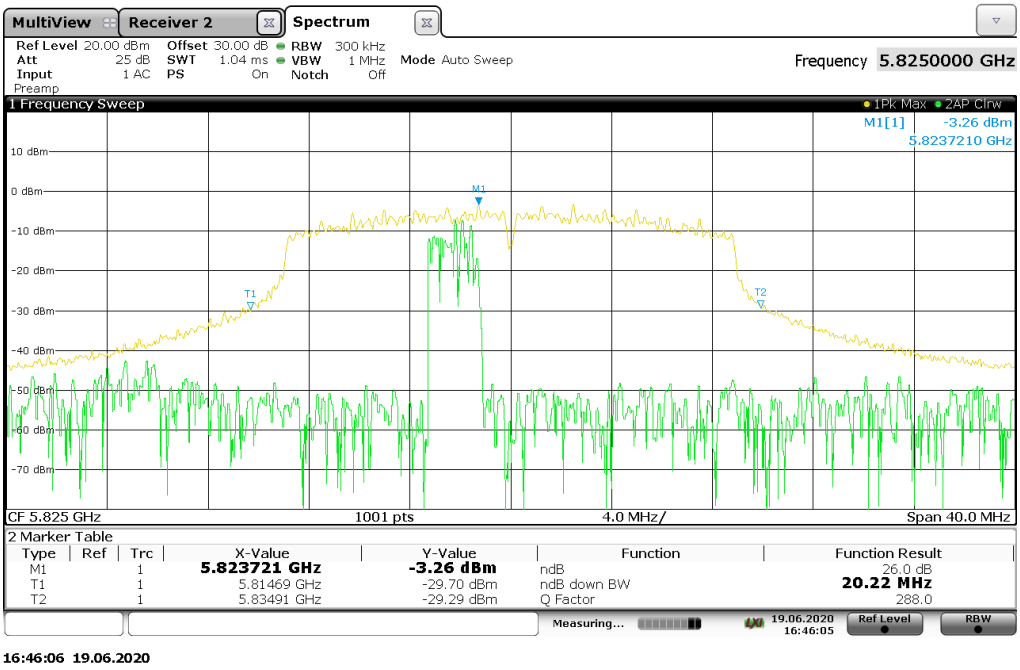


16:41:37 19.06.2020

26 dB bandwidth on 802.11a, 5745 MHz

16:44:53 19.06.2020

26 dB bandwidth on 802.11a, 5785MHz



26 dB bandwidth on 802.11a, 5825MHz

7.2 RSS-Gen 6.6 Occupied bandwidth

7.2.1 Definitions and limits

The emission bandwidth (×dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated × dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

7.2.2 Test summary

Test start date	

7.2.3 Observations, settings and special notes

Spectrum analyser settings:

Resolution bandwidth:	1 % to 5 % of OBW
Video bandwidth:	≥3 × RBW
Detector mode:	Peak
Trace mode:	Max Hold

7.2.4 Test data

Table 7.2-1: *99% bandwidth results*

Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5180	17.52
	5220	17.52
	5240	17.48

Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5745	17.52
	5785	17.47
	5825	17.51

Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5260	17.53
	5300	17.85
	5320	17.89

Modulation	Frequency, MHz	99% bandwidth, MHz
802.11a	5500	17.52
	5580	17.52
	5700	17.49

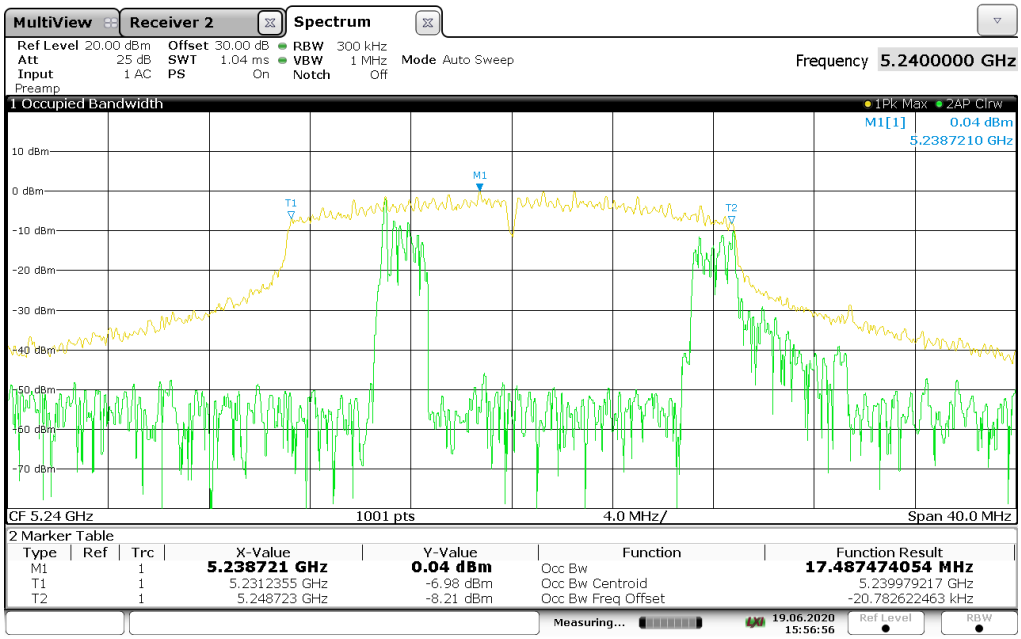
7.2.4 Test data, continued

15:41:01 19.06.2020

99 % bandwidth on 802.11a, 5180 MHz

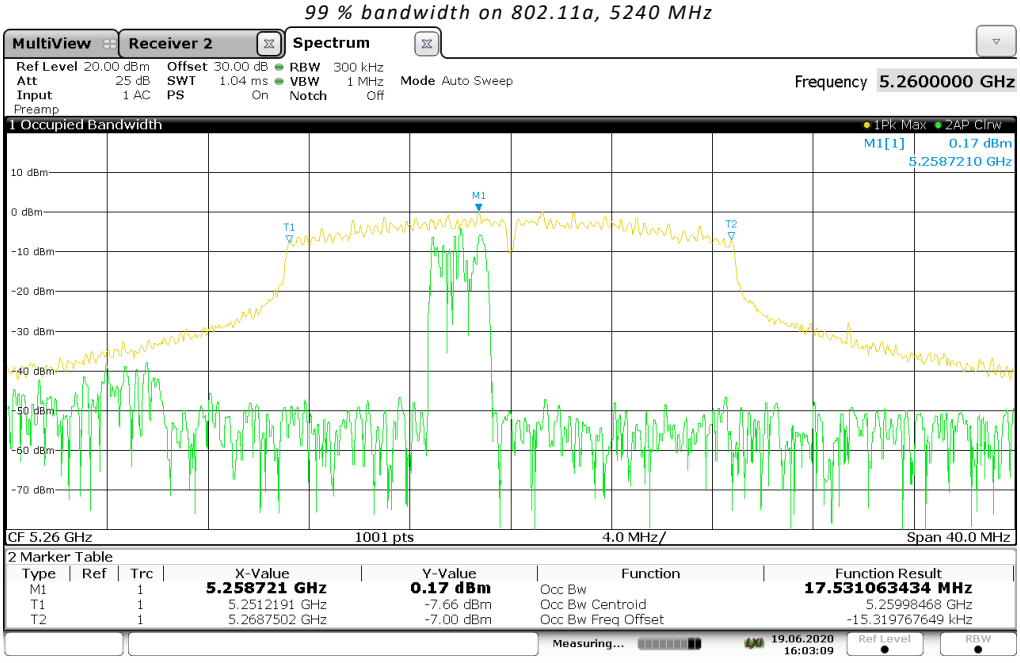
15:55:34 19.06.2020

99 % bandwidth on 802.11a, 5220 MHz



15:56:56 19.06.2020

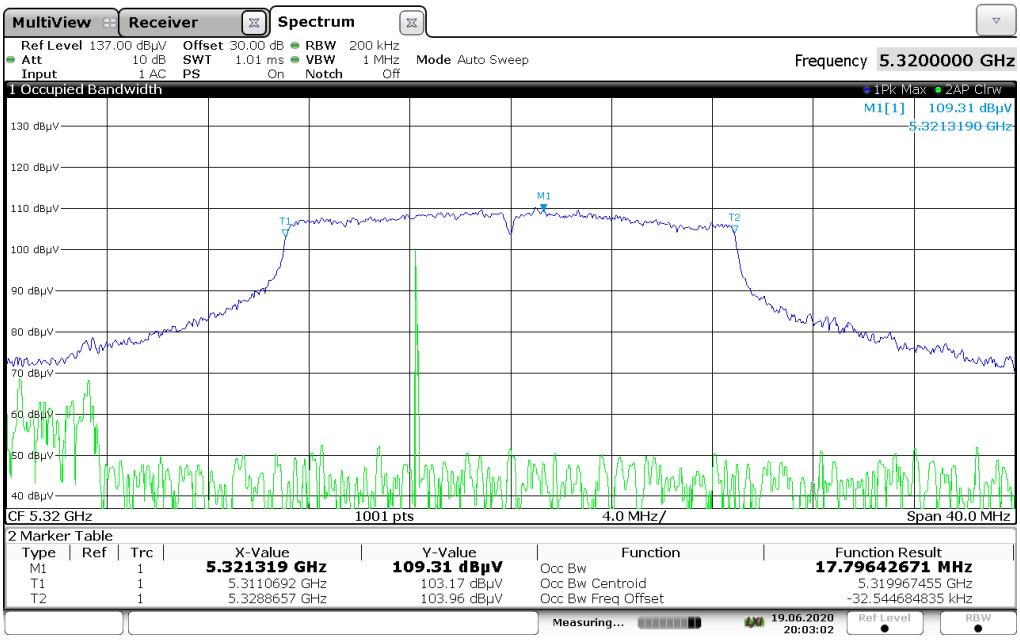
99 % bandwidth on 802.11a, 5240 MHz



16:03:10 19.06.2020

99 % bandwidth on 802.11a, 5250 MHz

99 % bandwidth on 802.11a, 5300MHz

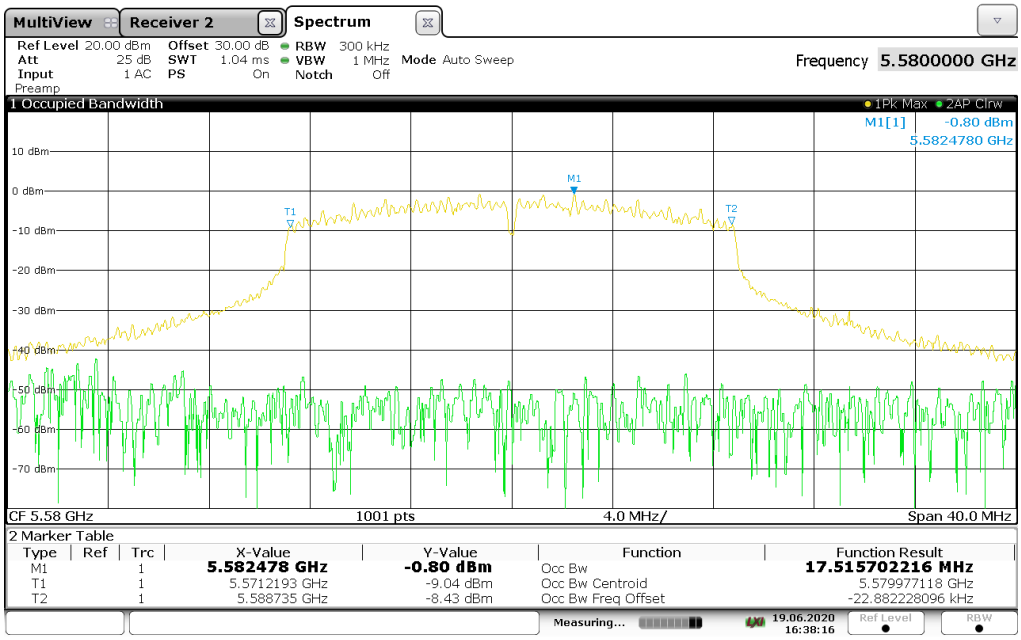


20:03:02 19.06.2020

99 % bandwidth on 802.11a, 5320MHz

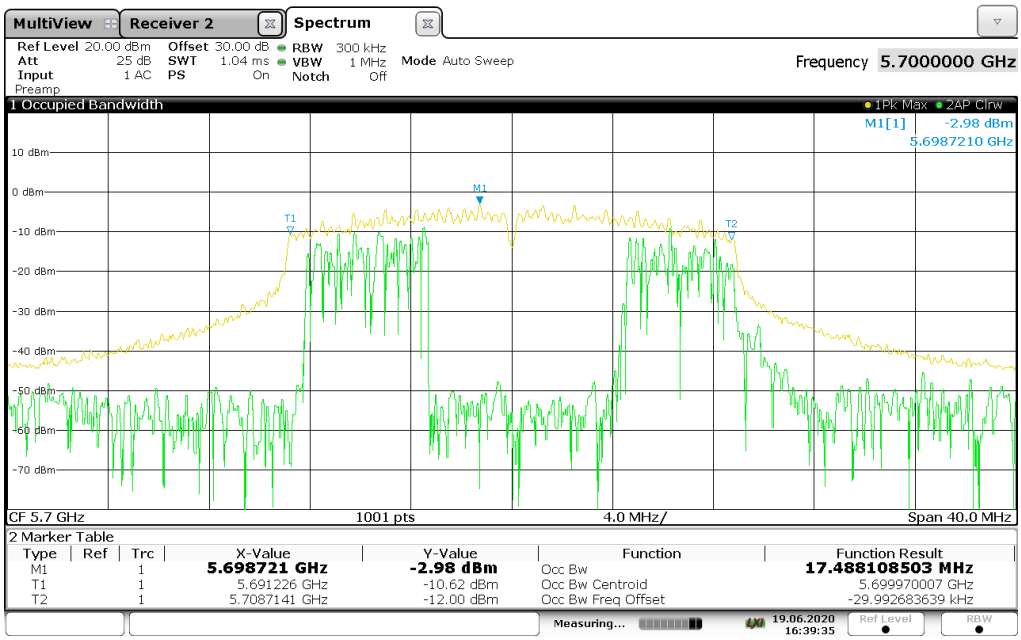
16:34:49 19.06.2020

99 % bandwidth on 802.11a, 5500MHz



16:38:16 19.06.2020

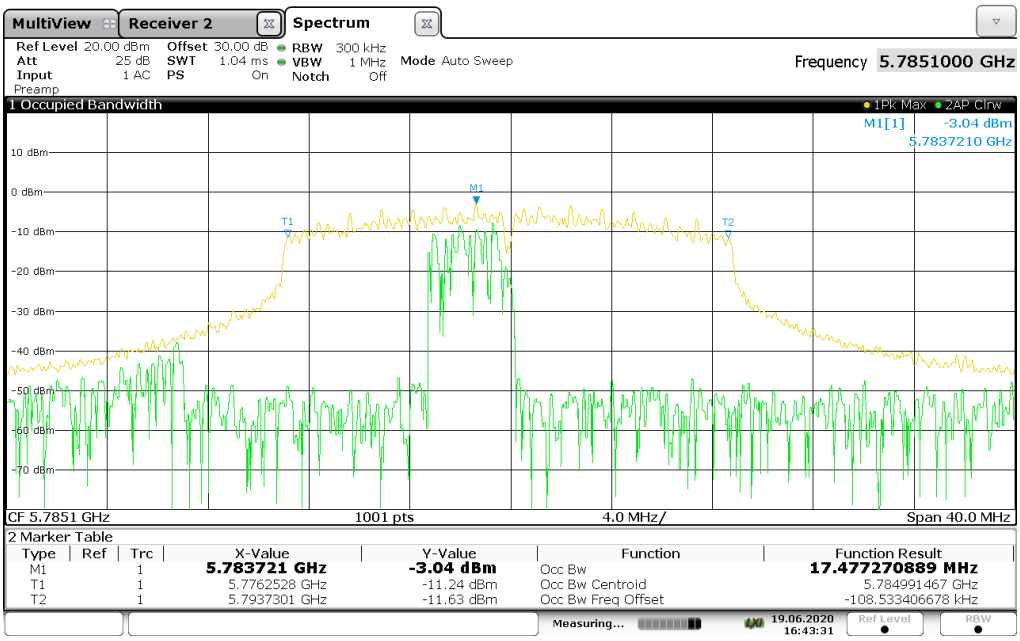
99 % bandwidth on 802.11a, 5580MHz



16:39:35 19.06.2020

99 % bandwidth on 802.11a, 5700MHz

16:42:15 19.06.2020



16:43:31 19.06.2020

99 % bandwidth on 802.11a, 5785MHz

99 % bandwidth on 802.11a, 5825MHz

7.3 FCC 15.407 output power and spectral density limits

7.3.1 Definitions and limits

FCC:

(i) For an outdoor access point operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30 dBm) provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30 dBm) provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30 dBm). In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24 dBm) provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED:

LE-LAN devices are restricted to indoor operation only in the band 5150–5250 MHz.

The maximum e.i.r.p. shall not exceed 200 mW (23 dBm) or $10 + 10 \times \log_{10}(B)$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

FCC:

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

ISED: band 5.725–5.85 GHz

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

FCC:

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B **is the 26 dB emission bandwidth in megahertz**

ISED:

Frequency band 5250-5350 MHz

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less.
The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz

Frequency bands 5470-5600 MHz and 5650-5725 MHz

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz aximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less.

Calculations:

utput power measurements results						26 dB bandwidth	99% Bandwidth	10*log10(250 mW)	11+10LOG10(26 dB Bandwidth)		
Modulation	**Frequency, MHz**	**Output power, dBm**	**Power limit, dBm**	**Margin, dB**							
802.11a	5180	14	30	-16		20.35	17.52				
	5220	15	30	-15		20.82	17.52				
	5240	14.9	30	-17.7		20.34	17.48				
Modulation	**Frequency, MHz**	**Output power, dBm**	**Power limit, dBm**	**Margin, dB**							
802.11a	5745	13.3	30	-16.7		20.18	17.52				
	5785	13.1	30	-16.9		19.58	17.47				
	5825	15.2	30	-14.8		20.22	17.51				
Modulation	**Frequency, MHz**	**Output power, dBm**	**Power limit, dBm**	**Margin, dB**							
802.11a	5260	14.9	24	-9.1		20.18	17.53	24.0	24.0		
	5300	15.2	24	-8.8		22.22	17.85	24.0	24.5		
	5320	15.2	24	-8.8		21.1	17.85	24.0	24.2		
								24.0			
								24.0			
Modulation	**Frequency, MHz**	**Output power, dBm**	**Power limit, dBm**	**Margin, dB**				24.0			
802.11a	5500	14.9	24	-9.1		20.18	17.52	24.0	24.0		
	5580	14.1	24	-9.9		20.26	17.52	24.0	24.1		
	5700	12.1	24	-11.9		20.22	17.49	24.0	24.1		

								26 dB bandwidth	99% Bandwidth		10+10*LOG10(99% bandwidth)		
	Modulation	**Frequency, MHz**	**Output power, dBm**	**Antenna Gain, dBi**	**EIRP, dBm**	**EIRP limit, dBm**	**Margin, dB**						
	802.11a	5180	14	2.3	16.3	22.4	-6.1	20.35	17.52	23.0	22.4		
		5220	15	2.3	17.3	22.4	-5.1	20.82	17.52	23.0	22.4		
		5240	14.9	2.3	16.9	22.4	-5.5	20.34	17.48	23.0	22.4		
	Modulation	**Frequency, MHz**	**Output power, dBm**	**Antenna Gain, dBi**	**EIRP, dBm**	**EIRP limit, dBm**	**Margin, dB**						
	802.11a	5745	13.3	2.3	15.6	30	-14.4	20.18	17.52				
		5785	13.1	2.3	15.4	30	-14.6	19.58	17.47				
		5825	12.7	2.3	15	30	-15	20.22	17.51				
	Modulation	**Frequency, MHz**	**Output power, dBm**	**Antenna Gain, dBi**	**EIRP, dBm**	**EIRP limit, dBm**	**Margin, dB**				11+10*LOG10(99% bandwidth)		
	802.11a	5260.0	14.9	2.3	17.2	23.4	-6.2	20.18	17.53	24.0	23.4		
		5300.0	15.2	2.3	17.5	23.5	-6.0	22.22	17.85	24.0	23.5		
		5320.0	15.2	2.3	16.9	23.5	-6.6	21.1	17.85	24.0	23.5		
								21.1	17.85	24.0	23.5		
	Modulation	**Frequency, MHz**	**Output power, dBm**	**Antenna Gain, dBi**	**EIRP, dBm**	**EIRP limit, dBm**	**Margin, dB**				17+10*LOG10(99% bandwidth)		
	802.11a	5500	14.9	2.3	17.2	29.4	-12.2	20.18	17.52	30.0	29.4		
		5580	14.1	2.3	16.4	29.4	-13	20.26	17.52	30.0	29.4		
		5700	14.9	2.3	15	29.4	-14.4	20.22	17.49	30.0	29.4		
								20.22	17.49	30.0	29.4		

7.3.2 Test summary

Test start date:	June 03, 2020

7.3.3 Observations, settings and special notes

As per manufacturer declaration, EUT is for indoor fix operation only. EUT was configured to continuous transmit mode during tests.
Output power was tested using RMS power meter.
The highest and lowest data rate setting have been investigated, only the worst-cases were presented.

Spectrum analyzer settings for PSD measurement:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Frequency span	> EBW
Detector mode	RMS
Trace mode	Power Averaging over 100 sweeps

Spectraldensity power not performed because partial tes were applied.

7.3.4 Test data

Table 7.3-1: *FCC Output power measurements results*

the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30 dBm)

Modulation	Frequency, MHz	Output power, dBm	Power limit, dBm	Margin, dB
802.11a	5180	14.0	30.0	-16.0
	5220	15.0	30.0	-15.0
	5240	14.9	30.0	-17.7

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W

Modulation	Frequency, MHz	Output power, dBm	Power limit, dBm	Margin, dB
802.11a	5745	13.3	30.0	-16.7
	5785	13.1	30.0	-16.9
	5825	15.2	30.0	-14.8

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz

Modulation	Frequency, MHz	Output power, dBm	Power limit, dBm	Margin, dB
802.11a	5260	14.9	24	-9.1
	5300	15.2	24	-8.8
	5320	15.2	24	-8.8

Modulation	Frequency, MHz	Output power, dBm	Power limit, dBm	Margin, dB
802.11a	5500	14.9	24	-9.1
	5580	14.1	24	-9.9
	5700	12.1	24	-11.9

Table 7.3-2: *ISED e.i.r.p measurements results*

LE-LAN devices are restricted to indoor operation only in the band 5150–5250 MHz.
The maximum e.i.r.p. shall not exceed 200 mW (23 dBm) or 10 + 10 × log10 (B), dBm, whichever power is less. B is the 99% emission bandwidth in megahertz

Modulation	Frequency, MHz	Output power, dBm	Antenna Gain, dBi	EIRP, dBm	EIRP limit, dBm	Margin, dB
802.11a	5180	14	2.3	16.3	22.4	-6.1
	5220	15	2.3	17.3	22.4	-5.1
	5240	14.9	2.3	16.9	22.4	-5.5

ISED: band 5.725–5.85 GHzThe maximum conducted output power shall not exceed 1 W.

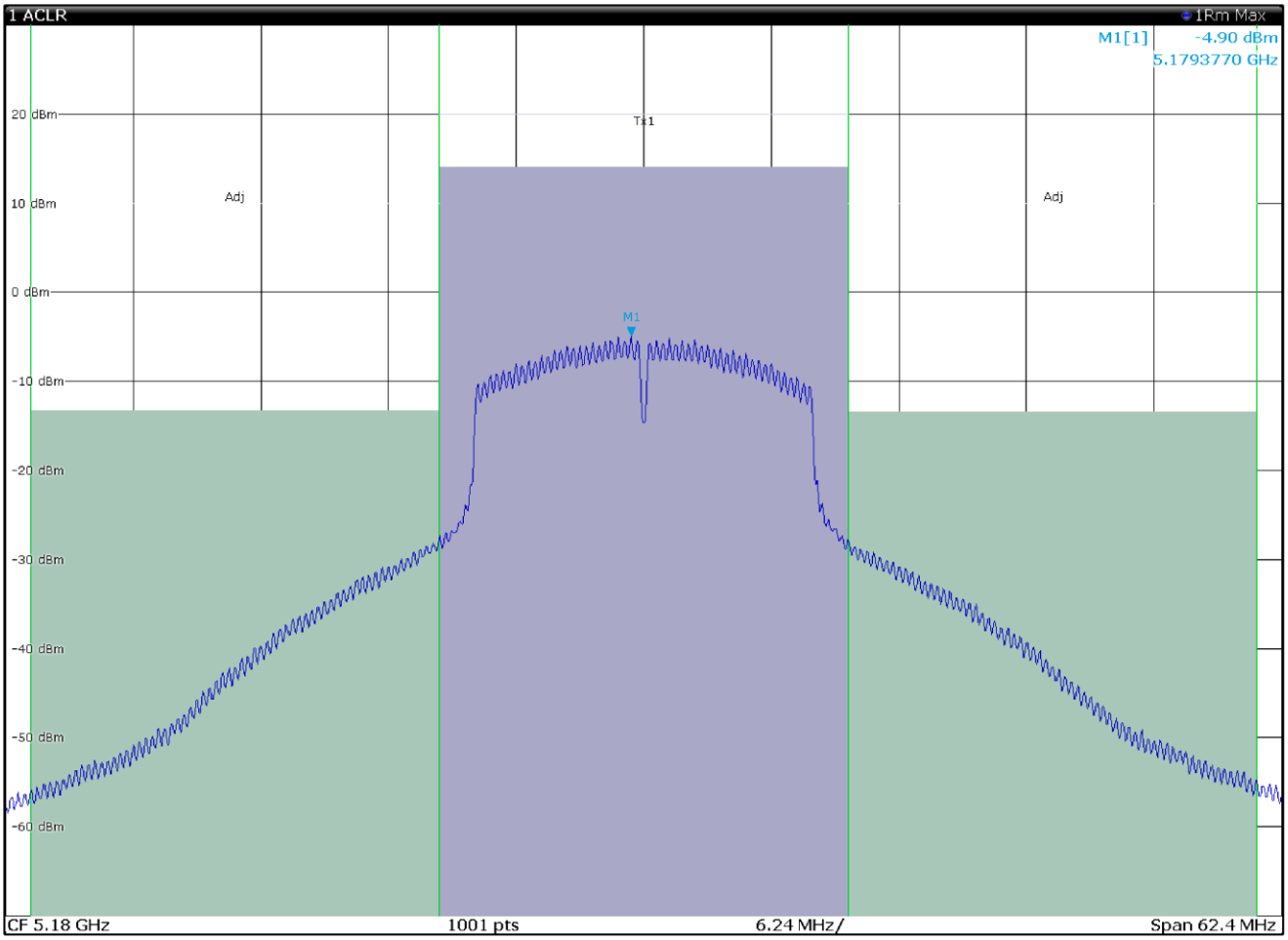
Modulation	Frequency, MHz	Output power, dBm	Antenna Gain, dBi	EIRP, dBm	EIRP limit, dBm	Margin, dB
802.11a	5745	13.3	2.3	15.6	30	-14.4
	5785	13.1	2.3	15.4	30	-14.6
	5825	12.7	2.3	15	30	-15

The maximum e.i.r.p. shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz
Maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less.

Modulation	Frequency, MHz	Output power, dBm	Antenna Gain, dBi	EIRP, dBm	EIRP limit, dBm	Margin, dB
802.11a	5260.0	14.9	2.3	17.2	23.4	-6.2
	5300.0	15.2	2.3	17.5	23.5	-6.0
	5320.0	15.2	2.3	16.9	23.5	-6.6

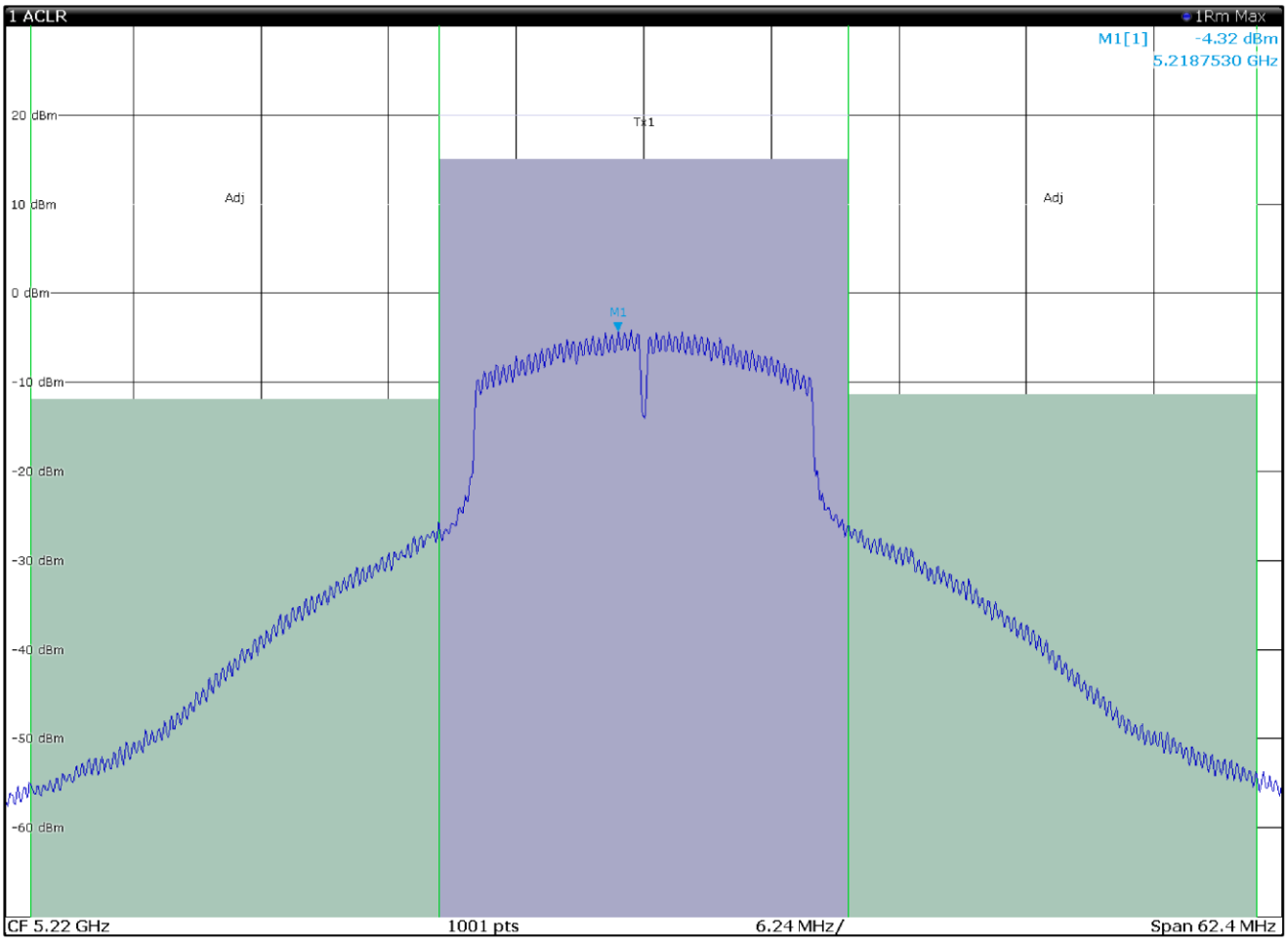
The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz
Maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less.

