



TEST REPORT

of the accredited test laboratory

TÜV Nr.: M/FG-16/135

Applicant: StreamUnlimited Engineering GmbH
High Tech Campus Vienna
Gutheil-Schoder-Gasse 10
A-1100 Vienna

Tested Product: STREAM810 Bluetooth / BLE / WIFI streaming module
Test report for Bluetooth part only

FCC-ID: 2AJYB-S810

IC-ID: 20504-S810

Manufacturer: See applicant

Output power / field strength: 229,1 mW cond. **power supply:** 5 VDC

Frequency range: 2412 - 2462 MHz **Channel separation:** 5 MHz

Standard: FCC: 47 CFR Part 15 (October 1, 2015 edition)
RSS-247 Issue 1, May 2015; including modifications and clarifications in CB Notice 2015-07

TUV Austria Services GmbH
Test laboratory for EMC

Supervisor of EMC-laboratory:

Ing. Wilhelm Seier



Copy Nbr.: 01

checked by:

Ing. Michael Emminger

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The results of this test report only refer to the provided equipment.

LIST OF MEASUREMENTS

The complete list of measurements called for in 47 CFR 15 and RSS-247 is given below.

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TEST OBJECT DATA

General EUT Description

This Bluetooth / BLE / WIFI module is using either 2.4 GHz frequencies or 5 GHz (WIFI only). This test report is only for the 2,4 GHz WIFI part. See additional test reports:

M/FG-16/133 for Bluetooth

M/FG-16/134 for BLE and

M/FG-16/136 for 5 GHz WIFI measurement results including photodocumentation.

2.1033 (c) Technical description

2.1033 (4) Type of emission:

802.11 standards – Channel bandwidths 10,55 MHz (DSSS), 17,07 MHz (20 MHz OFDM) and 36,47 MHz (40 M - aggregation of 2 non-overlapping 20 M OFDM channels) - Channel spacing 5 MHz.

2.1033 (5) Frequency range:

2412 till 2462 MHz (channel center frequencies) in 5 MHz steps resulting in 11 Channels (DSSS and 20 MHz channels)

2422 till 2452 MHz (channel center frequencies) in 5 MHz steps resulting in 7 Channels of 40 MHz bandwidth

2.1033 (6) Power range and Controls: The maximum peak output power is 229,1 mW and there is no power regulation.

2.1033 (7) Maximum output power rating: 229,1 mW.

2.1033 (8) DC Voltage and Current: 5 V DC

maximum current consumption: 300 mA

RSS-135 This standard does not apply to:

- 1.1.(a) a receiver that scans radio frequencies for the purpose of enabling its associated transmitter to avoid transmitting in an occupied frequency but which does not have the capability of decoding the message (e.g. converting it to audio voice) contained in the radio signal

Antennas used for all radiated measurements: 'STANDARD WLAN 1000418'

Tests were performed December 2nd till 14th 2016.

Number of channels and channel spacing

§ 2.1033

Conducted Measurement

Rated output power: 229,1 mW

There are 11 Channels used starting at 2412 till 2462 MHz each separated by 5 MHz channel spacing with a maximum bandwidth of 20 MHz.

Two channels spaced by 20 MHz can be used simultaneously to give a RF-Bandwidth of 40 MHz, resulting in 7 different channels with 40 MHz bandwidth and center frequencies of 2422 till 2452 MHz each separated by 5 MHz channel spacing.

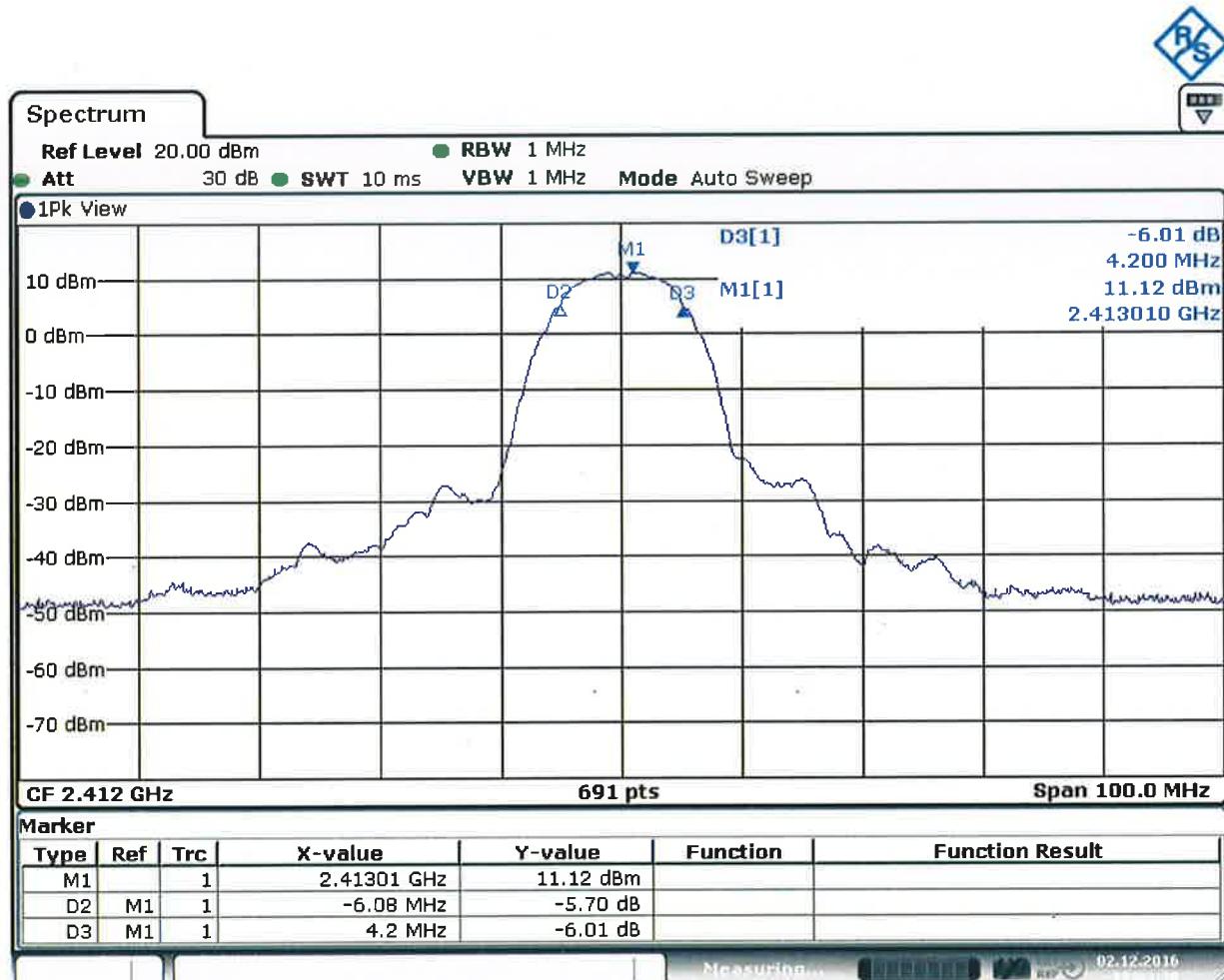
Test Equipment used: N/A

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – DSSS



6dB Bandwidth: 10,28 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

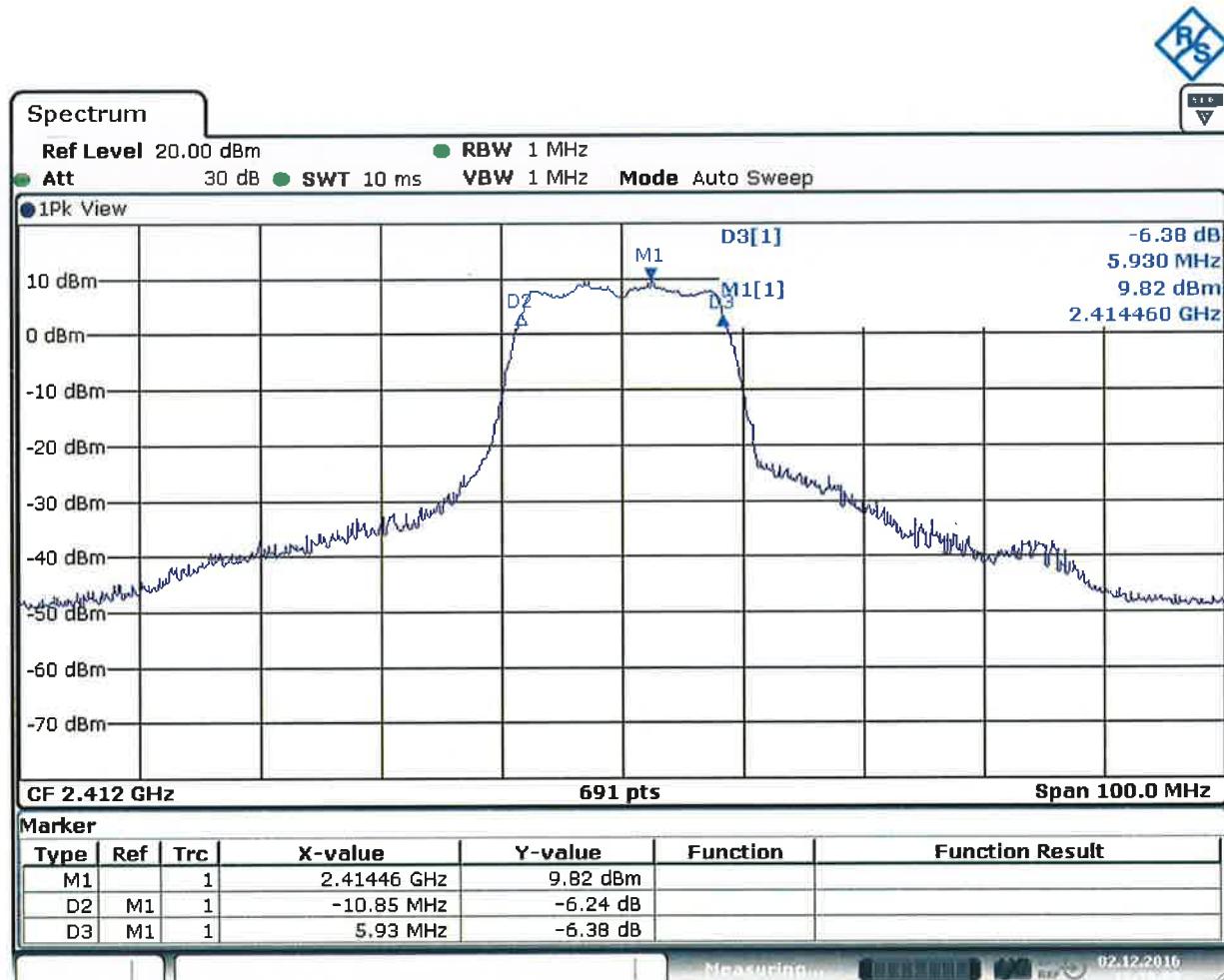
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – OFDM



6dB Bandwidth: 16,78 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditons

6 dB Bandwidth at least 500 kHz

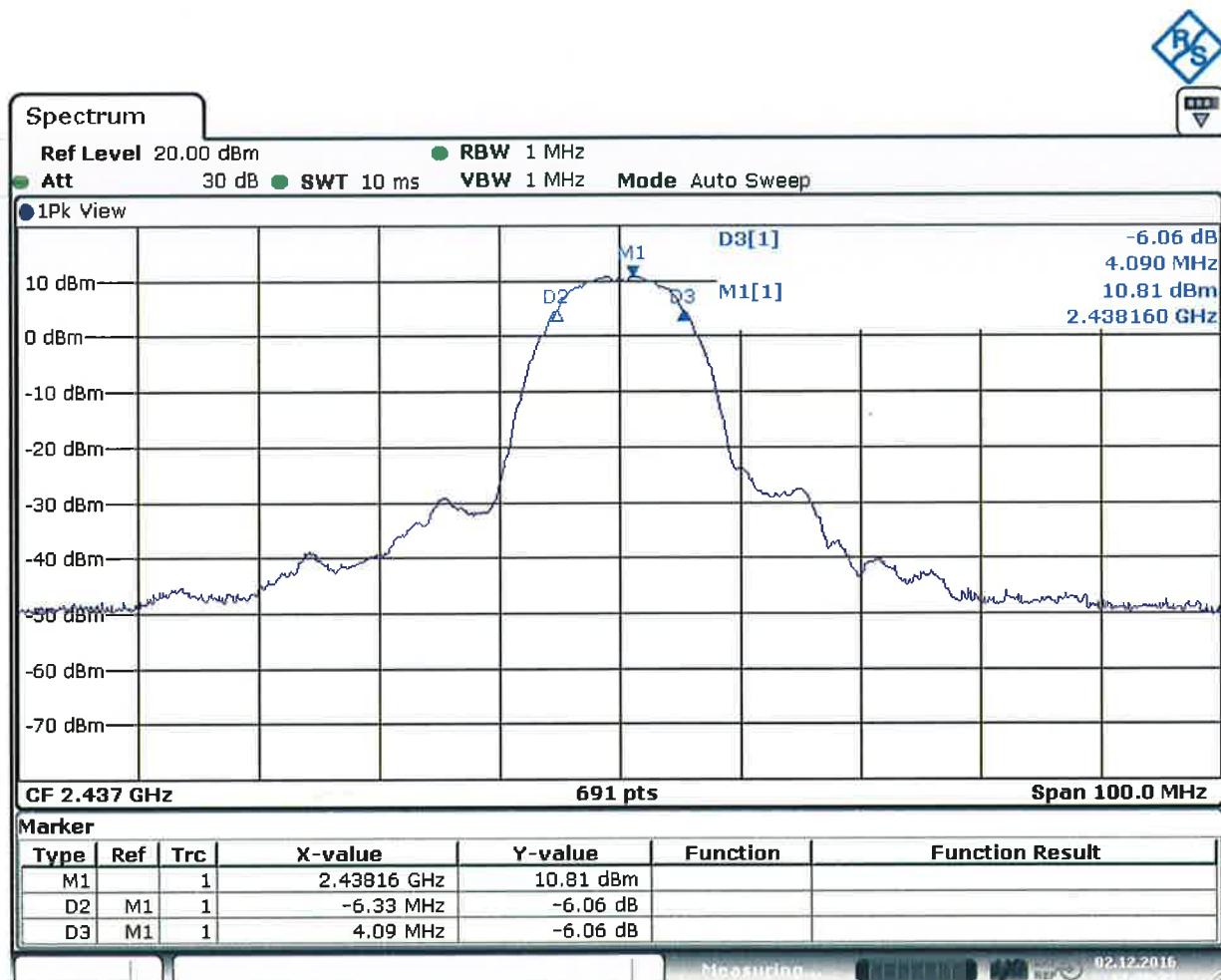
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – DSSS



6dB Bandwidth: 10,42 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditions

6 dB Bandwidth at least 500 kHz

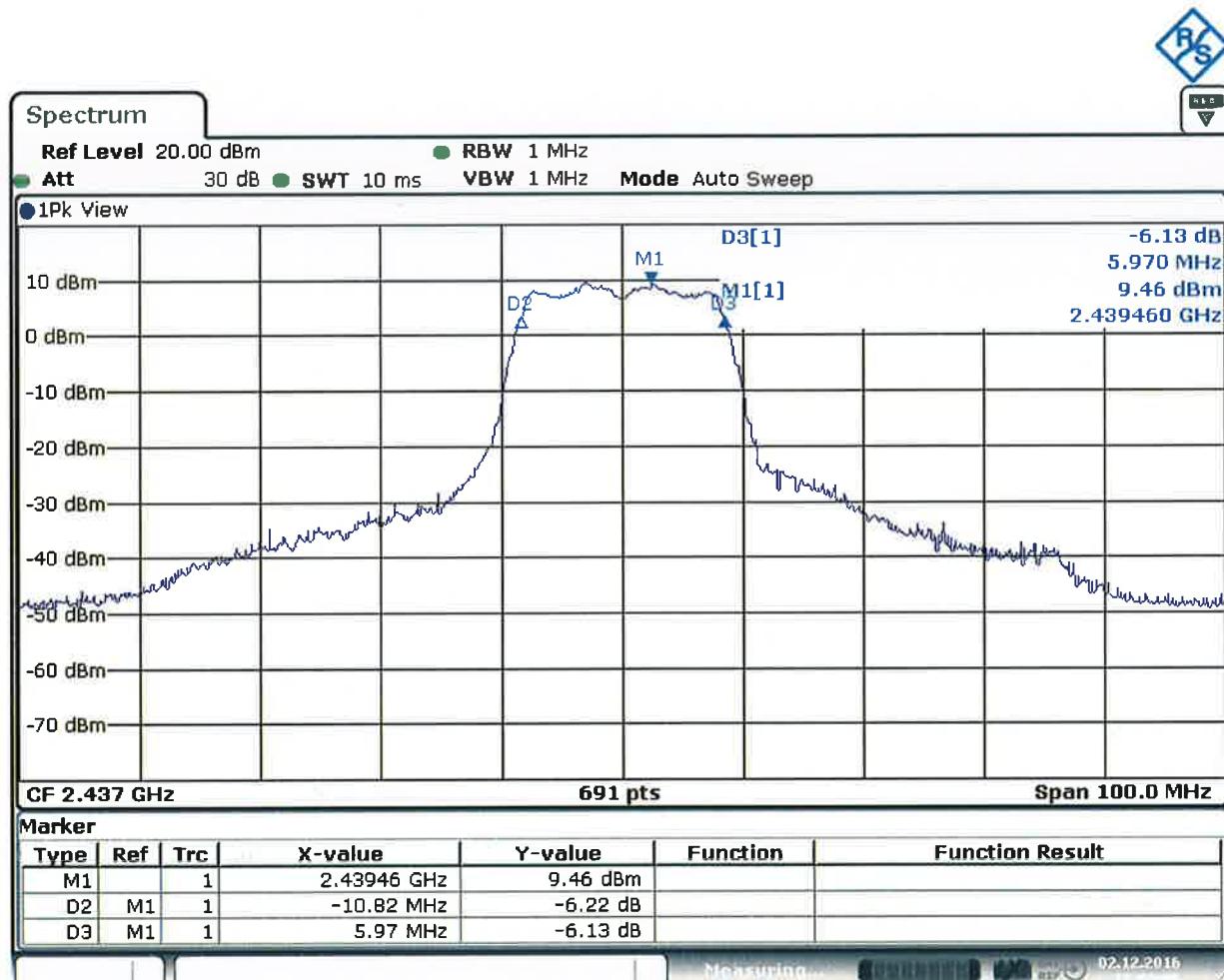
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – OFDM



Date: 2 DEC 2016 12:09:07

6dB Bandwidth: 16,79 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

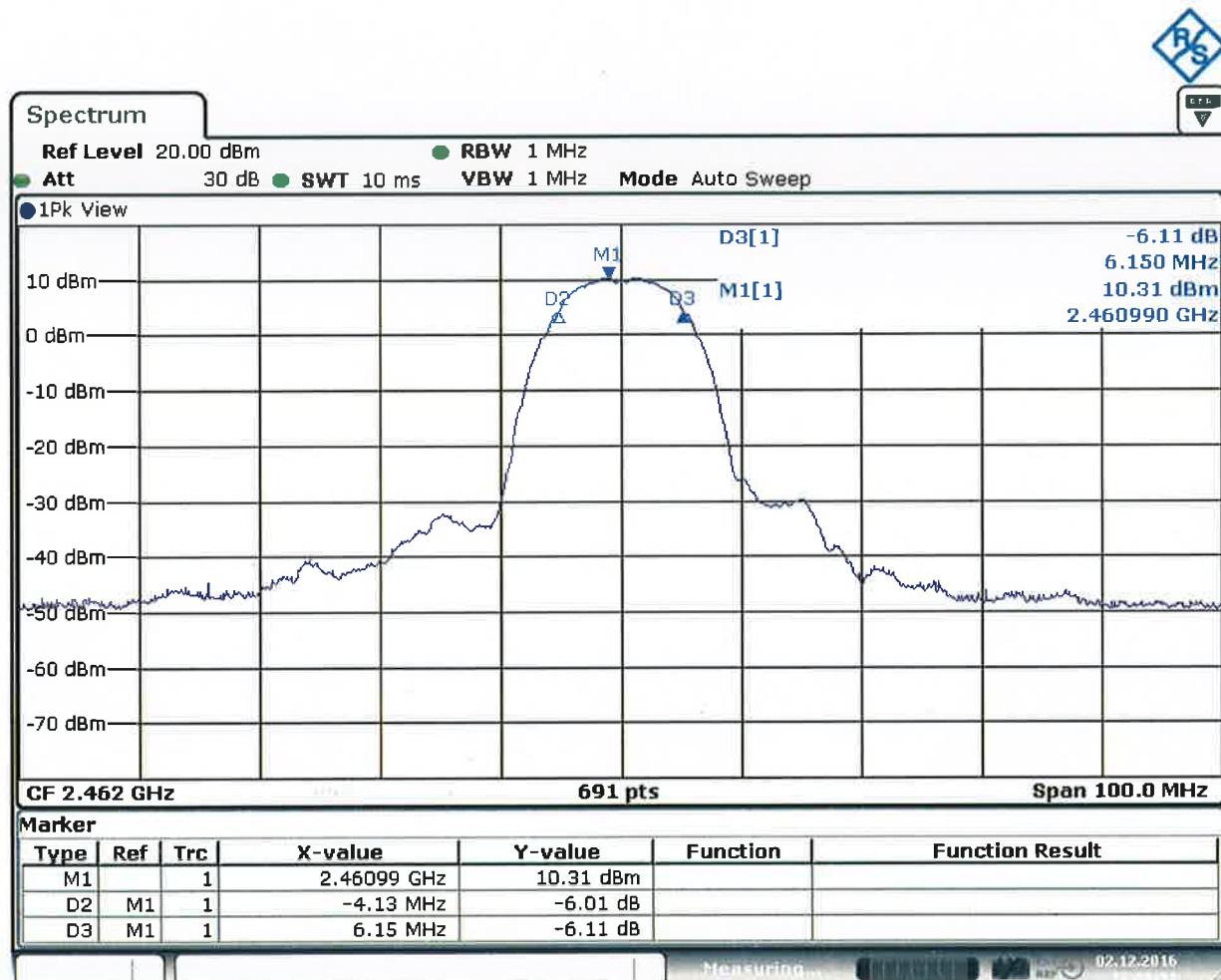
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – DSSS