Modulation	Frequency, MHz	Output power, dBm	Antenna Gain, dBi	EIRP, dBm	EIRP limit, dBm	Margin, dB
802.11a	5500	14.9	2.3	17.2	29.4	-12.2
	5580	14.1	2.3	16.4	29.4	-13
	5700	14.9	2.3	15	29.4	-14.4



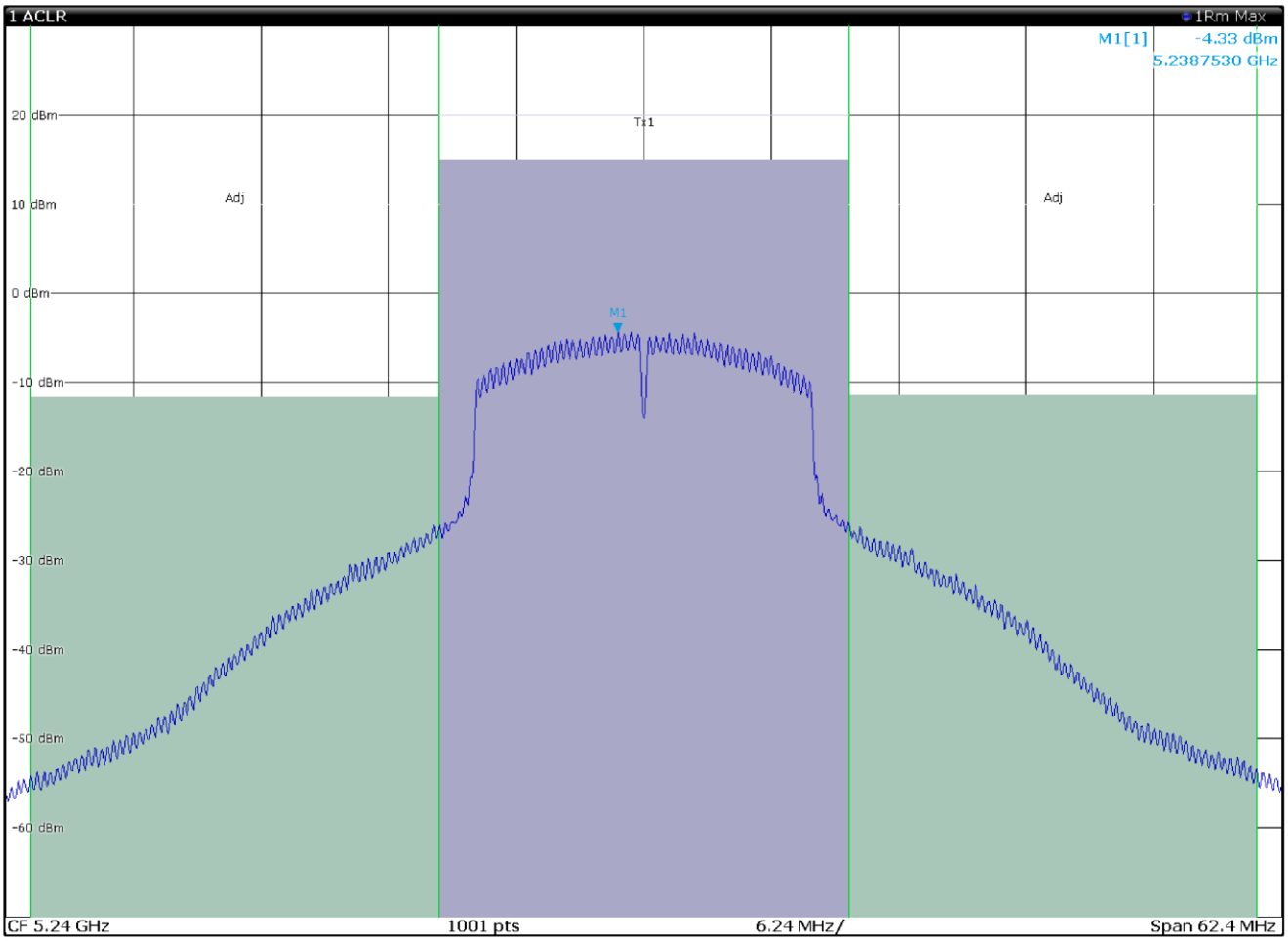
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**14.04 dBm**	
Tx Total			**14.04 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-13.36 dBm**	**-13.45 dBm**

Figure 7.3-1: *Output power on 802.11a – low channel*



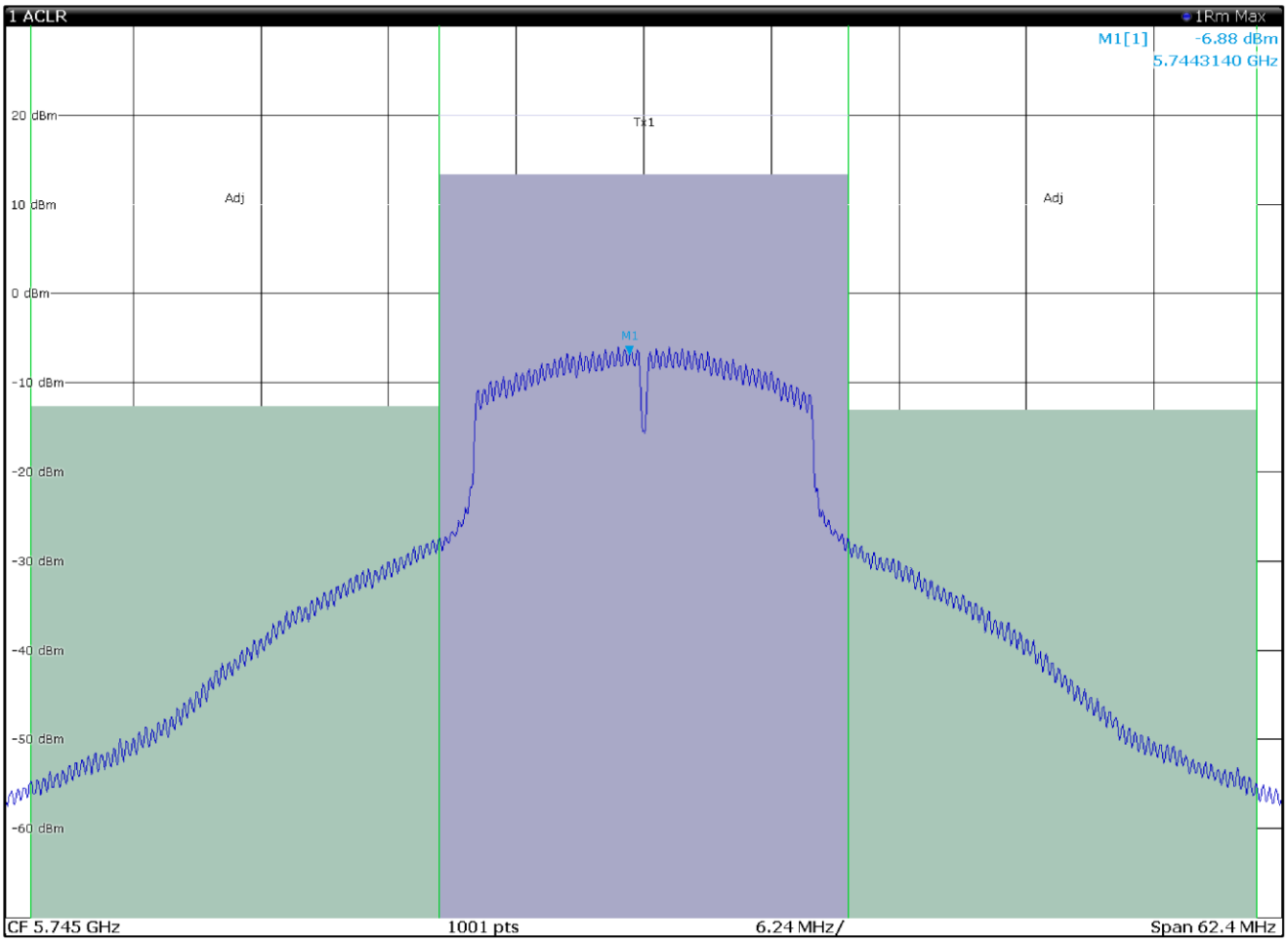
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**14.99 dBm**	
Tx Total			**14.99 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-11.93 dBm**	**-11.42 dBm**

Figure 7.3-2: *Output power on 802.11a – mid channel*



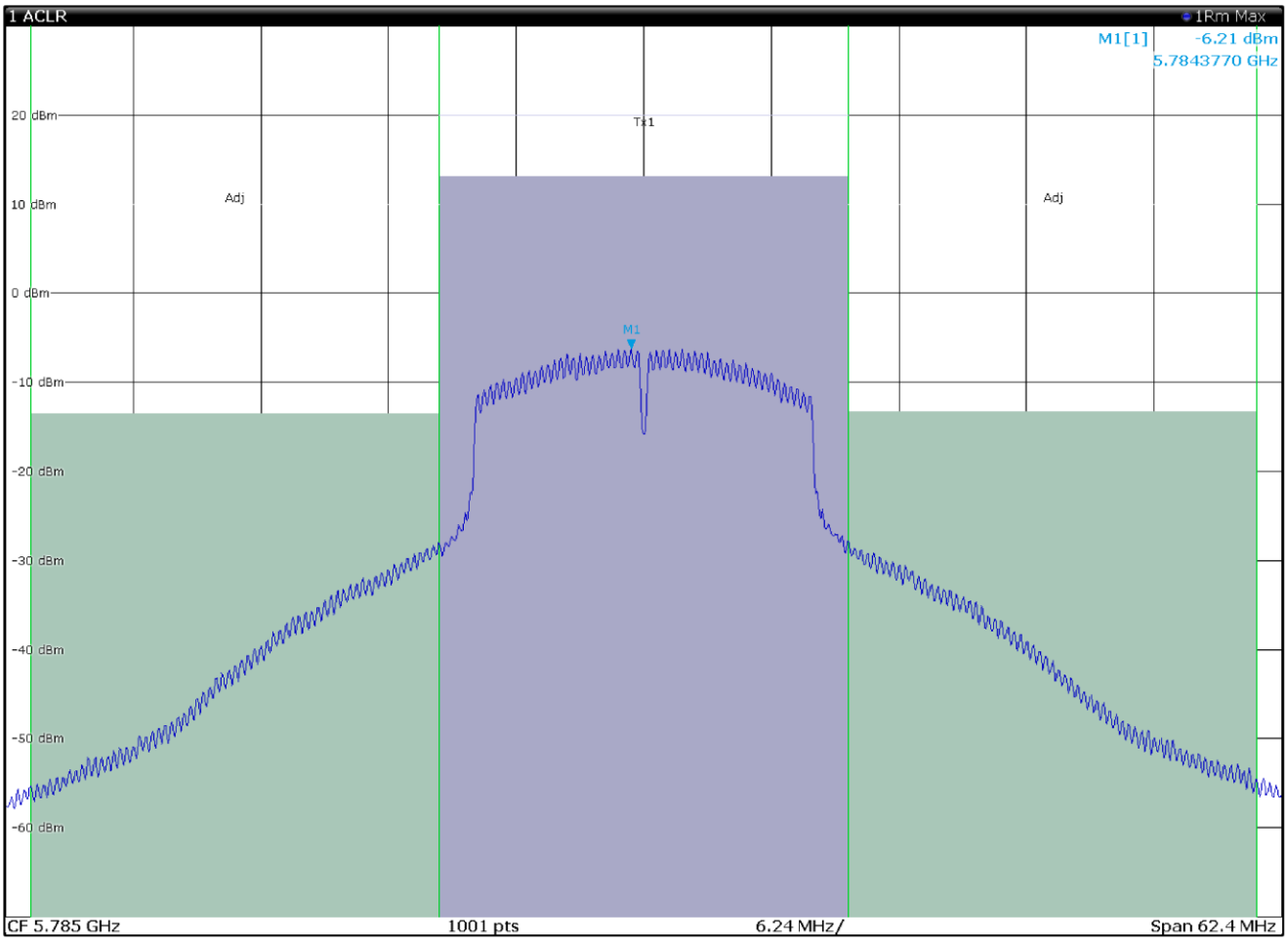
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**14.93 dBm**	
Tx Total			**14.93 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-11.74 dBm**	**-11.48 dBm**

Figure 7.3-3: *Output power on 802.11a – high channel*



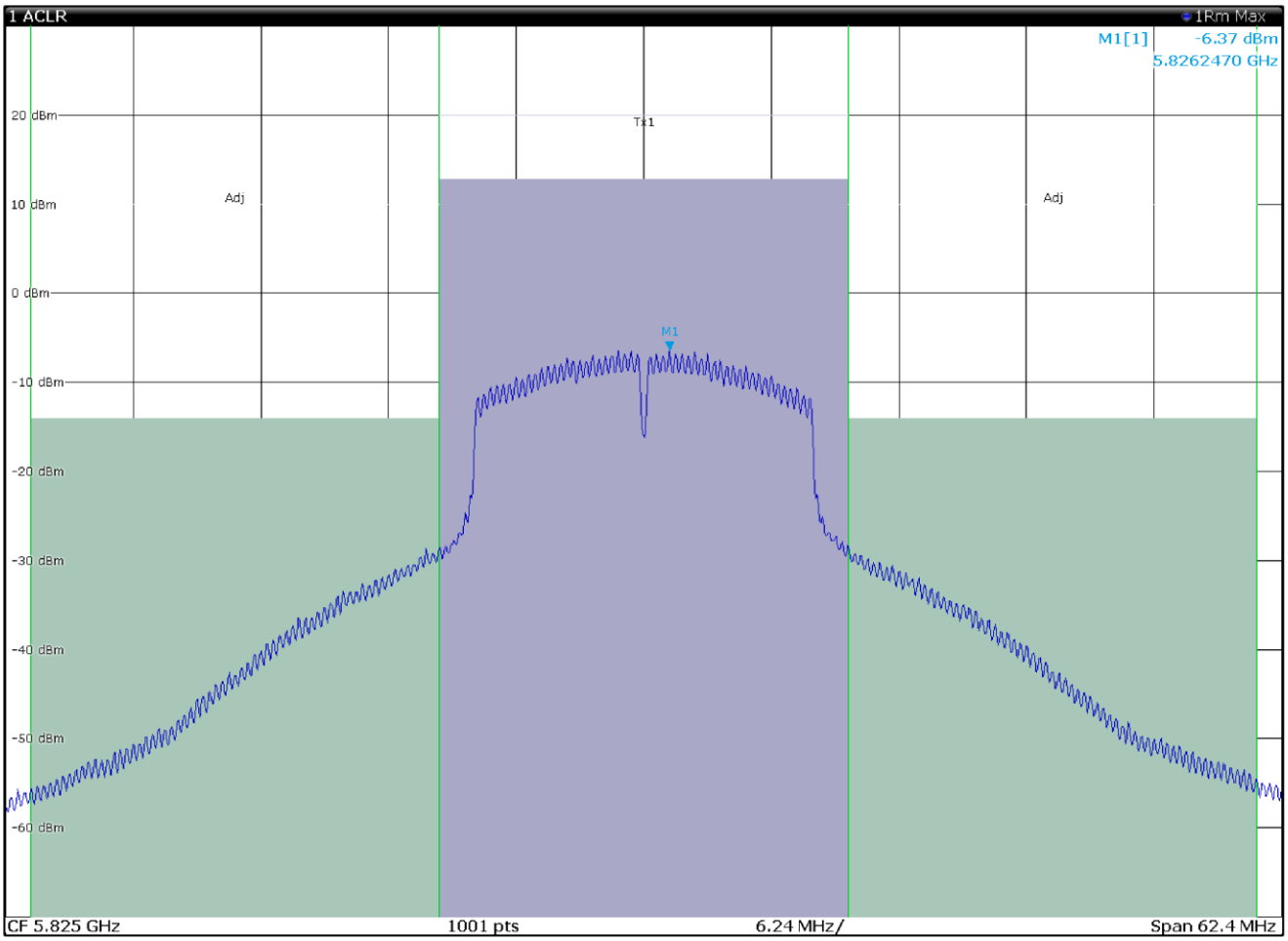
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**13.29 dBm**	
Tx Total			**13.29 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-12.69 dBm**	**-13.12 dBm**

Figure 7.3-4: *Output power on 802.11a – low channel*



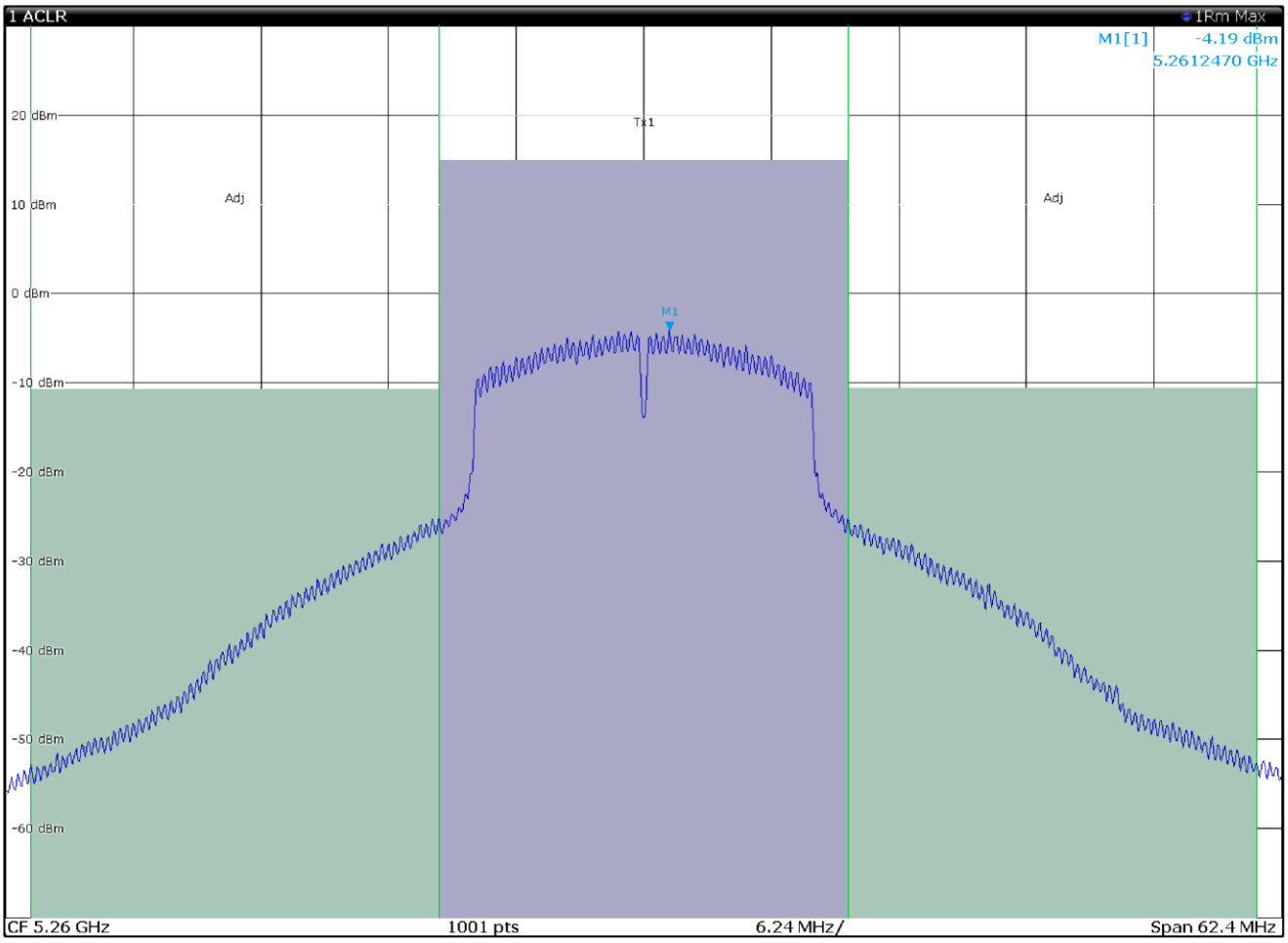
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**13.09 dBm**	
Tx Total			**13.09 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-13.51 dBm**	**-13.33 dBm**

Figure 7.3-5: *Output power on 802.11a – mid channel*



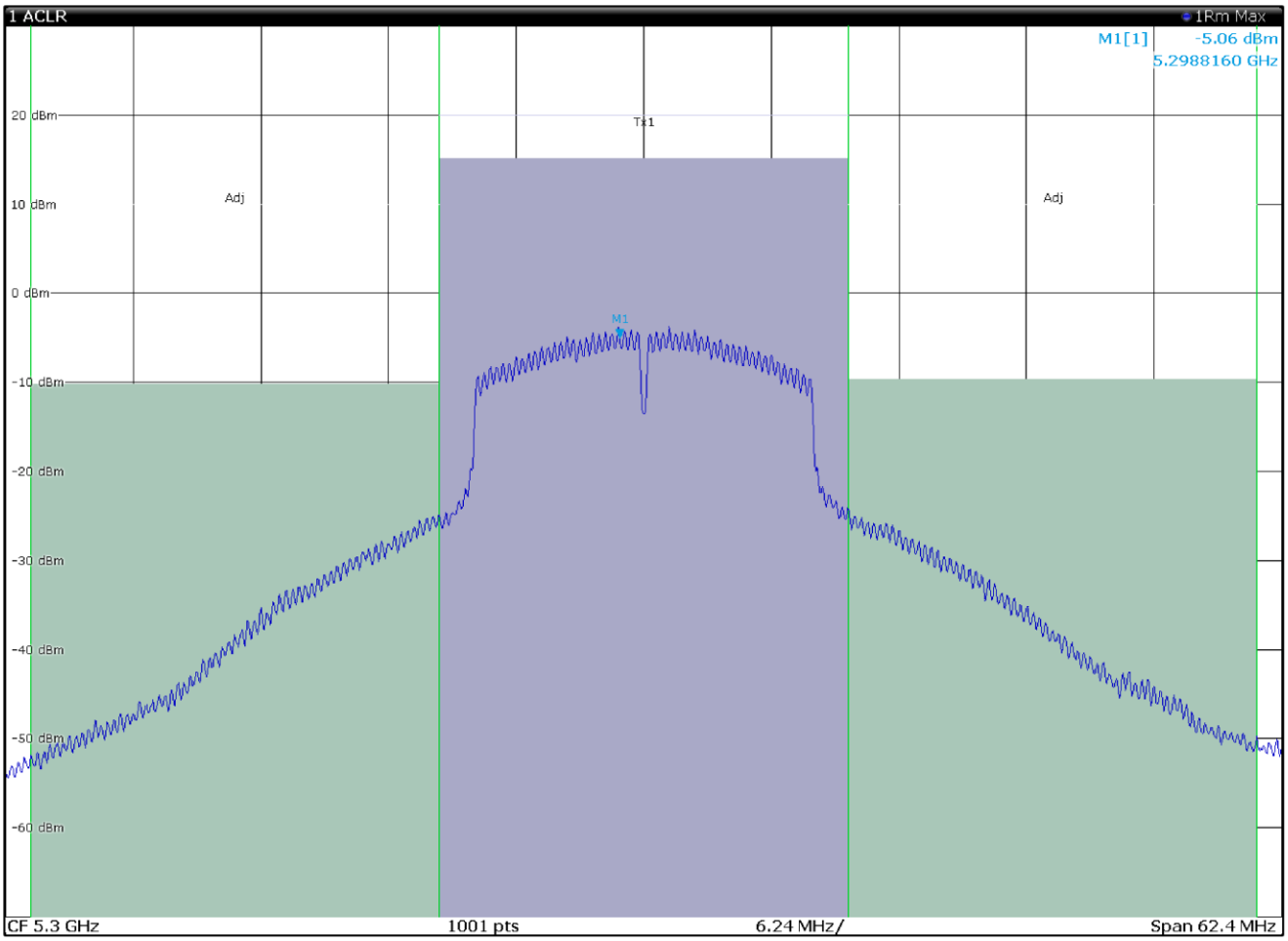
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**12.73 dBm**	
Tx Total			**12.73 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-14.09 dBm**	**-14.03 dBm**

Figure 7.3-6: *Output power on 802.11a – high channel*



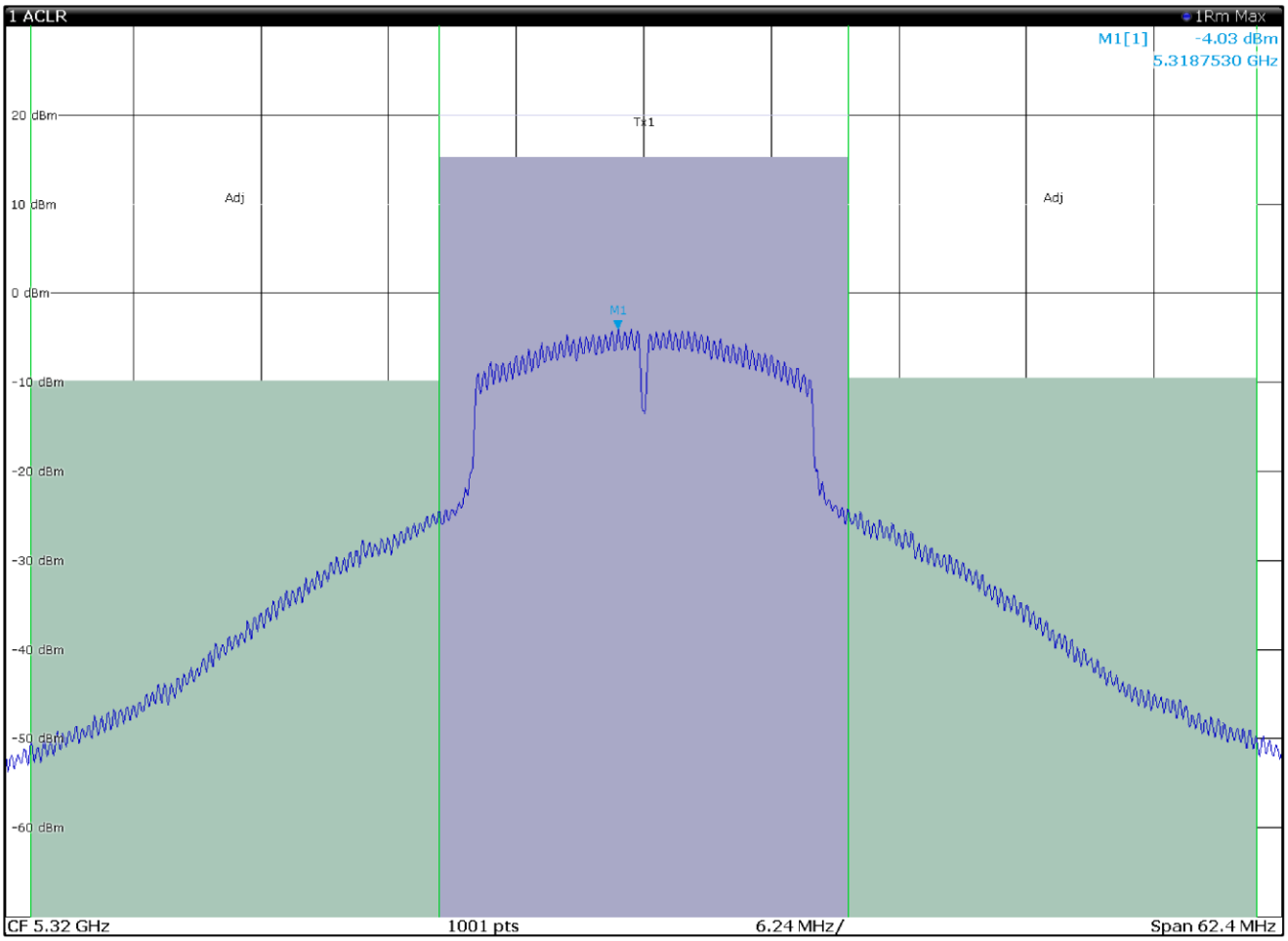
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**14.93 dBm**	
Tx Total			**14.93 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-10.73 dBm**	**-10.66 dBm**

Figure 7.3-4: *Output power on 802.11a – low channel*



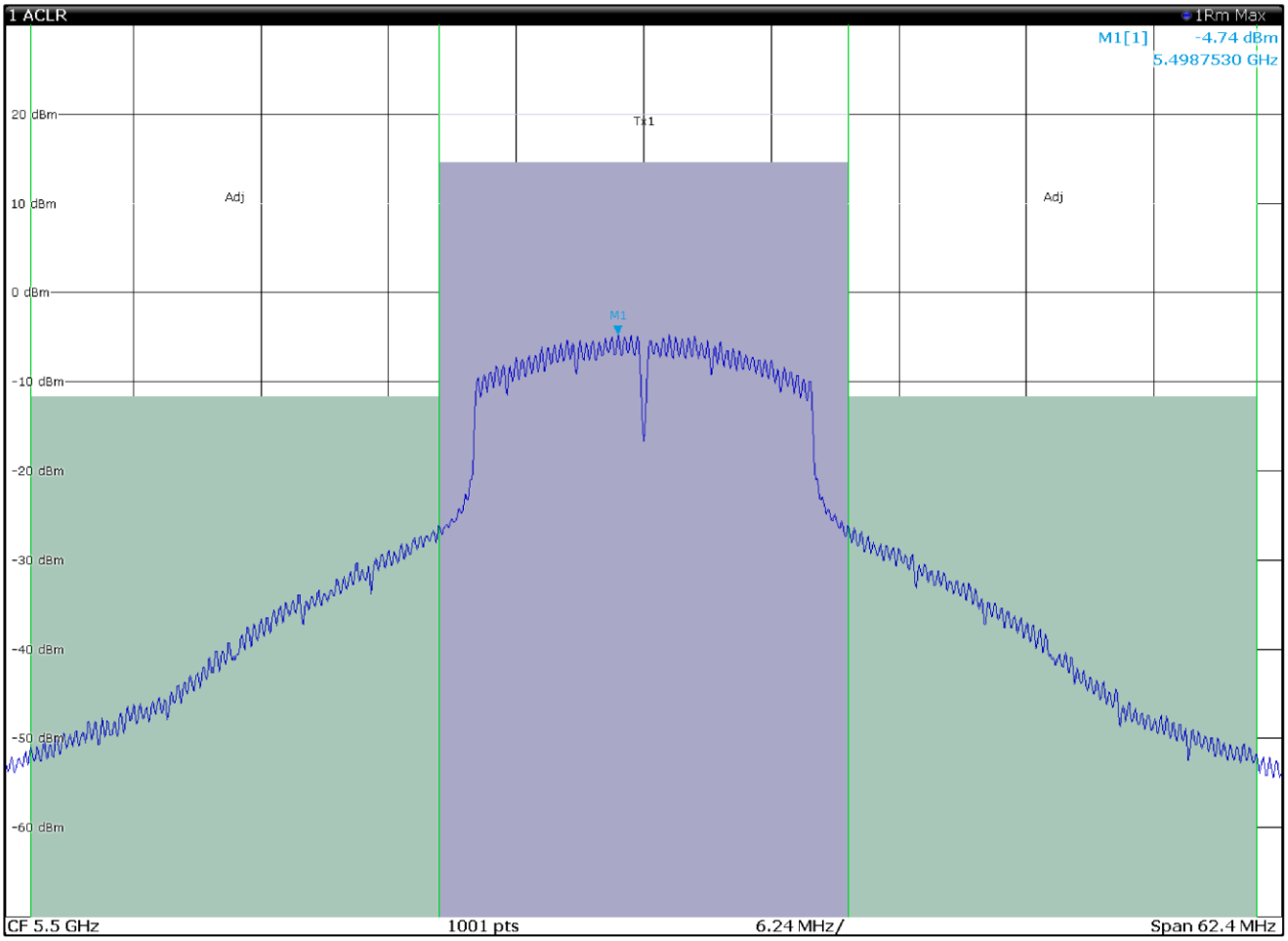
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**15.17 dBm**	
Tx Total			**15.17 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-10.24 dBm**	**-9.63 dBm**

Figure 7.3-5: *Output power on 802.11a – mid channel*



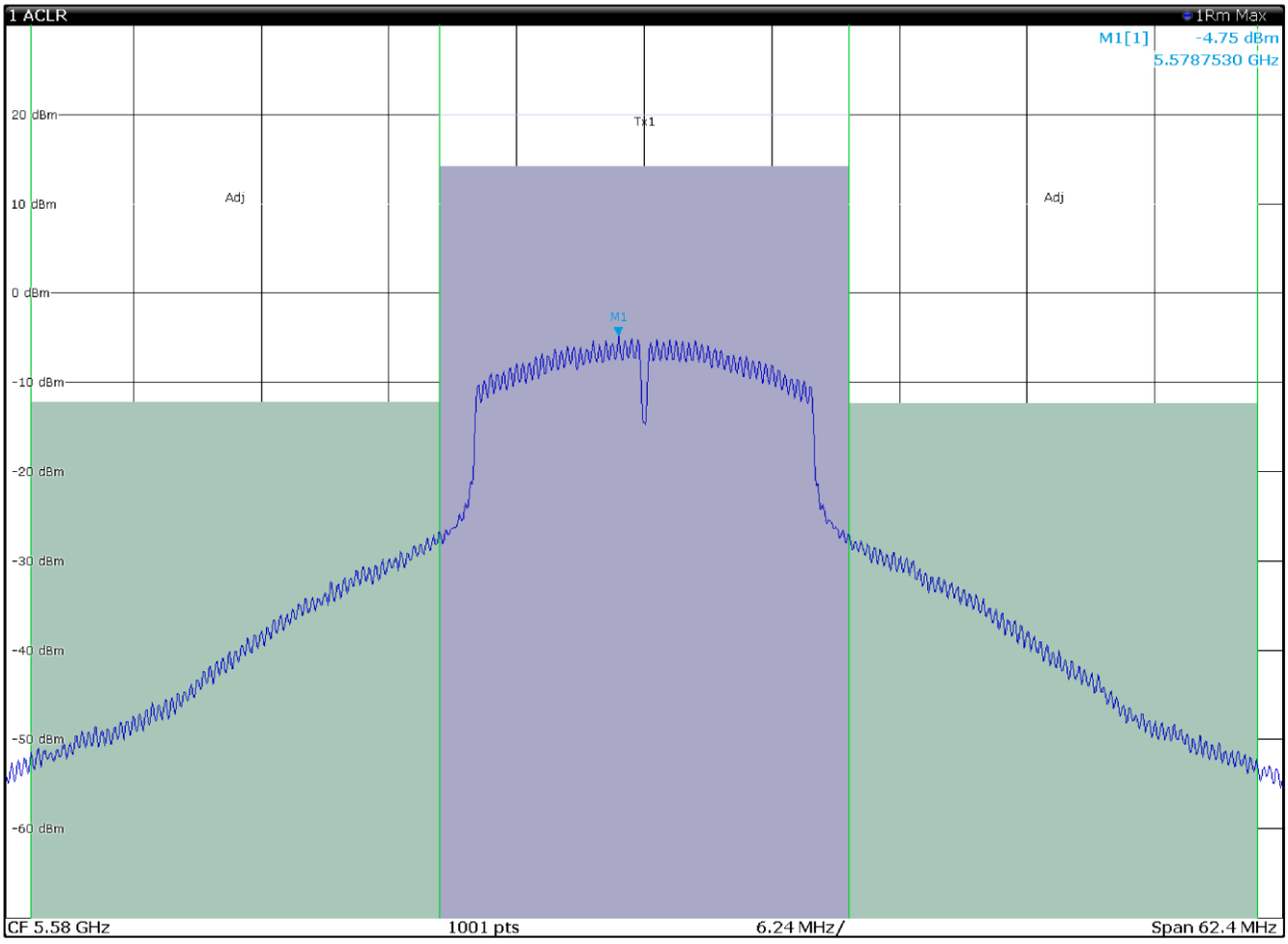
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**15.21 dBm**	
Tx Total			**15.21 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-9.88 dBm**	**-9.52 dBm**

Figure 7.3-7: *Output power on 802.11a – high channel*



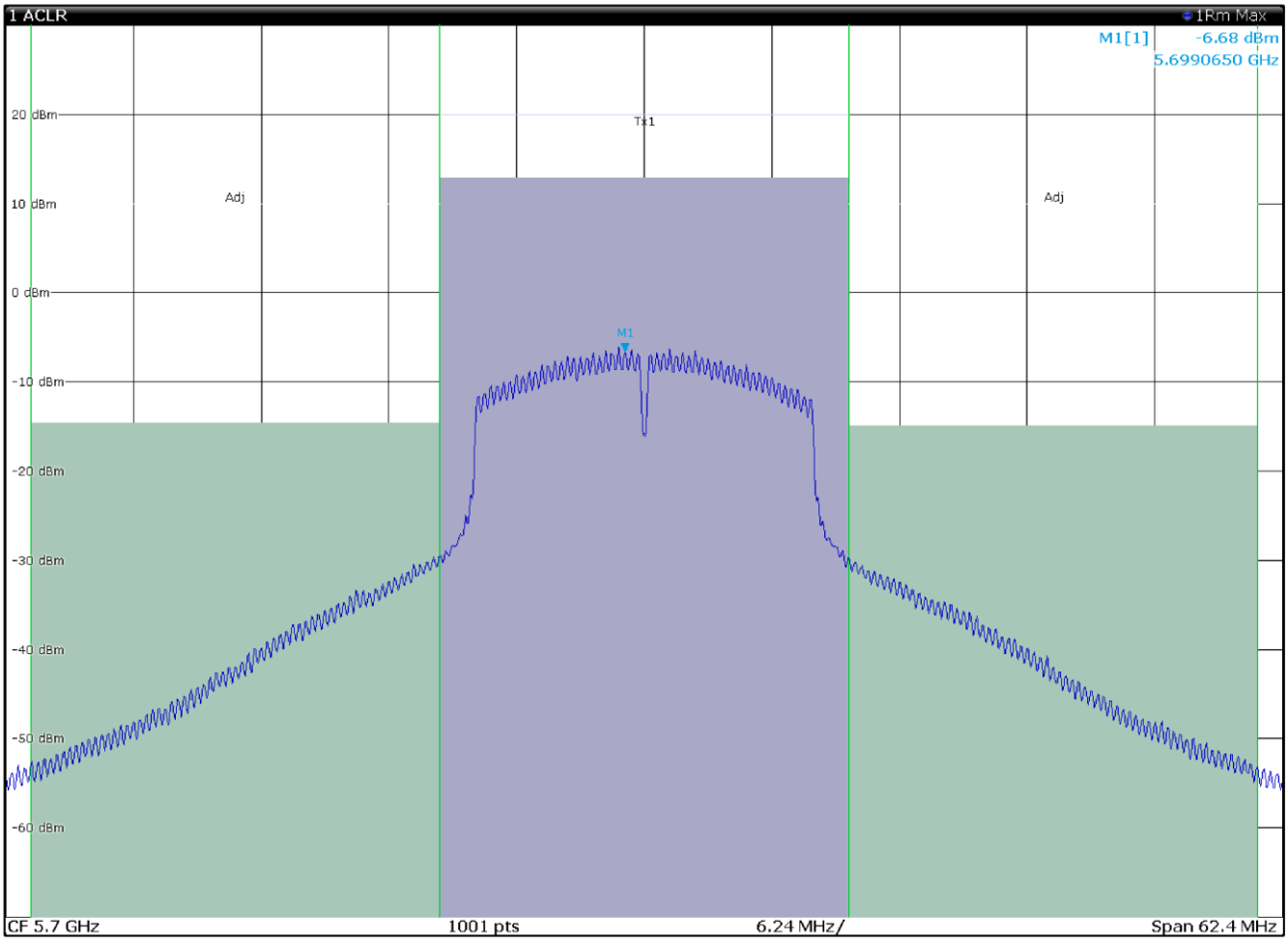
2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**14.93 dBm**	
Tx Total			**14.93 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-10.73 dBm**	**-10.66 dBm**

Figure 7.3-8: *Output power on 802.11a – low channel*



2 Result Summary			WLAN 802.11a	
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**14.14 dBm**	
Tx Total			**14.14 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-12.24 dBm**	**-12.34 dBm**

Figure 7.3-9: Output power on 802.11a –mid channel



16:37:23 03.06.2020 **Page 1/2**

2 Result Summary		WLAN 802.11a		
Channel	Bandwidth	Offset	Power	
Tx1 (Ref)	20.000 MHz		**12.84 dBm**	
Tx Total			**12.84 dBm**	
Channel	Bandwidth	Offset	Lower	Upper
Adj	20.000 MHz	20.000 MHz	**-14.62 dBm**	**-14.95 dBm**

7.4 FCC 15.407(b) Undesirable (unwanted) emissions

7.4.1 Definitions and limits

FCC:
(1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz.
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.
(7) The provisions of § 15.205 apply to intentional radiators operating under this section.
(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

ISED:
For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

RSS-Gen 8.10 Emissions falling within restricted frequency bands
Restricted bands, identified in Table 7.4-2, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply:
(a) fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of below;
(b) unwanted emissions falling into restricted bands of below shall comply with the limits specified in RSS-Gen;
(c) unwanted emissions not falling within restricted frequency bands shall either comply with the limits specified in the applicable RSS, or with those specified in RSS-Gen.

Table 7.4-1: *FCC §15.209 and RSS-Gen – Radiated emission limits*

Frequency, MHz	Field strength of emissions µV/m	Field strength of emissions dBµV/m	Measurement distance, m
0.009–0.490	2400/F *(F in kHz)*	$67.6 - 20 \times \log_{10}$(F) *(F in kHz)*	300
0.490–1.705	24000/F *(F in kHz)*	$87.6 - 20 \times \log_{10}$(F) *(F in kHz)*	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

7.4.1 Definitions and limits, continued

Table 7.4-2: *ISED restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	12.51975–12.52025	399.9–410	5.35–5.46
2.1735–2.1905	12.57675–12.57725	608–614	7.25–7.75
3.020–3.026	13.36–13.41	960–1427	8.025–8.5
4.125–4.128	16.42–16.423	1435–1626.5	9.0–9.2
4.17725–4.17775	16.69475–16.69525	1645.5–1646.5	9.3–9.5
4.20725–4.20775	16.80425–16.80475	1660–1710	10.6–12.7
5.677-5.683	25.5–25.67	1718.8–1722.2	13.25–13.4
6.215–6.218	37.5–38.25	2200–2300	14.47–14.5
6.26775–6.26825	73–74.6	2310–2390	15.35–16.2
6.31175–6.31225	74.8–75.2	2655–2900	17.7–21.4
8.291–8.294	108–138	3260–3267	22.01–23.12
8.362–8.366	156.52475–156.52525	3332–3339	23.6–24.0
8.37625–8.38675	156.7–156.9	3345.8–3358	31.2–31.8
8.41425–8.41475	240–285	3500–4400	36.43–36.5
12.29–12.293	322–335.4	4500–5150	Above 38.6

Note: Certain frequency bands listed in Table 7.4-2 and above 38.6 GHz are designated for low-power license-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

Table 7.4-3: *FCC restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

7.4.2 Test summary

Test start date:	April 14, 2020

7.4.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to 40 GHz while the EUT was continuously transmitting.
Conducted measurements were performed on the antenna ports, with the highest and the lowest data rate, the worst case is presented.
In the conducted plots below, the reference level offset was adjusted to include antenna directional gains, the max peak gain of two antenna configurations has been applied to show as representative worst case.
Radiated measurements below 18 GHz were performed at a distance of 3 m. Radiated measurements above 18 GHz were performed at a distance of 1 m.
Cabinet radiation were performed while the antenna connector was terminated with 50 Ω load. Below 1 GHz and above 18 GHz, no emissions related to RF transmitter were detected within 6 dB below the limit.

Spectrum analyser for peak conducted measurements within restricted bands below 1 GHz:

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

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

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

Spectrum analyser for average conducted measurements within restricted bands above 1 GHz for frequencies where peak results were above the average limit:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	RMS
Trace mode:	Power average
Number of averaging traces:	100

Spectrum analyser for peak conducted measurements outside restricted bands:

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

Spectrum analyzer 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 analyzer 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

7.4.4 Test data

sDygate 10-06-35 e Dygate 10-06-34

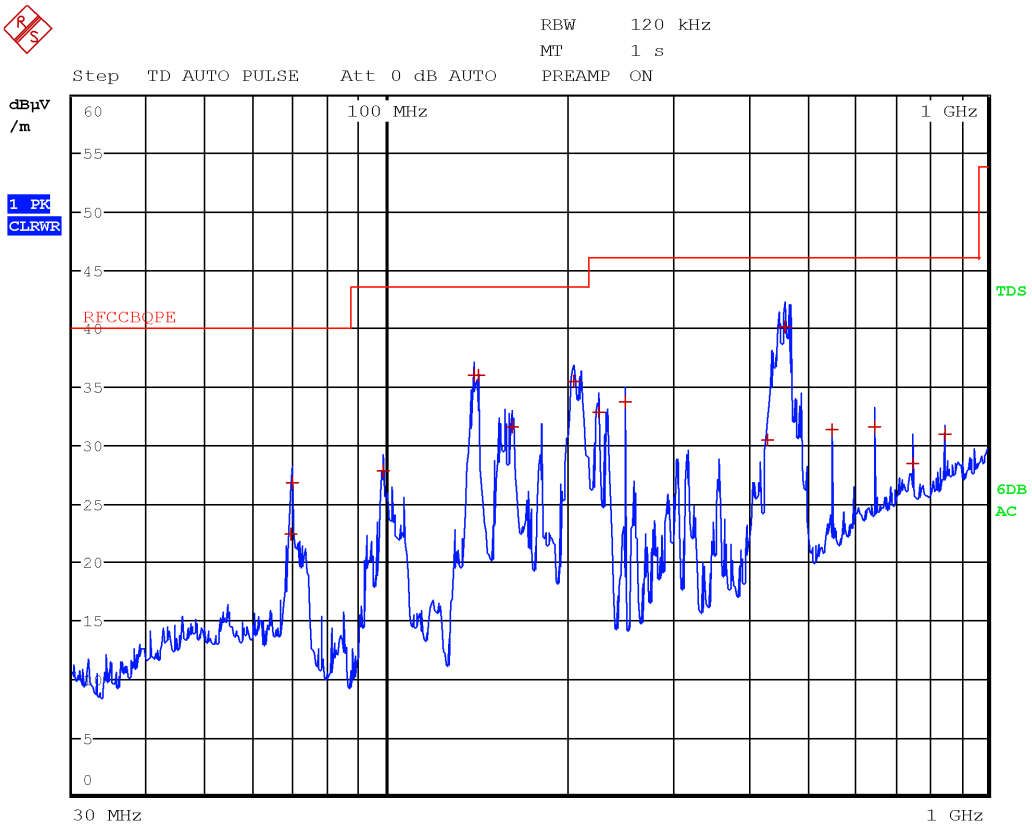


Figure 7.4-1: *Radiated spurious emissions 30 to 1000 MHz, 5220 MHz with antenna in horizontal polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
68.9700	26.3	40.0	-13.7	QP
98.4600	33.1	43.5	-10.4	QP
150.0000	28.2	43.5	-15.3	QP
200.0100	24.6	43.5	-18.9	QP
650.0100	32.2	46.0	-13.8	QP
750.0300	30.6	46.0	-15.4	QP

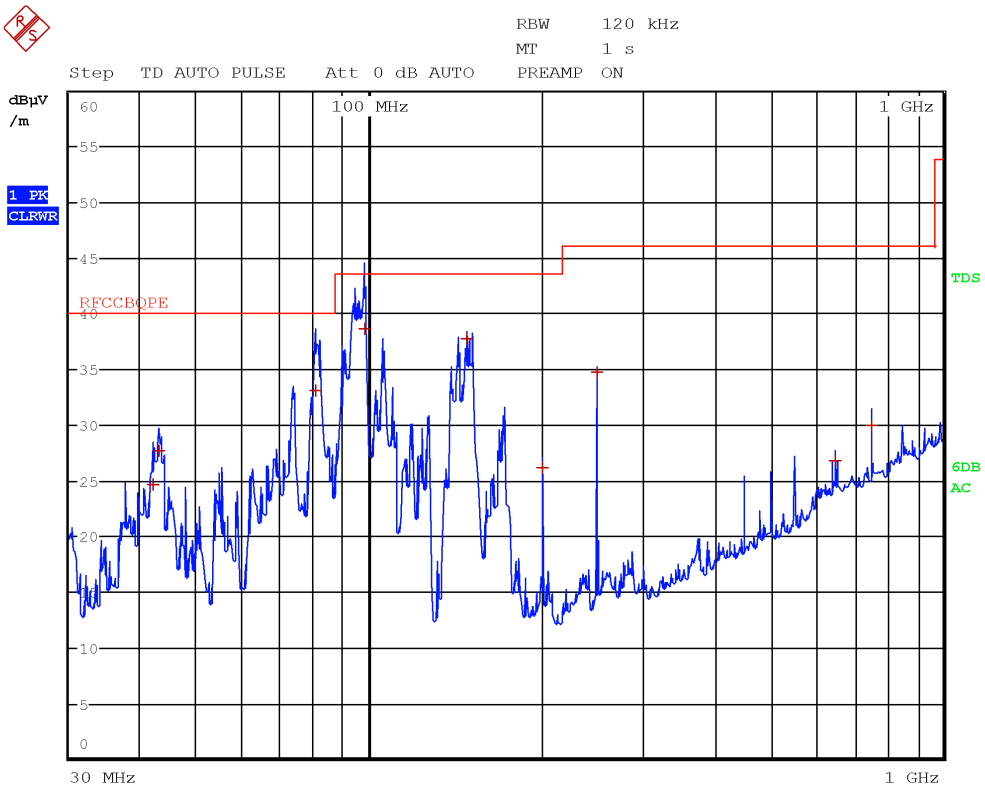


Figure 7.4-2: *Radiated spurious emissions 30 to 1000 MHz, 5220 MHz with antenna in vertical polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
69.1800	22.3	40.0	-17.7	QP
69.6900	26.8	40.0	-13.2	QP
98.5200	27.8	43.5	-15.7	QP
139.7400	36.0	43.5	-7.5	QP
142.0500	36.0	43.5	-7.5	QP
162.0000	31.6	43.5	-11.9	QP
205.5000	35.4	43.5	-8.1	QP
225.3900	32.8	46.0	-13.2	QP
250.0200	33.7	46.0	-12.3	QP
430.9200	30.5	46.0	-15.5	QP
460.3800	40.2	46.0	-5.8	QP
550.0200	31.4	46.0	-14.6	QP
650.0100	31.6	46.0	-14.4	QP
750.0300	28.4	46.0	-17.6	QP
849.9900	30.9	46.0	-15.1	QP

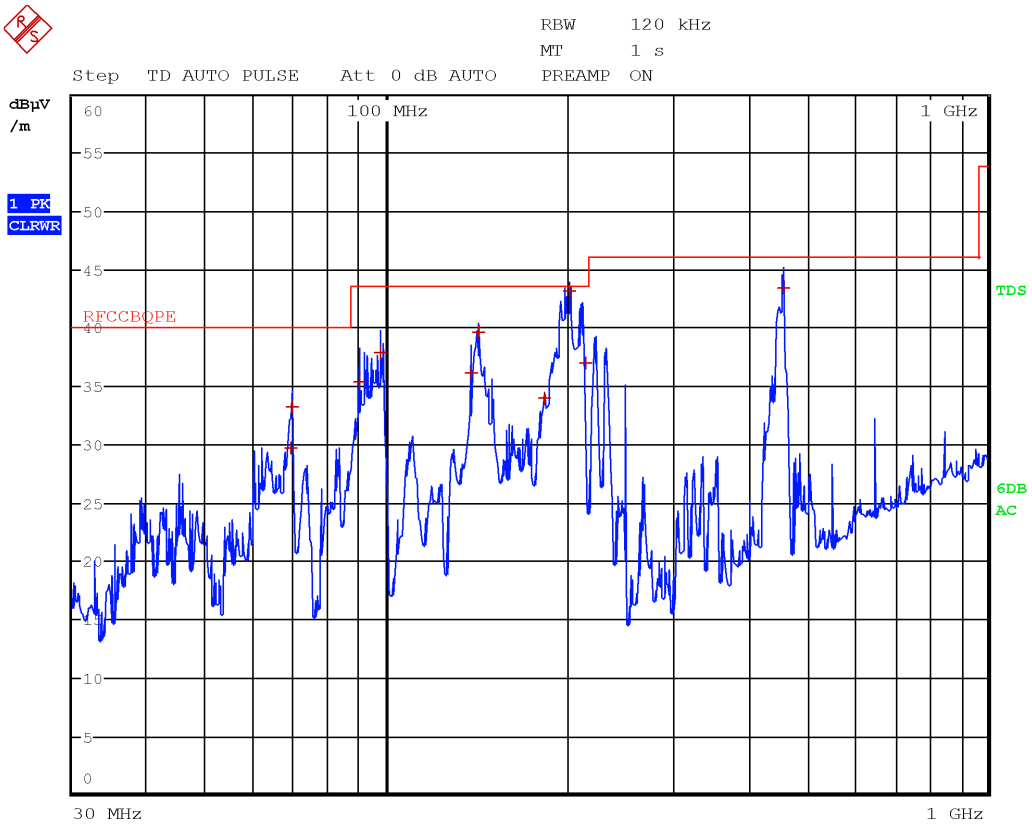


Figure 7.4-3: *Radiated spurious emissions 30 to 1000 MHz, 5785 MHz with antenna in vertical polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
69.3000	29.7	40.0	-10.3	QP
69.7200	33.2	40.0	-6.8	QP
90.3900	35.4	43.5	-8.1	QP
97.8300	37.8	43.5	-5.7	QP
138.5400	36.1	43.5	-7.4	QP
142.1100	39.7	43.5	-3.8	QP
183.2100	33.9	43.5	-9.6	QP
201.9900	43.1	43.5	-0.4	QP
213.7800	37.0	43.5	-6.5	QP
457.9800	43.4	46.0	-2.6	QP

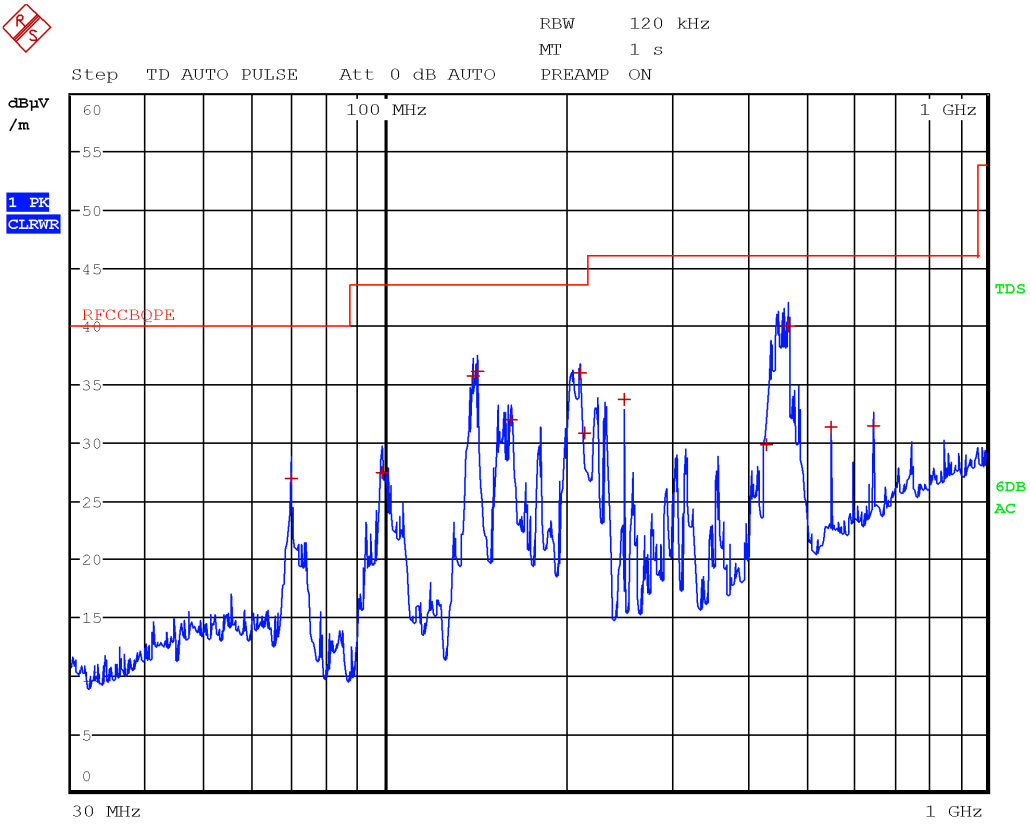


Figure 7.4-3: *Radiated spurious emissions 30 to 1000 MHz, 5785MHz with antenna in horizontal polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
69.6900	26.9	40.0	-13.1	QP
98.4900	27.5	43.5	-16.0	QP
139.7700	35.7	43.5	-7.8	QP
142.0800	36.1	43.5	-7.4	QP
162.0300	32.0	43.5	-11.5	QP
211.3800	36.0	43.5	-7.5	QP
213.7800	30.8	43.5	-12.7	QP
250.0200	33.7	46.0	-12.3	QP
430.9200	29.8	46.0	-16.2	QP
467.4000	40.0	46.0	-6.0	QP
550.0200	31.3	46.0	-14.7	QP
650.0100	31.5	46.0	-14.5	QP

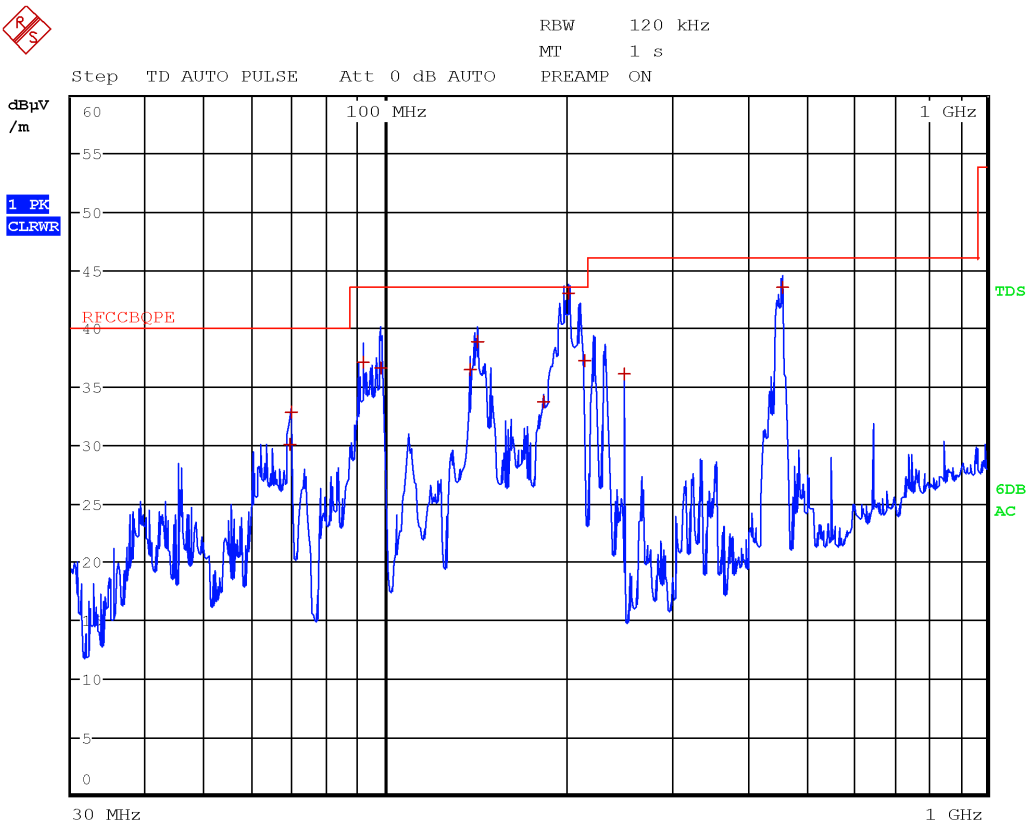


Figure 7.4-5: *Radiated spurious emissions 30 to 1000 MHz, 5300 MHz with antenna in vertical polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
69.3000	30.1	40.0	-9.9	QP
69.7200	32.8	40.0	-7.2	QP
91.5600	37.1	43.5	-6.4	QP
98.4300	36.6	43.5	-6.9	QP
138.6000	36.4	43.5	-7.1	QP
142.1400	38.9	43.5	-4.6	QP
183.2400	33.8	43.5	-9.7	QP
201.9600	43.1	43.5	-0.4	QP
213.7800	37.2	43.5	-6.3	QP
250.0200	36.1	46.0	-9.9	QP
456.7800	43.6	46.0	-2.4	QP

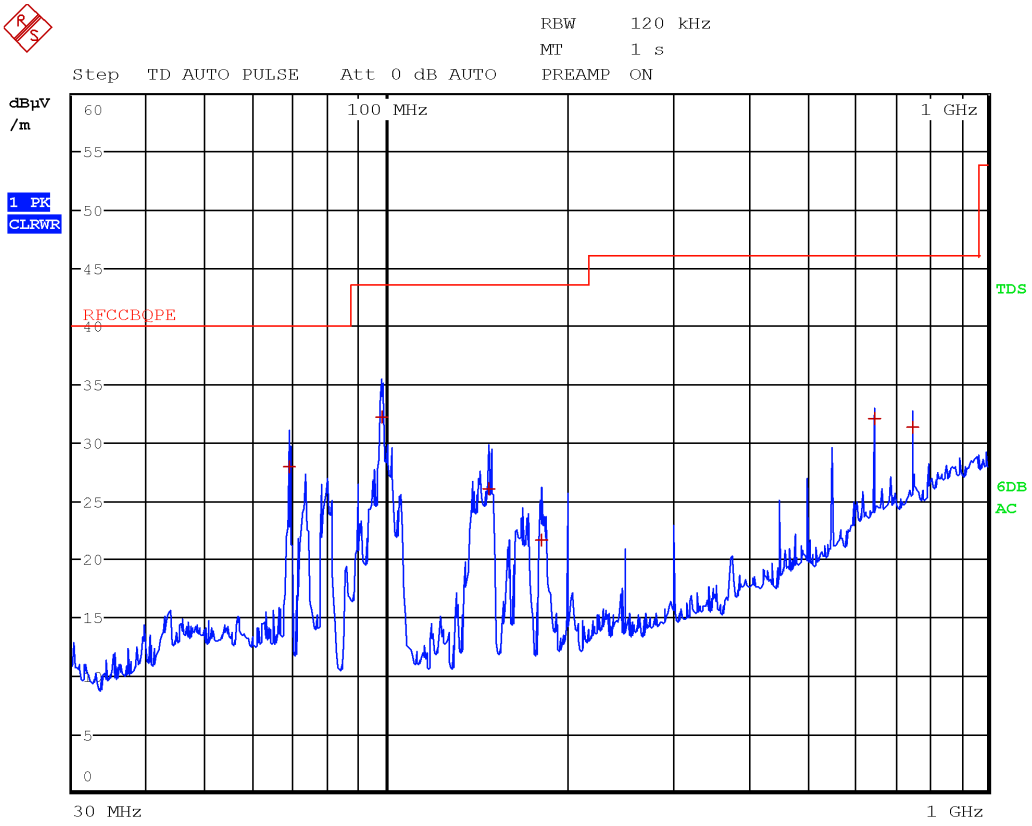


Figure 7.4-6: *Radiated spurious emissions 30 to 1000 MHz, 5300 MHz with antenna in horizontal polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
69.6900	25.8	40.0	-14.2	QP
98.4300	27.0	43.5	-16.5	QP
139.7400	35.3	43.5	-8.2	QP
142.0800	36.2	43.5	-7.3	QP
162.0300	32.4	43.5	-11.1	QP
211.3500	36.2	43.5	-7.3	QP
213.7800	30.4	43.5	-13.1	QP
250.0200	33.6	46.0	-12.4	QP
430.9500	29.8	46.0	-16.2	QP
467.3400	40.2	46.0	-5.8	QP
549.9900	31.3	46.0	-14.7	QP
650.0100	31.4	46.0	-14.6	QP
850.0200	30.8	46.0	-15.2	QP

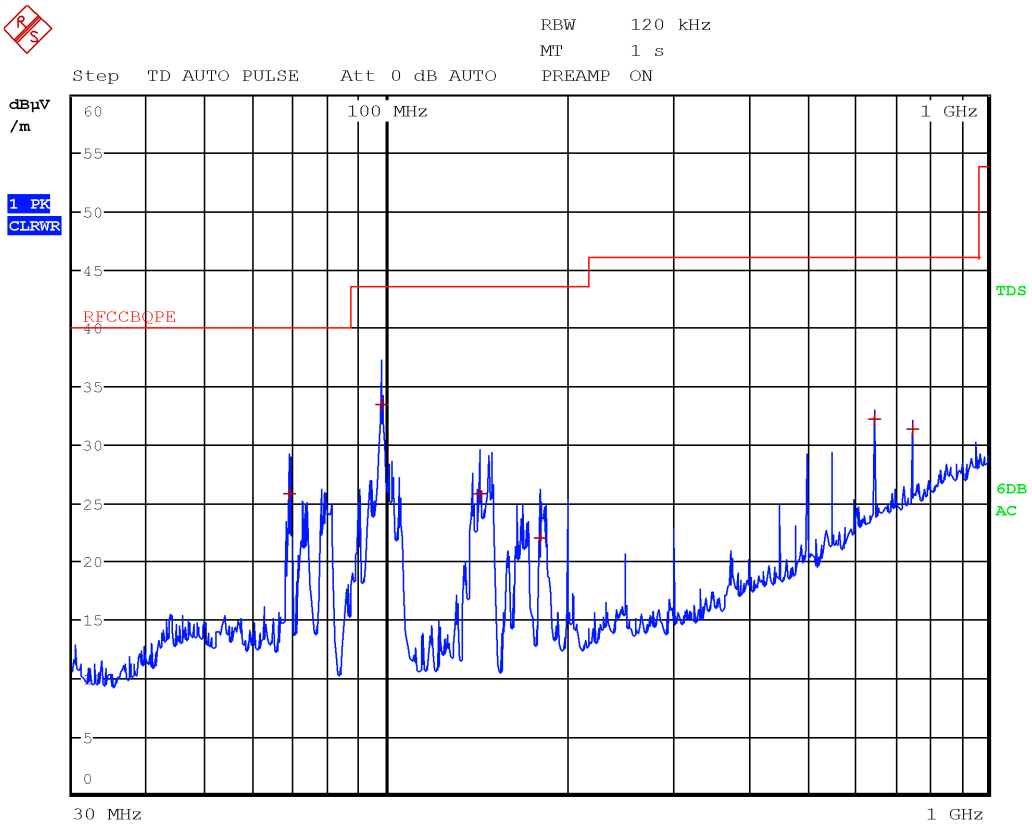


Figure 7.4-7: *Radiated spurious emissions 30 to 1000 MHz, 5580 MHz with antenna in horizontal polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
69.6900	27.3	40.0	-12.7	QP
98.4900	25.6	43.5	-17.9	QP
138.5100	34.4	43.5	-9.1	QP
142.1100	36.0	43.5	-7.5	QP
162.0300	32.6	43.5	-10.9	QP
211.3500	36.3	43.5	-7.2	QP
232.4700	32.8	46.0	-13.2	QP
250.0200	33.7	46.0	-12.3	QP
430.8600	29.2	46.0	-16.8	QP
467.4300	39.7	46.0	-6.3	QP
550.0200	31.2	46.0	-14.8	QP
650.0100	31.4	46.0	-14.6	QP
850.0200	30.8	46.0	-15.2	QP