Date: 2.DEC.2016 12:06:32

6dB Bandwidth: 10,28 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditons

6 dB Bandwidth at least 500 kHz

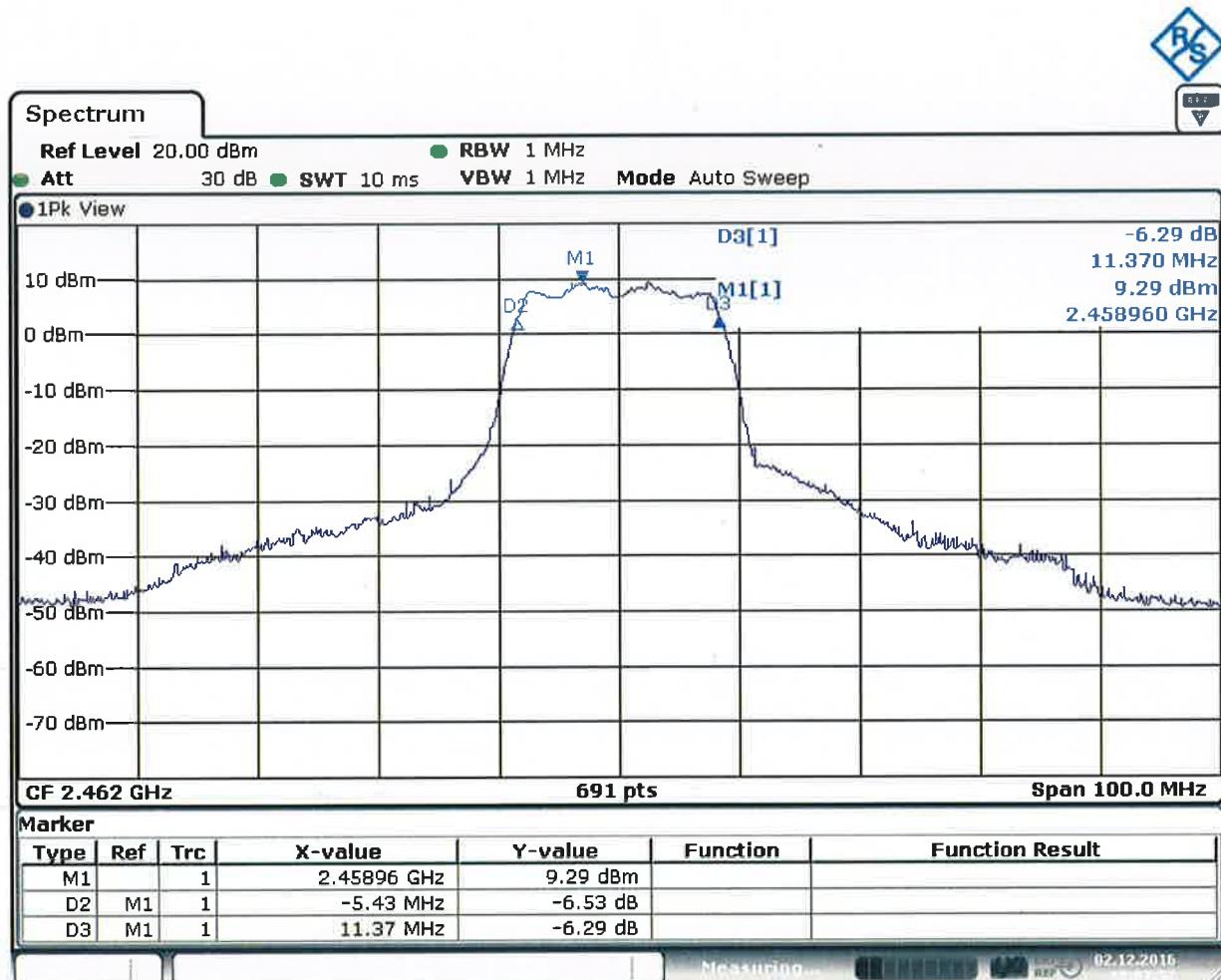
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:07:57

6dB Bandwidth: 16,80 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

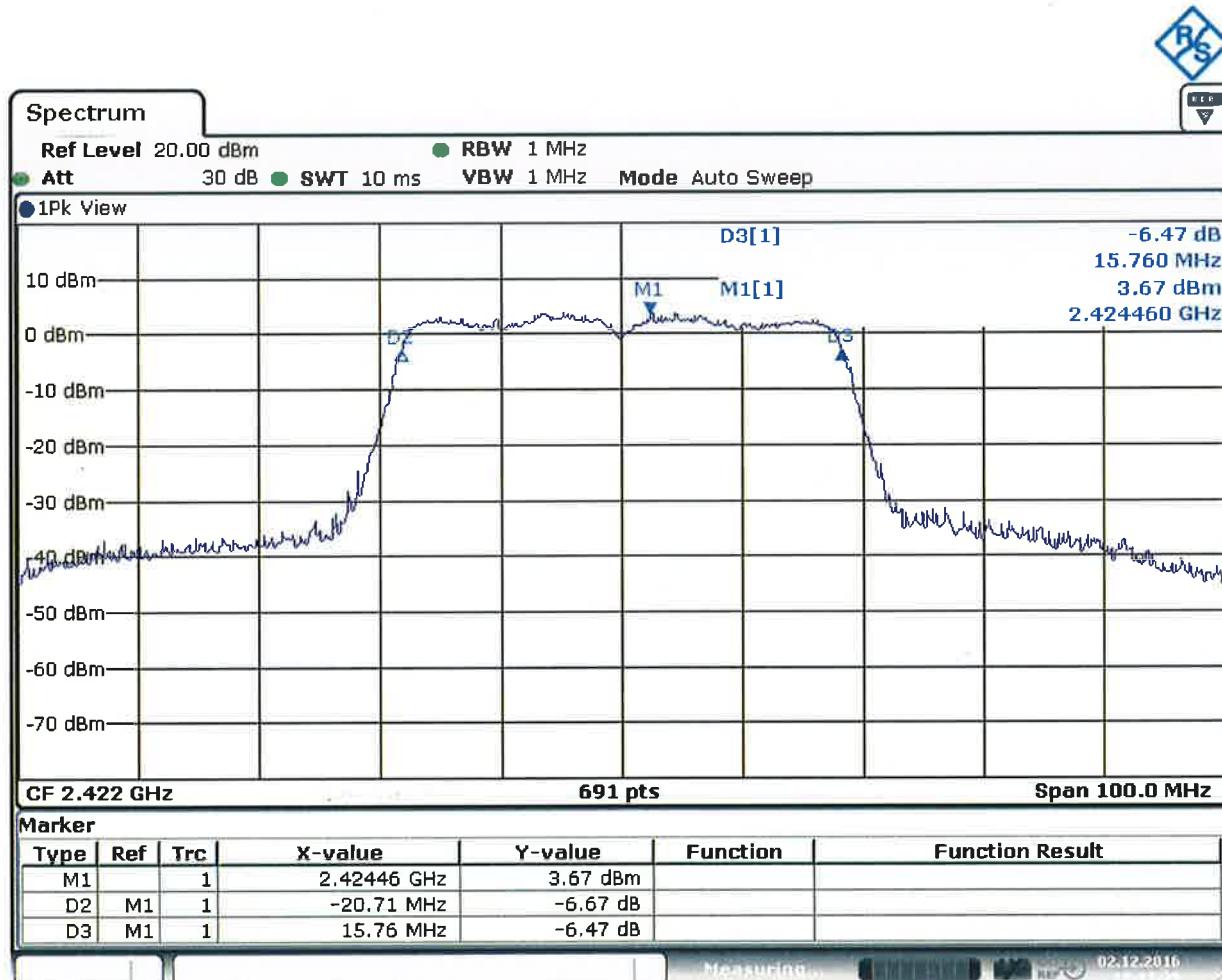
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channels 1+5 (2422 MHz center frequency)



Date: 2.DEC.2016 12:11:39

6dB Bandwidth: 36,47 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

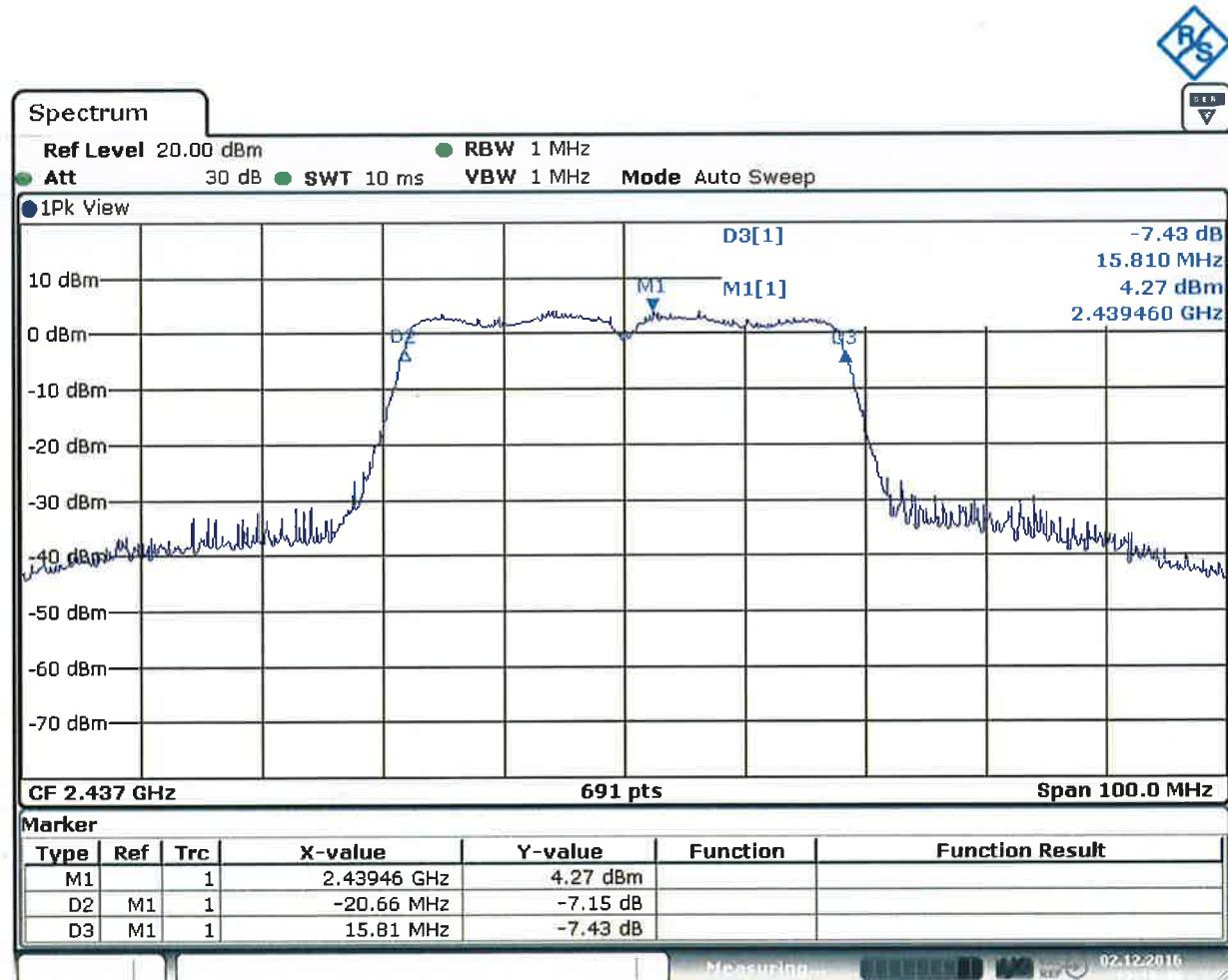
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channels 4 + 8 (2437 MHz center frequency)



Date: 2.DEC.2016 12:13:46

6dB Bandwidth: 36,47 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

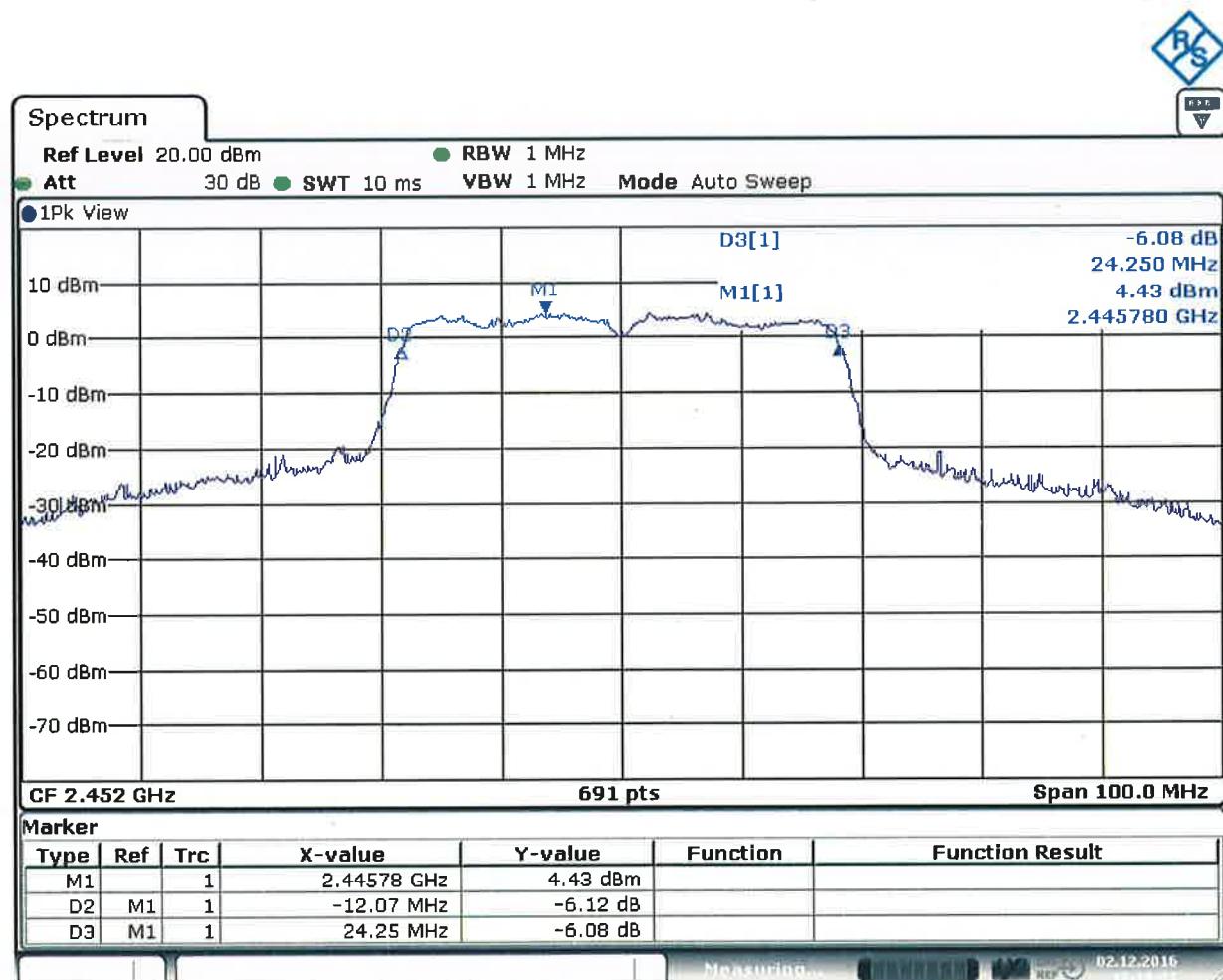
Test Equipment used: EMV-205

6dB Bandwidth

§ 15.247(a)(2)
5.2(1)

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 7 + 11 (2452 MHz center frequency)



Date: 2.DEC.2016 12:18:21

6dB Bandwidth: 36,32 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditions

6 dB Bandwidth at least 500 kHz

Test Equipment used: EMV-205

6dB Bandwidth

§ 15.247(a)(2)
5.2(1)

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – DSSS



6dB Bandwidth: 10,42 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditions

6 dB Bandwidth at least 500 kHz

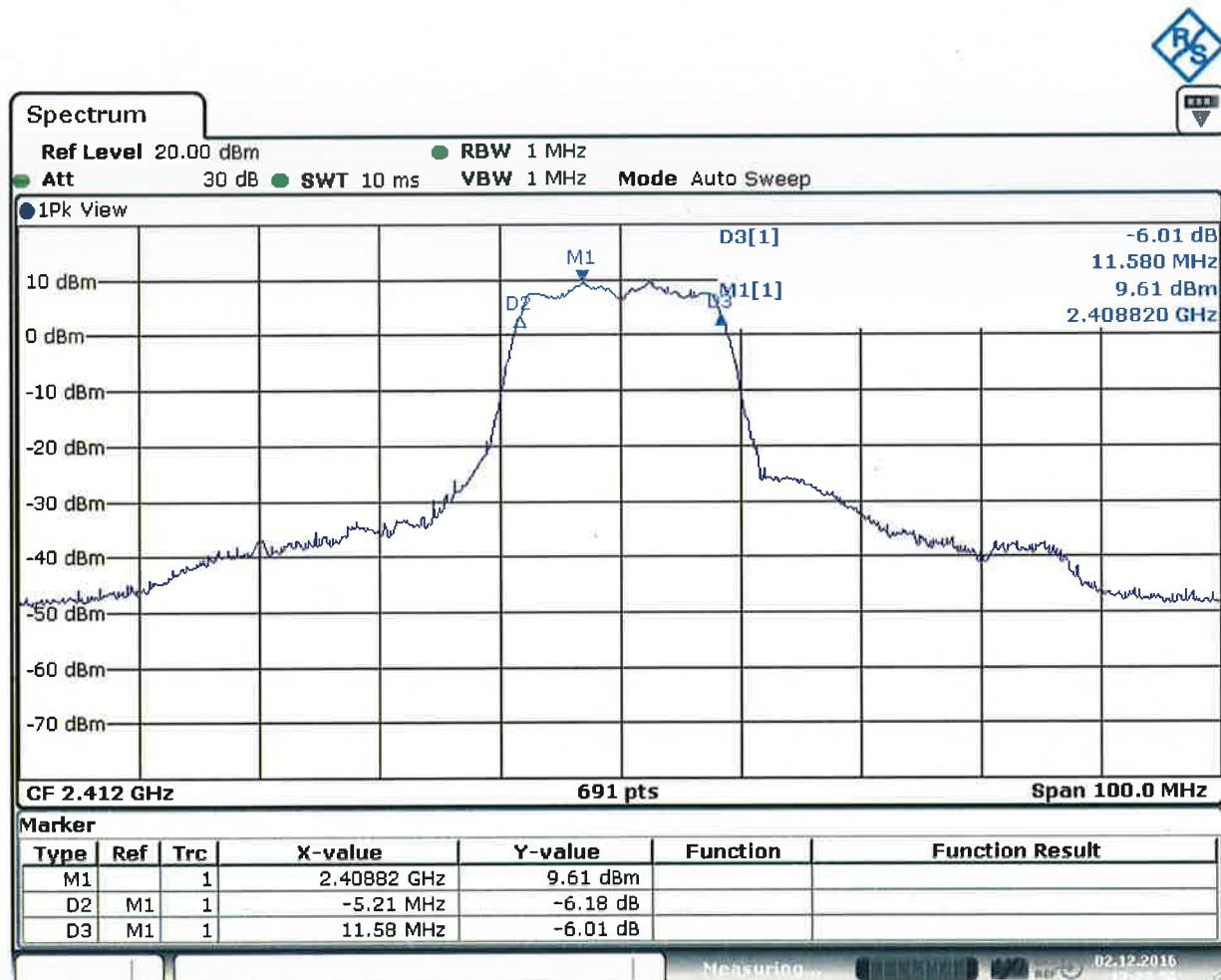
Test Equipment used: EMV-205

6dB Bandwidth

§ 15.247(a)(2)
5.2(1)

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:22:56

6dB Bandwidth: 16,79 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditons

6 dB Bandwidth at least 500 kHz

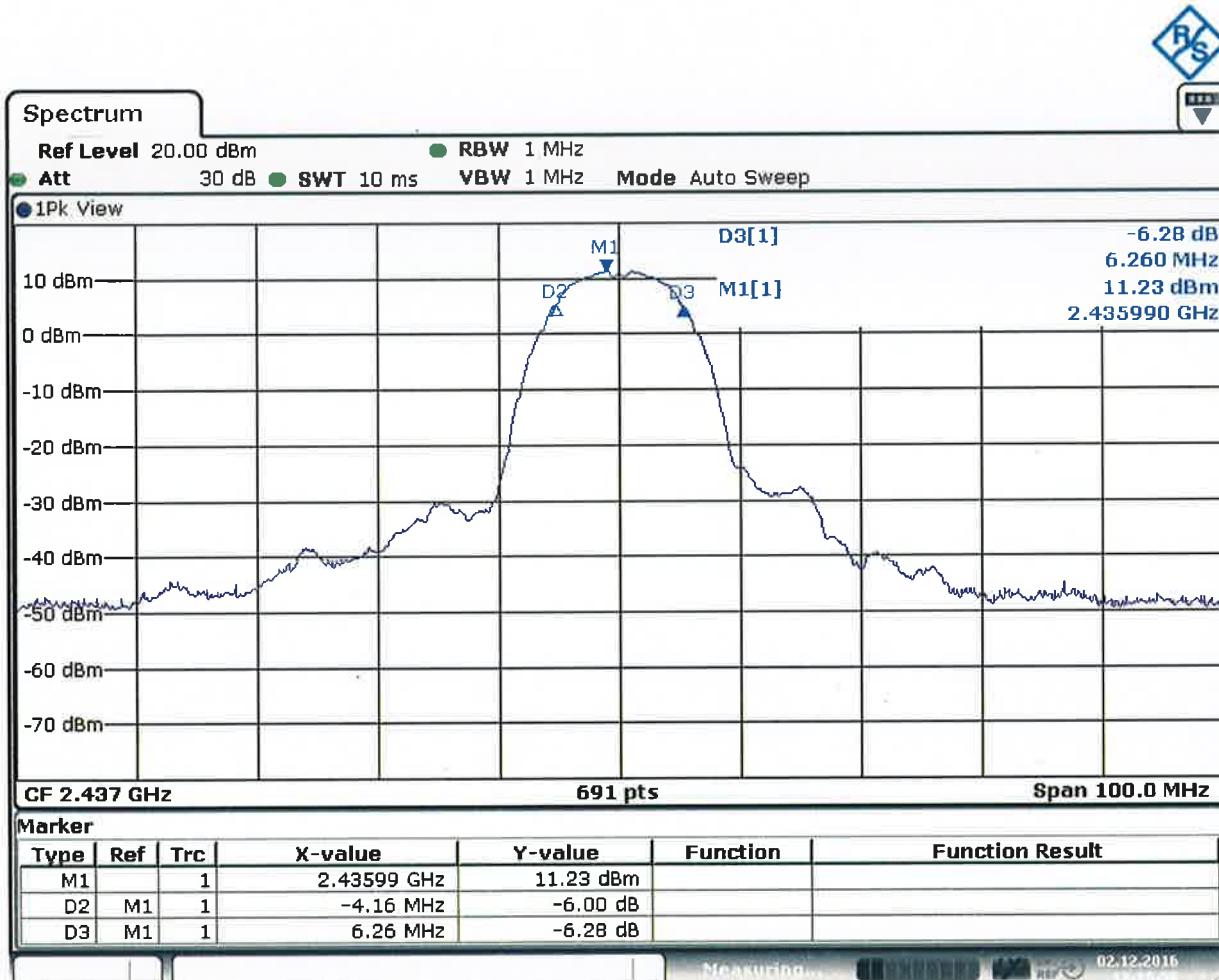
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – DSSS



Date: 2.DEC.2016 12:26:50

6dB Bandwidth: 10,42 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditons

6 dB Bandwidth at least 500 kHz

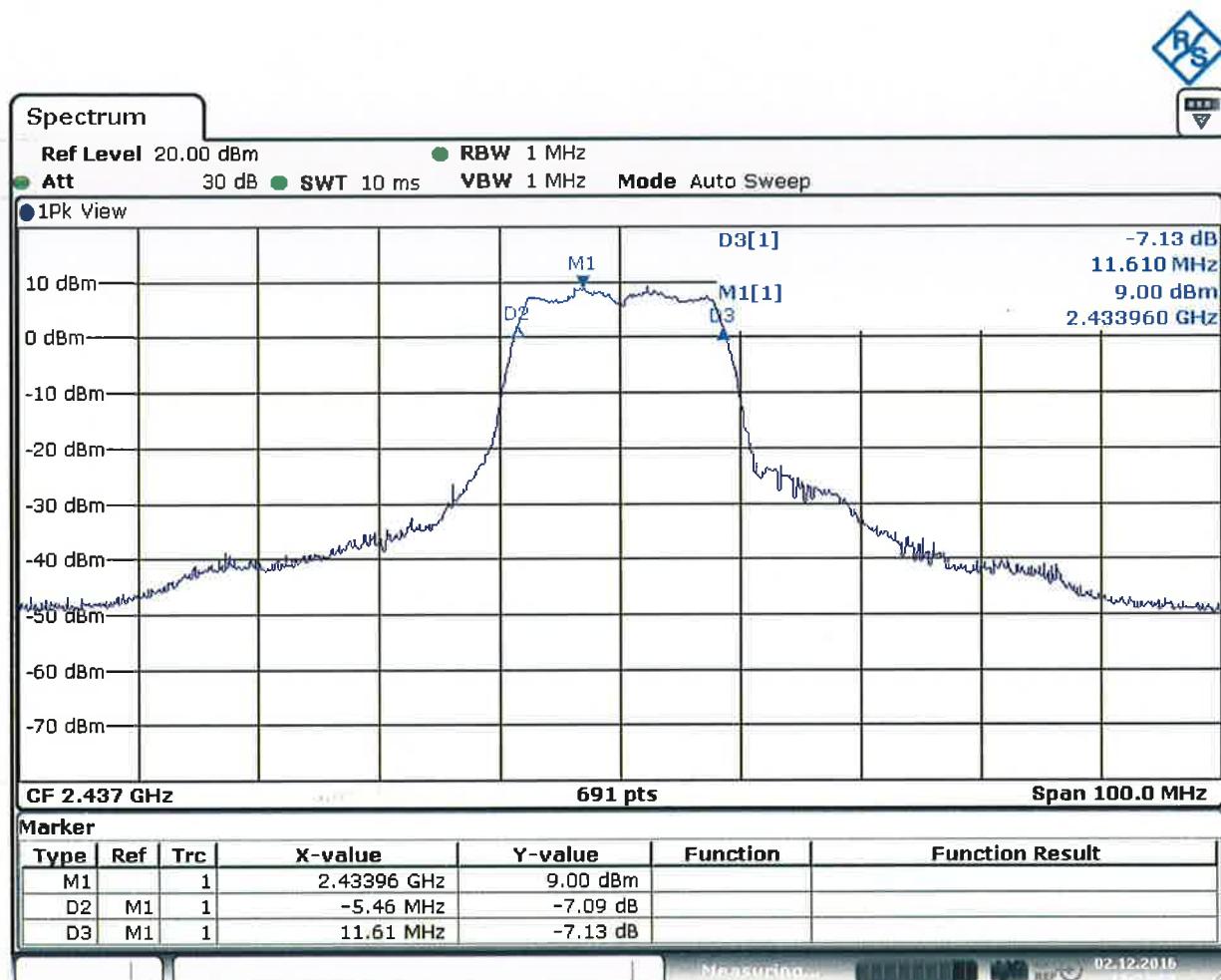
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:23:54

6dB Bandwidth: 17,07 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditons

6 dB Bandwidth at least 500 kHz

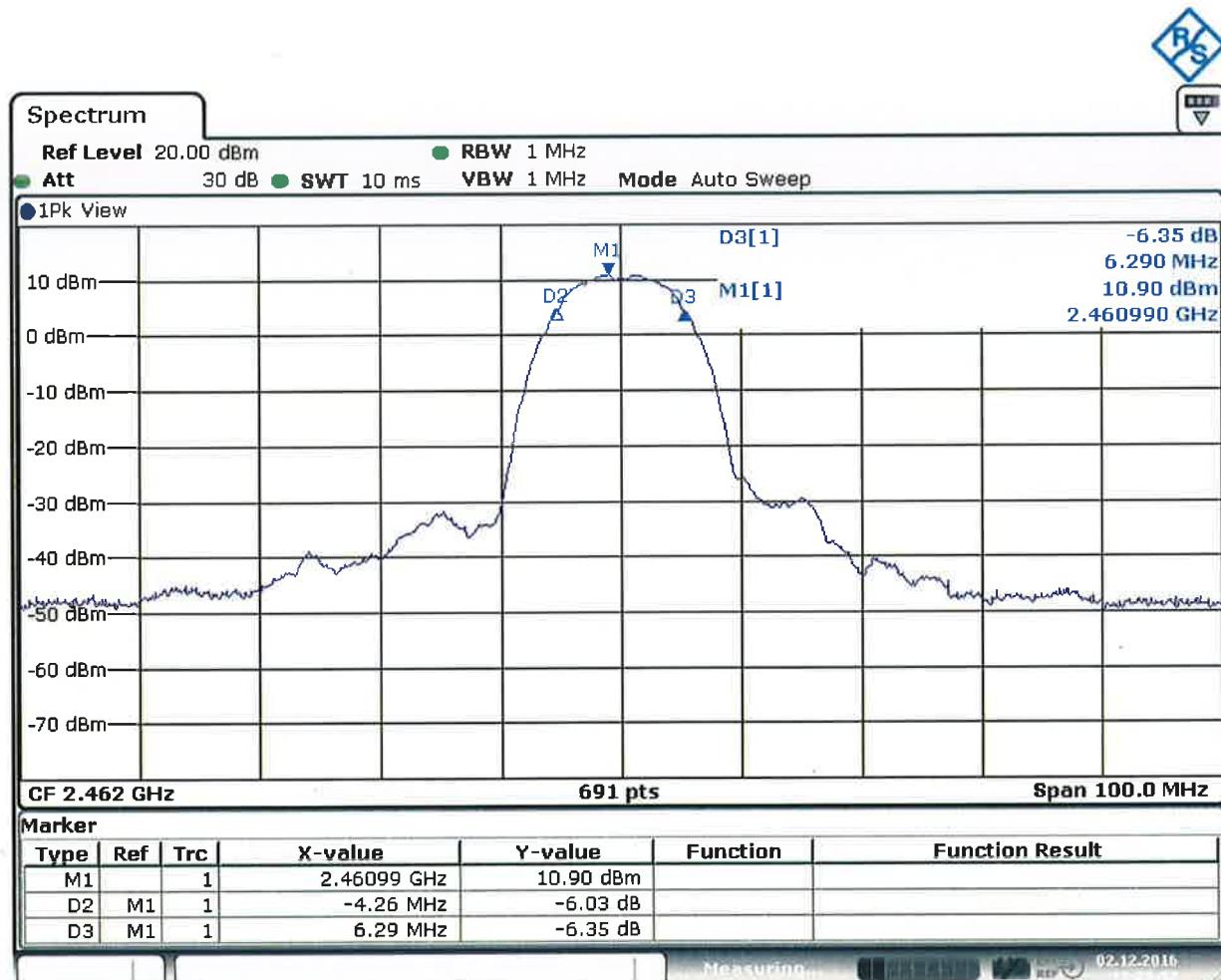
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – DSSS



Date: 2.DEC.2016 12:25:58

6dB Bandwidth: 10,55 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditions

6 dB Bandwidth at least 500 kHz

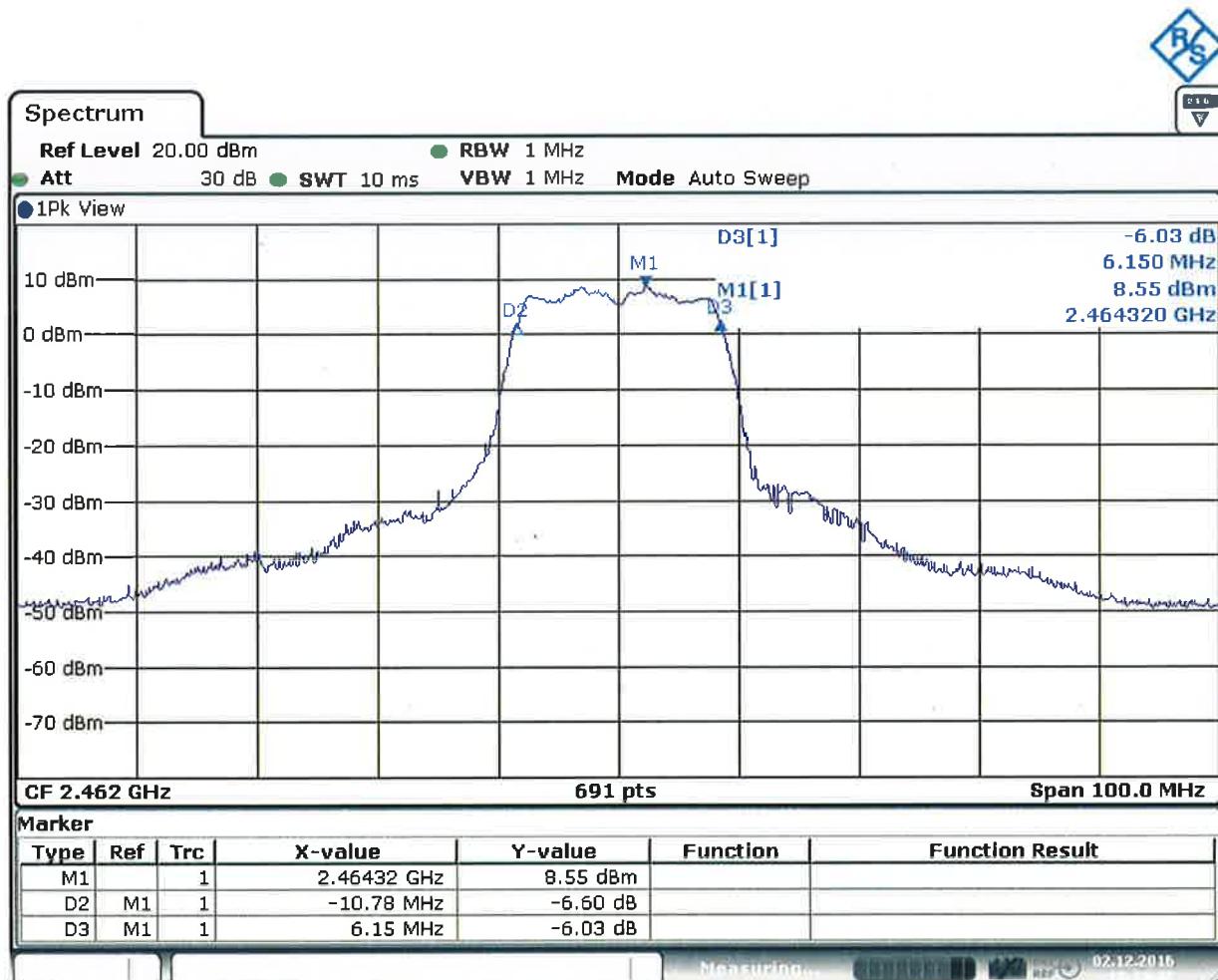
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:24:47

6dB Bandwidth: 16,93 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

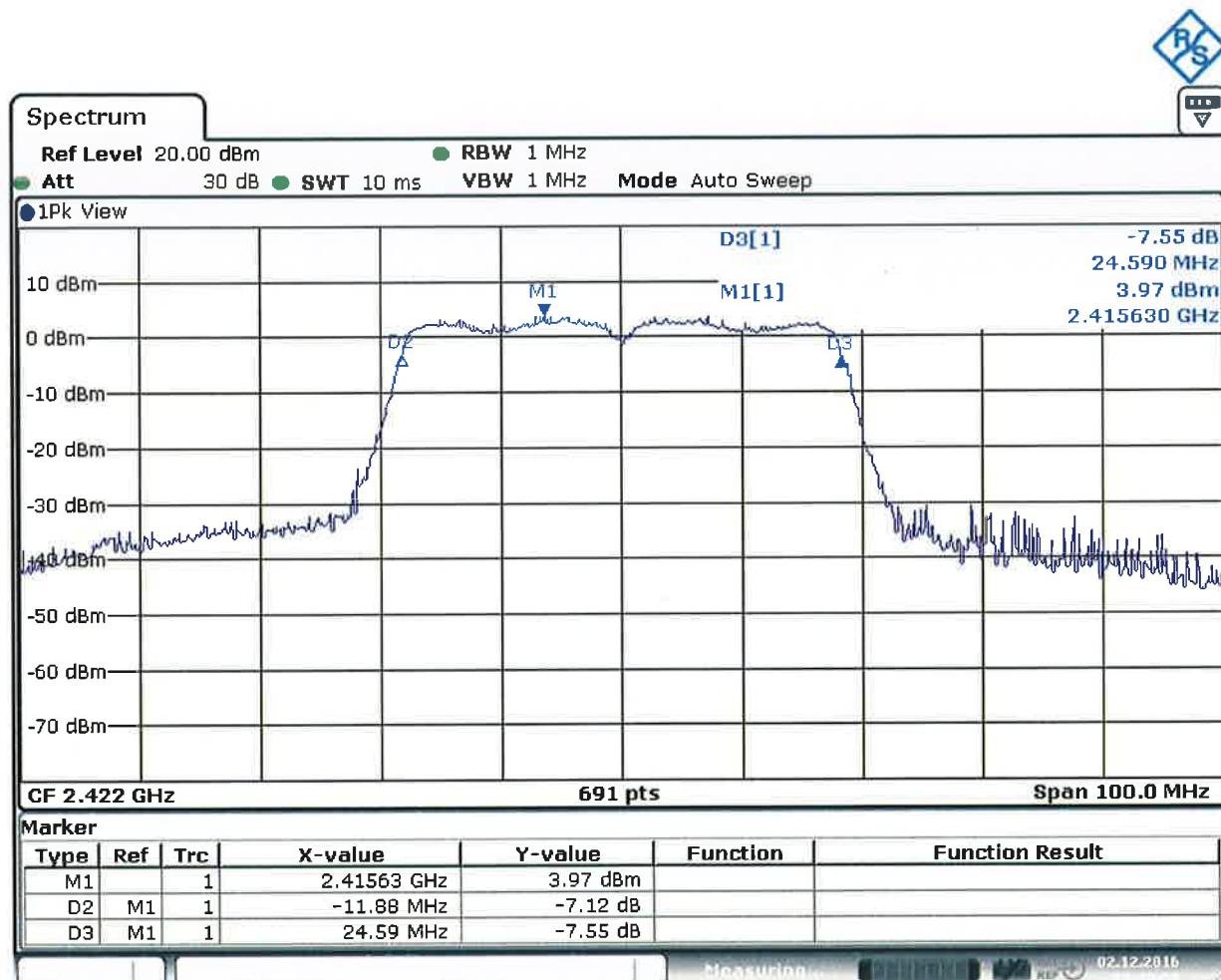
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channels 1+5 (2422 MHz center frequency)



Date: 2.DEC.2016 12:20:38

6dB Bandwidth: 36,47 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2(1)