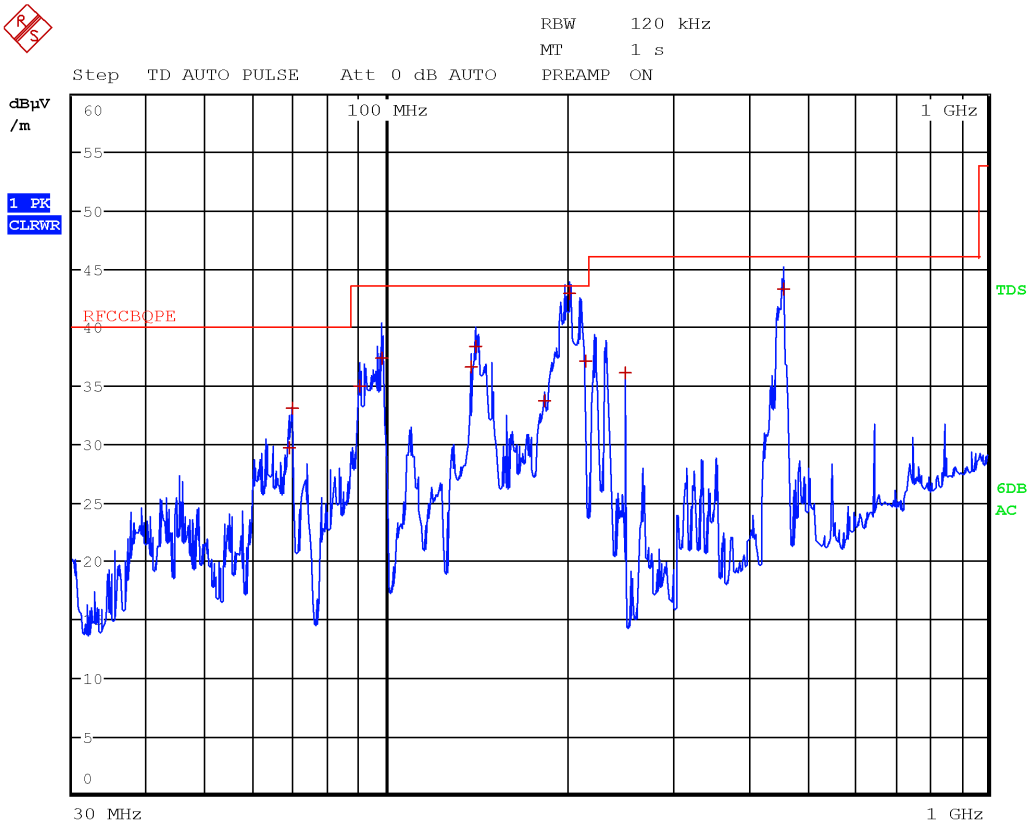


Figure 7.4-8: *Radiated spurious emissions 30 to 1000 MHz, 5580 MHz with antenna in vertical polarization*

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
42.3300	25.4	40.0	-14.6	QP
43.5000	29.0	40.0	-11.0	QP
81.5400	31.8	40.0	-8.2	QP
98.4000	39.7	43.5	-3.8	QP
150.0000	37.2	43.5	-6.3	QP
200.0100	25.9	43.5	-17.6	QP
250.0200	34.1	46.0	-11.9	QP
650.0100	27.2	46.0	-18.8	QP
750.0000	29.9	46.0	-16.1	QP

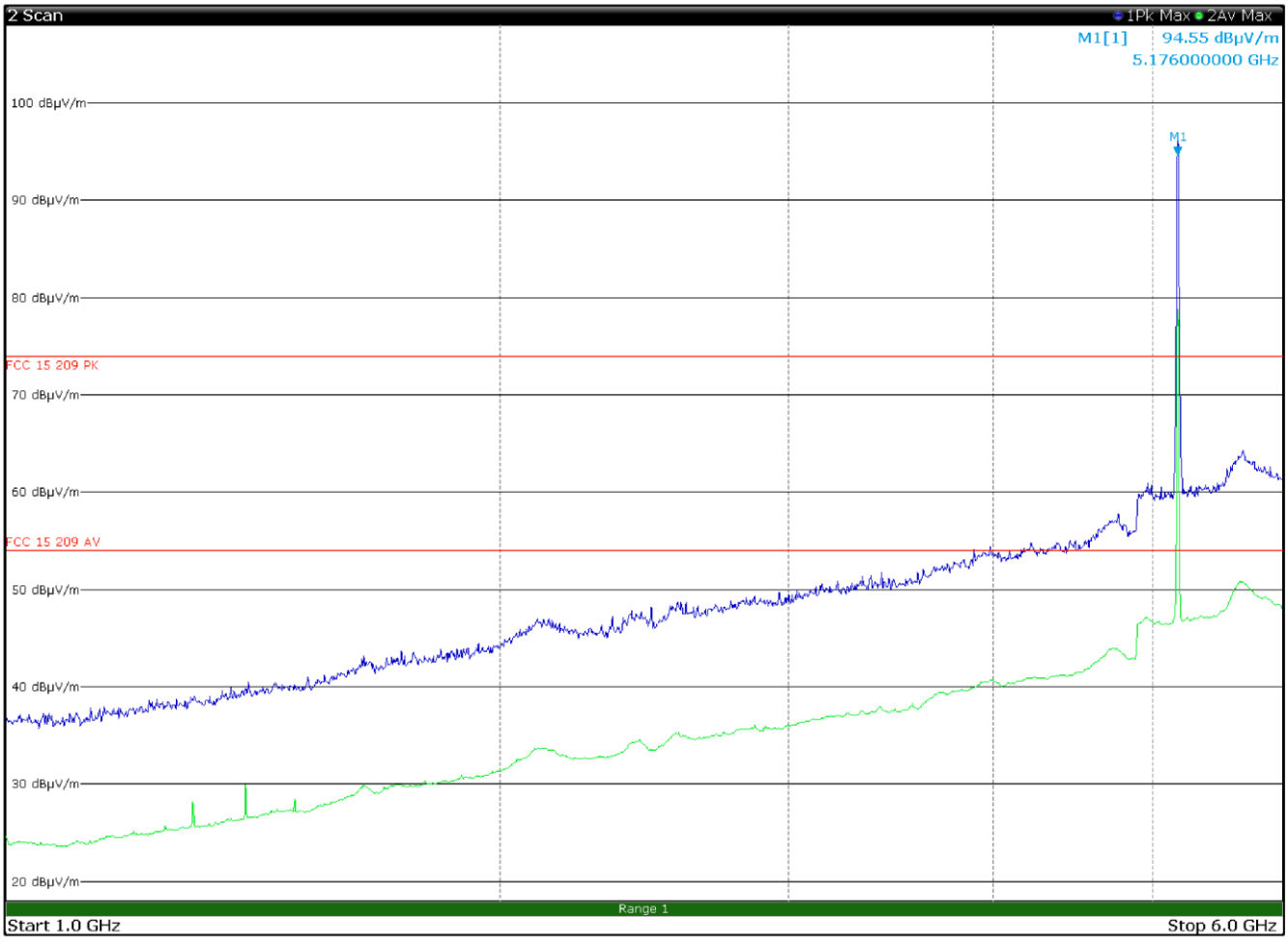


Figure 7.4-9: *Radiated spurious emissions 1 to 6 GHz, 5180 MHz with antenna in horizontal polarization*

Limit exceeded by the carrier

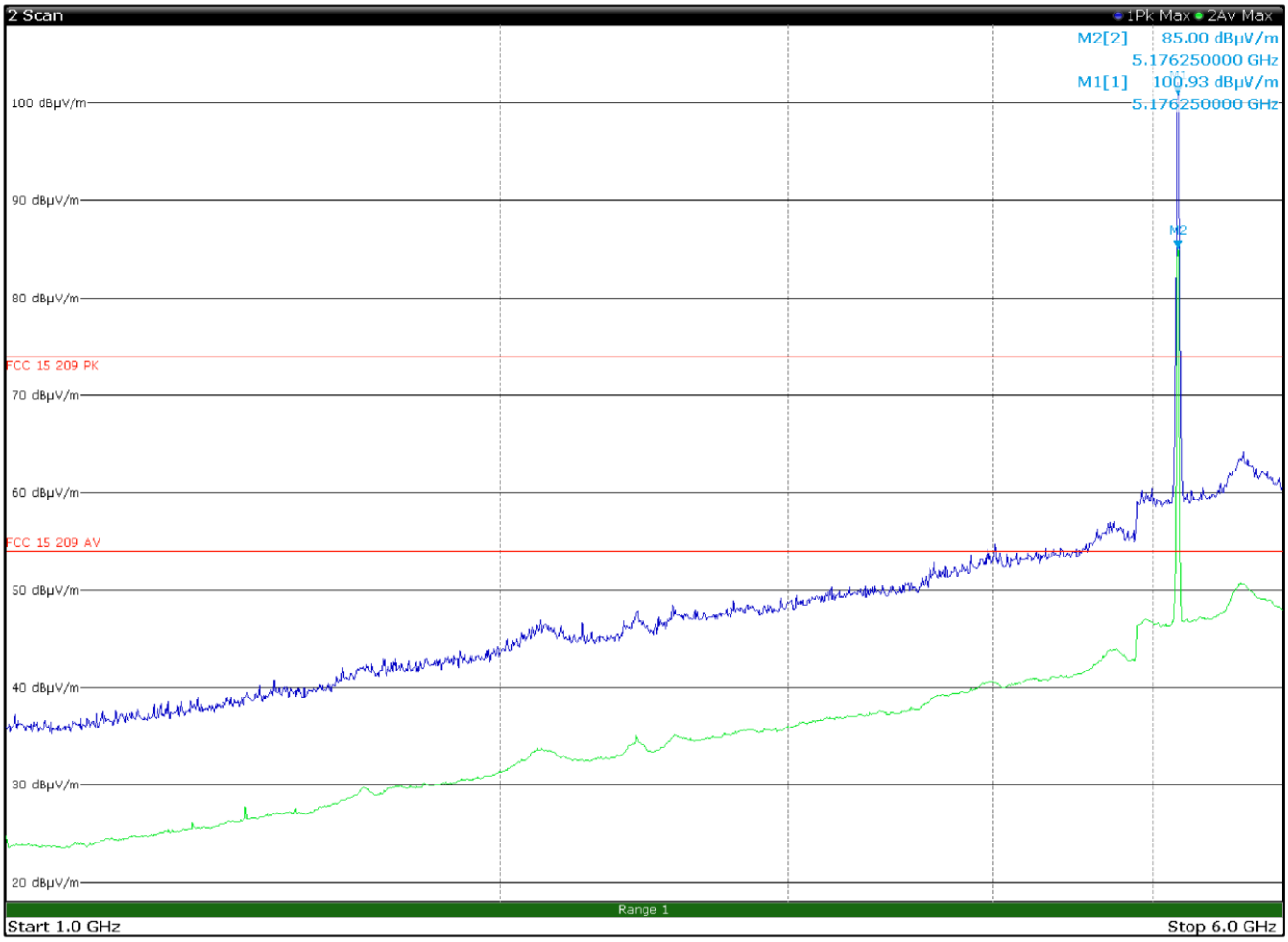


Figure 7.4-3: *Radiated spurious emissions 1 to 6 GHz, 5180 MHz with antenna in vertical polarization*

Limit exceeded by the carrier

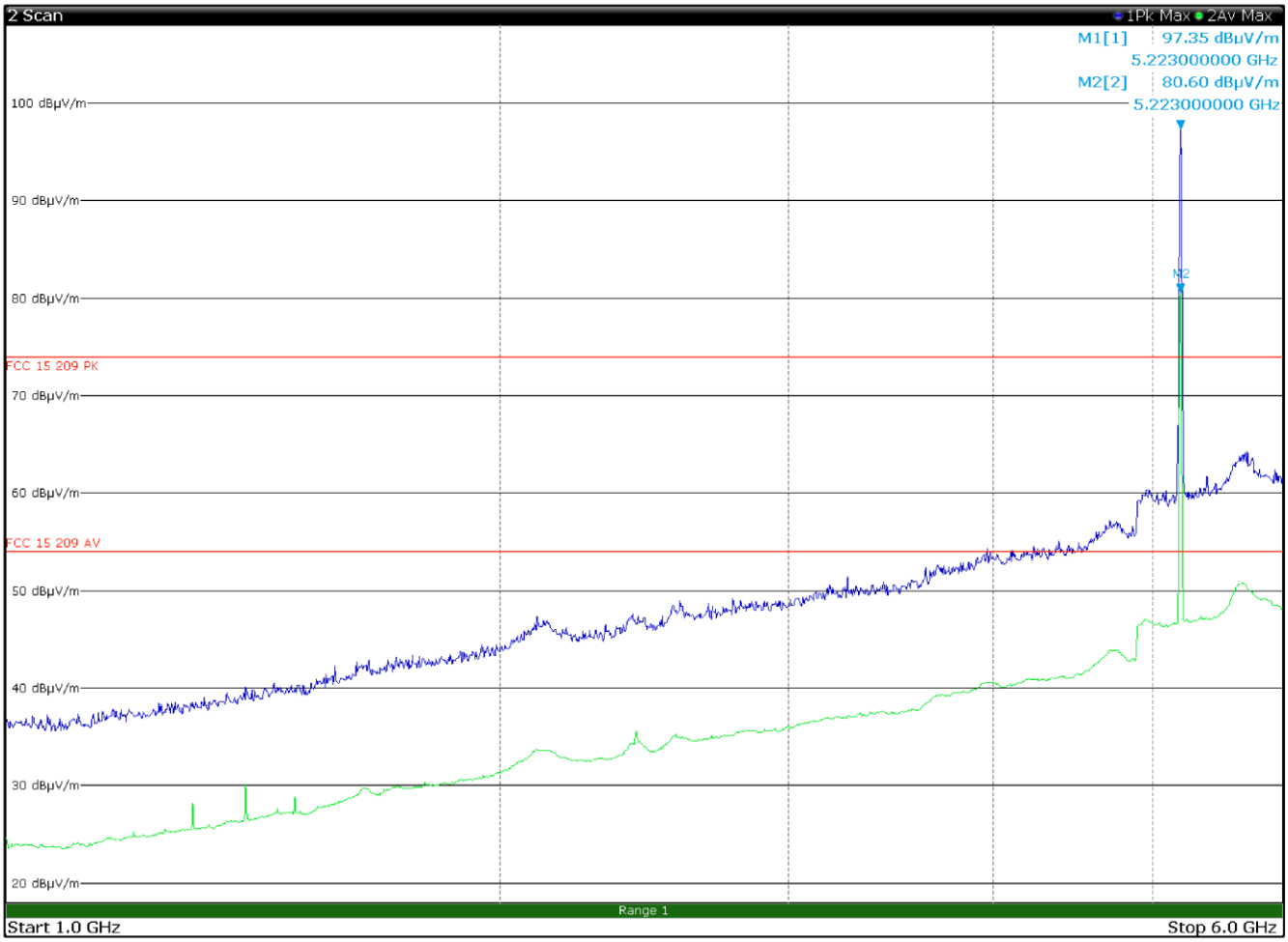


Figure 7.4-4: *Radiated spurious emissions 1 to 6 GHz, 5220 MHz with antenna in horizontal polarization*

Limit exceeded by the carrier

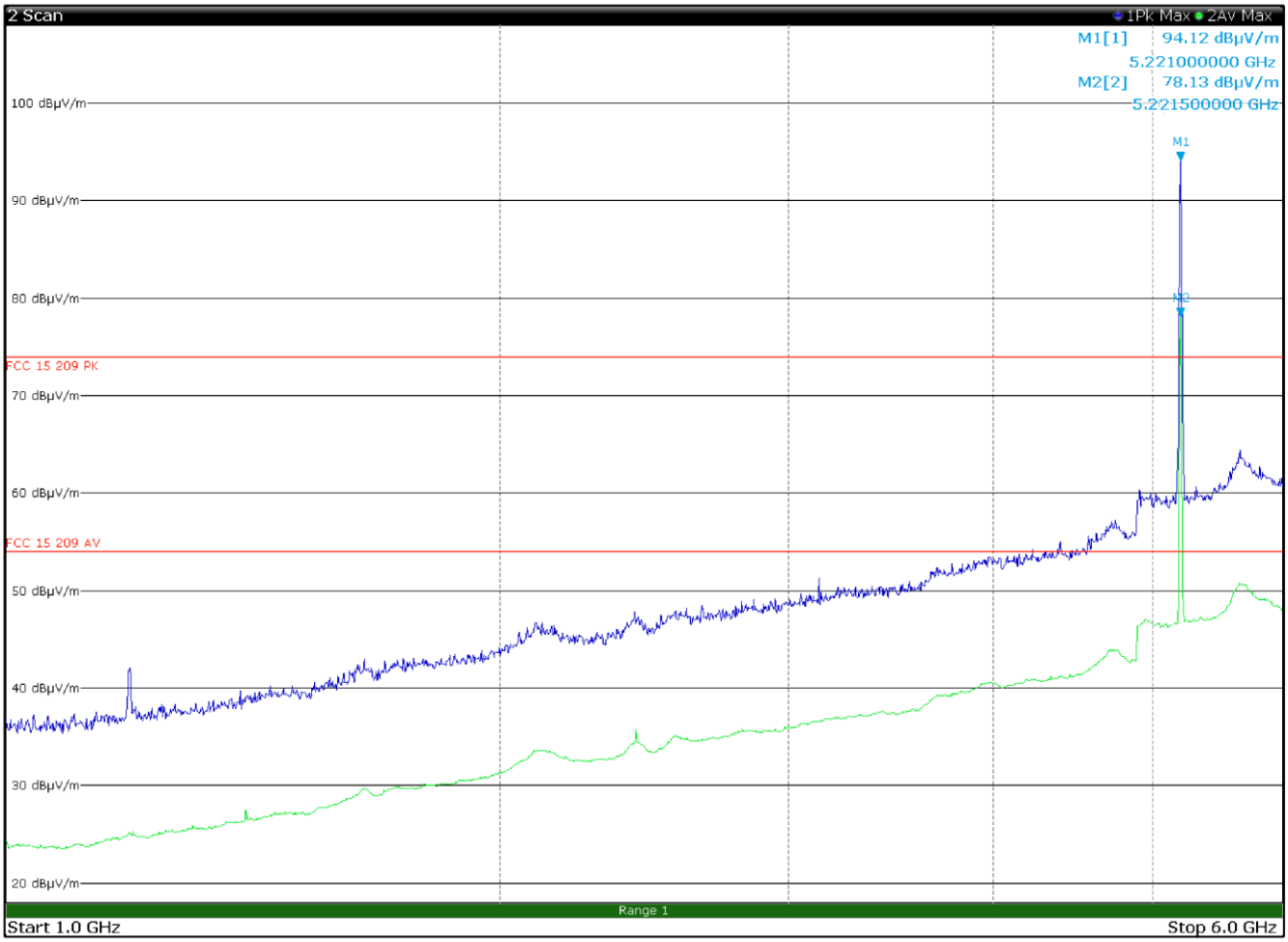


Figure 7.4-5: *Radiated spurious emissions 1 to 6 GHz, 5220 MHz with antenna in vertical polarization*

Limit exceeded by the carrier

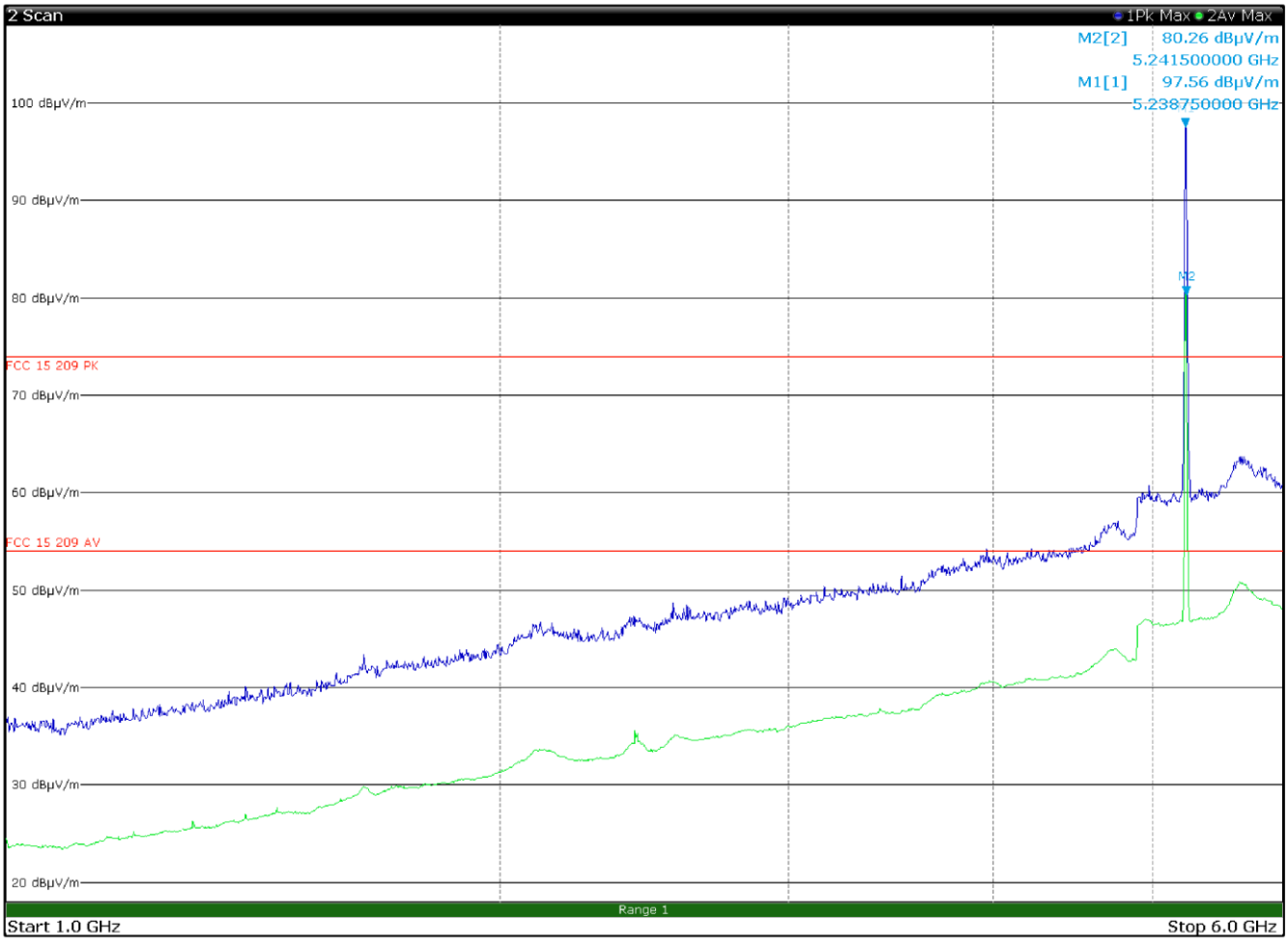


Figure 7.4-13: *Radiated spurious emissions 1 to 6 GHz, 5240 MHz with antenna in horizontal polarization*

Limit exceeded by the carrier

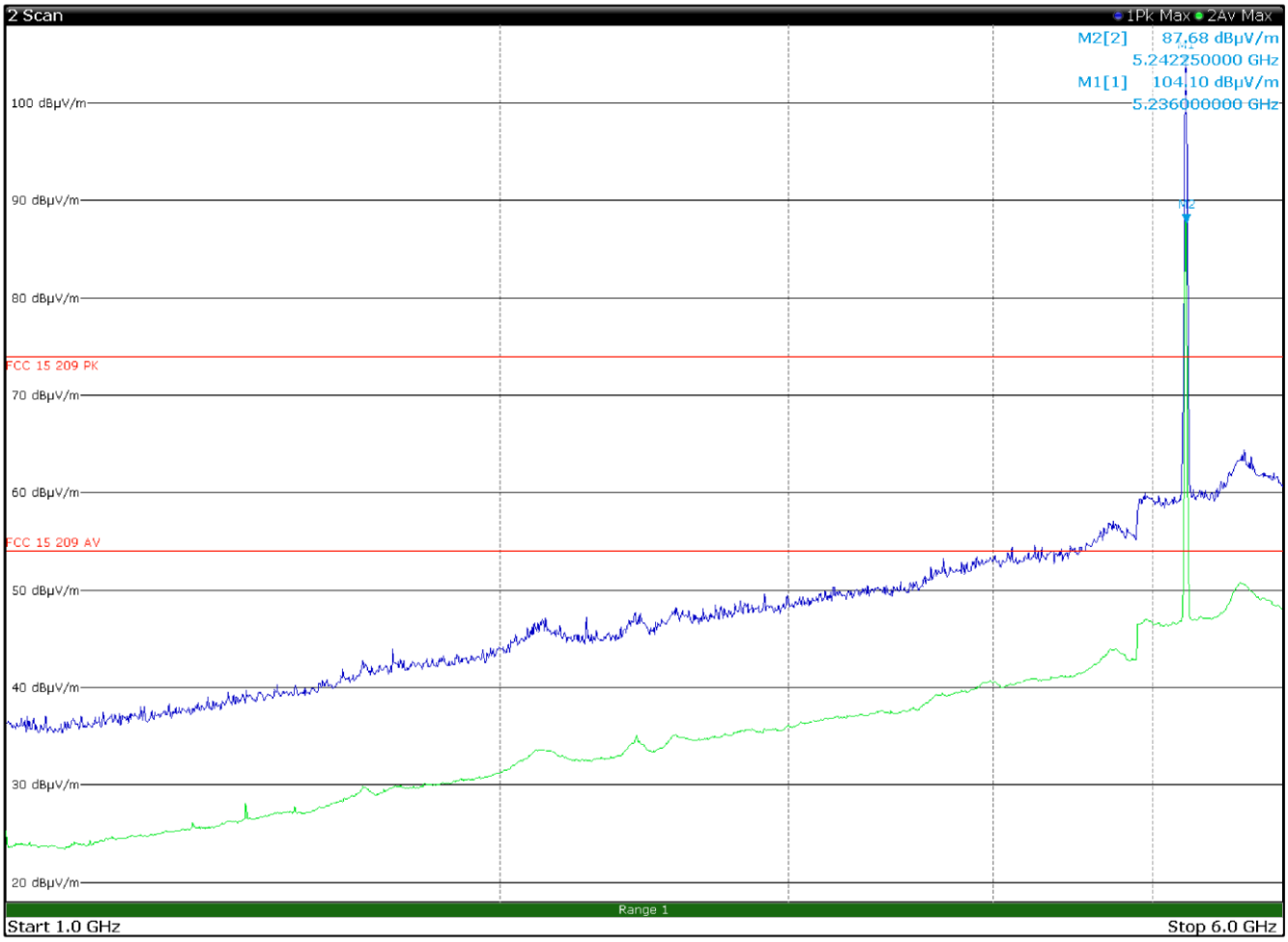


Figure 7.4-6: *Radiated spurious emissions 1 to 6 GHz, 5240 MHz with antenna in vertical polarization*

Limit exceeded by the carrier

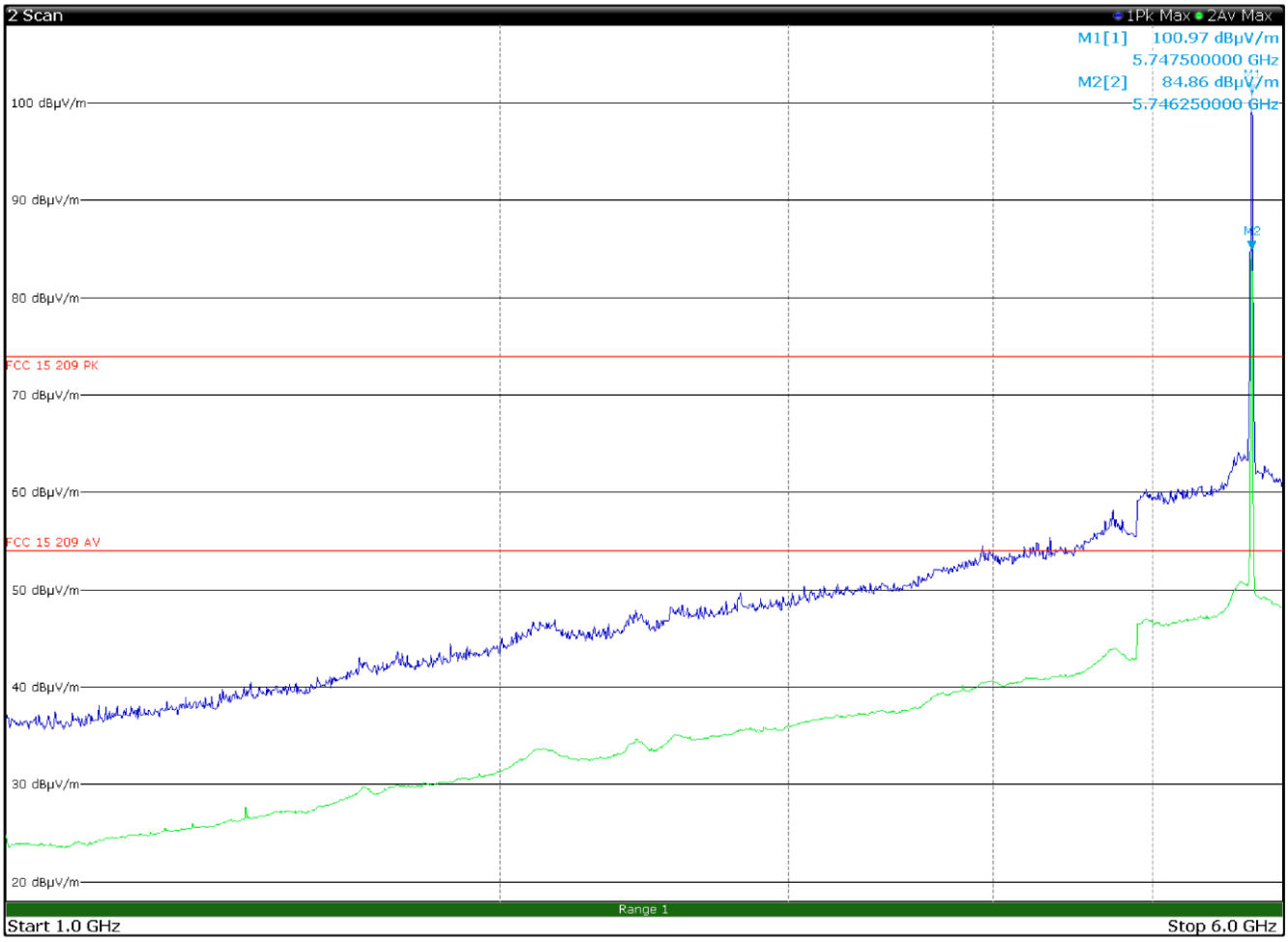


Figure 7.4-7: *Radiated spurious emissions 1 to 6 GHz, 5745 MHz with antenna in vertical polarization*

Limit exceeded by the carrier

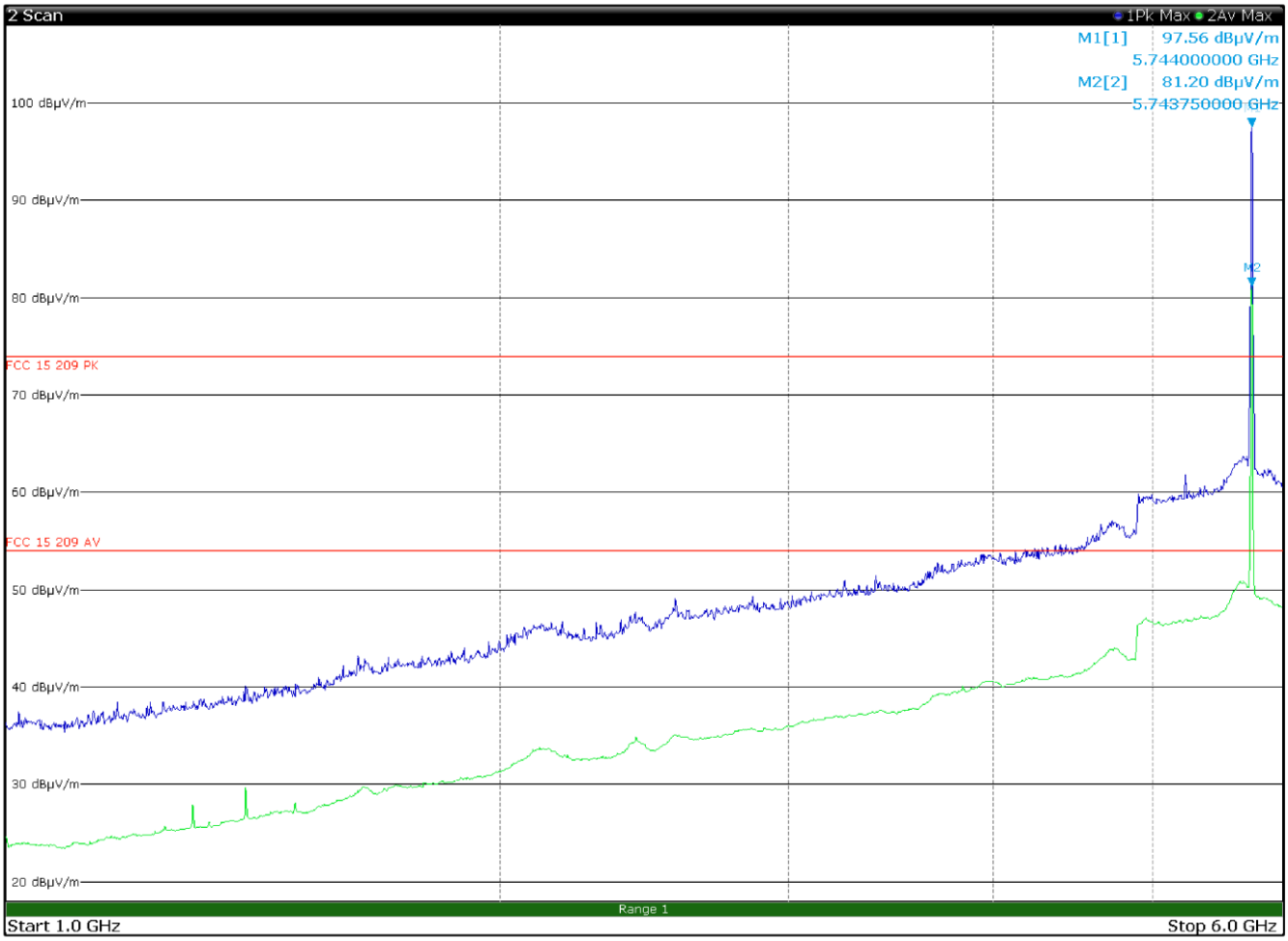


Figure 7.4-8: *Radiated spurious emissions 1 to 6 GHz, 5745 MHz with antenna in horizontal polarization*

Limit exceeded by the carrier

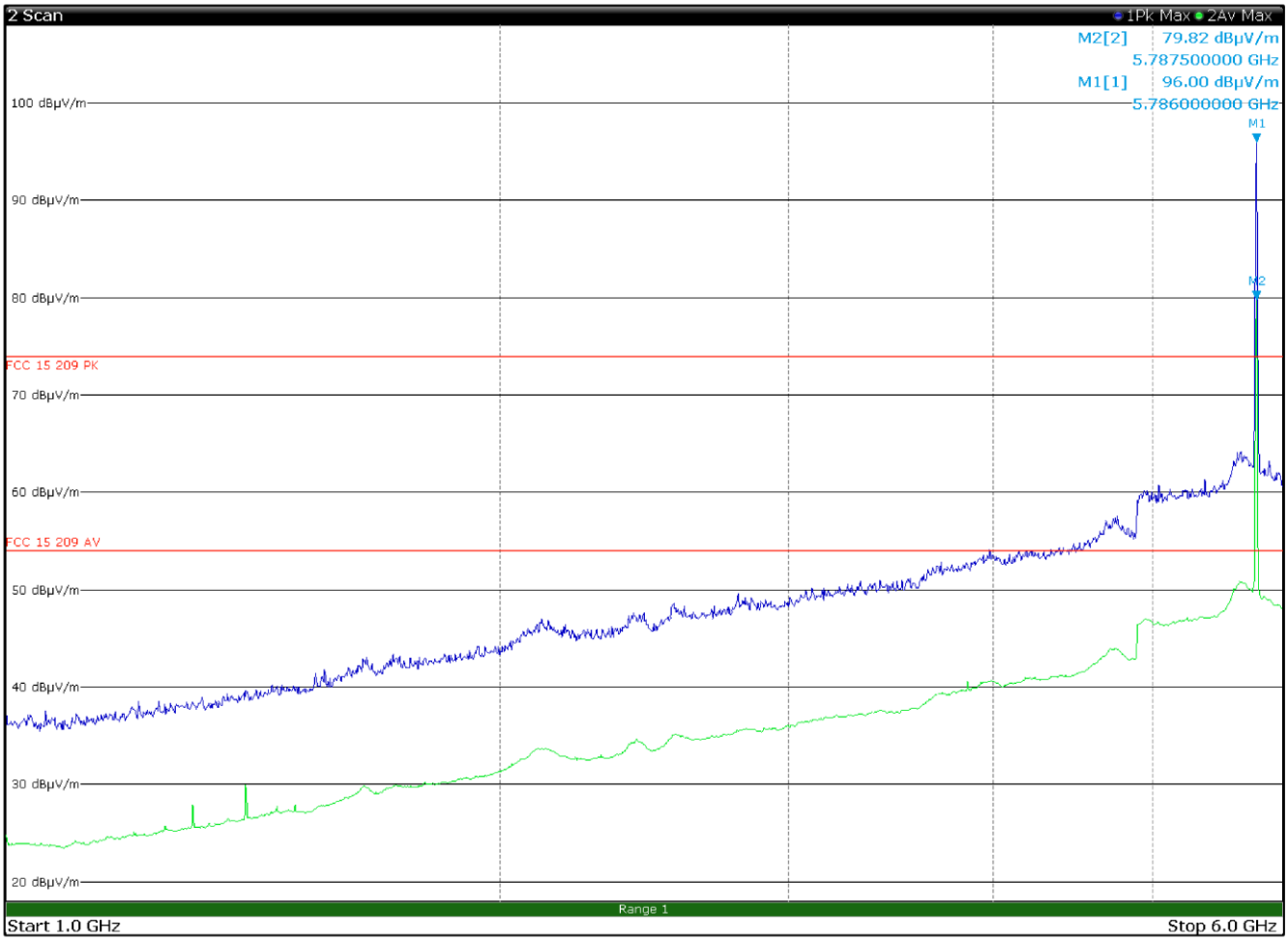


Figure 7.4-9: *Radiated spurious emissions 1 to 6 GHz, 5785 MHz with antenna in horizontal polarization*

Limit exceeded by the carrier

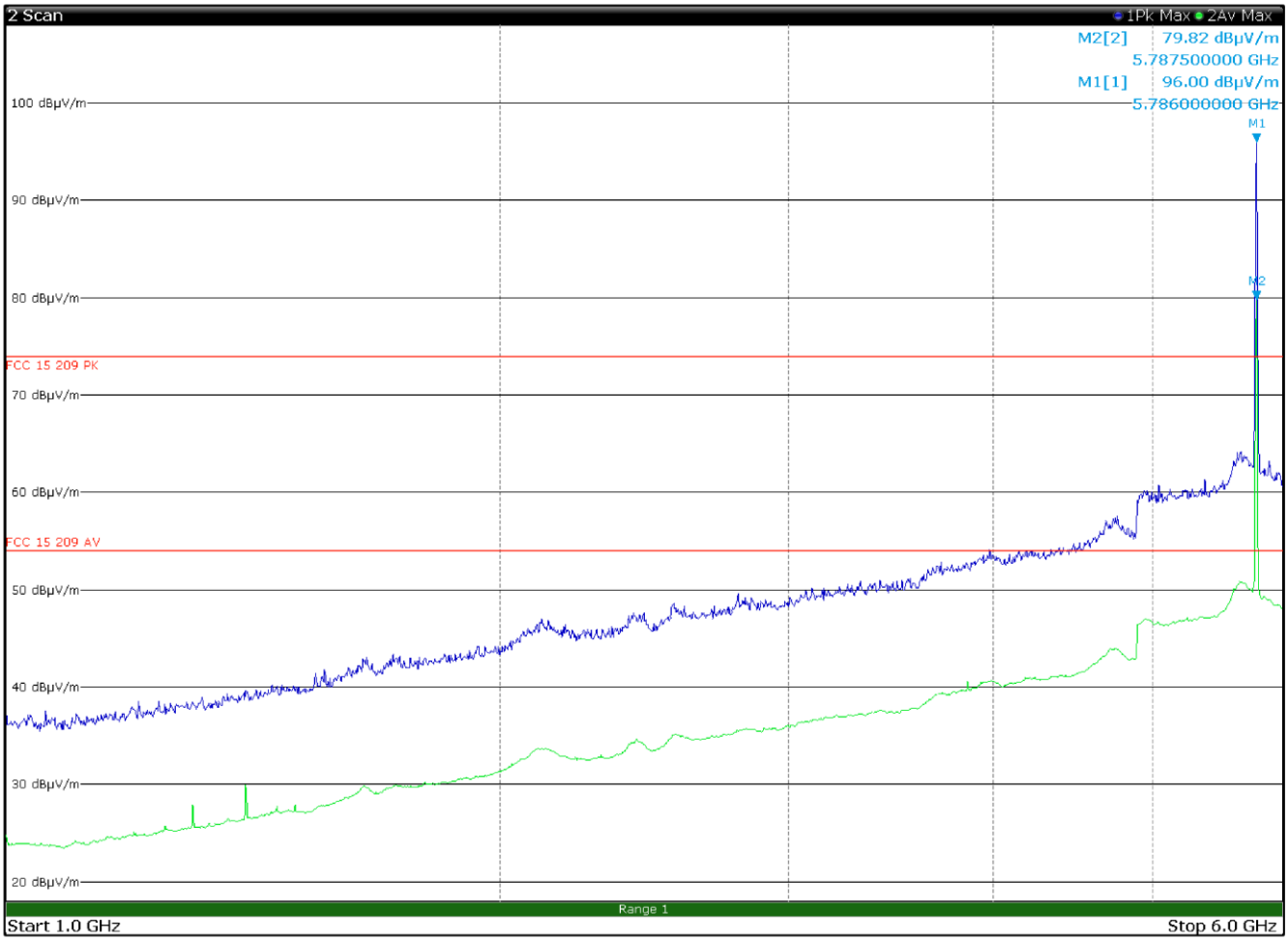


Figure 7.4-10: *Radiated spurious emissions 1 to 6 GHz, 5785 MHz with antenna in vertical polarization*

Limit exceeded by the carrier

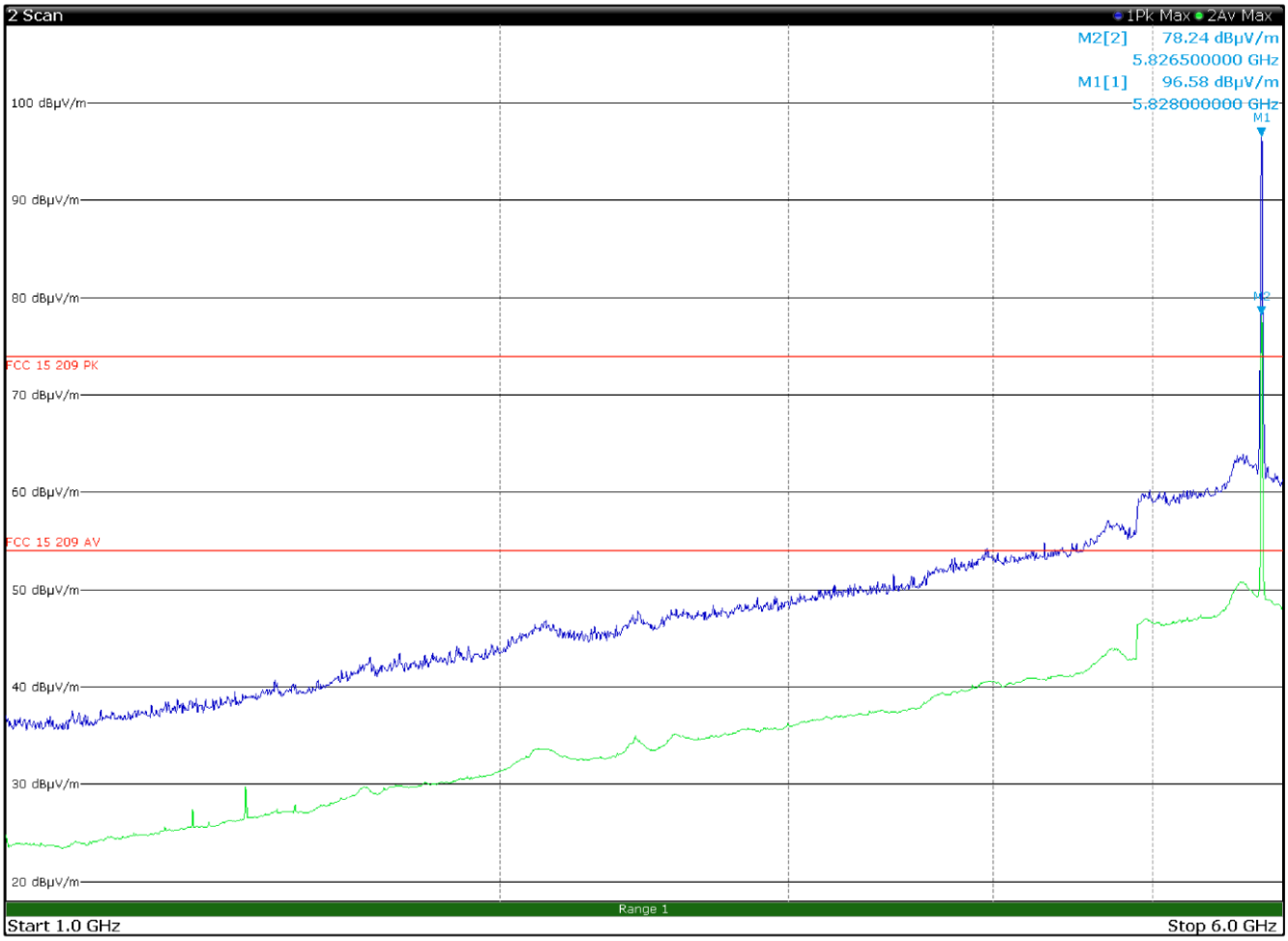


Figure 7.4-19: *Radiated spurious emissions 1 to 6 GHz, 5825 MHz with antenna in horizontal polarization*

Limit exceeded by the carrier

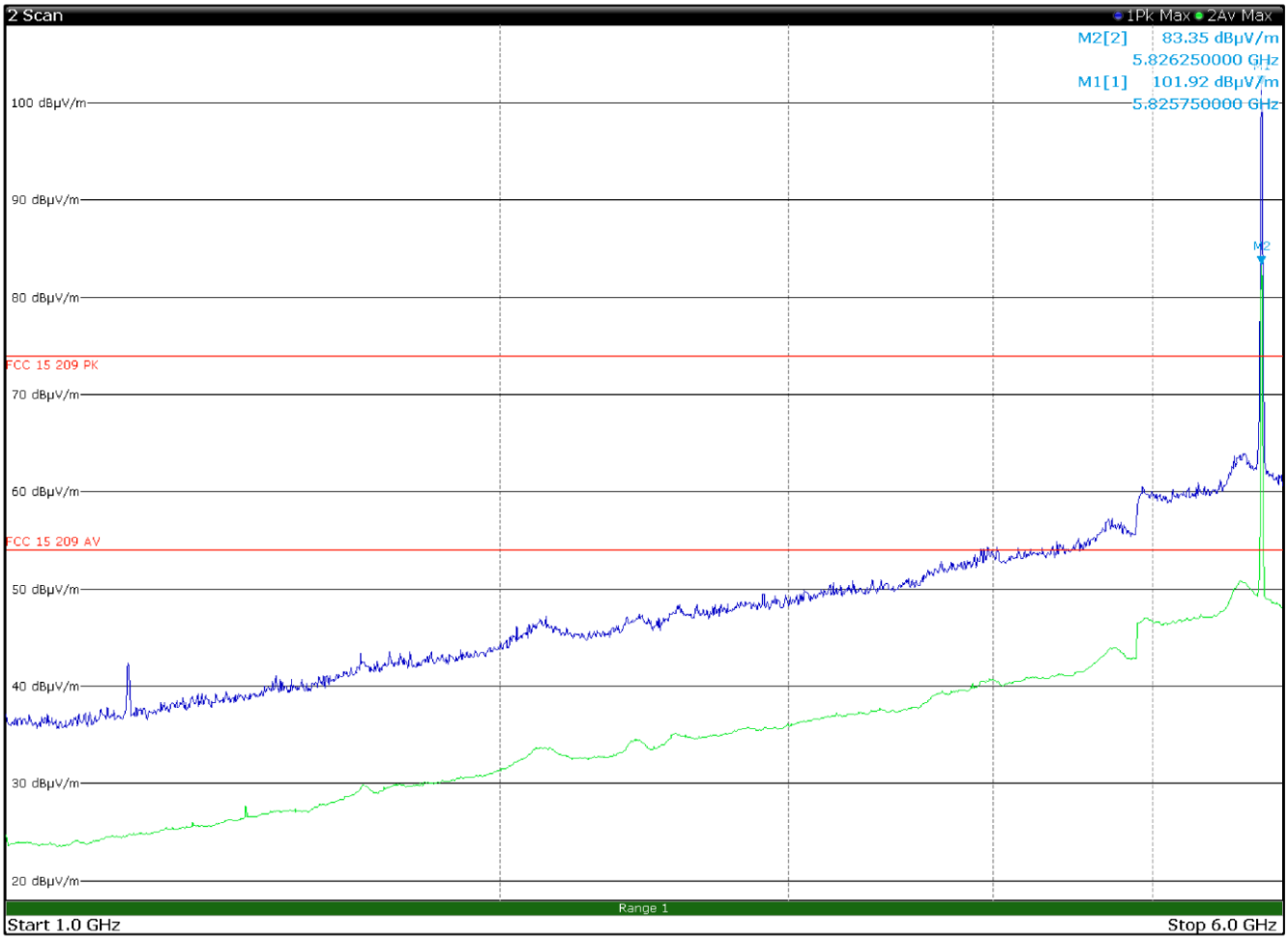


Figure 7.4-11: *Radiated spurious emissions 1 to 6 GHz, 5825 MHz with antenna in vertical polarization*

Limit exceeded by the carrier

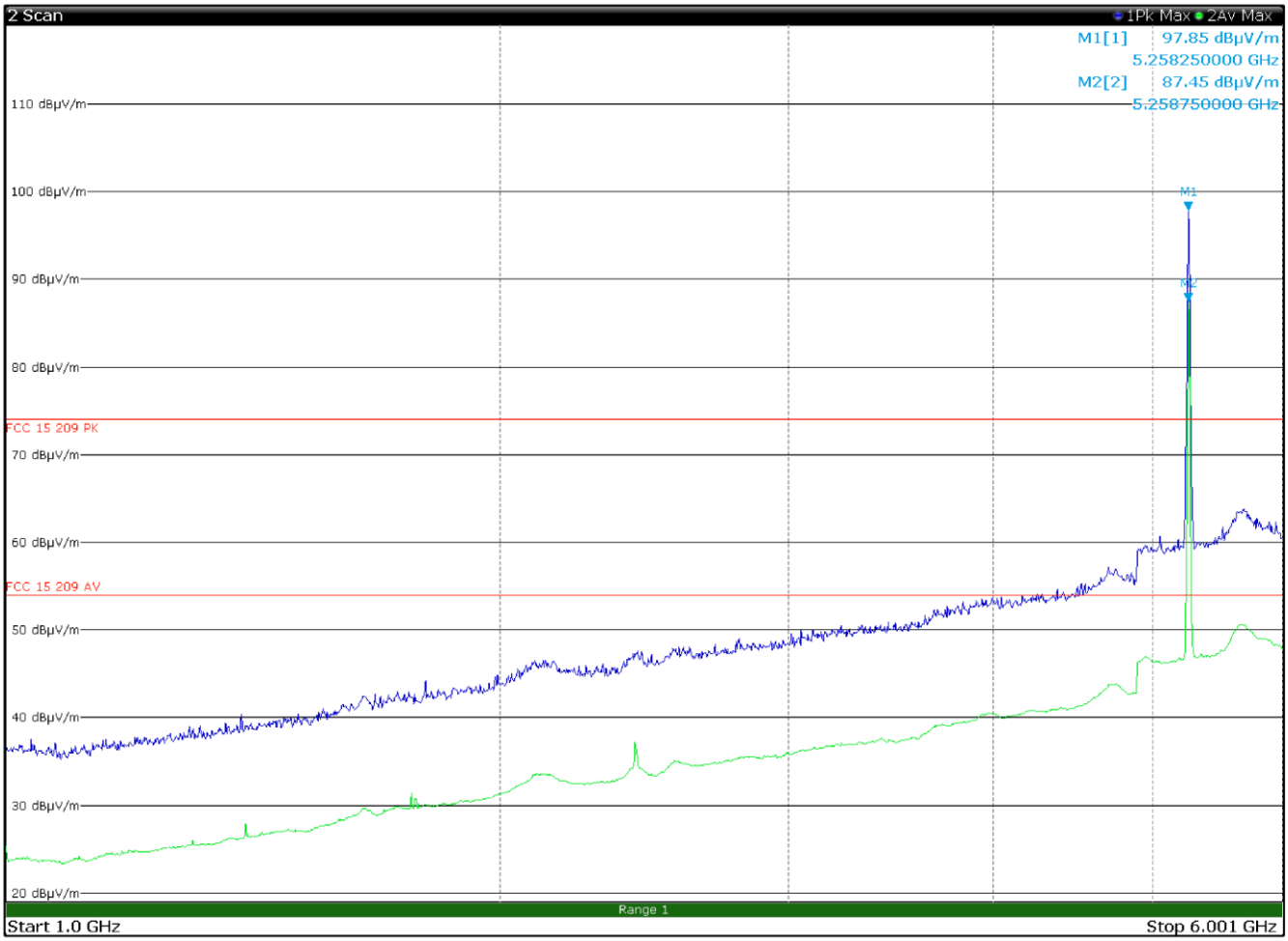


Figure 7.4-21: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5260 MHz with antenna in horizontal polarization (5260 MHz)*

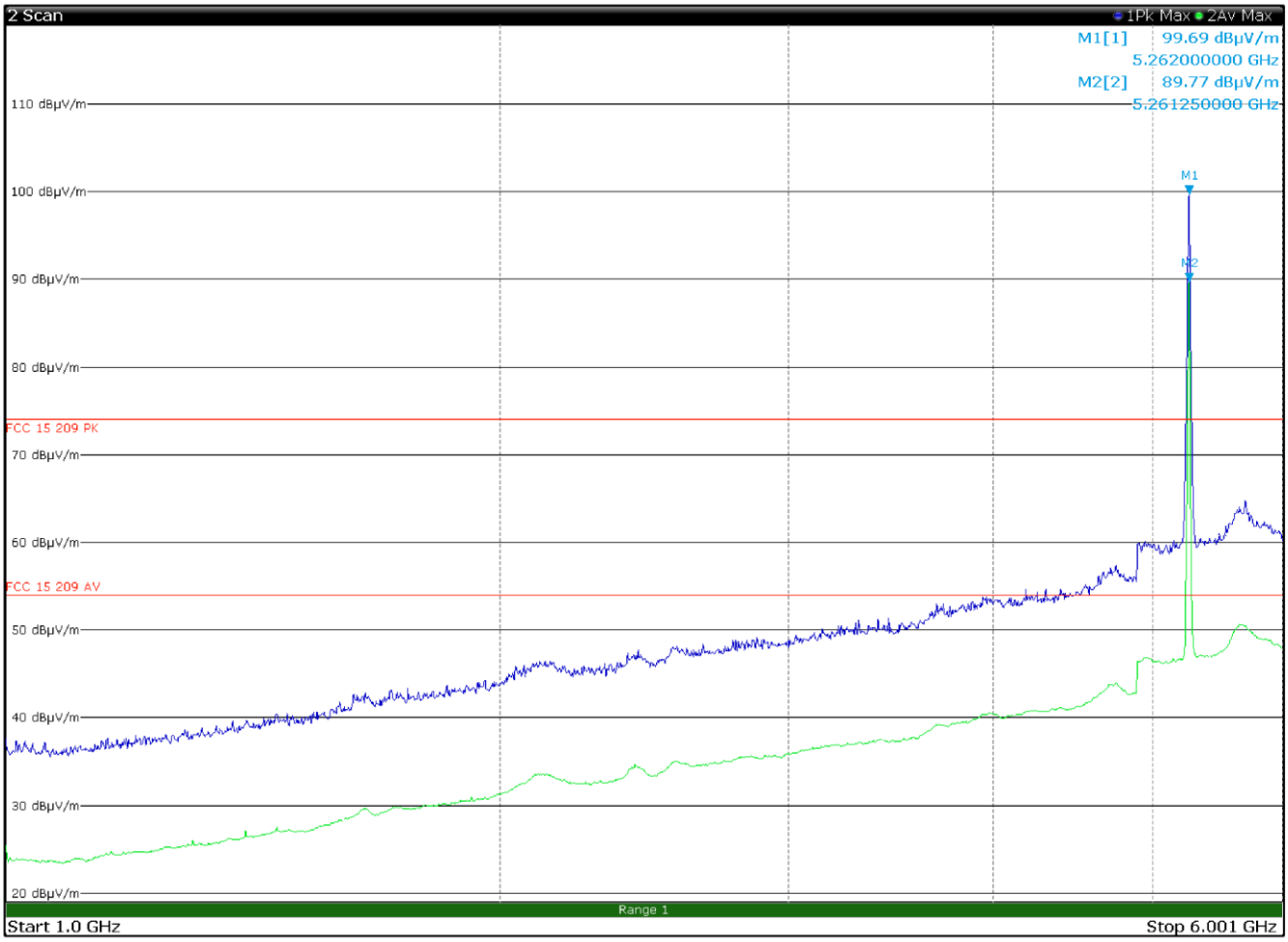


Figure 7.4-22: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5260 MHz with antenna in vertical polarization (5260 MHz)*

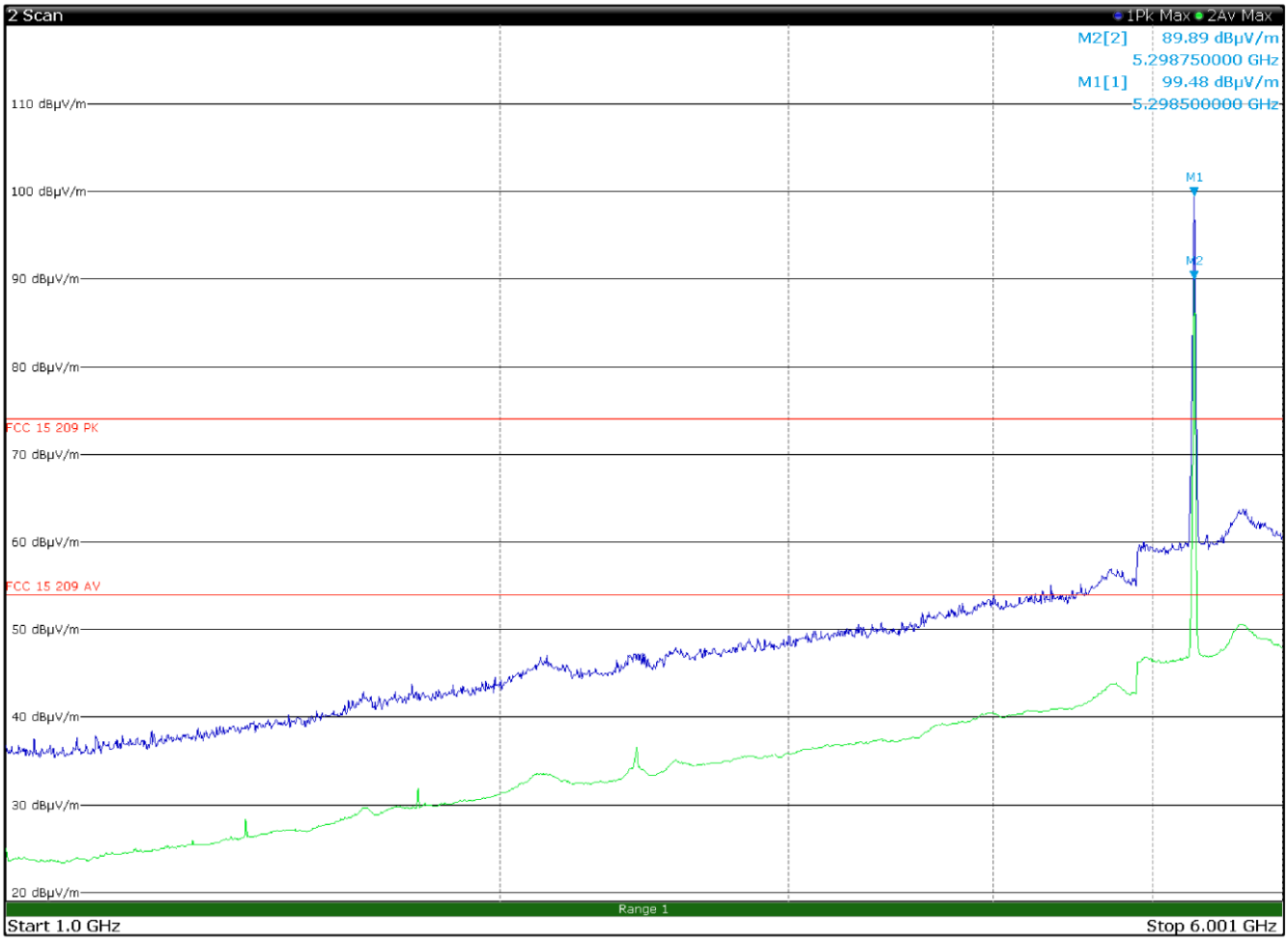


Figure 7.4-23: *Radiated spurious emissions 1 to 6 GHz, Mid channel, 5300 MHz with antenna in horizontal polarization (5300 MHz)*

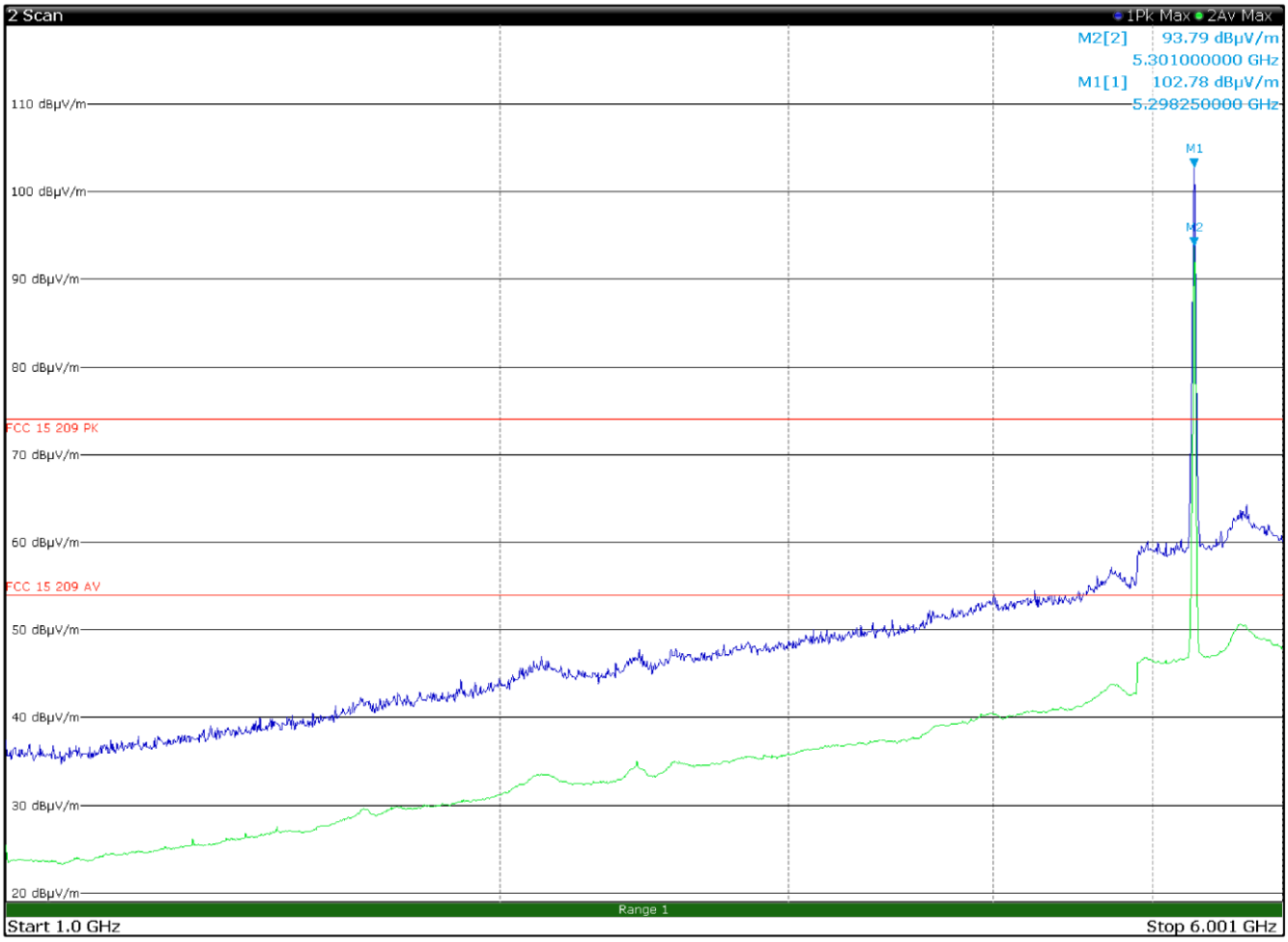


Figure 7.4-24: *Radiated spurious emissions 1 to 6 GHz, Mid channel, 5300 MHz with antenna in vertical polarization (5300 MHz)*