Under normal test conditons

6 dB Bandwidth at least 500 kHz

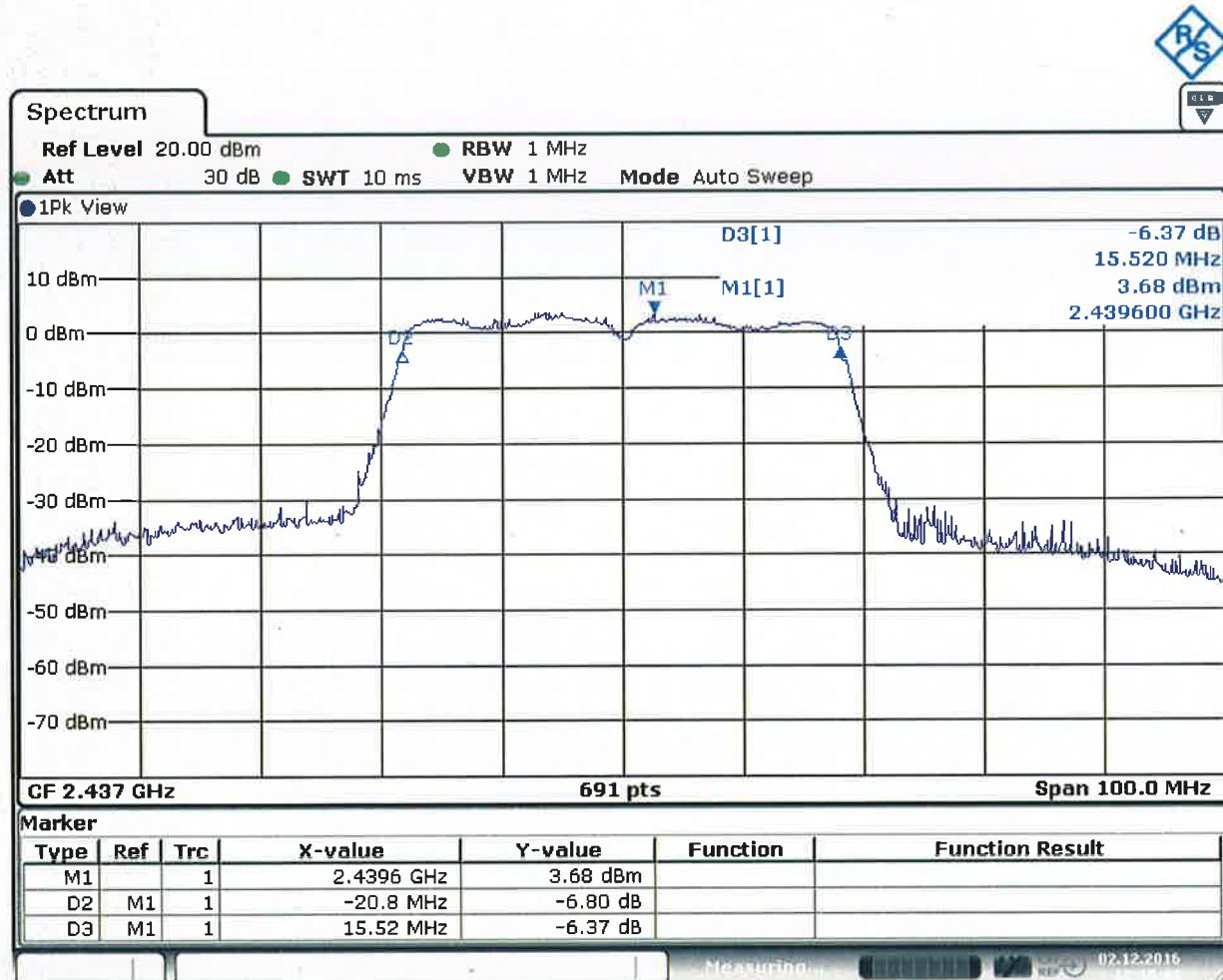
Test Equipment used: EMV-205

6dB Bandwidth

**§ 15.247(a)(2)
5.2(1)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channels 4 + 8 (2437 MHz center frequency)



Date: 2.DEC.2016 12:19:43

6dB Bandwidth: 36,32 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

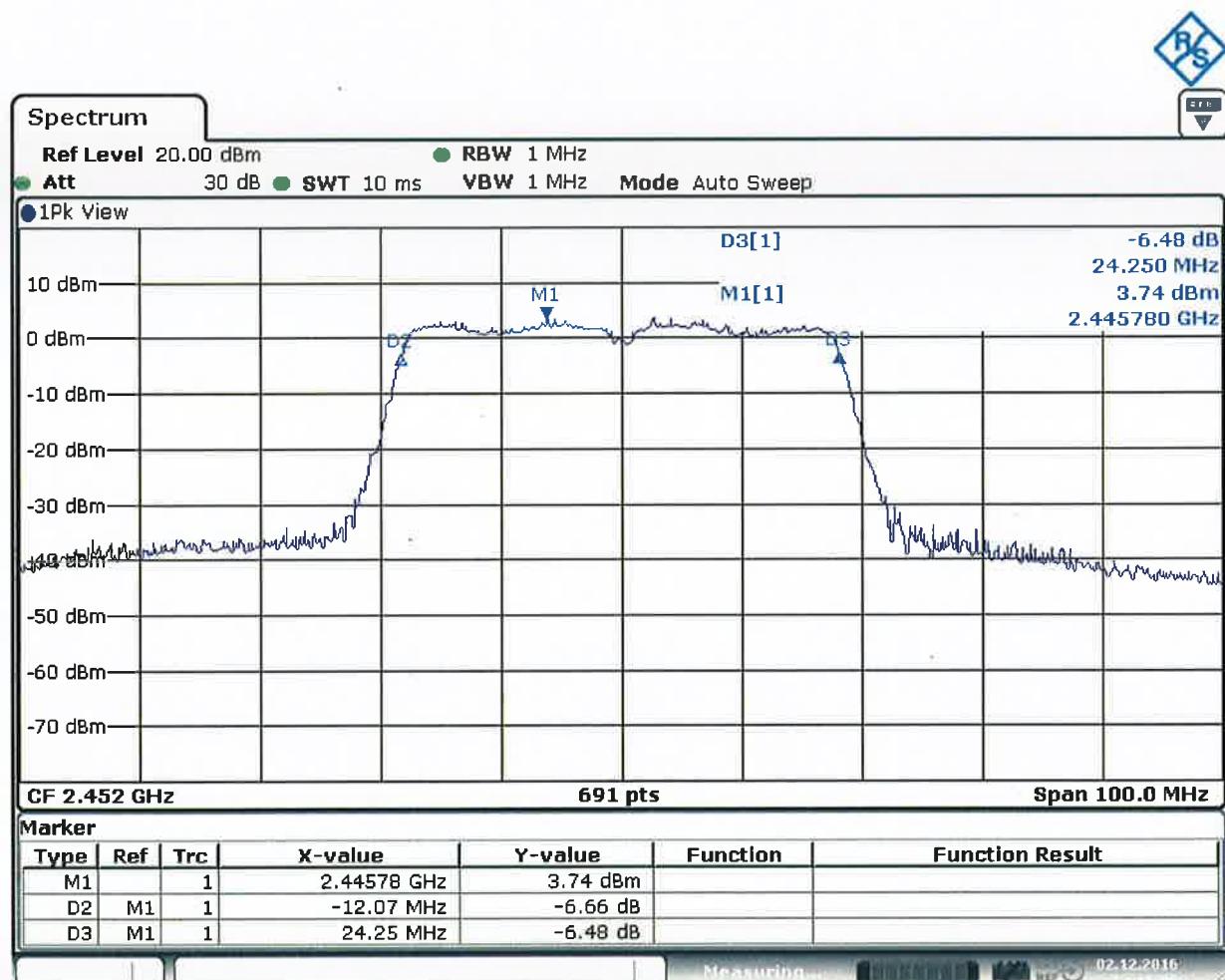
Test Equipment used: EMV-205

6dB Bandwidth

§ 15.247(a)(2)
5.2(1)

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 7 + 11 (2452 MHz center frequency)



Date: 2.DEC.2016 12:16:06

6dB Bandwidth: 36,32 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(1)**

Under normal test conditons

6 dB Bandwidth at least 500 kHz

Test Equipment used: EMV-205

Maximum Peak RF Power Output (conducted)

**§ 15.247(b)(3)
5.4(4)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW

Test conditions		Transmitter power (mW)		
		2412 (2422) MHz	2437 MHz	2462 (2452) MHz
T_{nom} (23) °C	DSSS	107,2	100,0	100,0
	OFDM – 20 MHz	190,5	199,5	195,0
	OFDM – 40 MHz	154,9	162,2	229,1
Measurement uncertainty		$\pm 0,75$ dB		

LIMIT **SUBCLAUSE 15.247(b)(3) – 5.4(4)**

Under normal test conditons	1W conducted (4W eirp)
-----------------------------	------------------------

Test Equipment used: NT-204; NT-229; NT233/1a

Maximum Peak RF Power Output (conducted)

**§ 15.247(b)(3)
5.4(4)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW

Test conditions		Transmitter power (mW)		
		2412 (2422) MHz	2437 MHz	2462 (2452) MHz
T_{nom} (23) °C	DSSS	123,0	114,8	104,7
	OFDM – 20 MHz	190,5	182,0	166,0
	OFDM – 40 MHz	154,9	154,9	154,9
Measurement uncertainty		$\pm 0,75$ dB		

LIMIT

SUBCLAUSE 15.247(b)(3) – 5.4(4)

Under normal test conditons	1W conducted (4W eirp)
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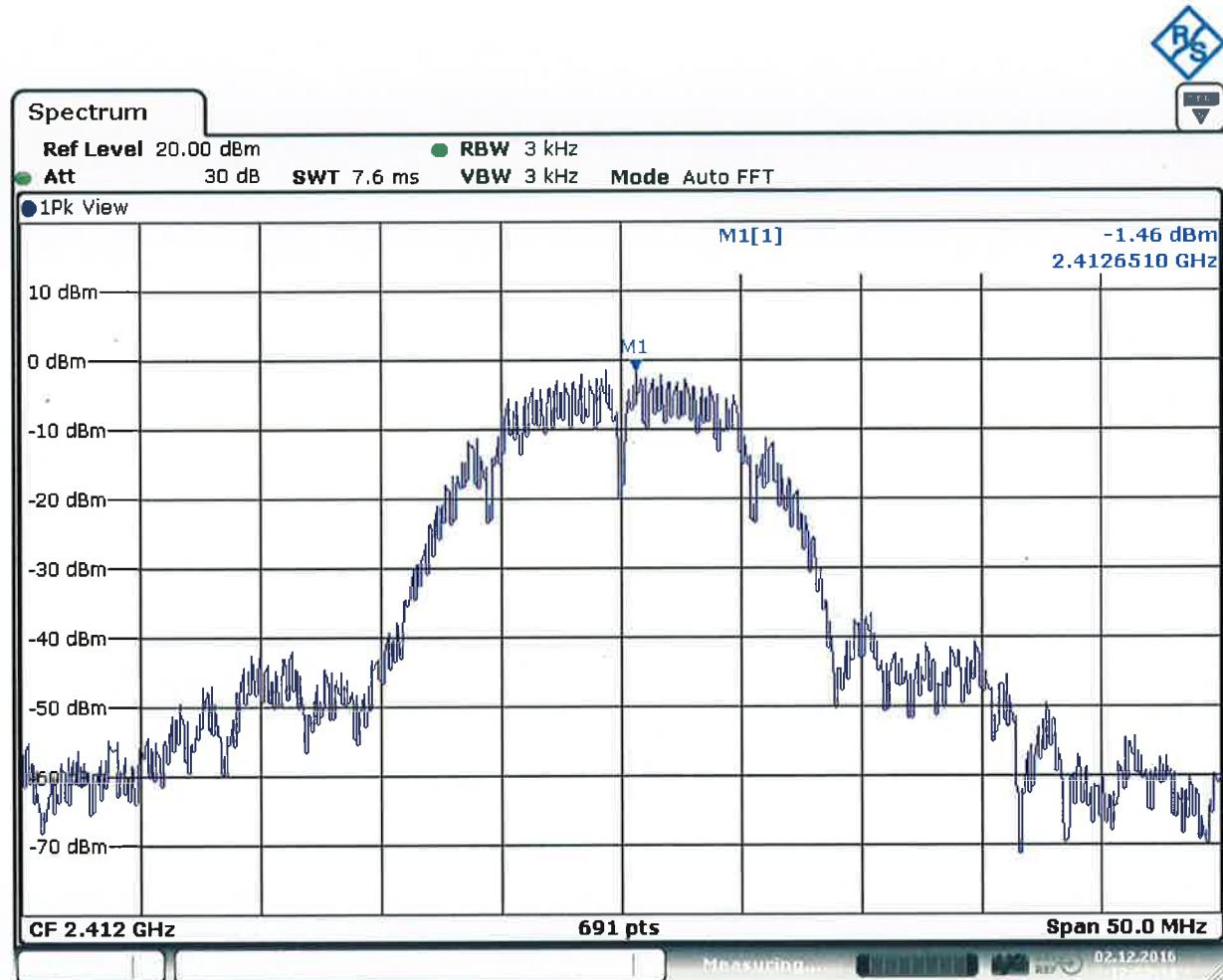
Test Equipment used: NT-204; NT-229; NT233/1a

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – DSSS



Date: 2 DEC 2016 12:55:34

Power Spectral density: -1,46 dBm @ 2412,651 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(2)**

Under normal test conditons

+8dBm in any 3 kHz band

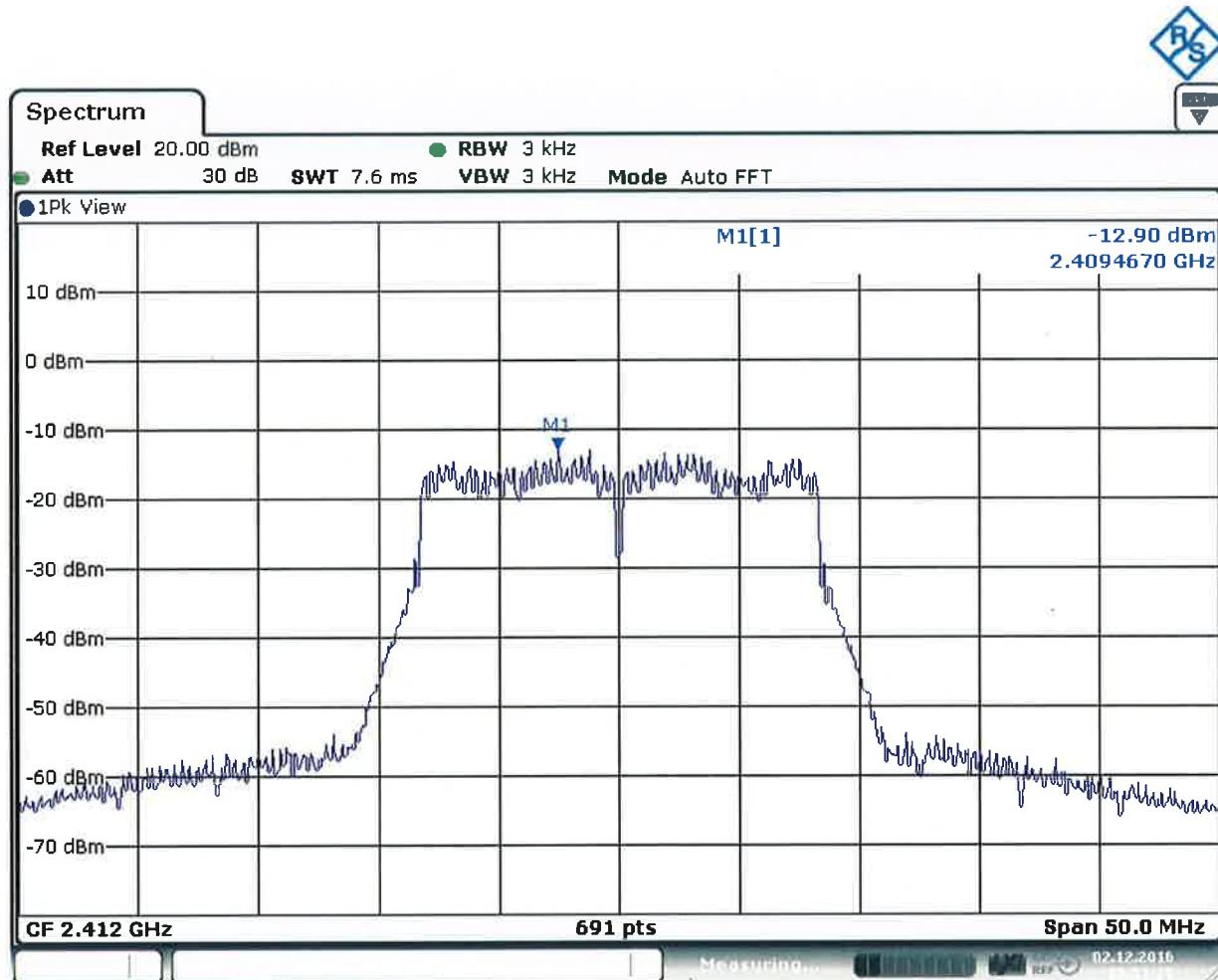
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – OFDM



Date: 2 DEC 2016 12:51:40

Power Spectral density: -12,90 dBm @ 2409,467 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(2)**

Under normal test conditons

+8dBm in any 3 kHz band

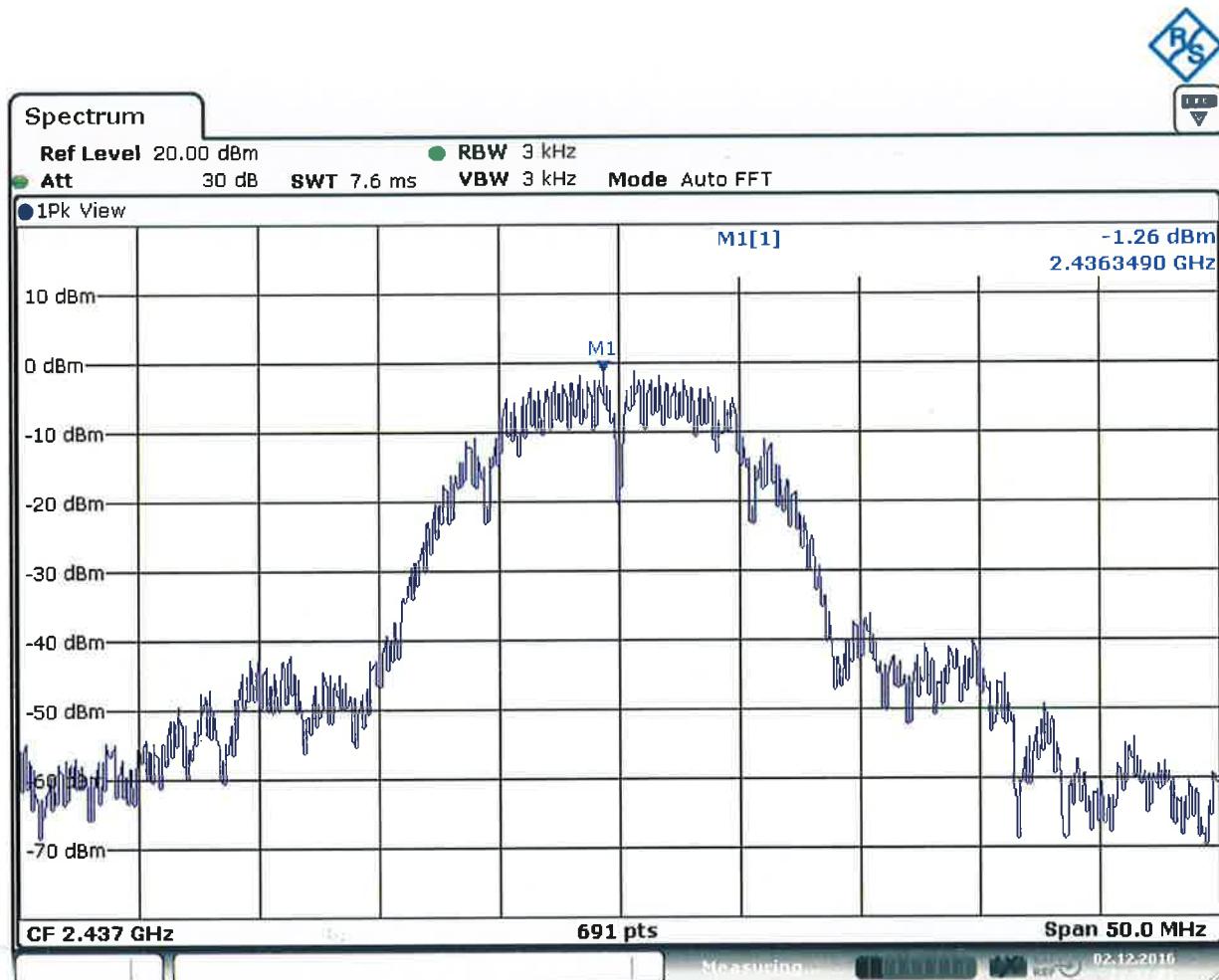
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – DSSS



Date: 2.DEC.2016 12:57:02

Power Spectral density: -1,26 dBm @ 2436,349 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

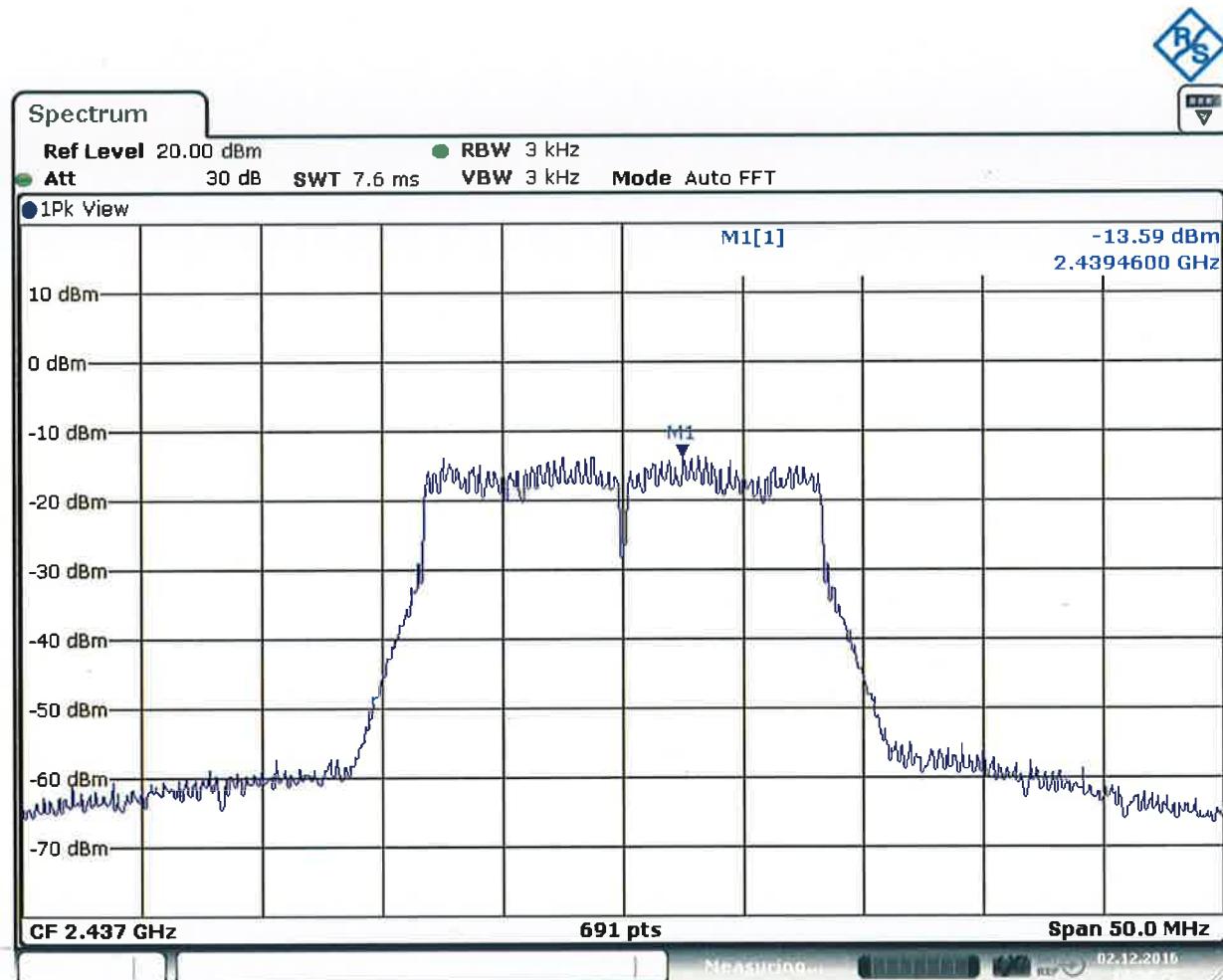
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:52:27

Power Spectral density: -13,59 dBm @ 2439,460 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(2)**

Under normal test conditons	+8dBm in any 3 kHz band
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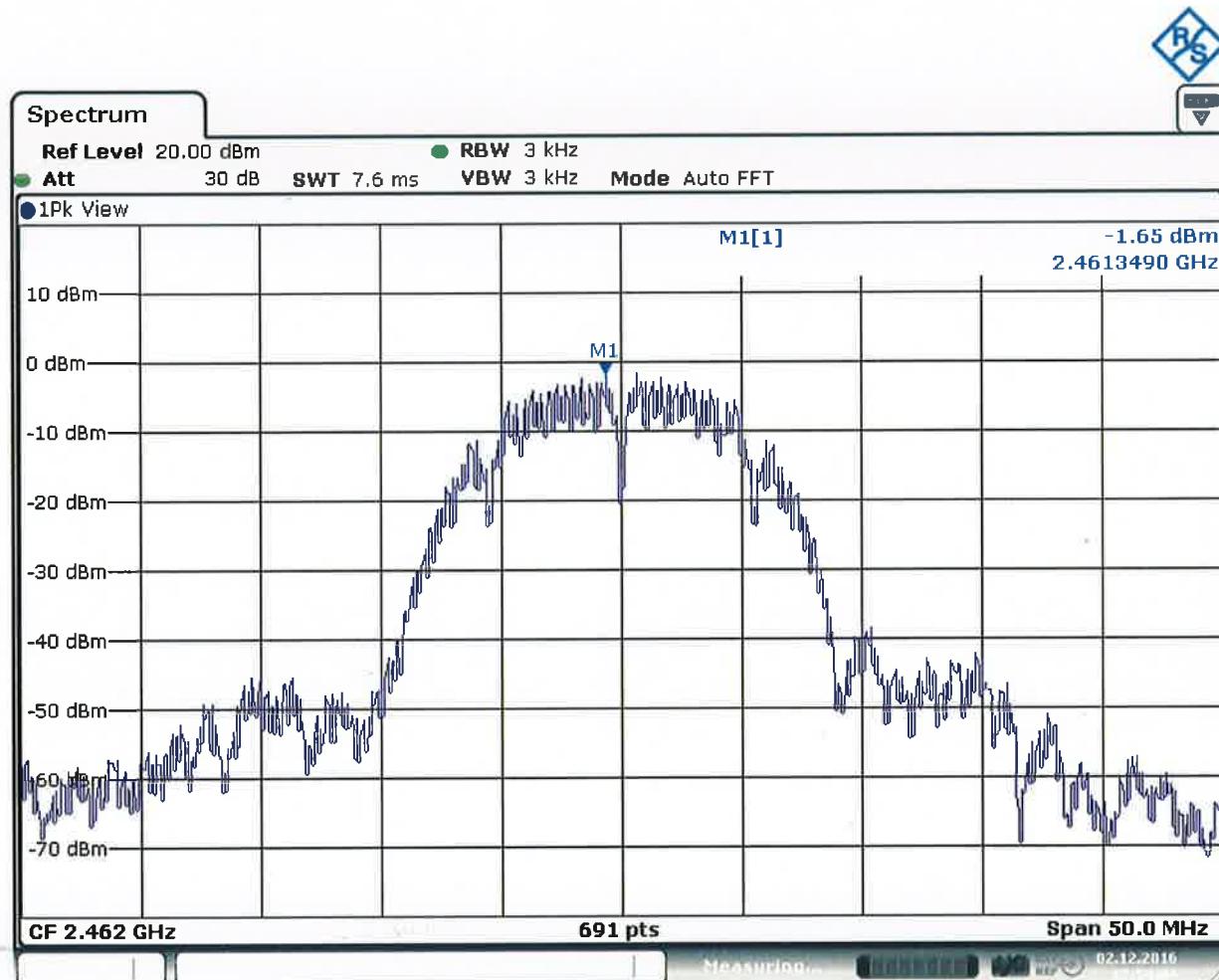
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – DSSS



Date: 2.DEC.2016 12:54:05

Power Spectral density: -1,65 dBm @ 2461,349 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

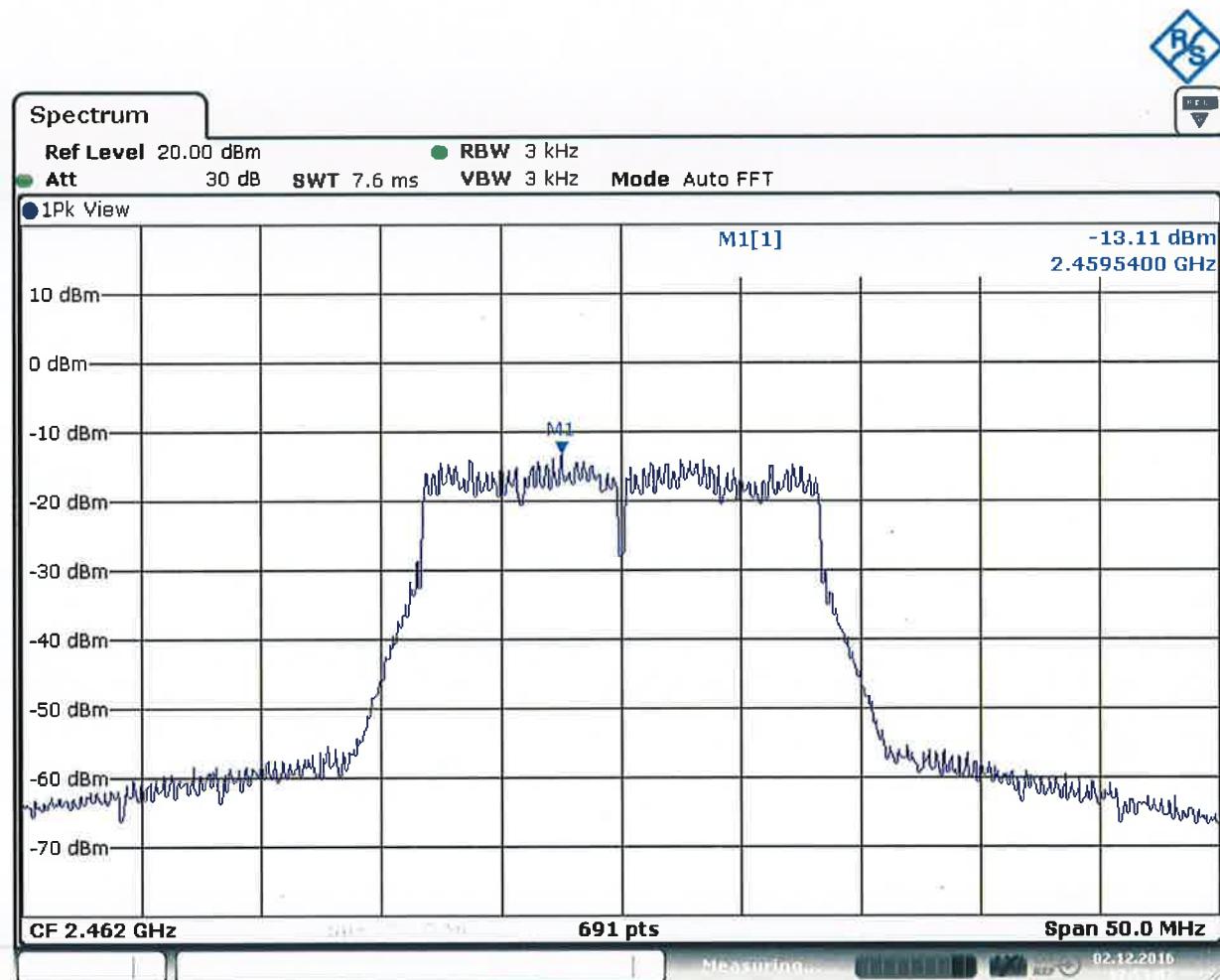
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:53:07

Power Spectral density: -13,11 dBm @ 2459,540 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(2)**

Under normal test conditons	+8dBm in any 3 kHz band
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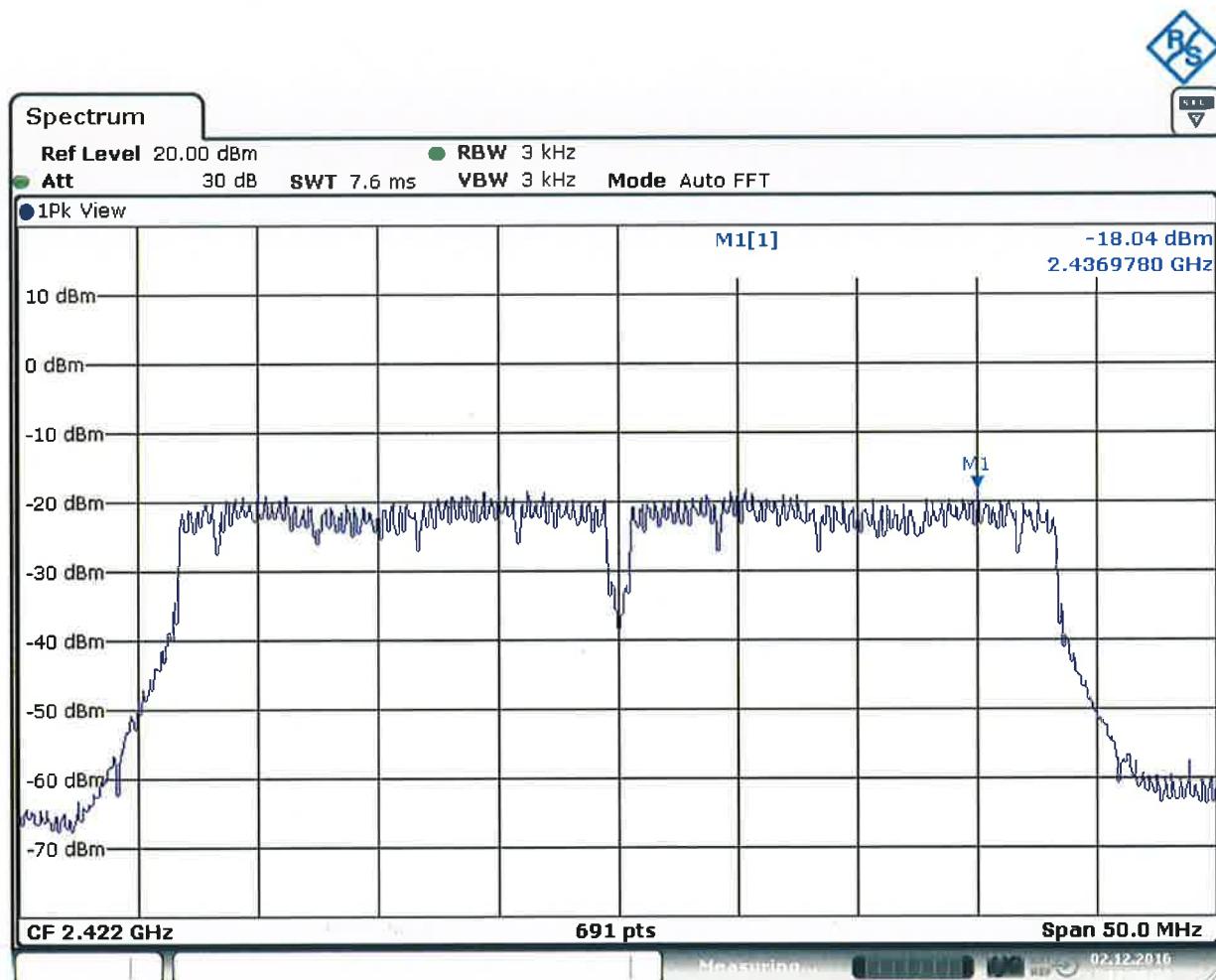
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 1 + 5 (2422 MHz center frequency)



Power Spectral density: -18,04 dBm @ 2436,978 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

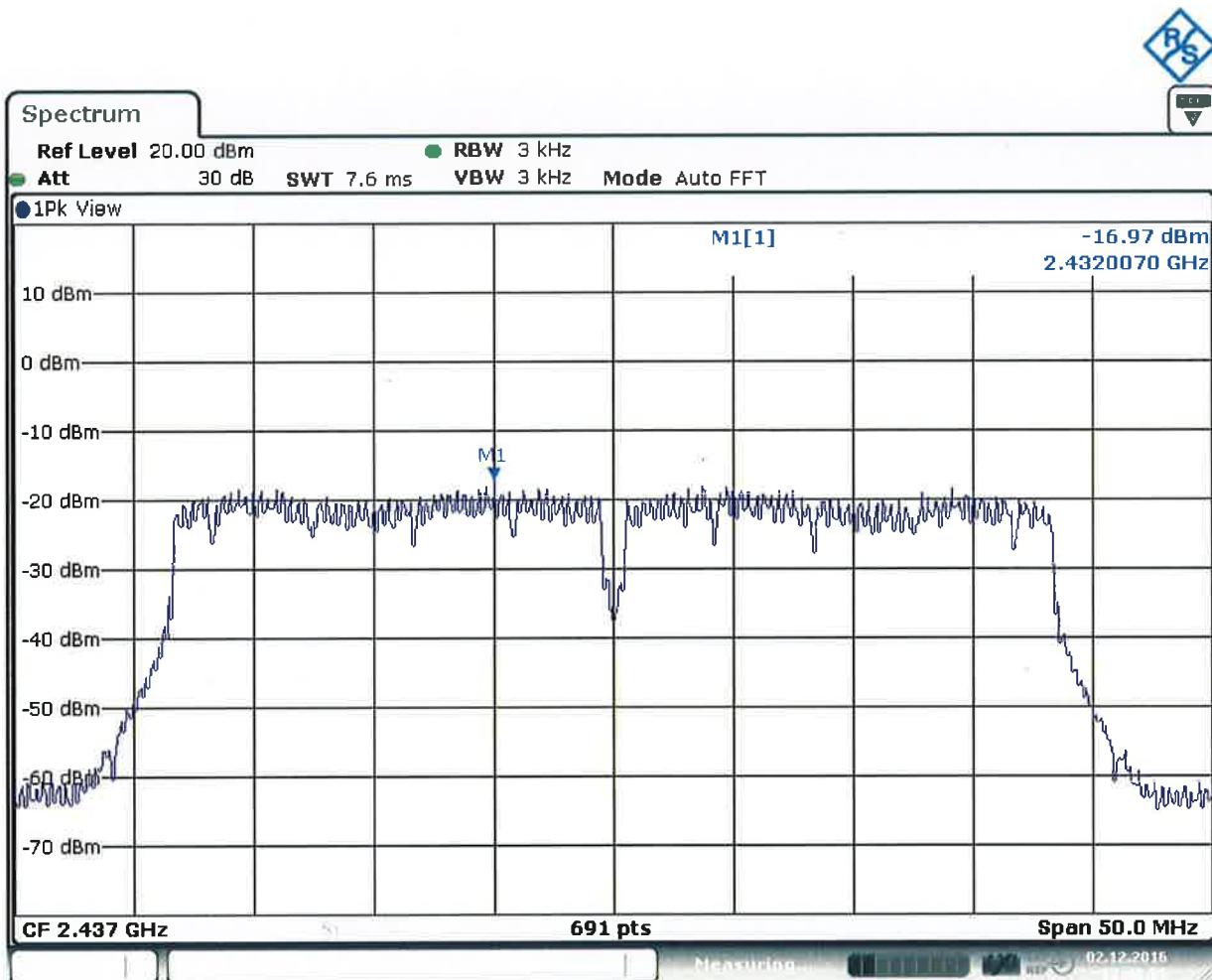
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 4 + 8 (2437 MHz center frequency)



Date: 2.DEC.2016 12:49:55

Power Spectral density: -16,97 dBm @ 2432,007 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons	+8dBm in any 3 kHz band
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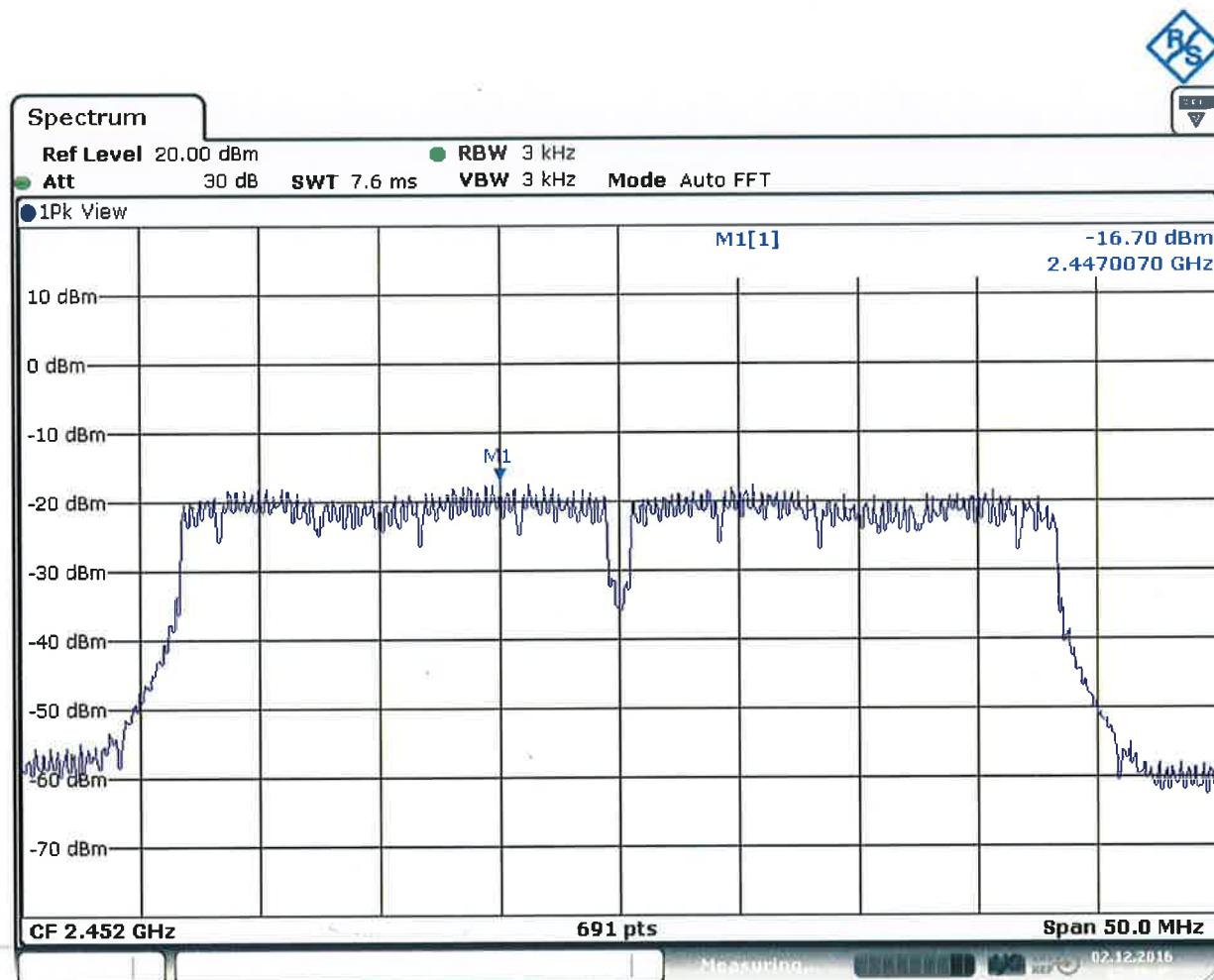
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 1

Rated output power: 229,1 mW Channel 7 + 11 (2452 MHz center frequency)



Date: 2.DEC.2016 12:48:45

Power Spectral density: -16,70 dBm @ 2447,007 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