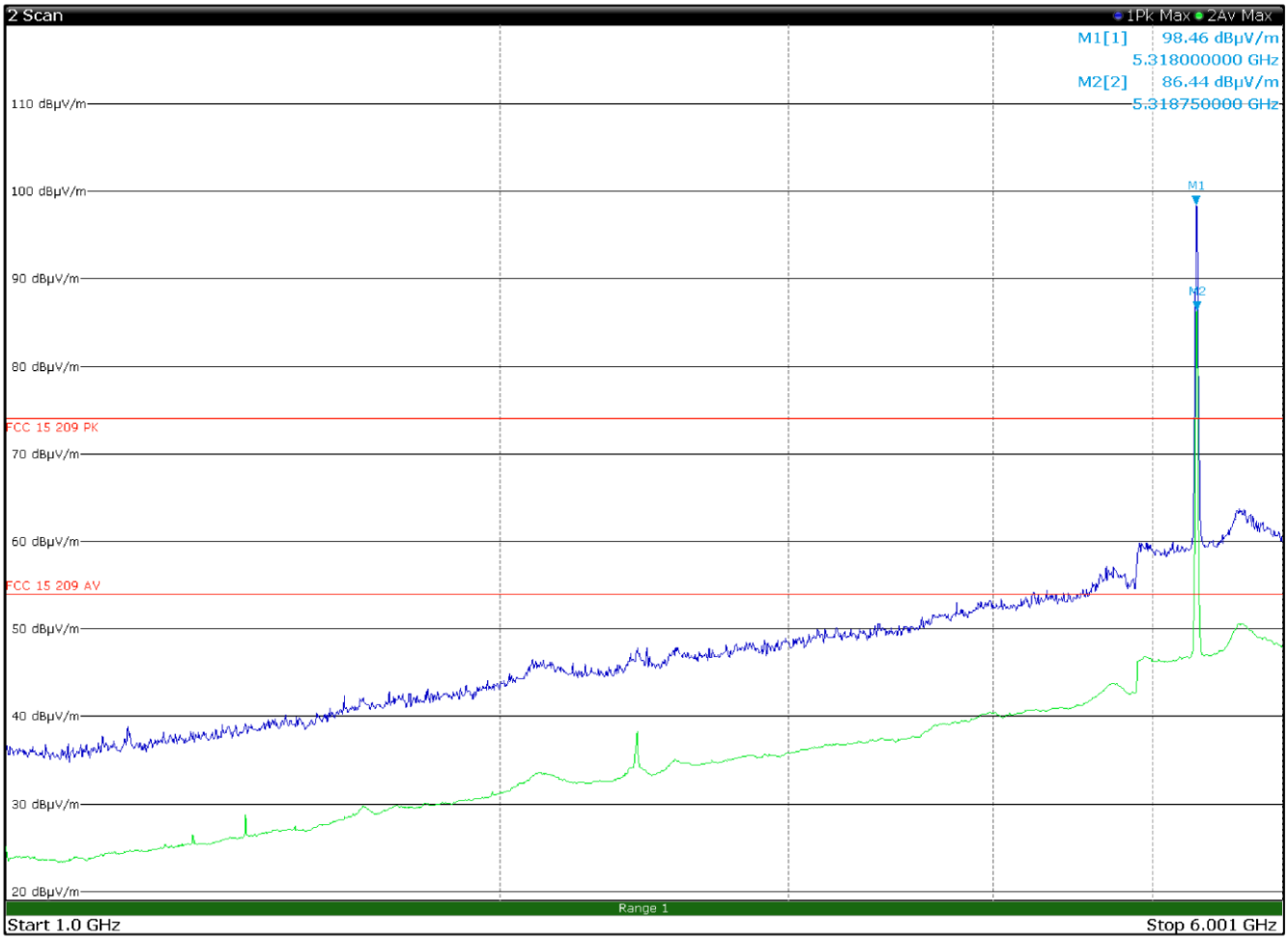


Figure 7.4-25: *Radiated spurious emissions 1 to 6 GHz, High channel, 5320 MHz with antenna in horizontal polarization (5320 MHz)*

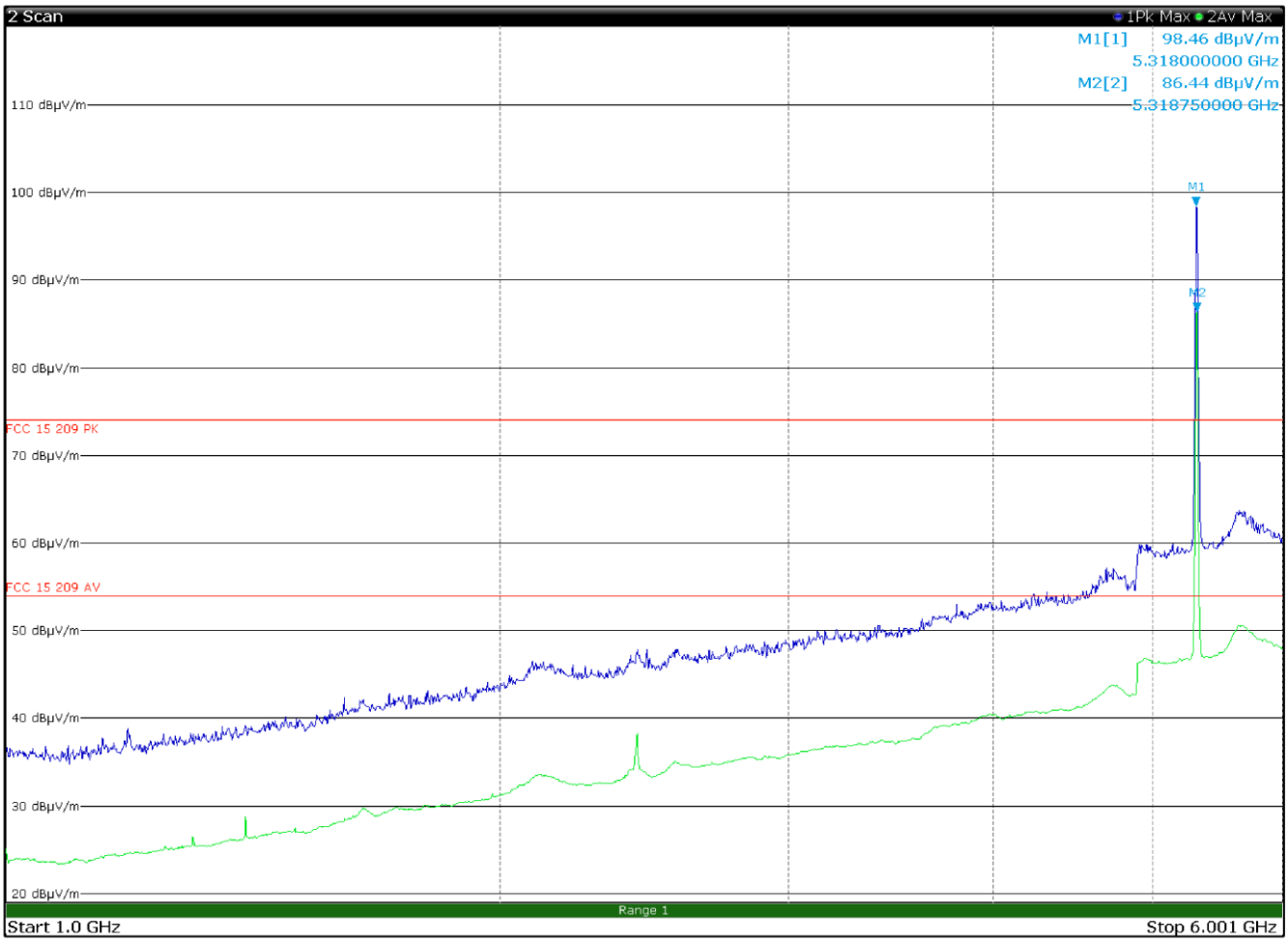


Figure 7.4-26: *Radiated spurious emissions 1 to 6 GHz, High channel, 5320 MHz with antenna in horizontal polarization (5320MHz)*

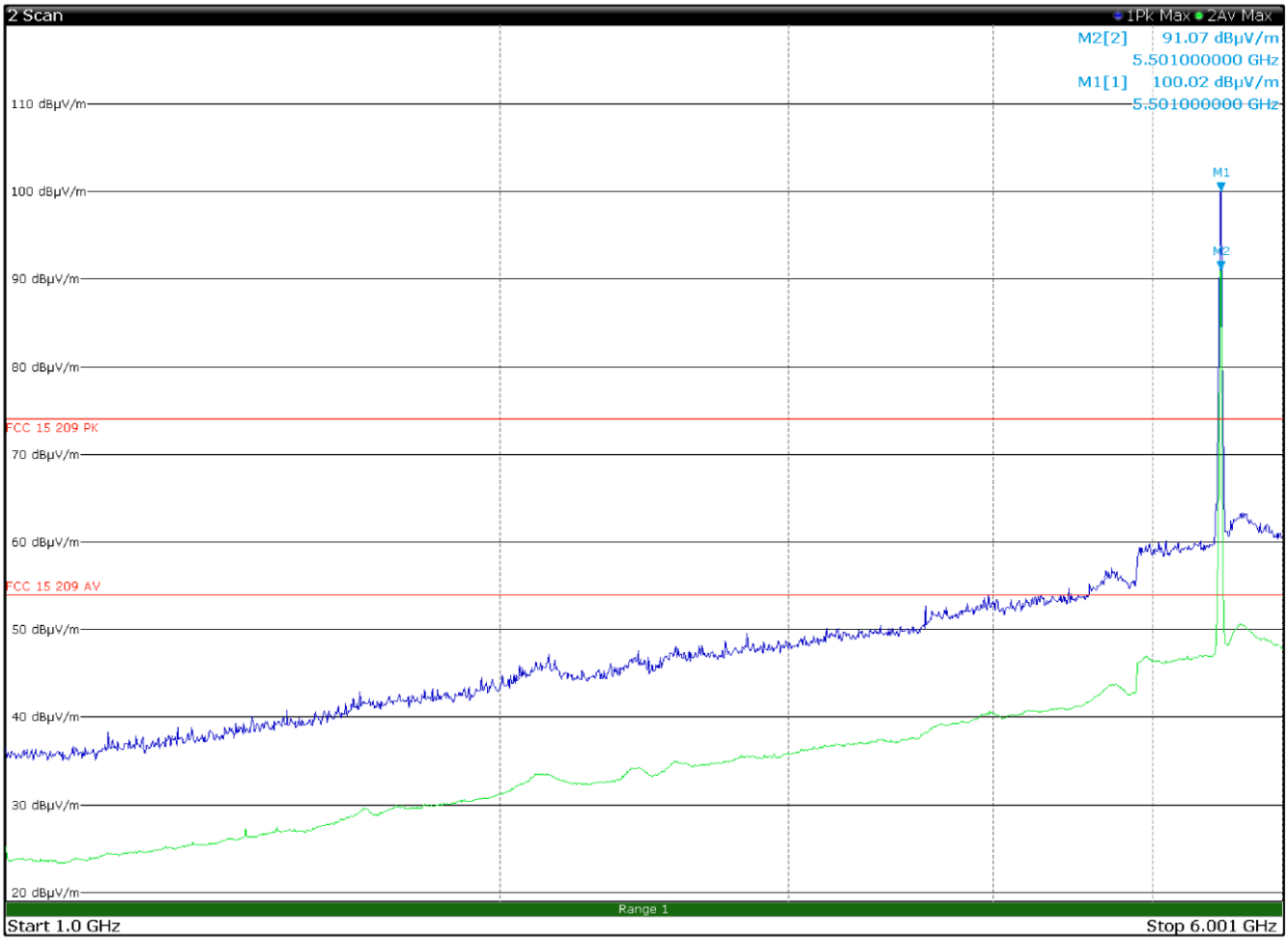


Figure 7.4-27: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5500 MHz with antenna in vertical polarization (5500 MHz)*

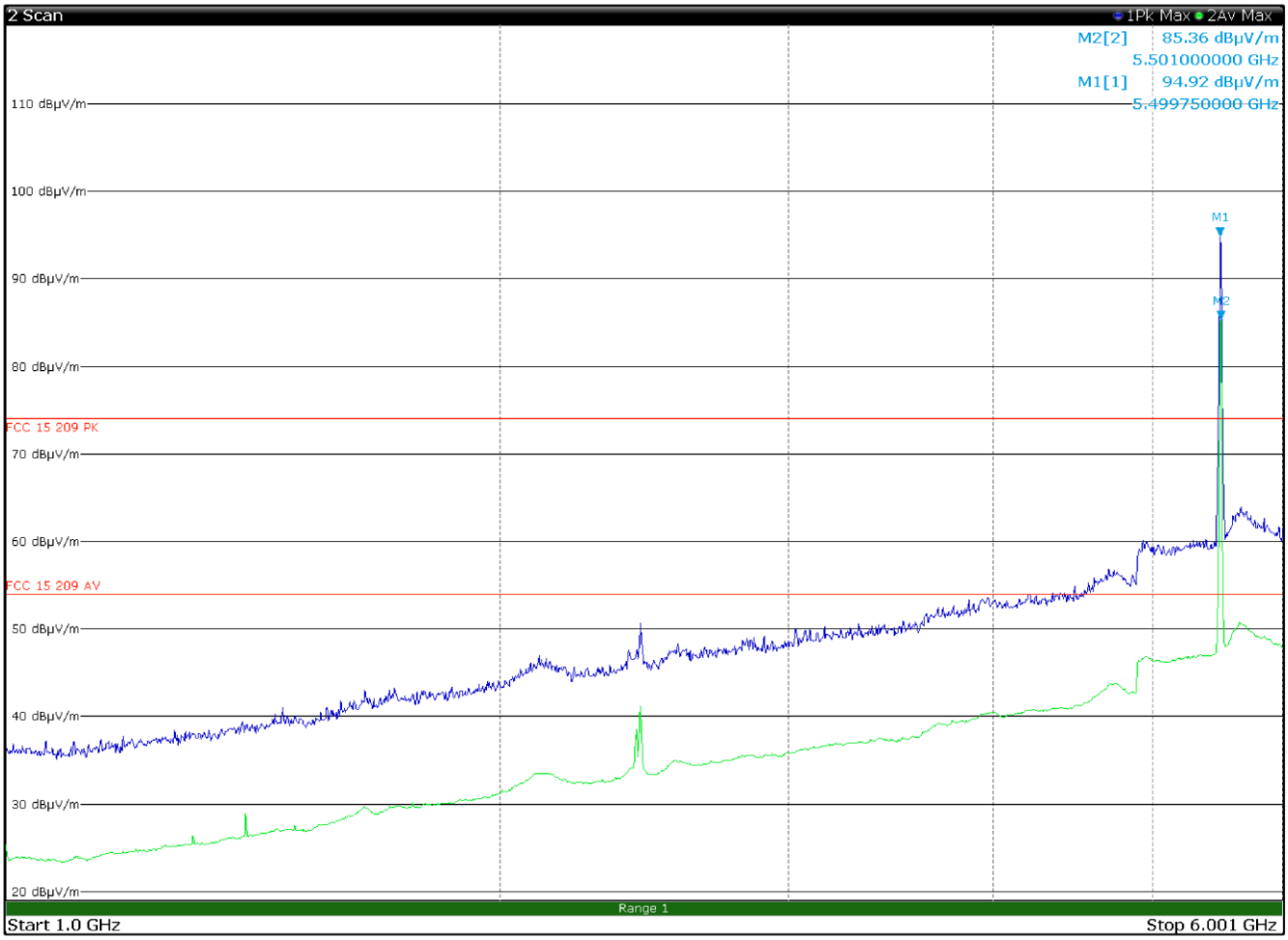


Figure 7.4-28: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5500 MHz with antenna in horizontal polarization (5500MHz)*

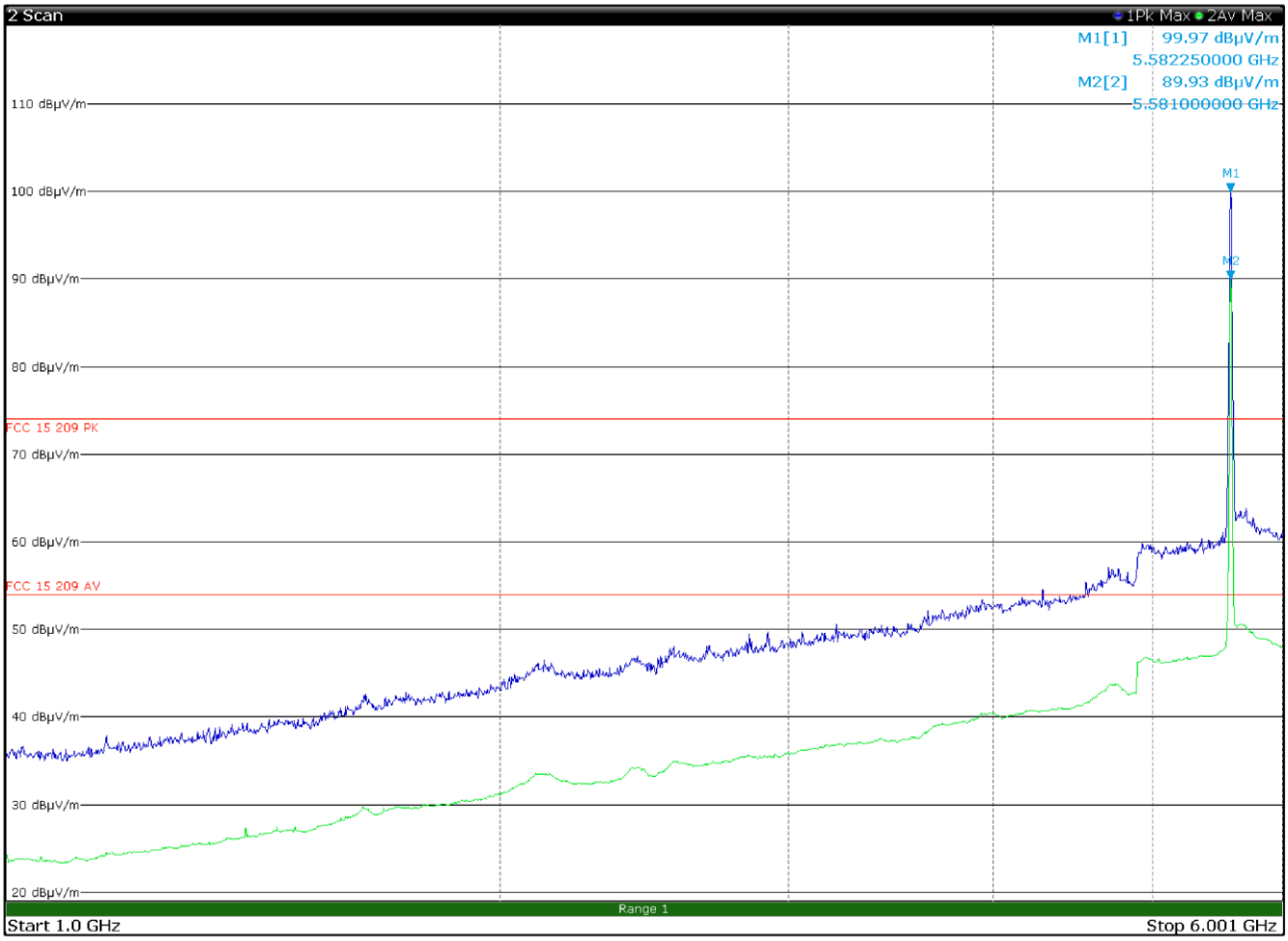


Figure 7.4-29: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5580 MHz with antenna in vertical polarization (5580 MHz)*

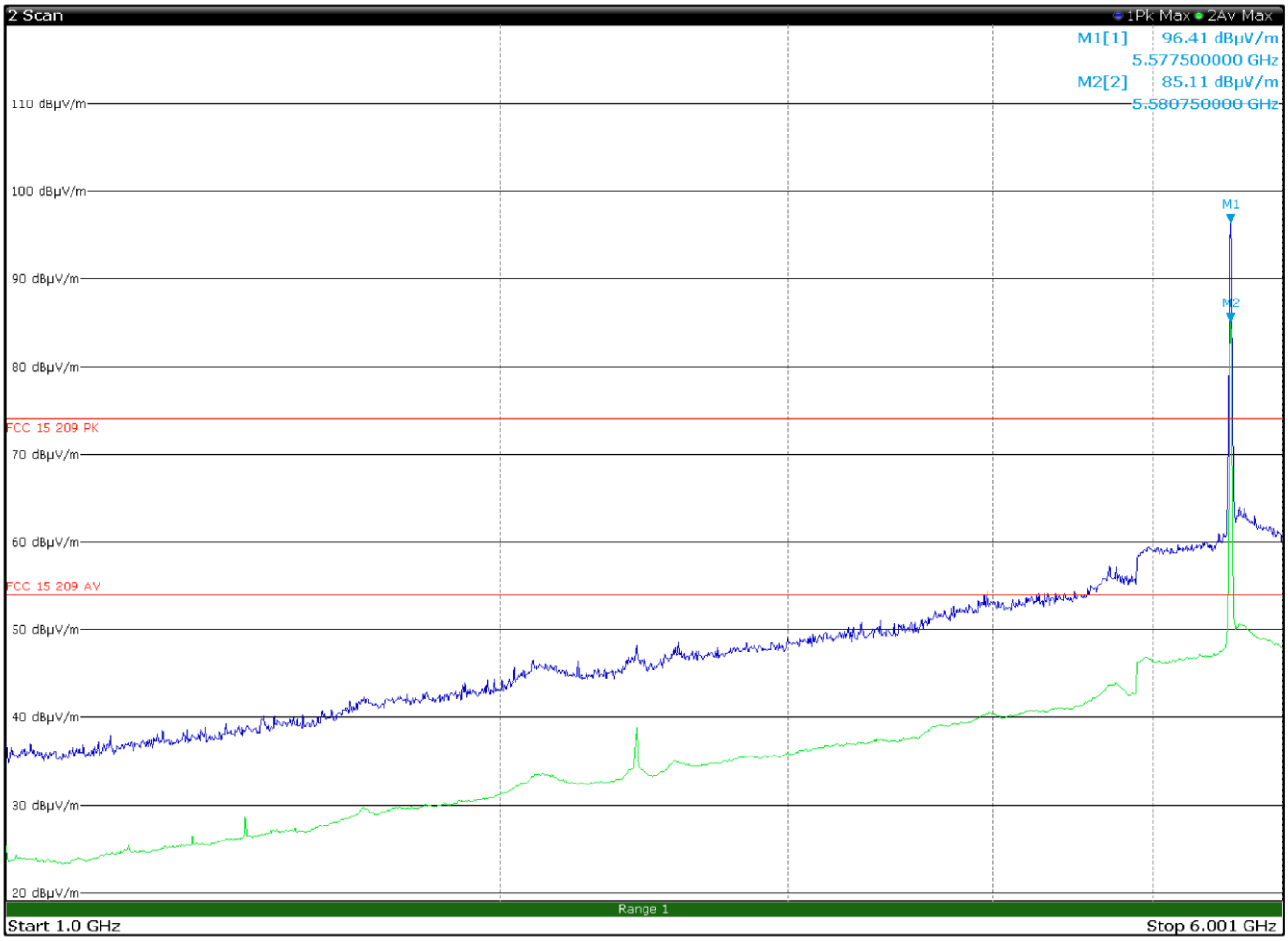


Figure 7.4-30: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5580 MHz with antenna in horizontal polarization (5580 MHz)*

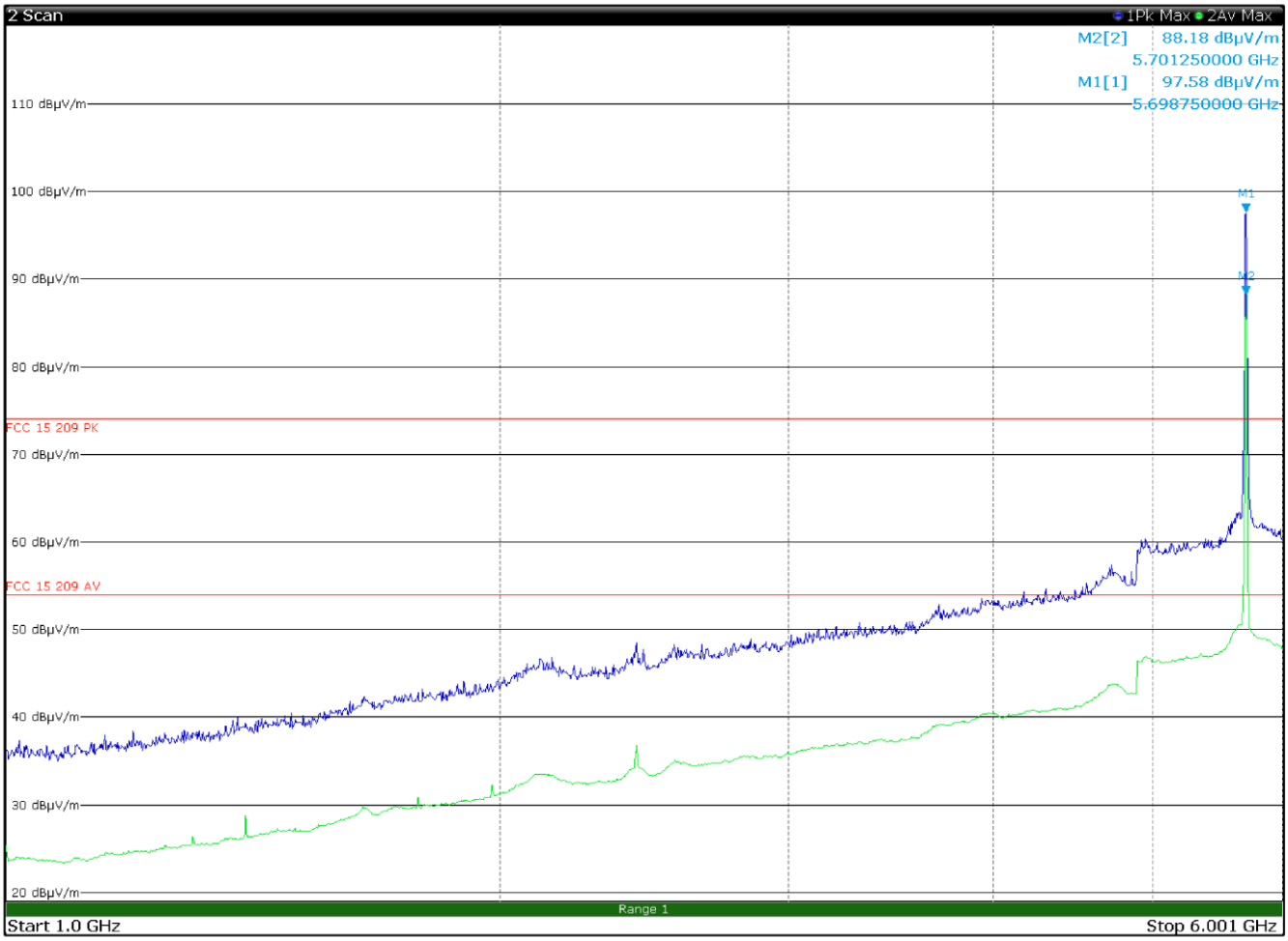


Figure 7.4-31: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5700MHz with antenna in vertical polarization (5700 MHz)*

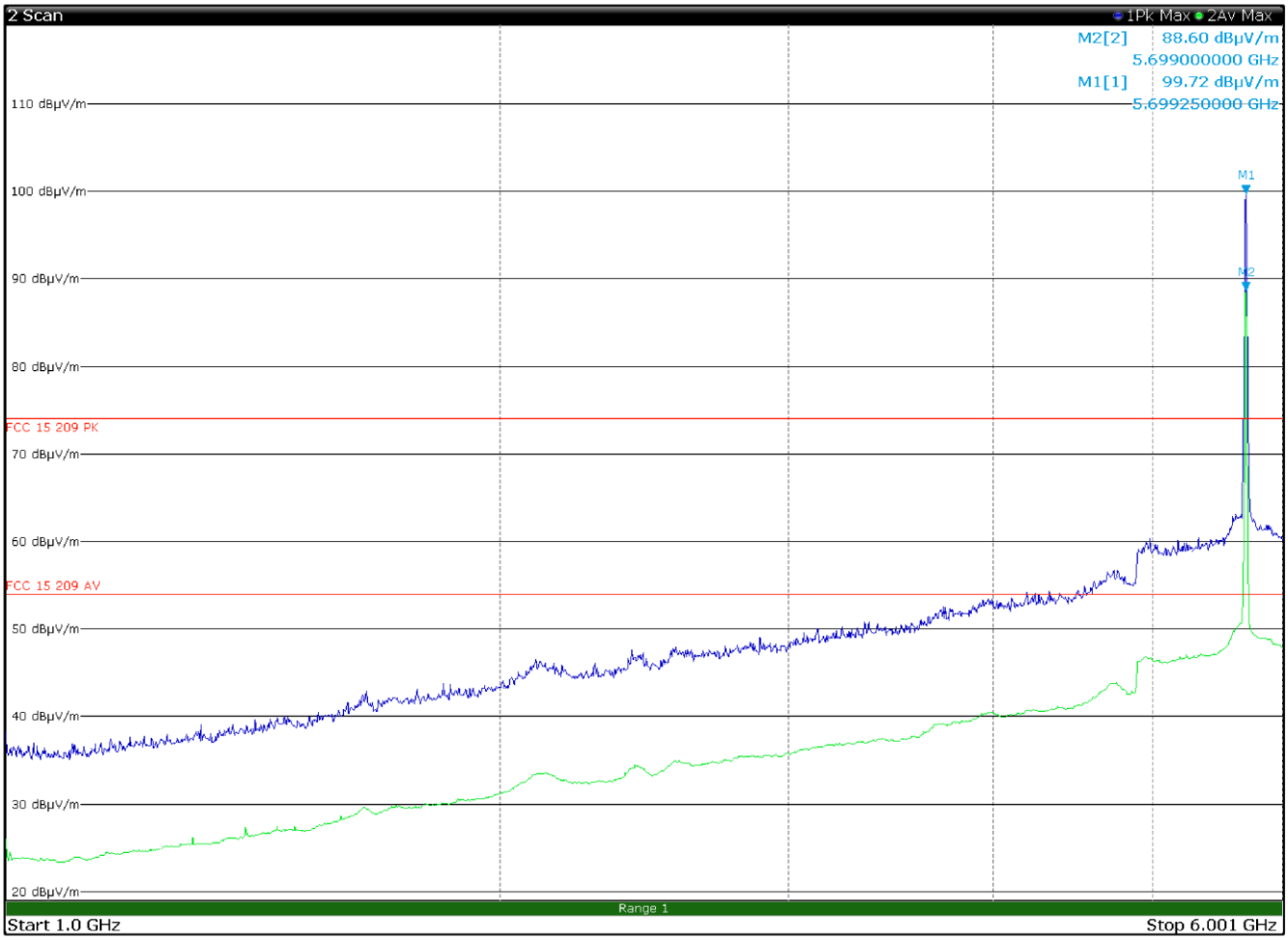


Figure 7.4-32: *Radiated spurious emissions 1 to 6 GHz, Low channel, 5700MHz with antenna in horizontal polarization (5700 MHz)*

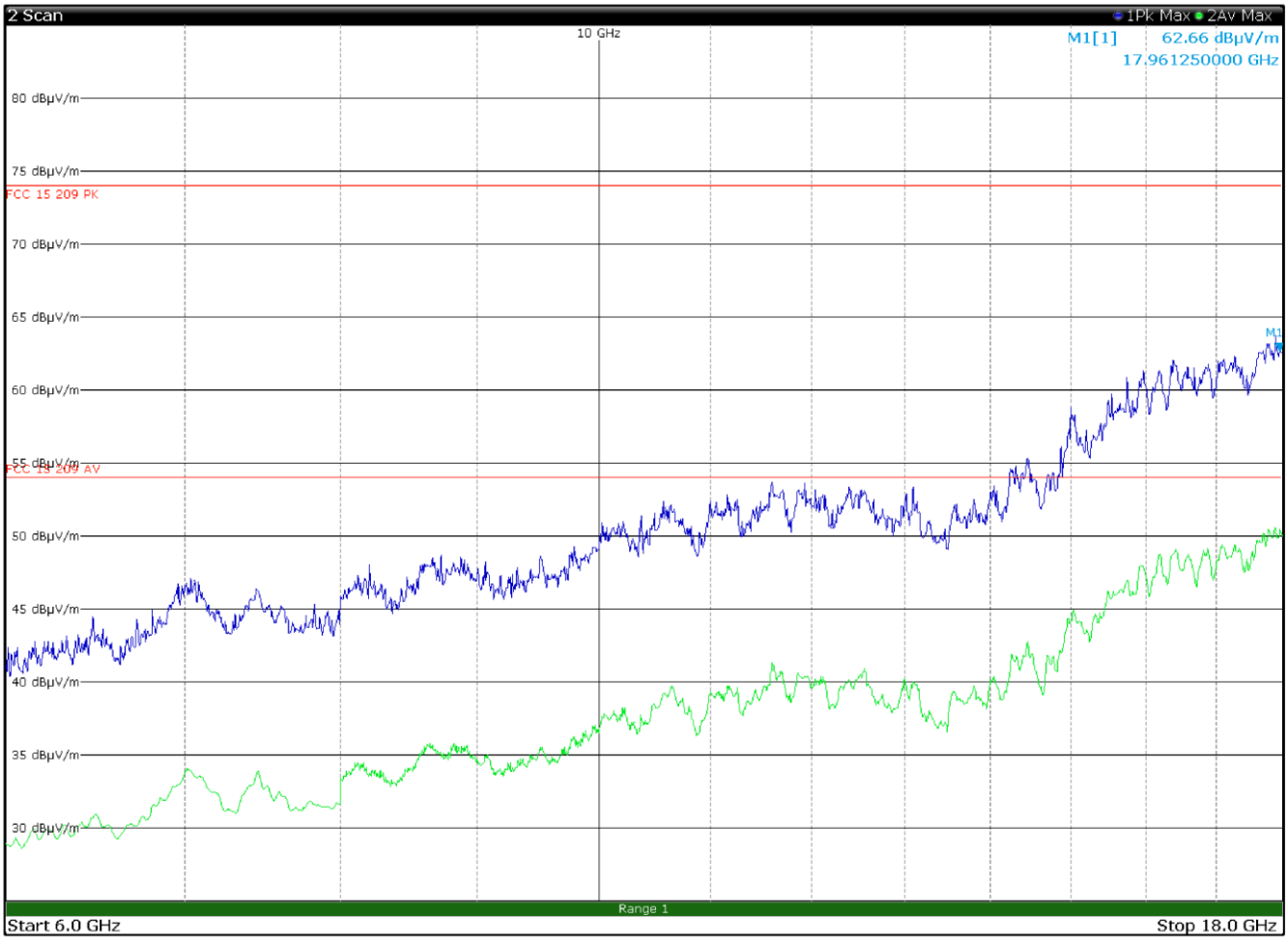


Figure 7.4-33: *Radiated spurious emissions 6 to 18 GHz, 5180 MHz with antenna in horizontal polarization*