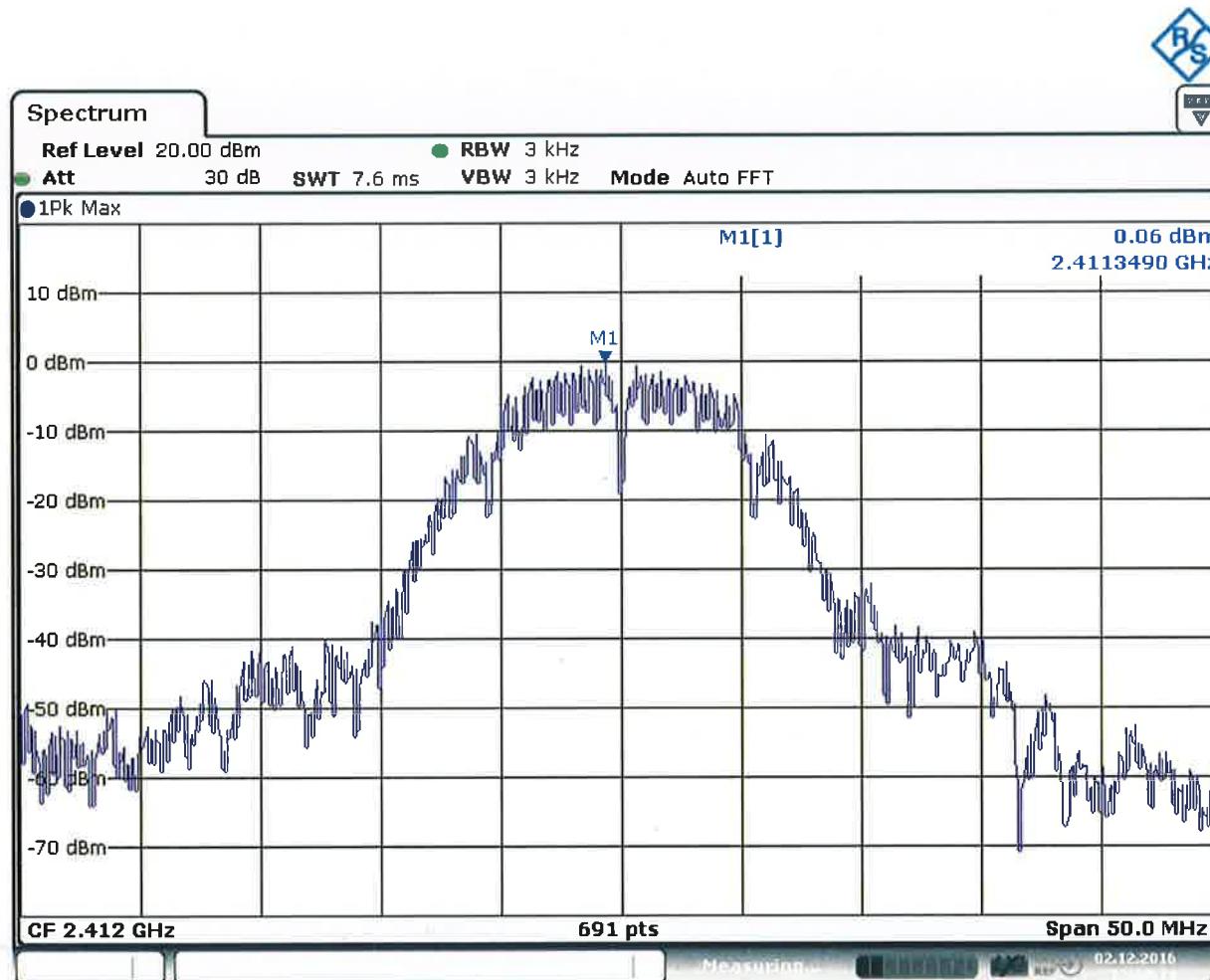
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – DSSS



Date: 2.DEC.2016 12:37:15

Power Spectral density: 0,06 dBm @ 2411,349 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons	+8dBm in any 3 kHz band
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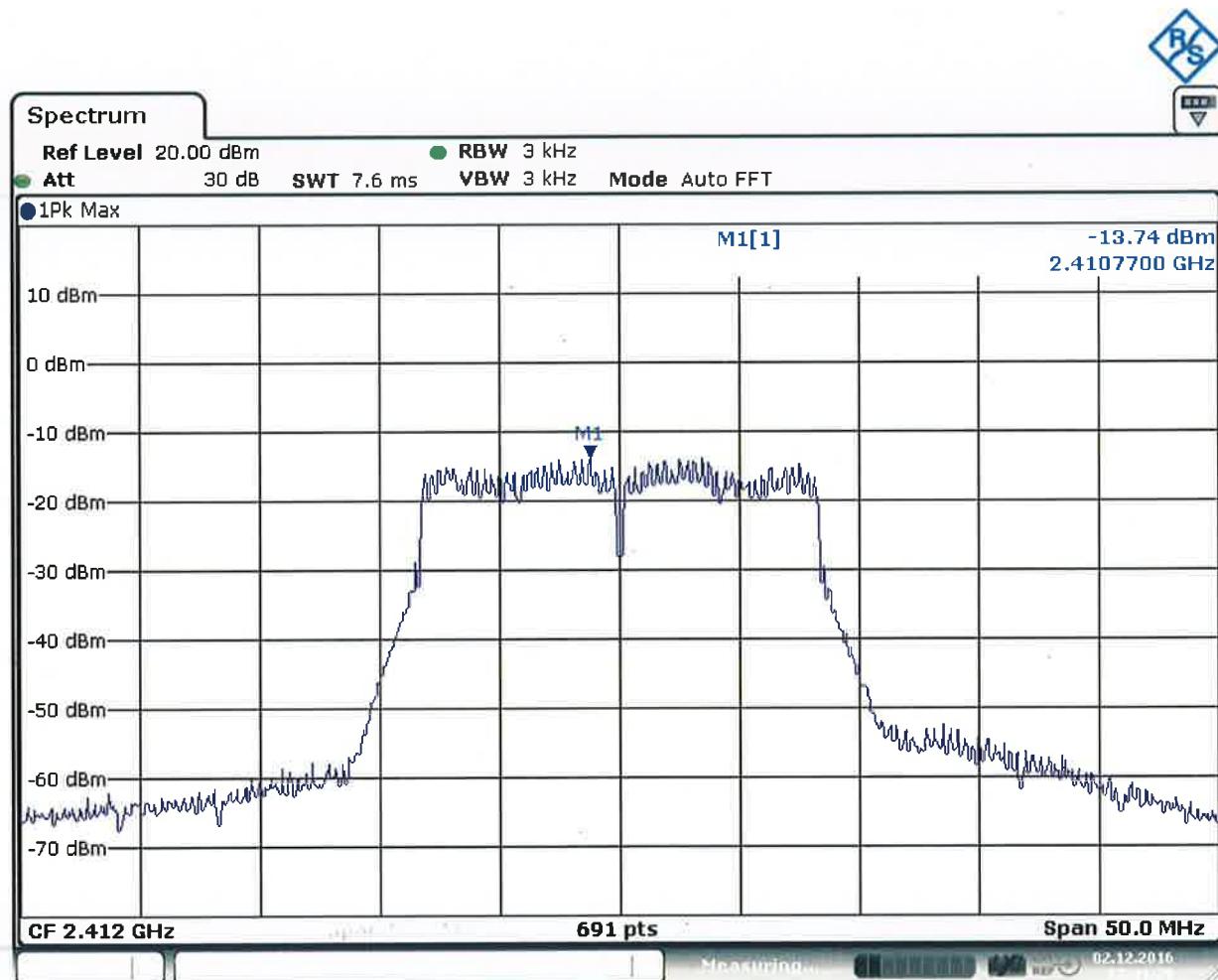
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 1 (2412 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:41:29

Power Spectral density: -13,74 dBm @ 2410,770 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

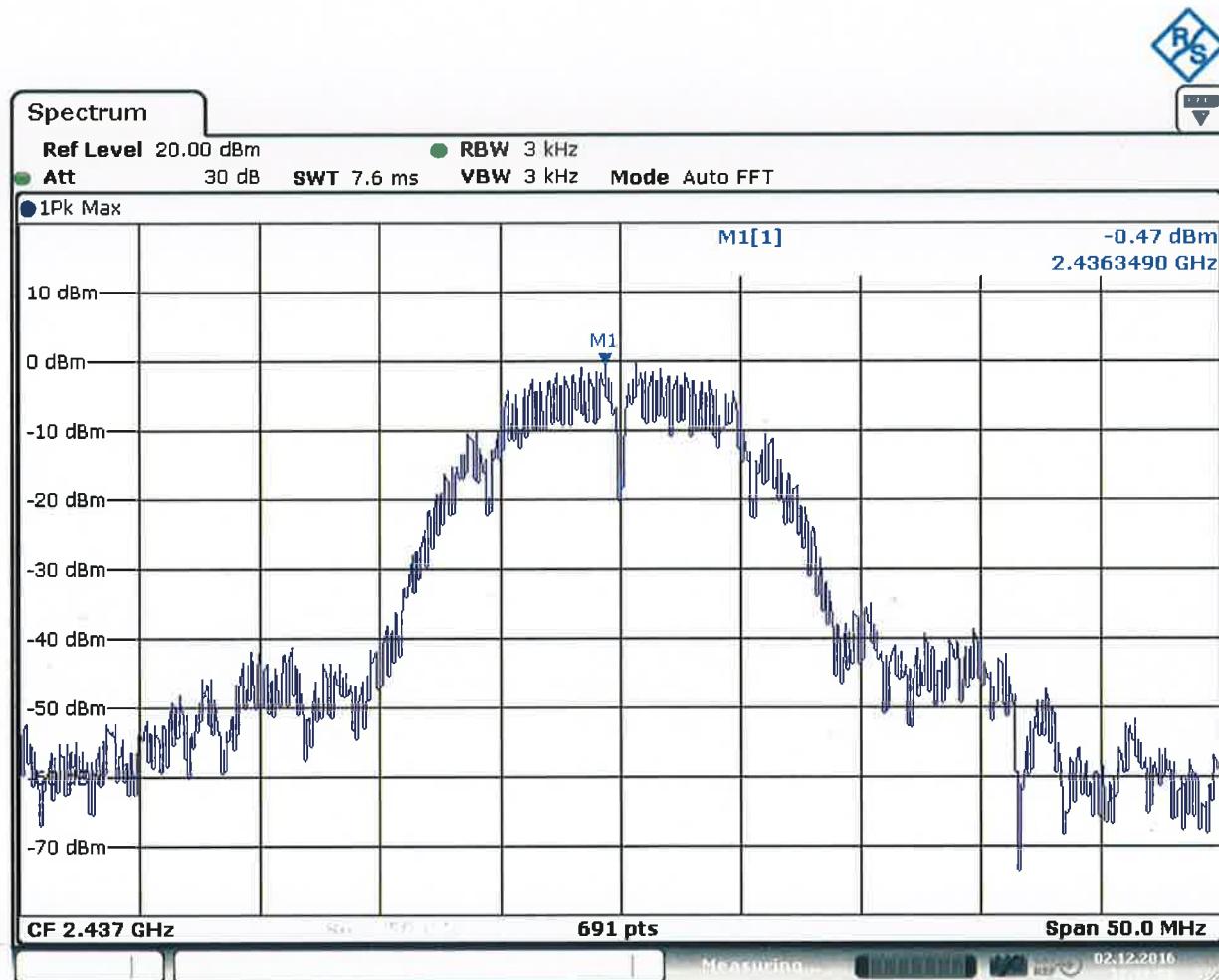
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – DSSS



Power Spectral density: -0,47 dBm @ 2436,349 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

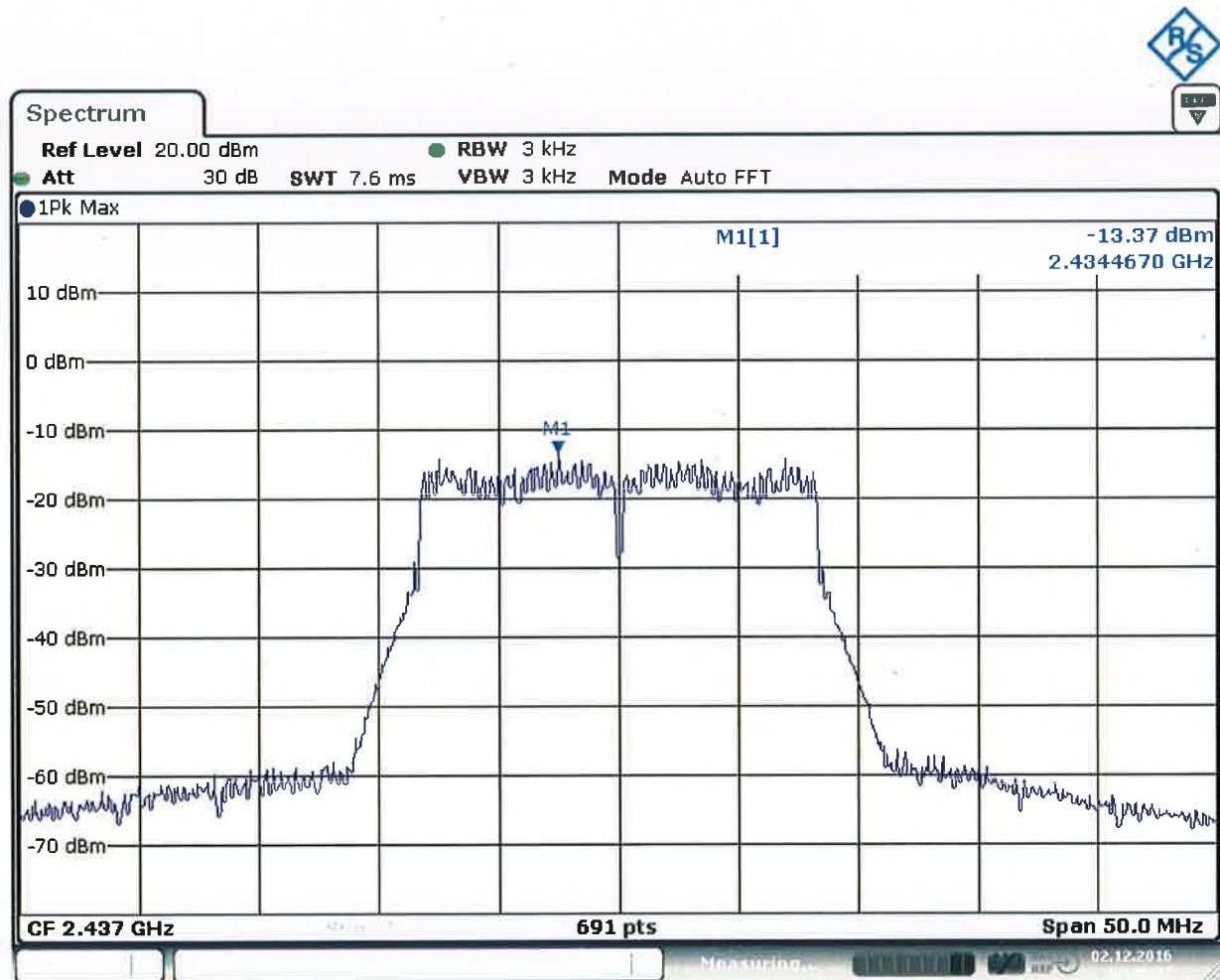
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 6 (2437 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:40:28

Power Spectral density: -13,37 dBm @ 2434,467 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(2)**

Under normal test conditons	+8dBm in any 3 kHz band
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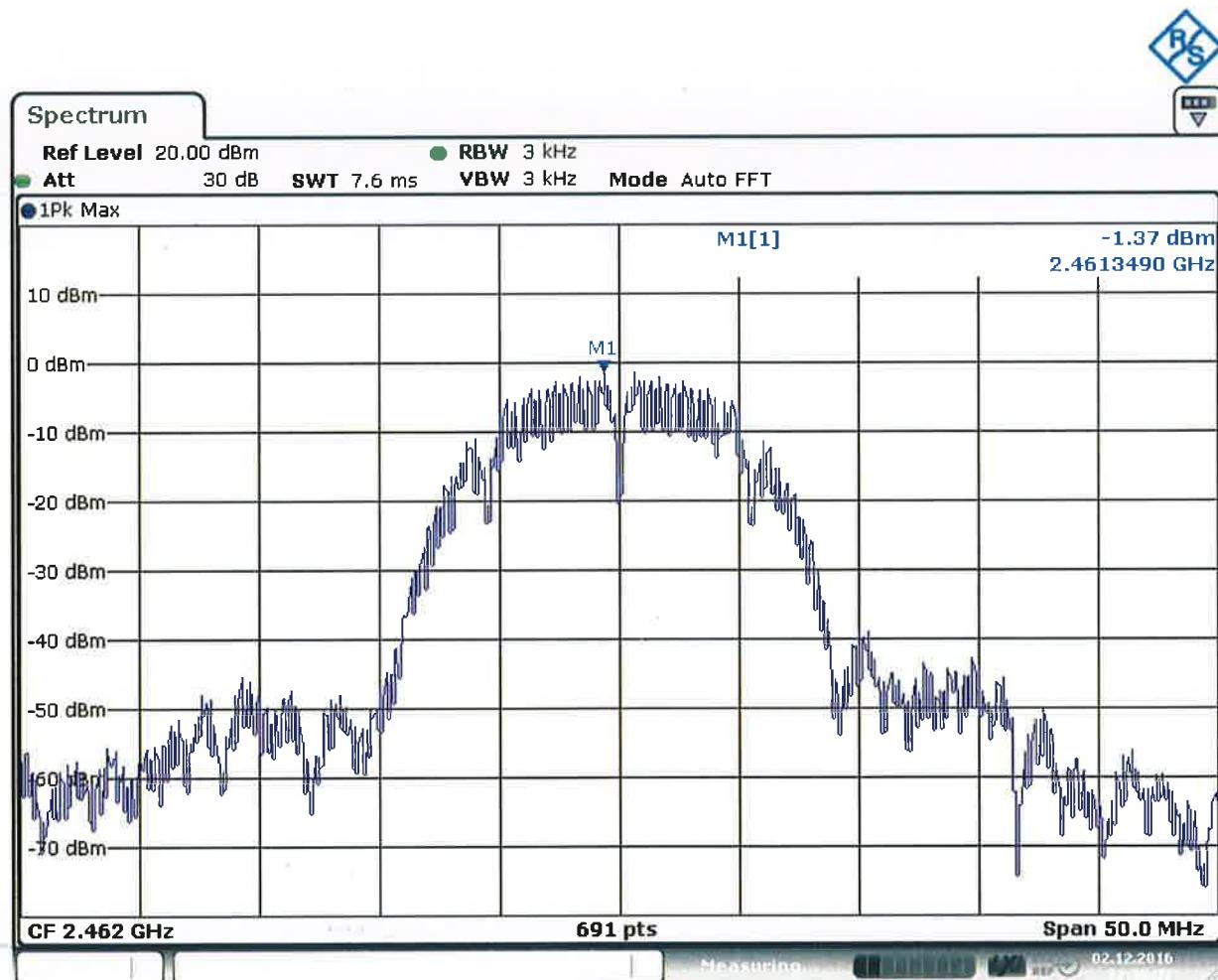
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – DSSS



Power Spectral density: -1,37 dBm @ 2461,349 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons	+8dBm in any 3 kHz band
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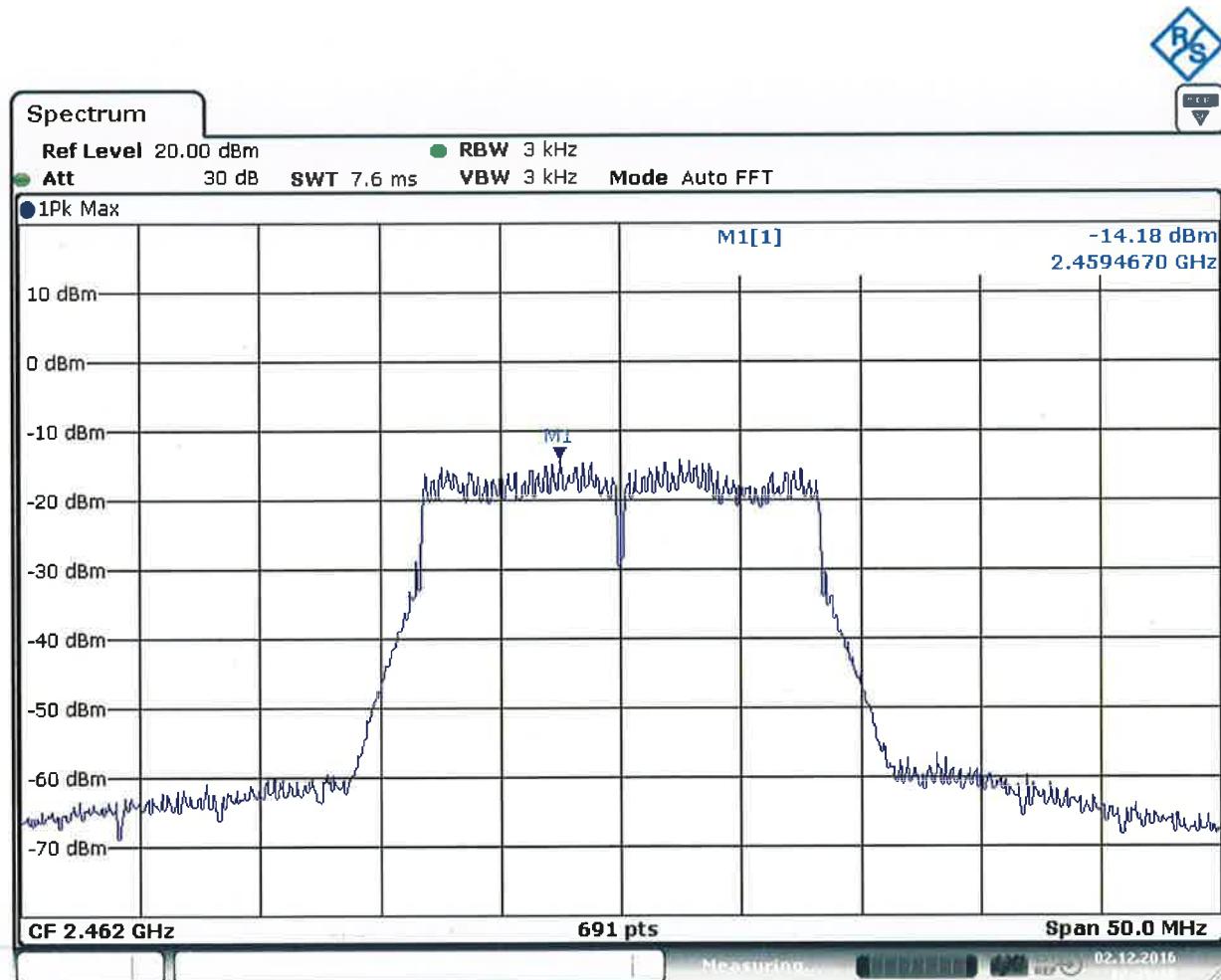
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 11 (2462 MHz center frequency) – OFDM