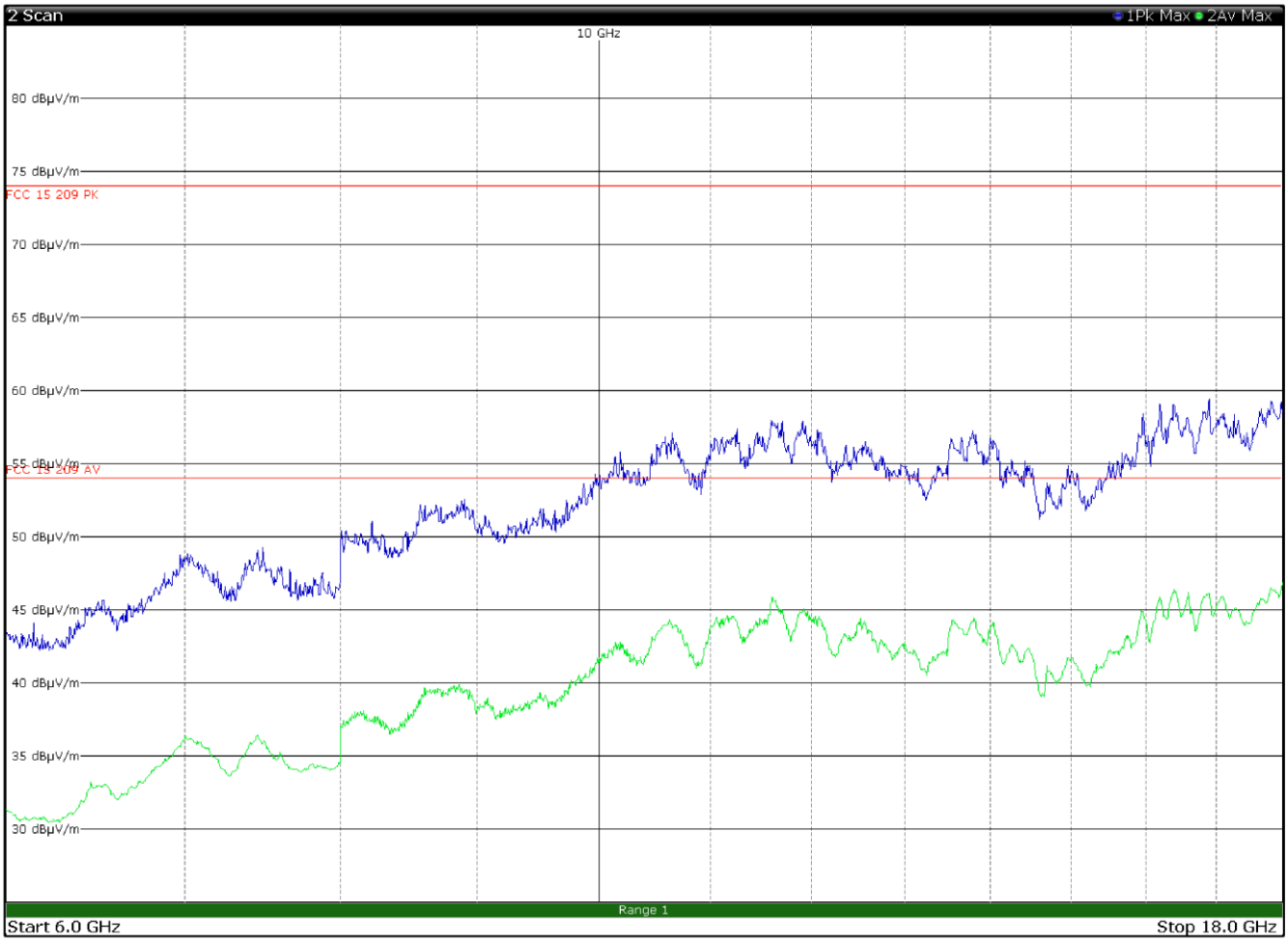


Figure 7.4-34: *Radiated spurious emissions 6 to 18 GHz, 5180 MHz with antenna in vertical polarization*

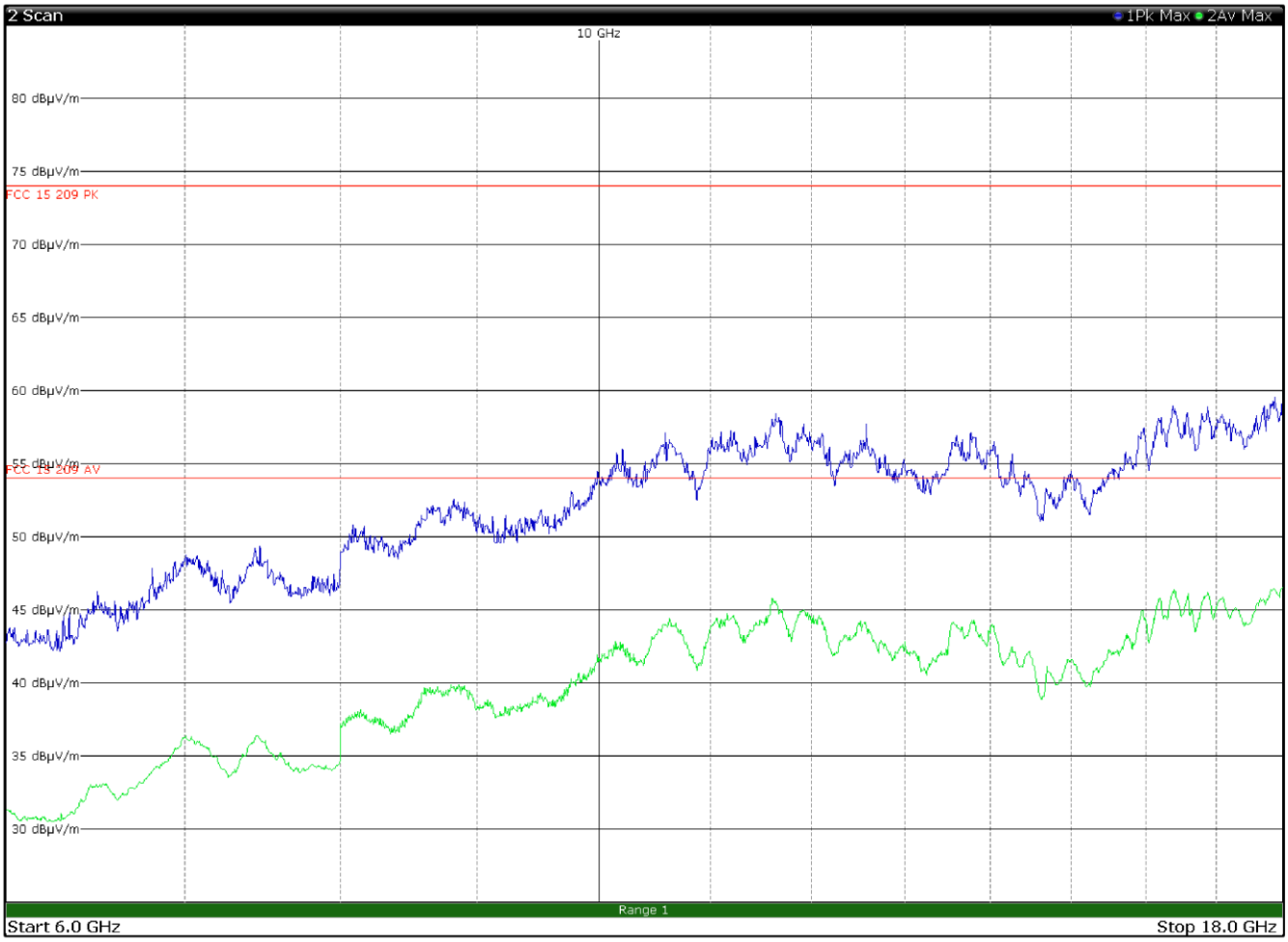


Figure 7.4-35: *Radiated spurious emissions 6 to 18 GHz, 5220 MHz with antenna in horizontal polarization*

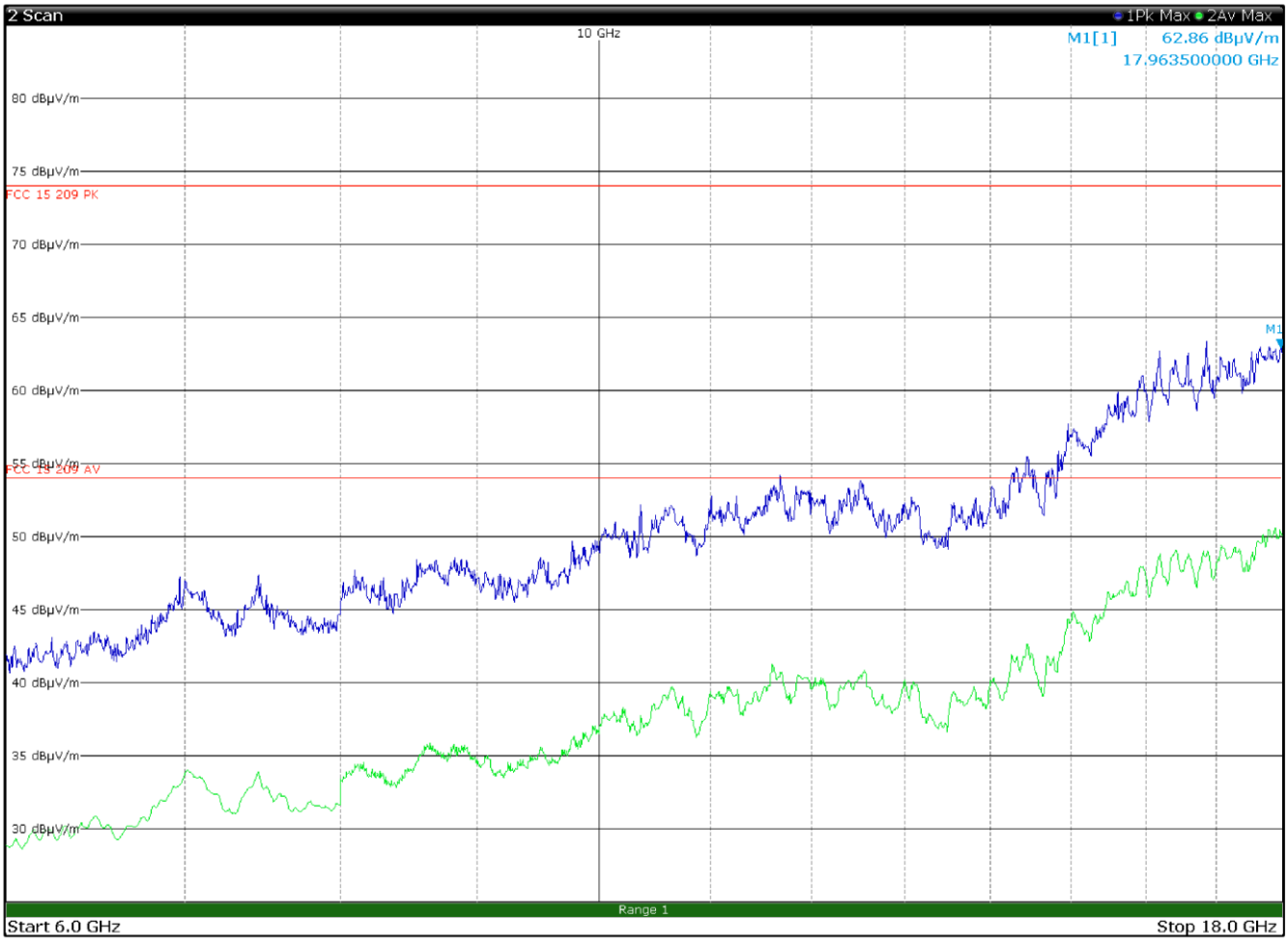


Figure 7.4-36: *Radiated spurious emissions 6 to 18 GHz, 5220 MHz with antenna in vertical polarization*

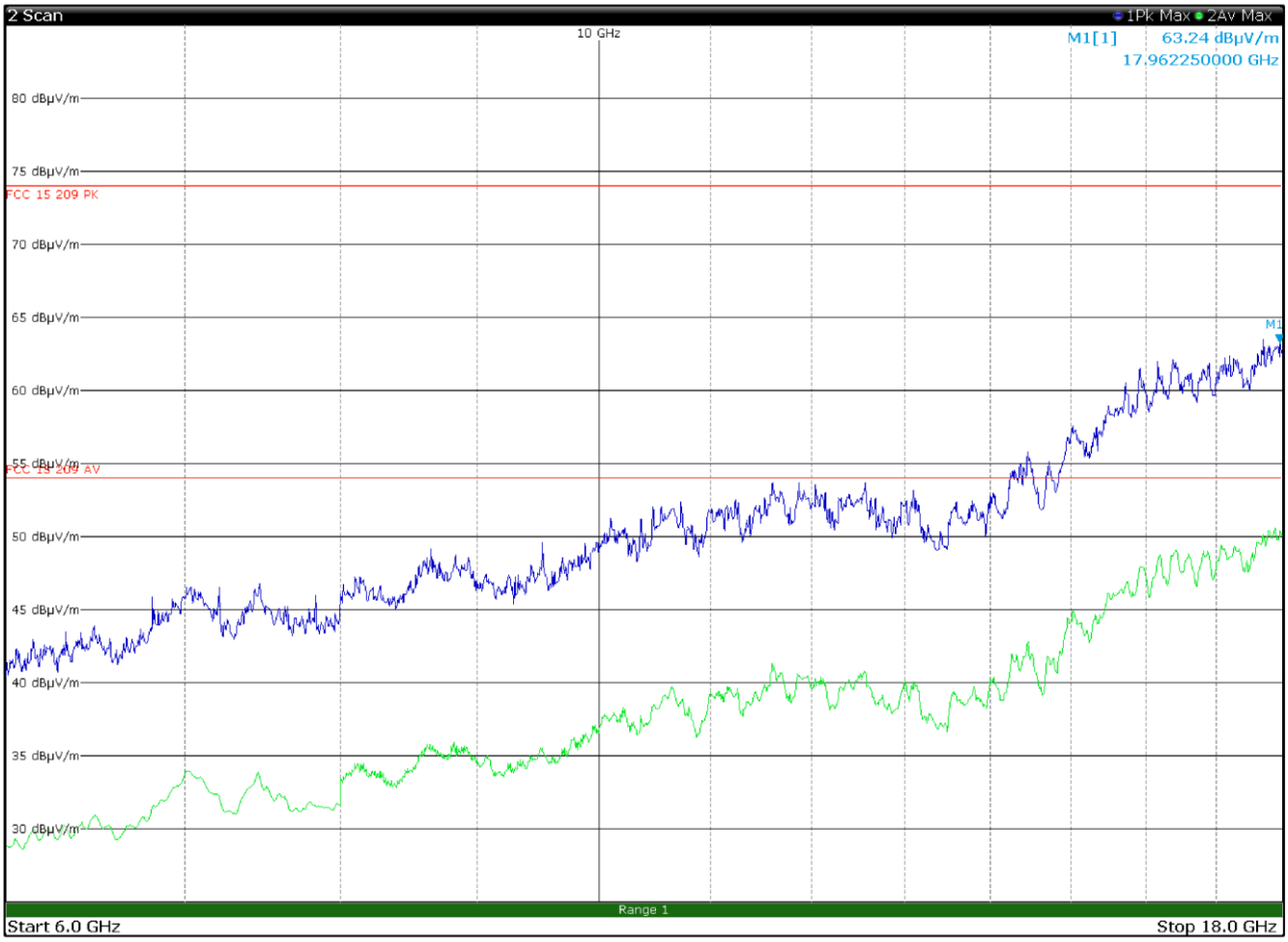


Figure 7.4-37*Radiated spurious emissions 6 to 18 GHz, 5240 MHz channel with antenna in horizontal polarization*

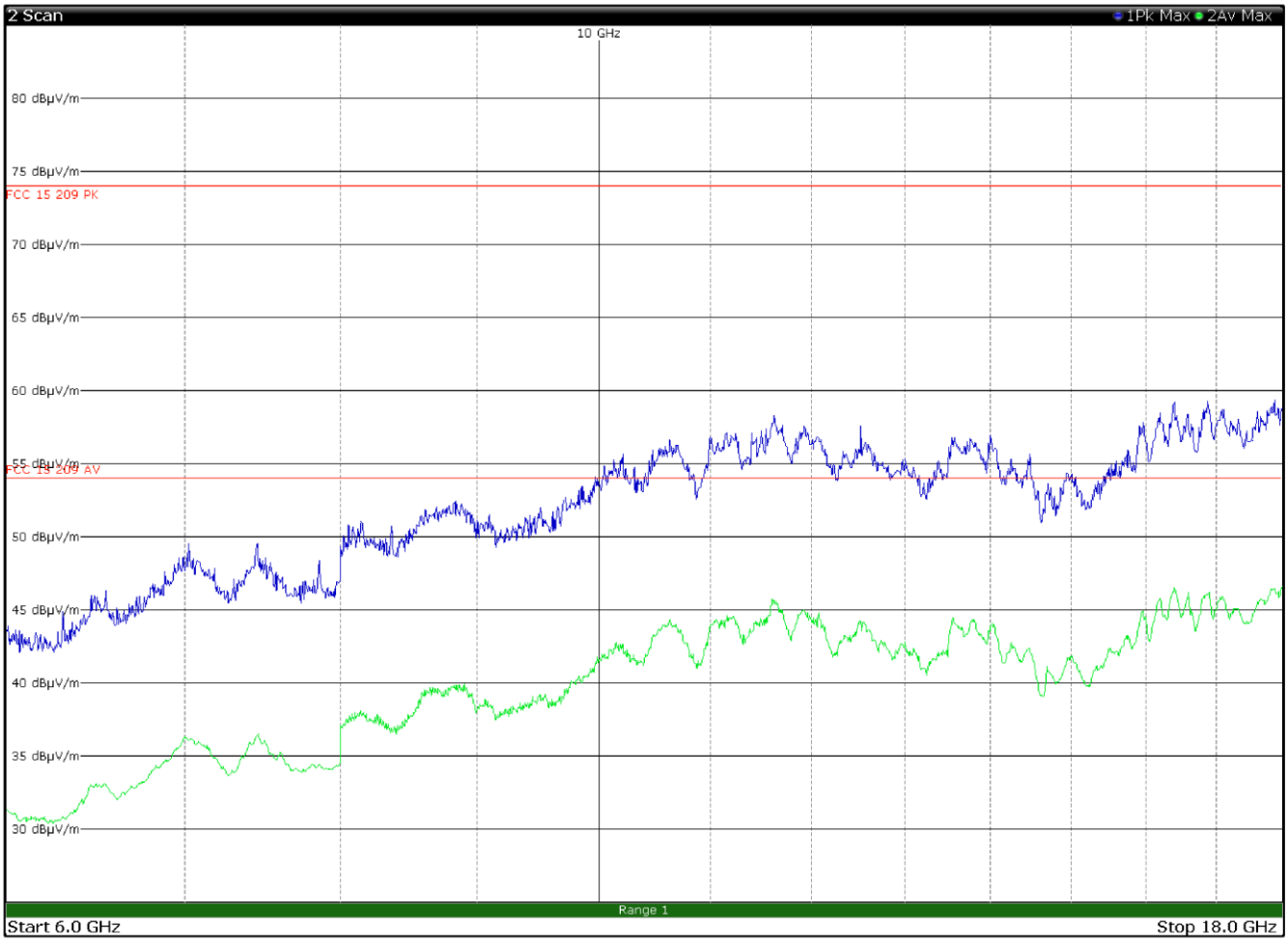


Figure 7.4-38: *Radiated spurious emissions 6 to 18 GHz, 5240 MHz with antenna in vertical polarization*

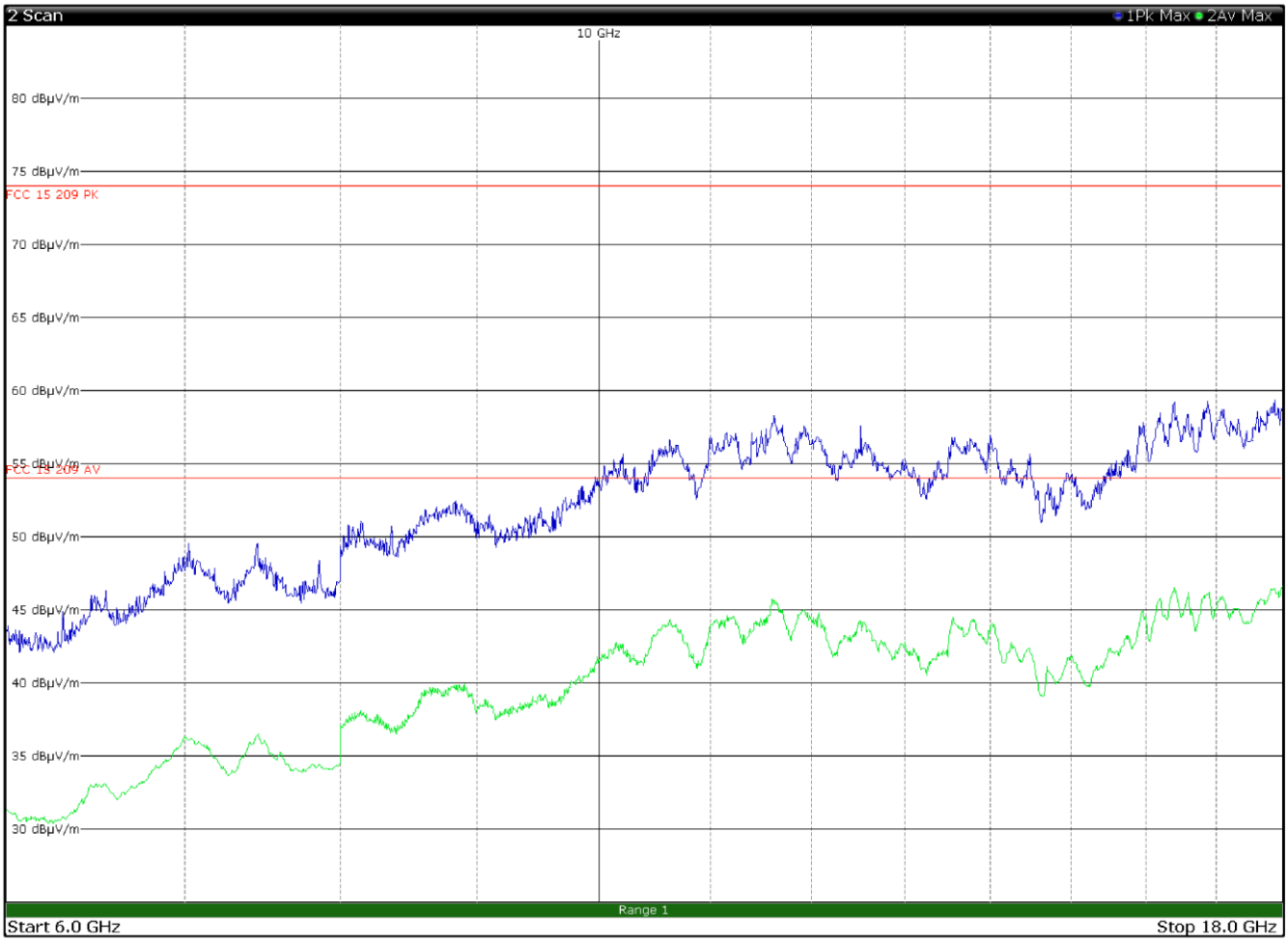


Figure 7.4-39: *Radiated spurious emissions 6 to 18 GHz, 5745 MHz with antenna in vertical polarization*

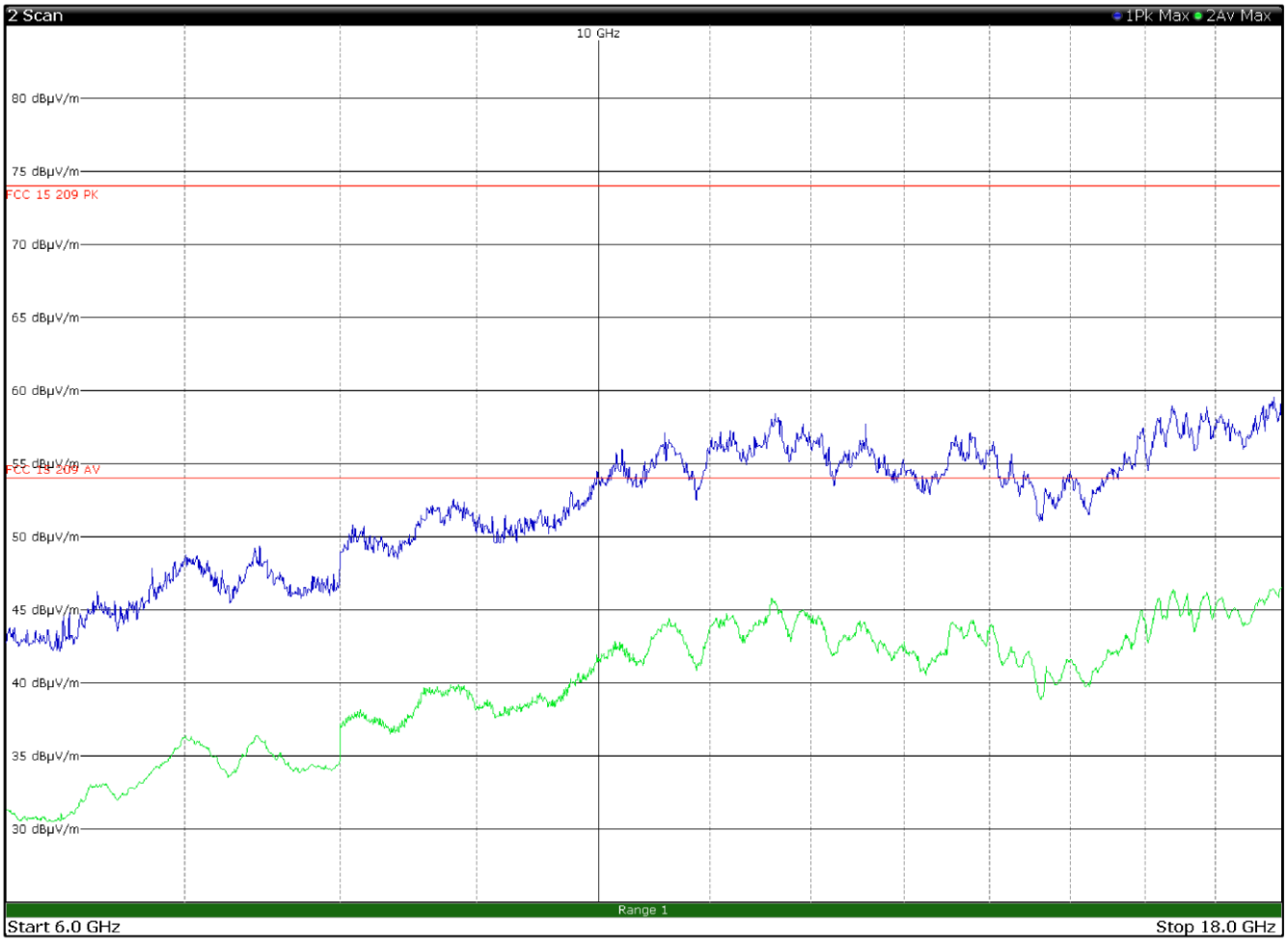


Figure 7.4-40: *Radiated spurious emissions 6 to 18 GHz, 5745 MHz with antenna in horizontal polarization*

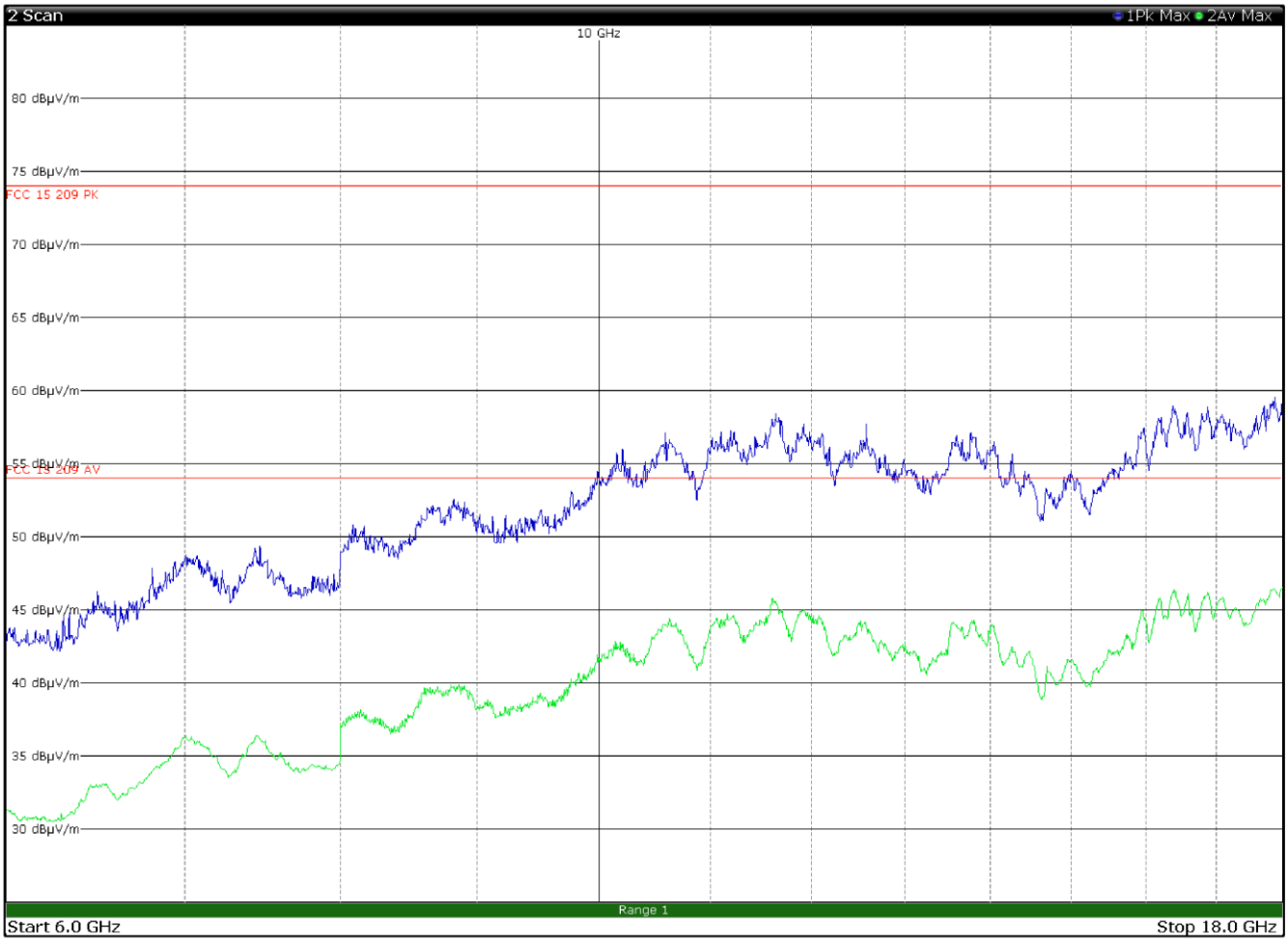


Figure 7.4-41 *Radiated spurious emissions 6 to 18 GHz, 5785 MHz with antenna in horizontal polarization*

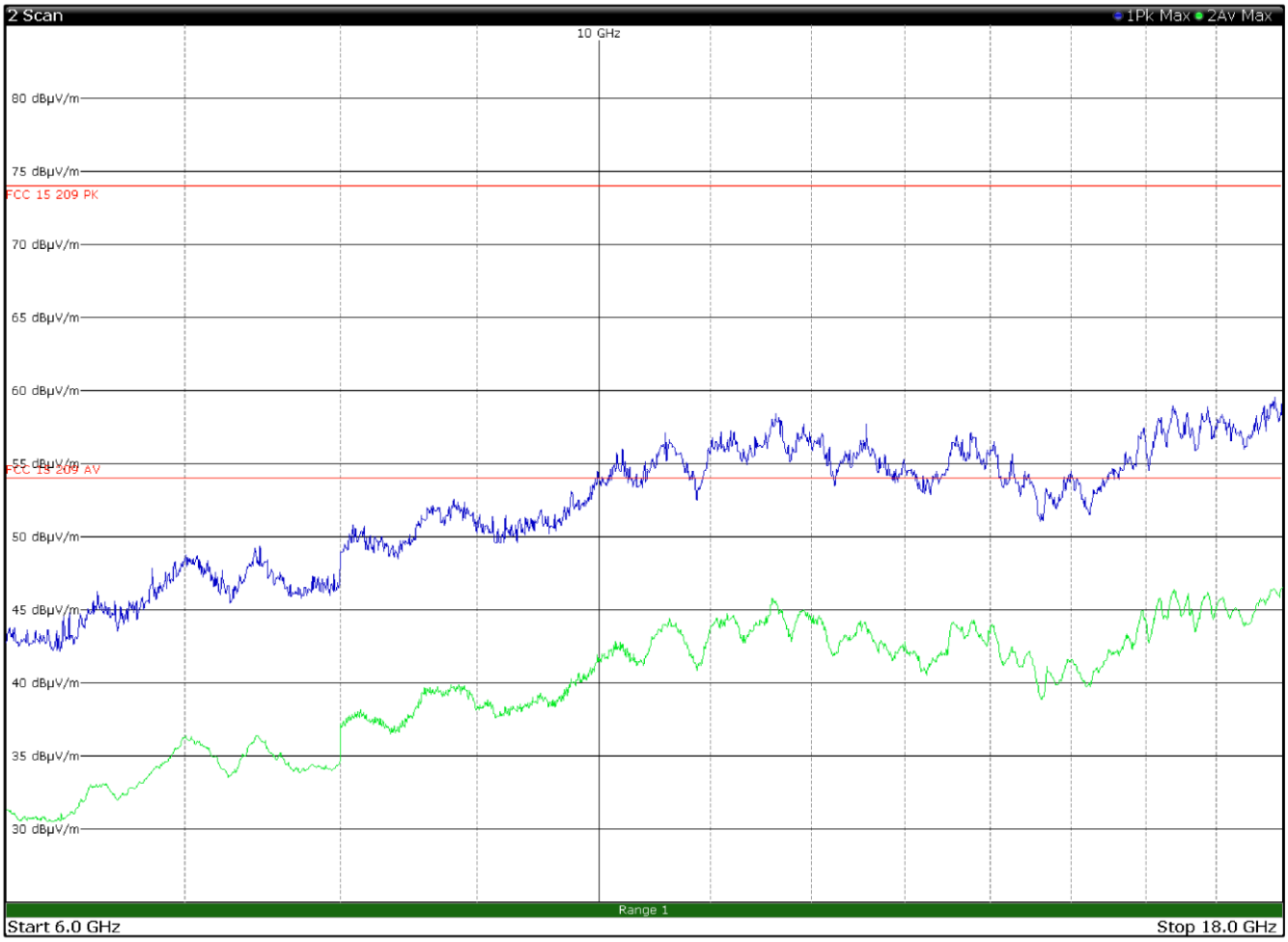


Figure 7.4-42: *Radiated spurious emissions 6 to 18 GHz, 5785 MHz with antenna in vertical polarization*

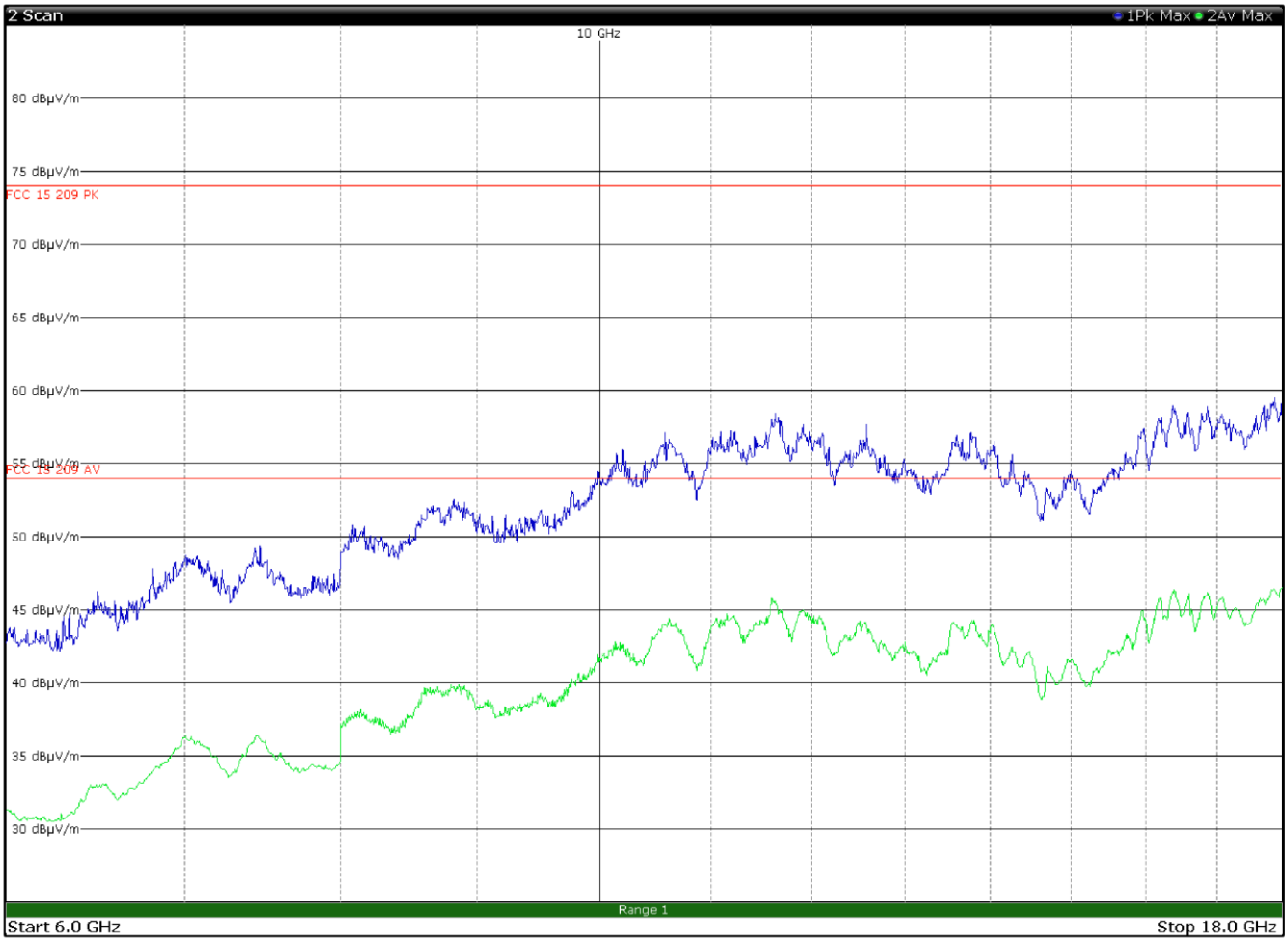


Figure 7.4-43: *Radiated spurious emissions 6 to 18 GHz, 5825MHz with antenna in horizontal polarization*

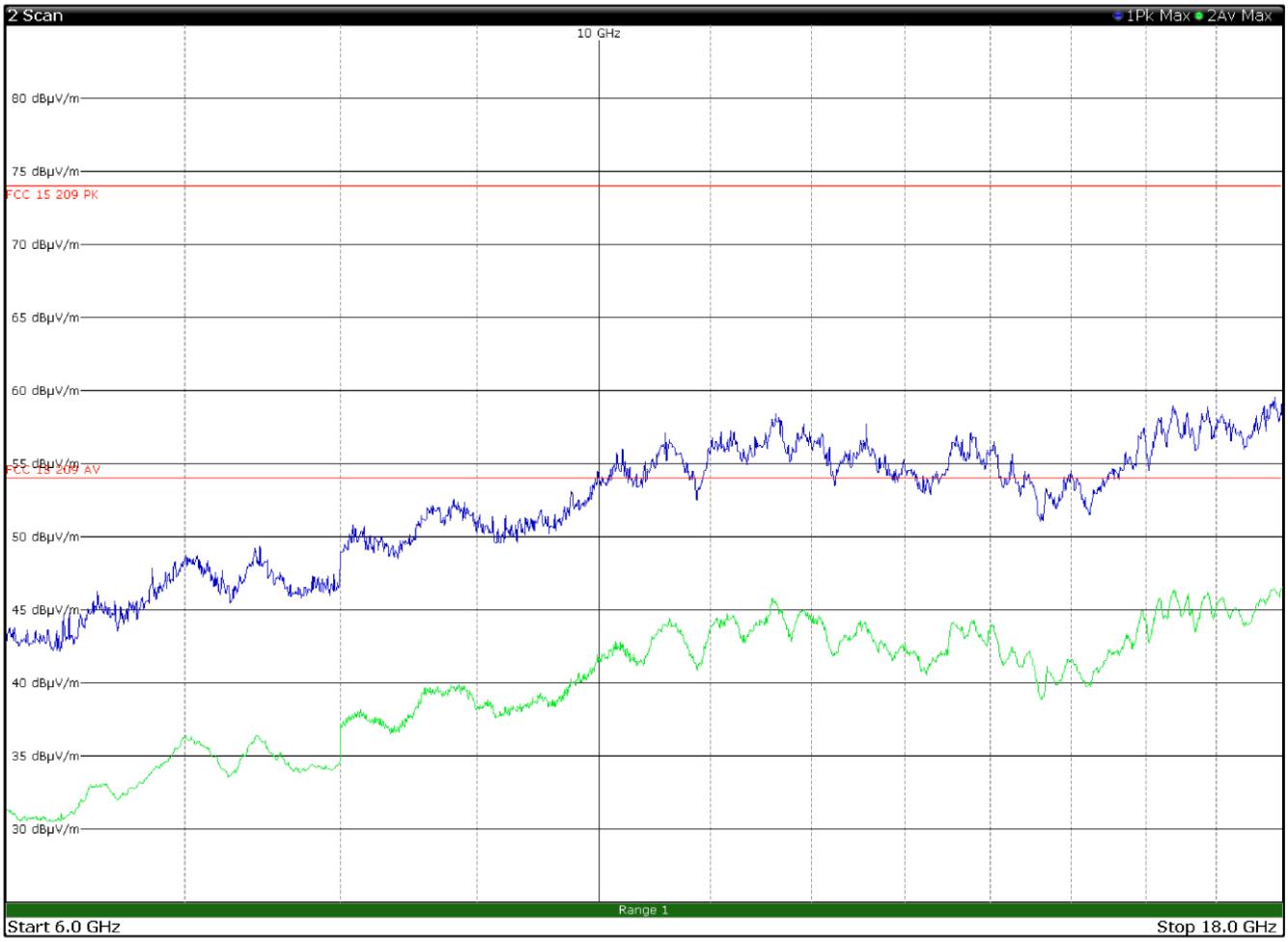


Figure 7.4-44: *Radiated spurious emissions 6 to 18 GHz, 5825 MHz with antenna in vertical polarization*

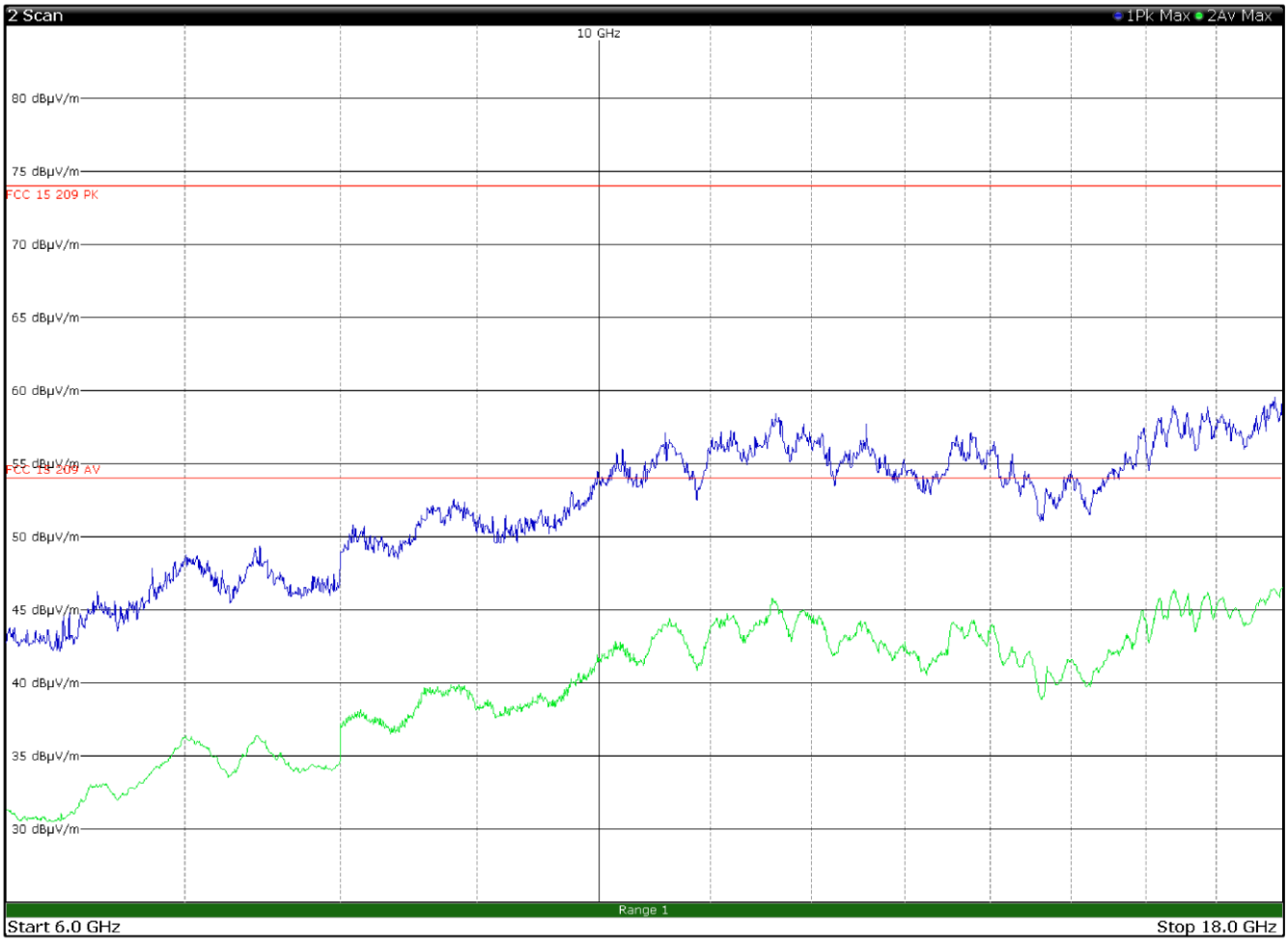


Figure 7.4-45: *Radiated spurious emissions 6 to 18 GHz, 5260 MHz with antenna in horizontal polarization*

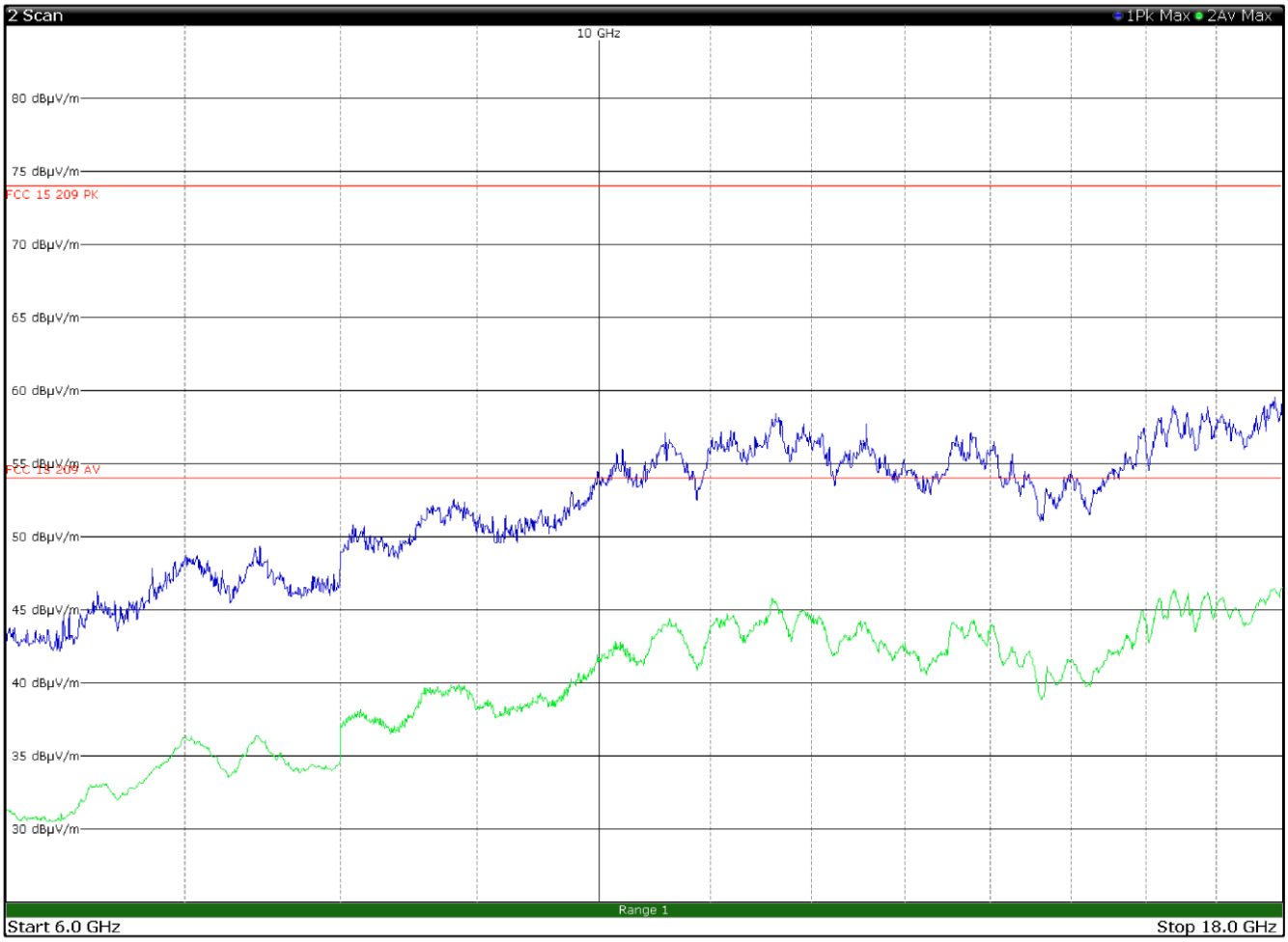


Figure 7.4-46: *Radiated spurious emissions 6 to 18 GHz, 5260 MHz with antenna in vertical polarization*

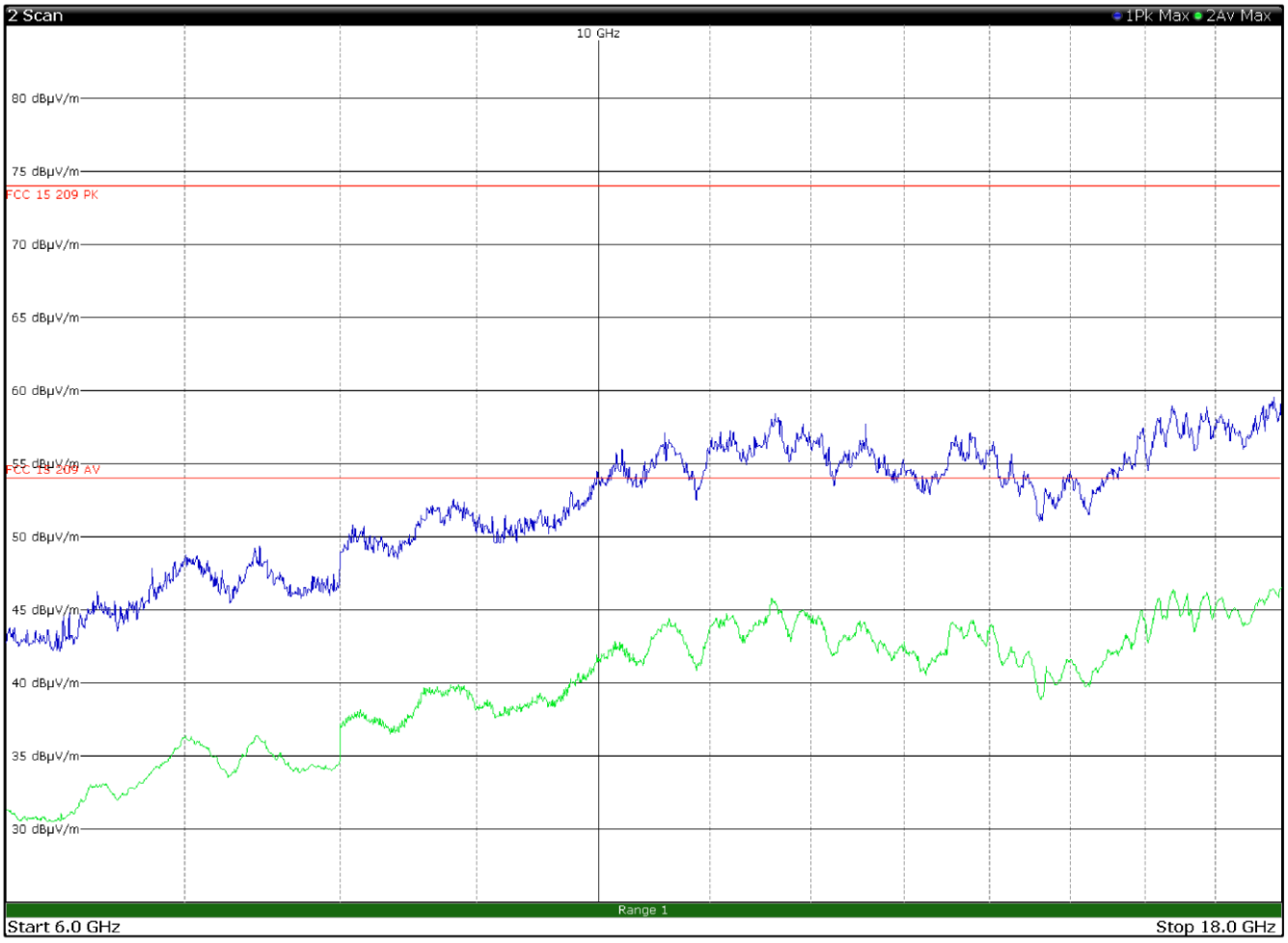


Figure 7.4-47: *Radiated spurious emissions 6 to 18 GHz, 5300 MHz with antenna in horizontal polarization*

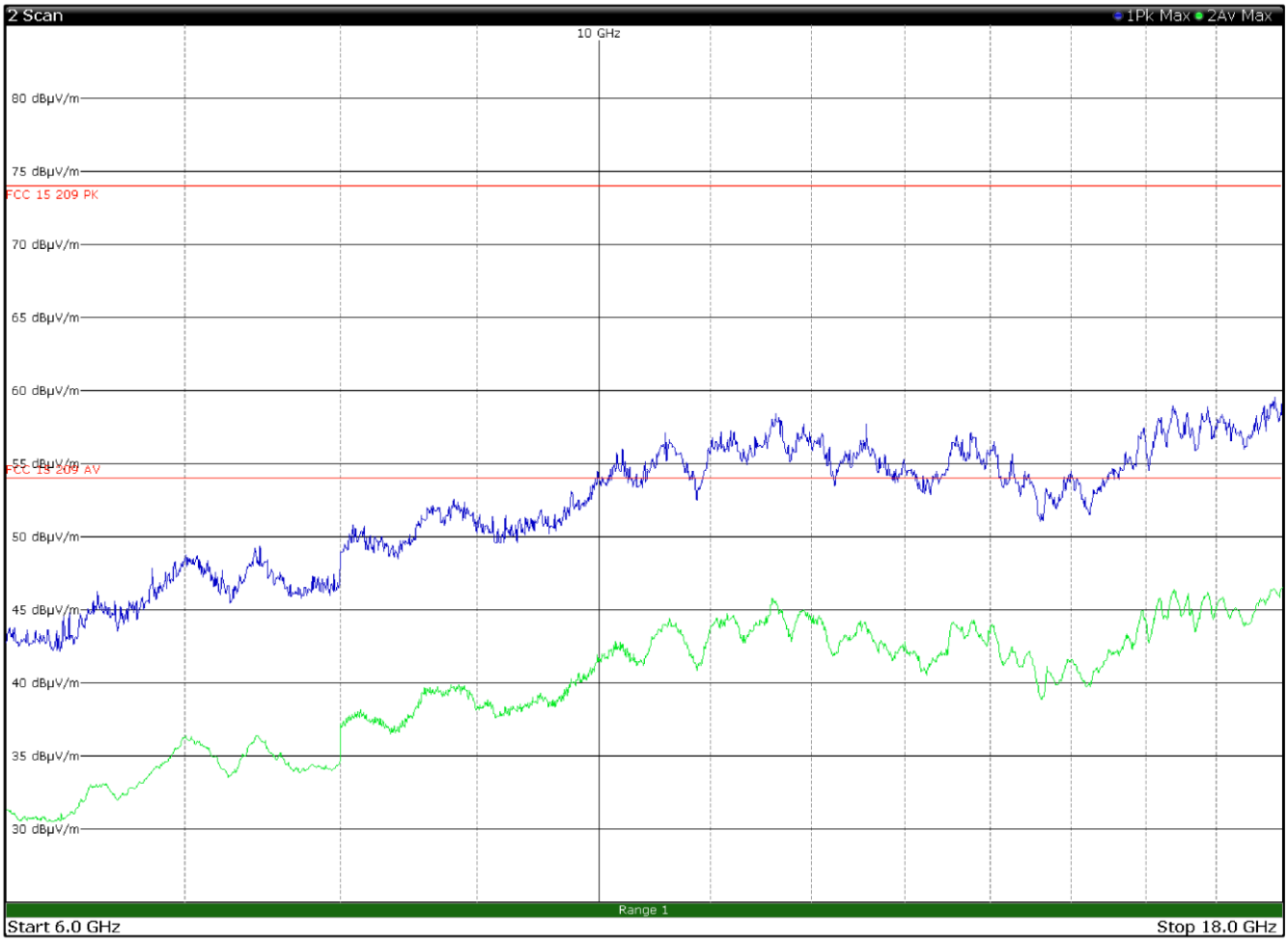


Figure 7.4-48: *Radiated spurious emissions 6 to 18 GHz, 5300 MHz with antenna in vertical polarization*

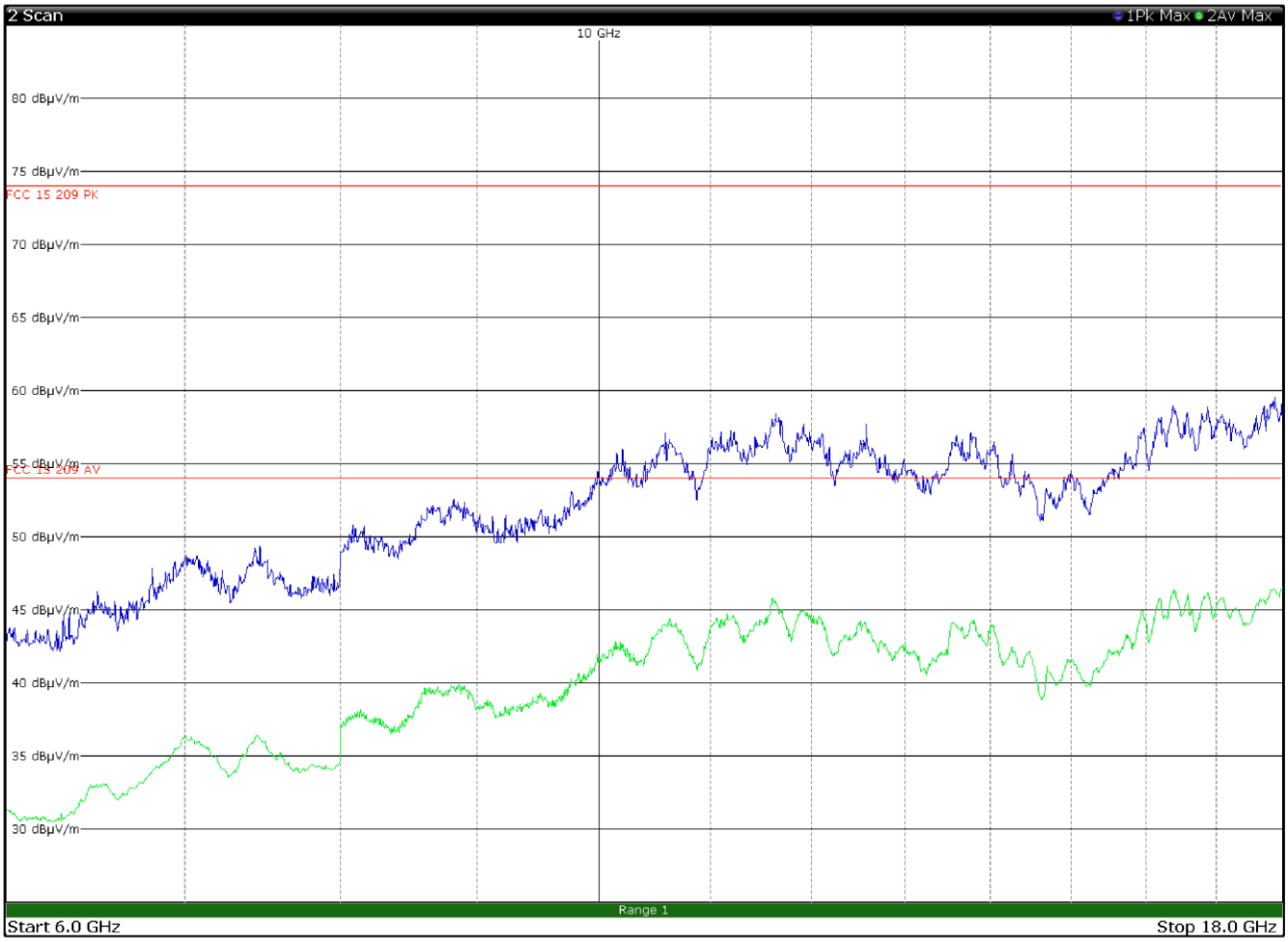


Figure 7.4-49: *Radiated spurious emissions 6 to 18 GHz, 5320 MHz with antenna in horizontal polarization*

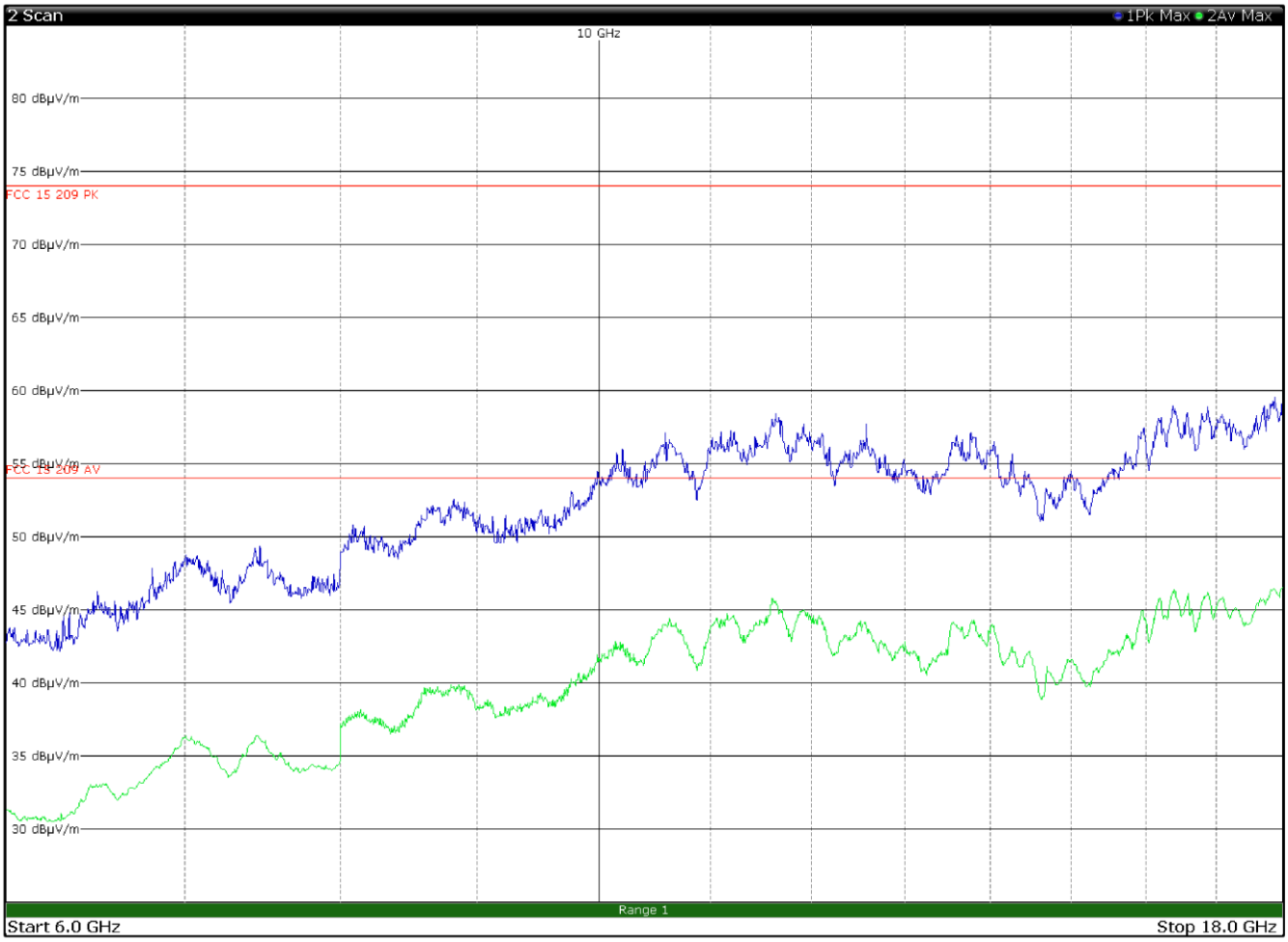


Figure 7.4-50: *Radiated spurious emissions 6 to 18 GHz, 5320 MHz with antenna in vertical polarization*