Date: 2.DEC.2016 12:39:30

Power Spectral density: -14,18 dBm @ 2459,467 MHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2(2)**

Under normal test conditons	+8dBm in any 3 kHz band
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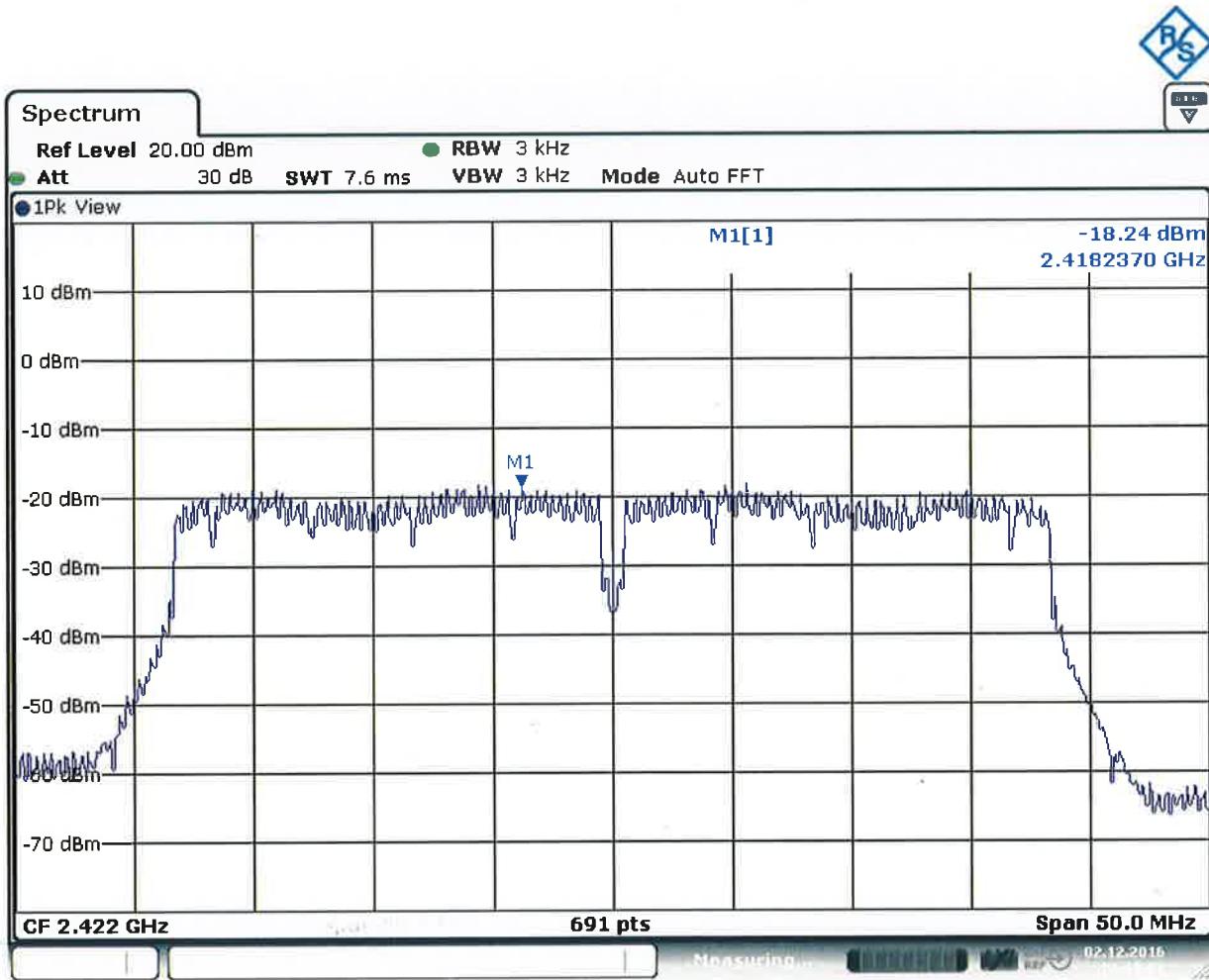
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 1 + 5 (2422 MHz center frequency)



Date: 2.DEC.2016 12:43:01

Power Spectral density: -18.24 dBm @ 2418.237 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

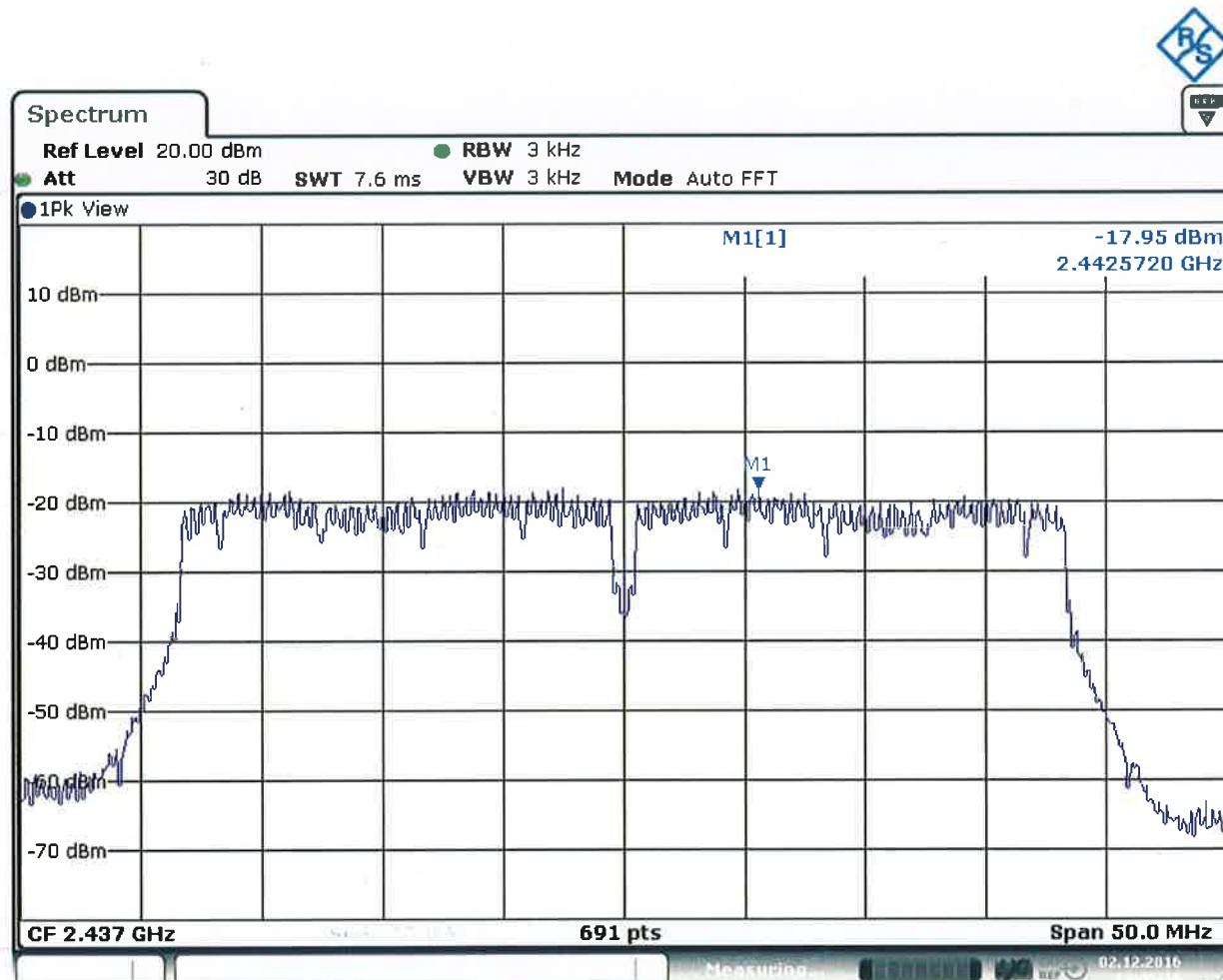
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 4 + 8 (2437 MHz center frequency)



Date: 2.DEC.2016 12:45:17

Power Spectral density: -17,95 dBm @ 2442,572 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

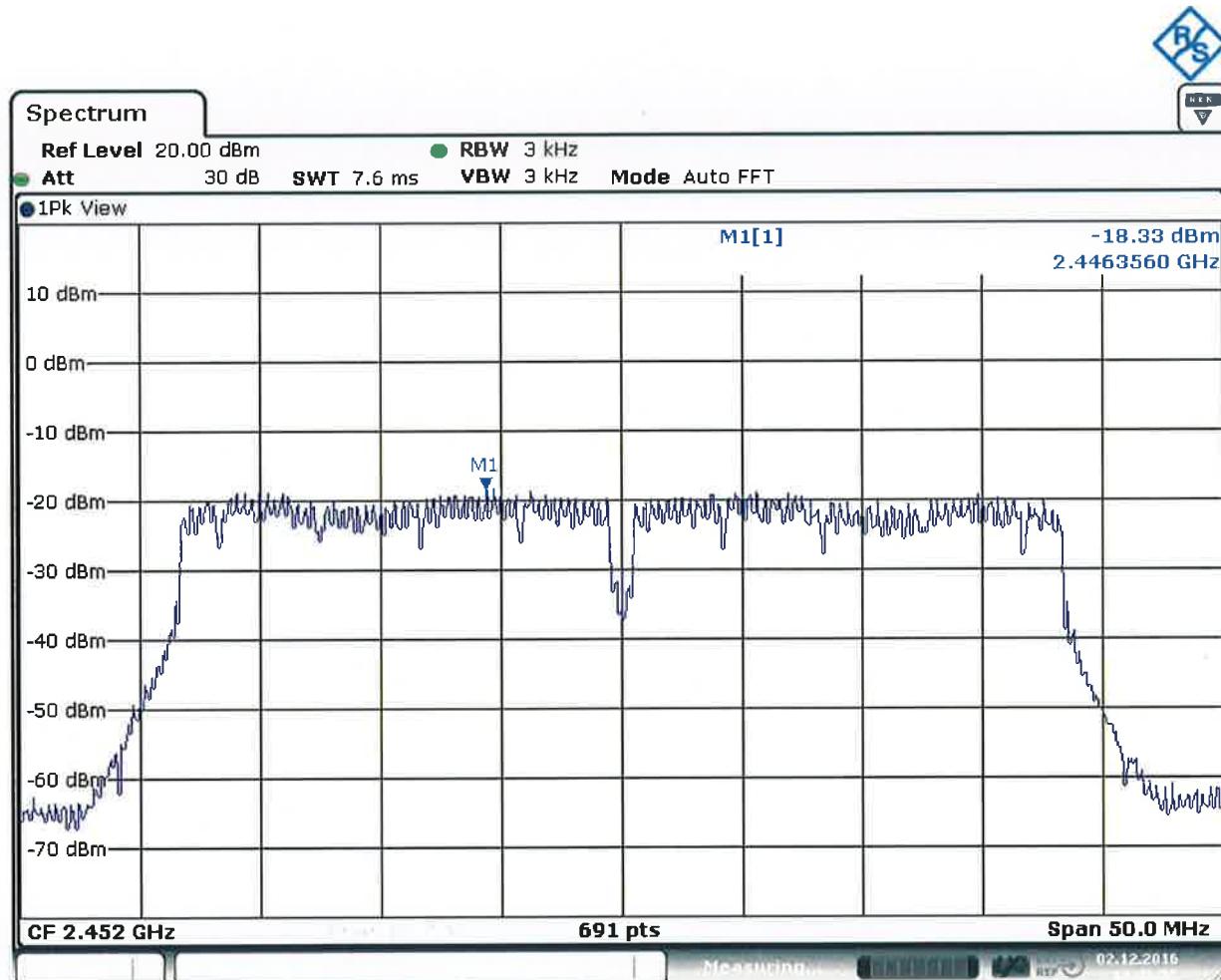
Test Equipment used: EMV-205

Power spectral density (conducted)

**§ 15.247(e)
5.2(2)**

Conducted Measurement – Antenna 2

Rated output power: 229,1 mW Channel 7 + 11 (2452 MHz center frequency)



Date: 2.DEC.2016 12:46:26

Power Spectral density: -18,33 dBm @ 2446,356 MHz

LIMIT

SUBCLAUSE 15.247(e) – 5.2(2)

Under normal test conditons

+8dBm in any 3 kHz band

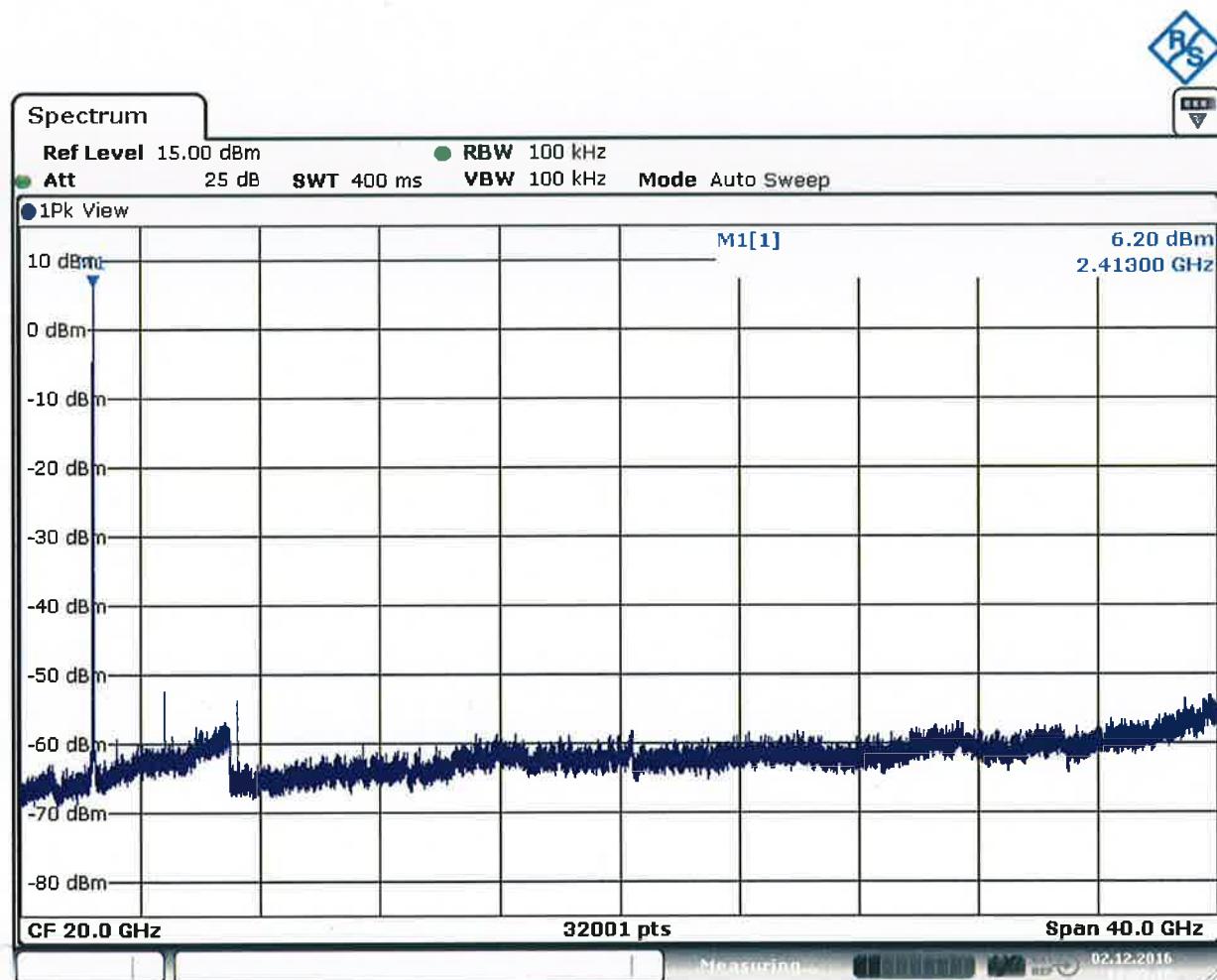
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 1: 2412 MHz – DSSS



Date: 2.DEC.2016 13:09:13

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

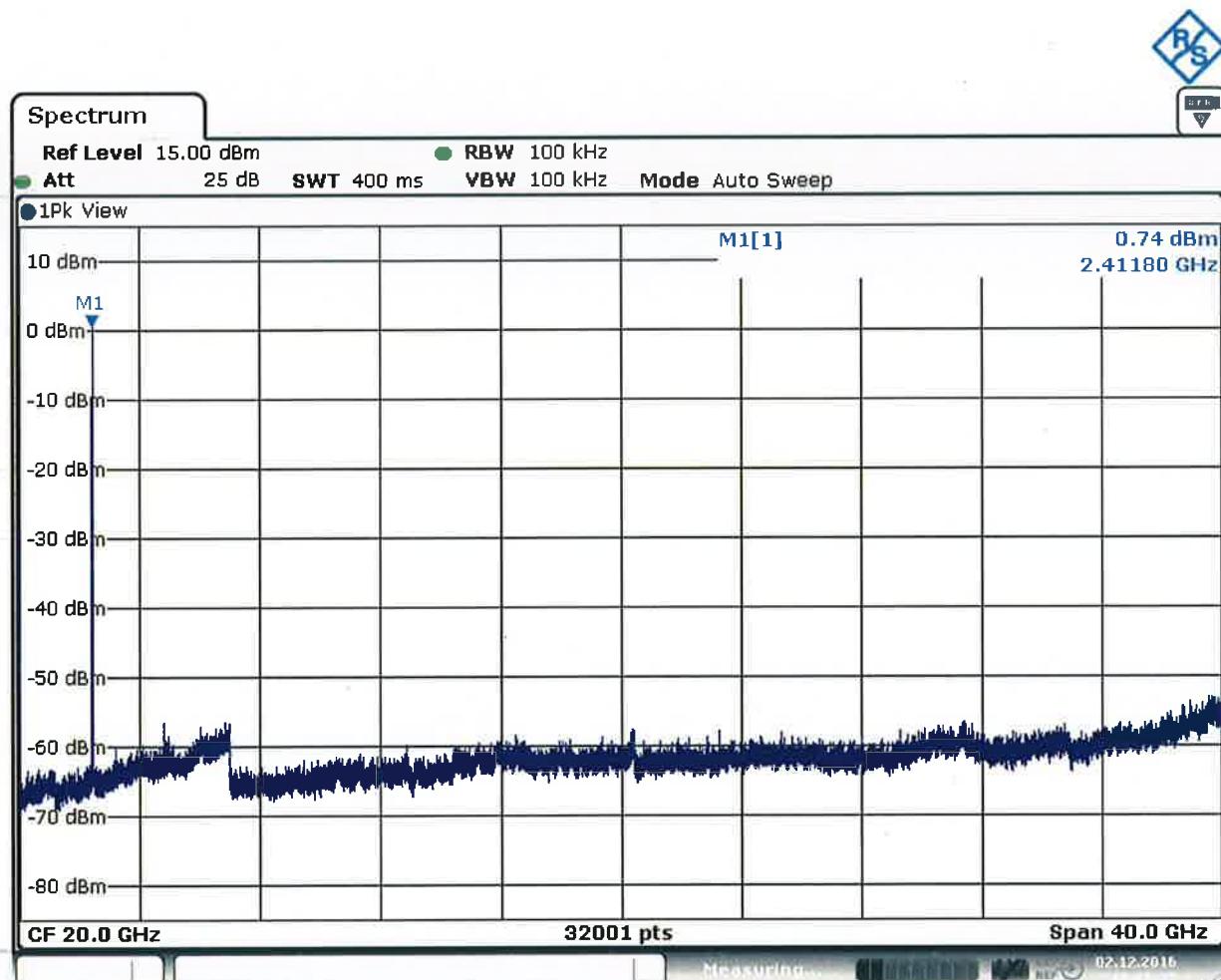
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 1: 2412 MHz – OFDM



Date: 2.DEC.2016 13:16:21

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

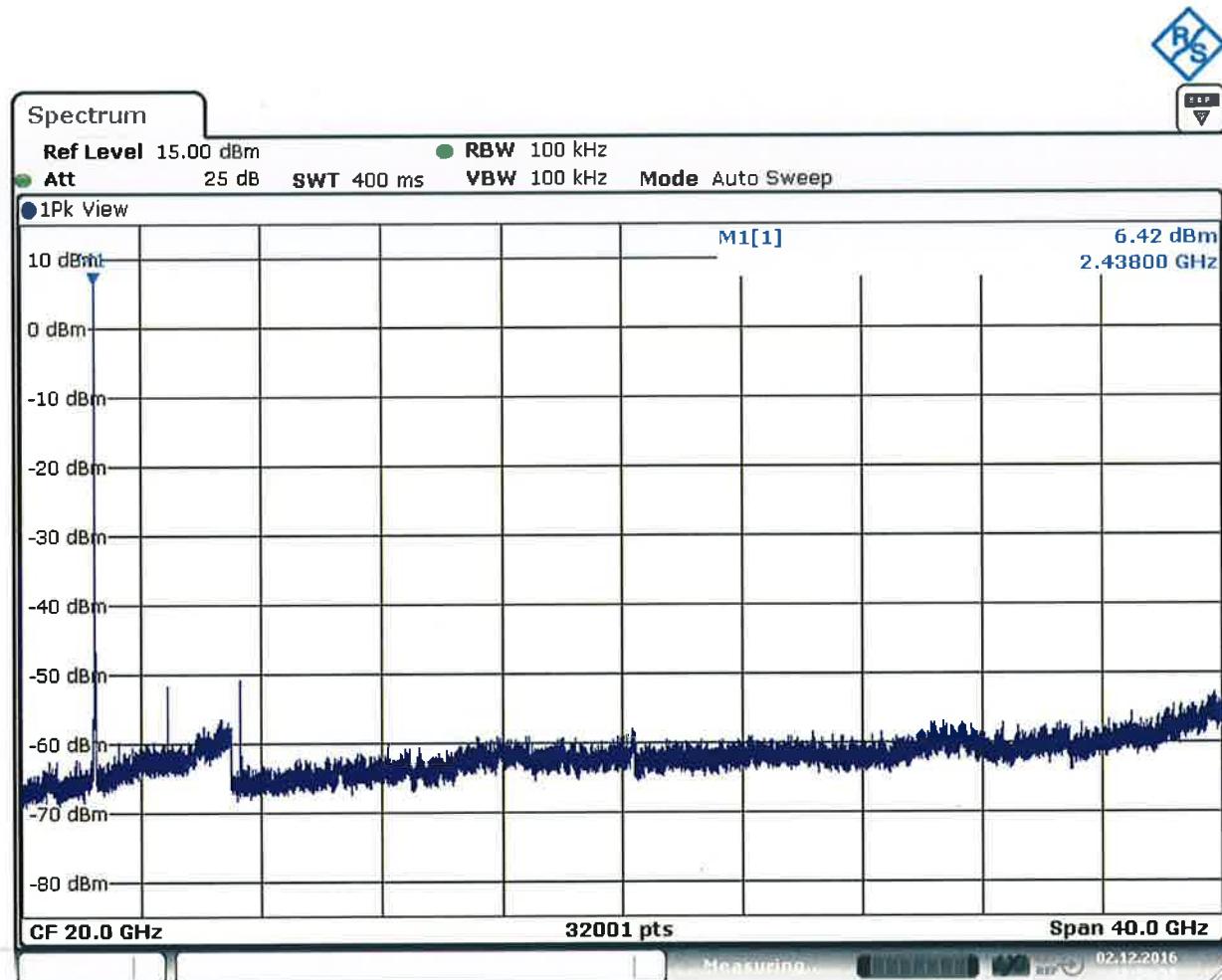
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 6: 2437 MHz – DSSS



Date: 2.DEC.2016 12:59:58

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

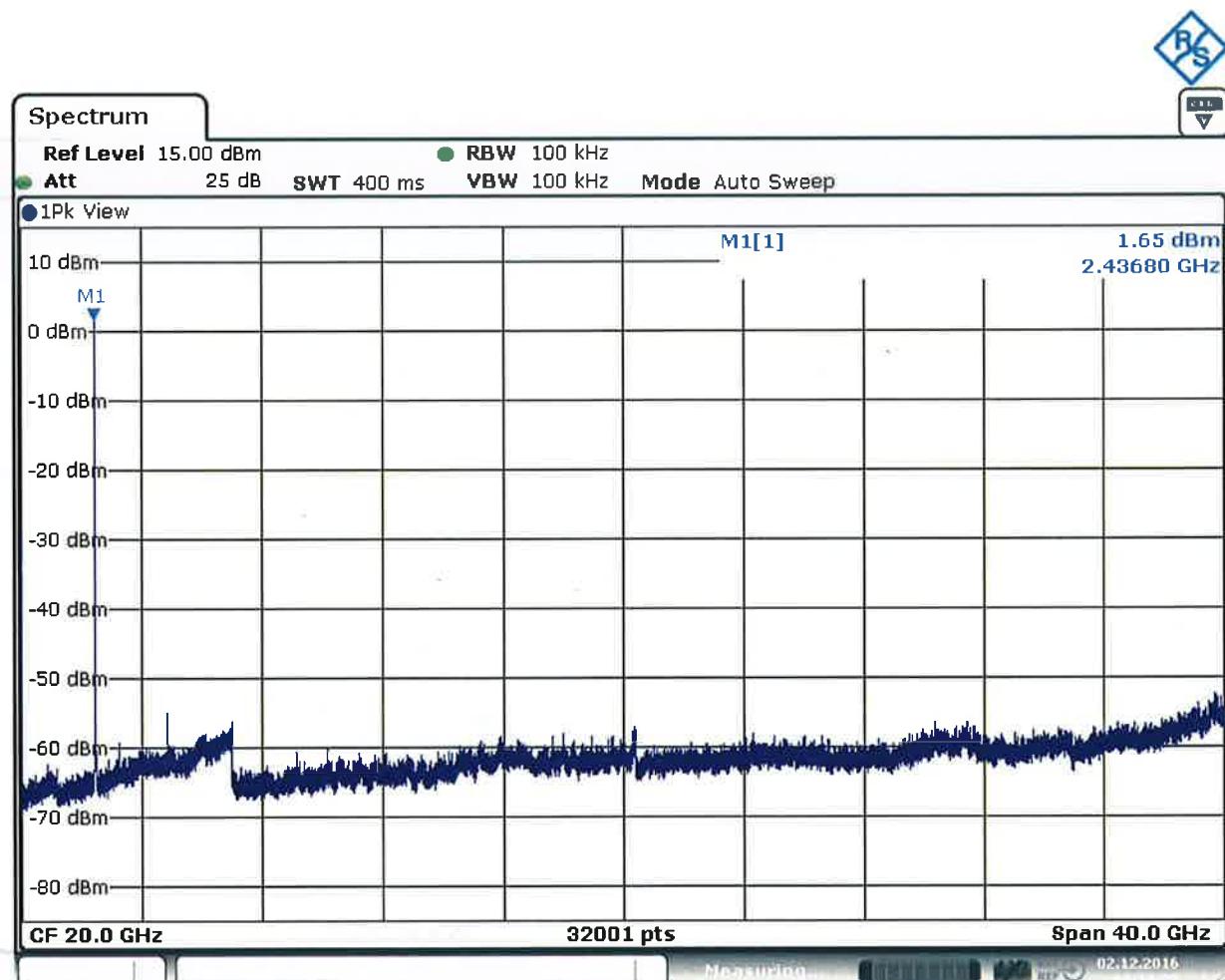
At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions** § 15.247(d)
5.5

Conducted Measurement – Antenna 1

Setup: CH 6: 2437 MHz – OFDM



Date: 2.DEC.2016 13:14:22

LIMIT SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

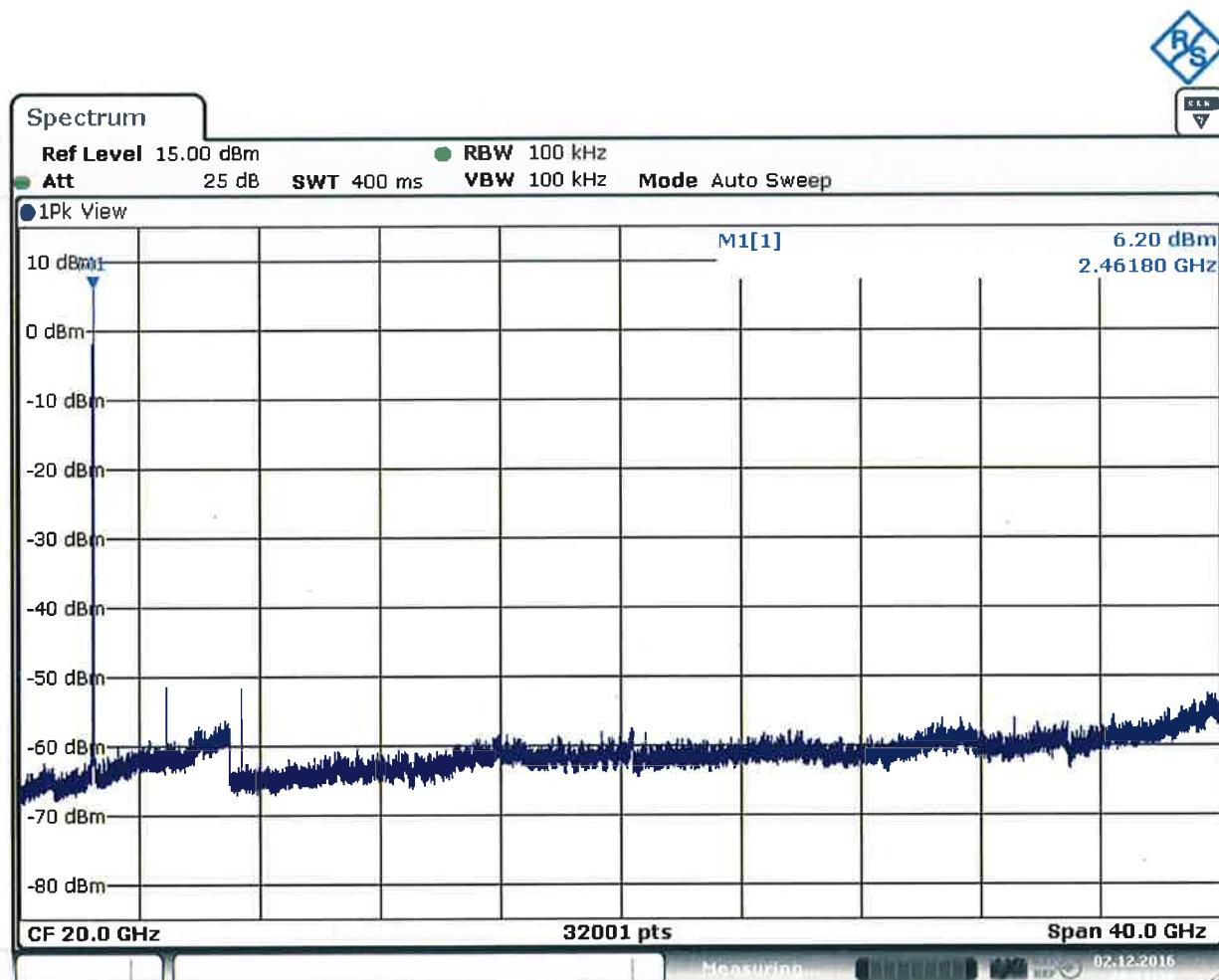
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 11: 2462 MHz – DSSS



Date: 2.DEC.2016 13:11:30

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

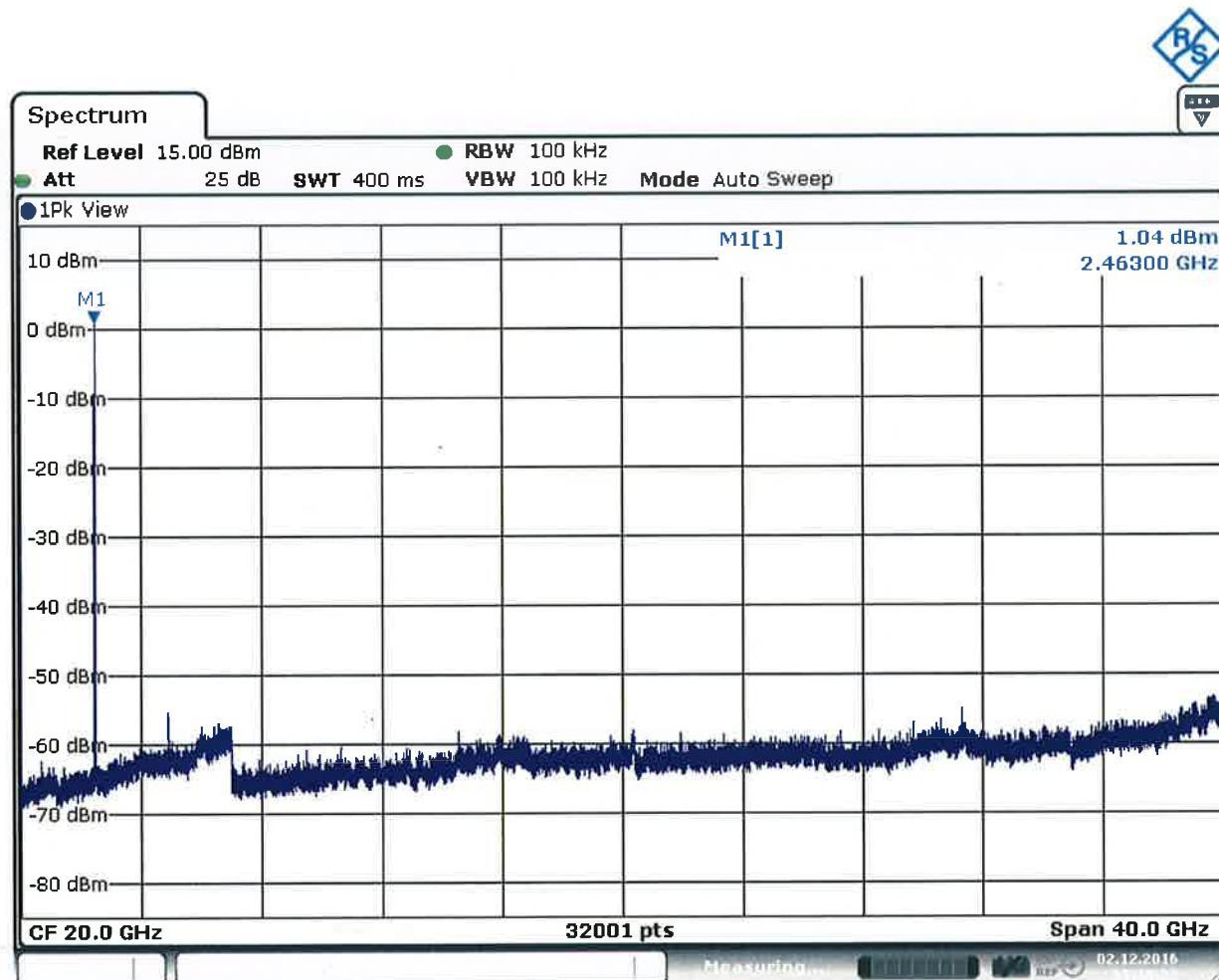
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 11: 2462 MHz – OFDM



Date: 2.DEC.2016 13:15:22

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

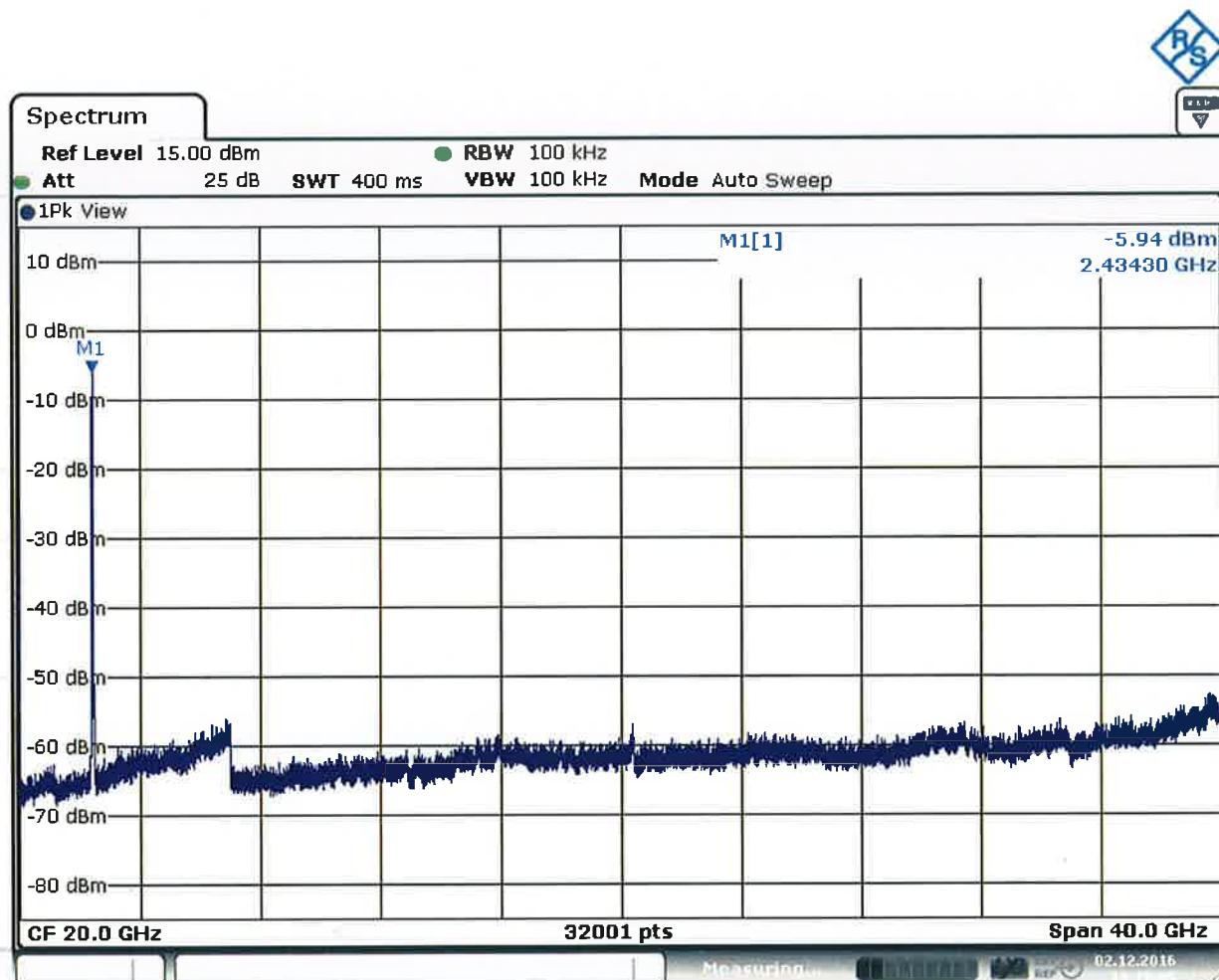
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 1 + 5: 2422 MHz



Date: 2.DEC.2016 13:18:06

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

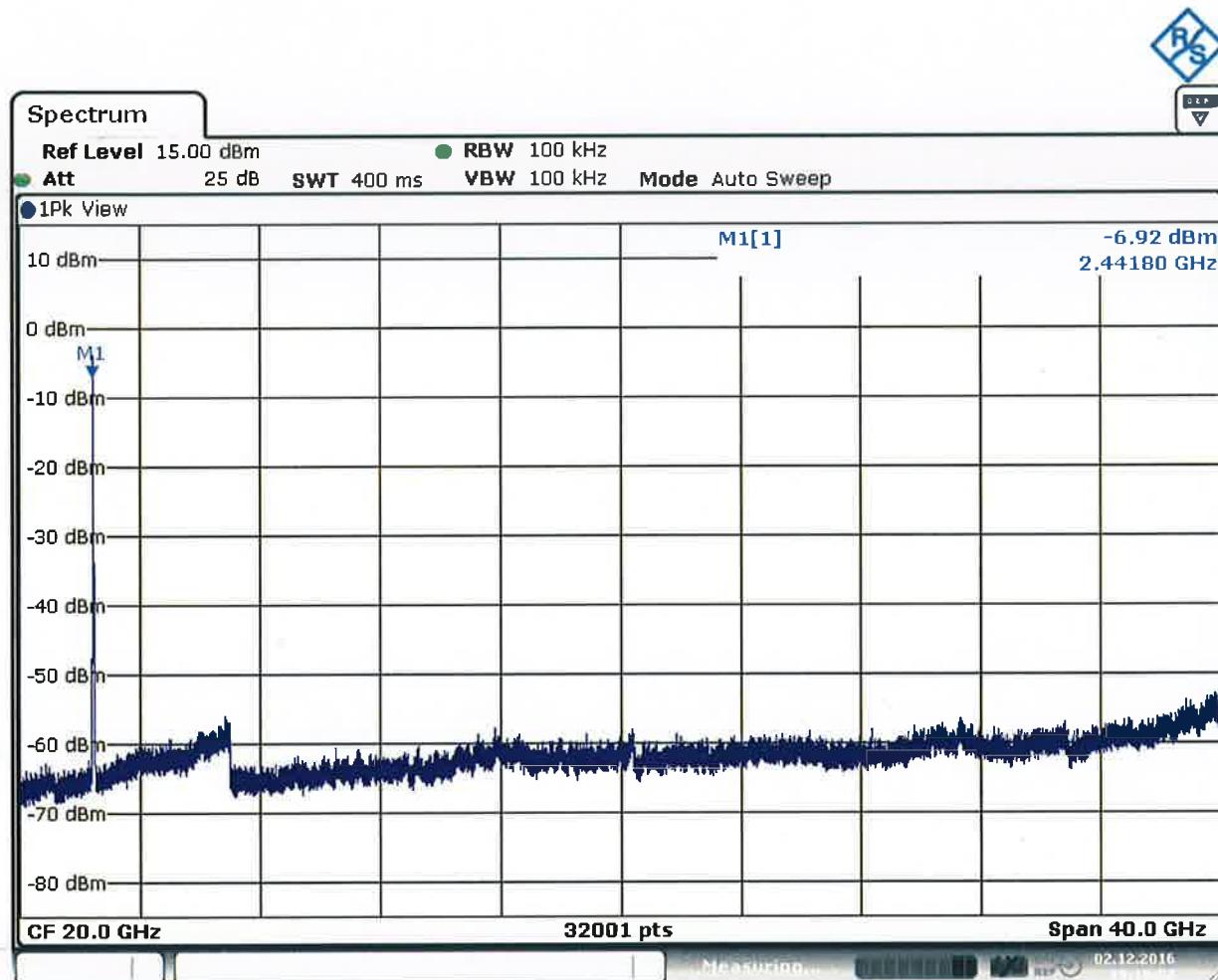
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 4 + 8: 2437 MHz



Date: 2.DEC.2016 13:19:52

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

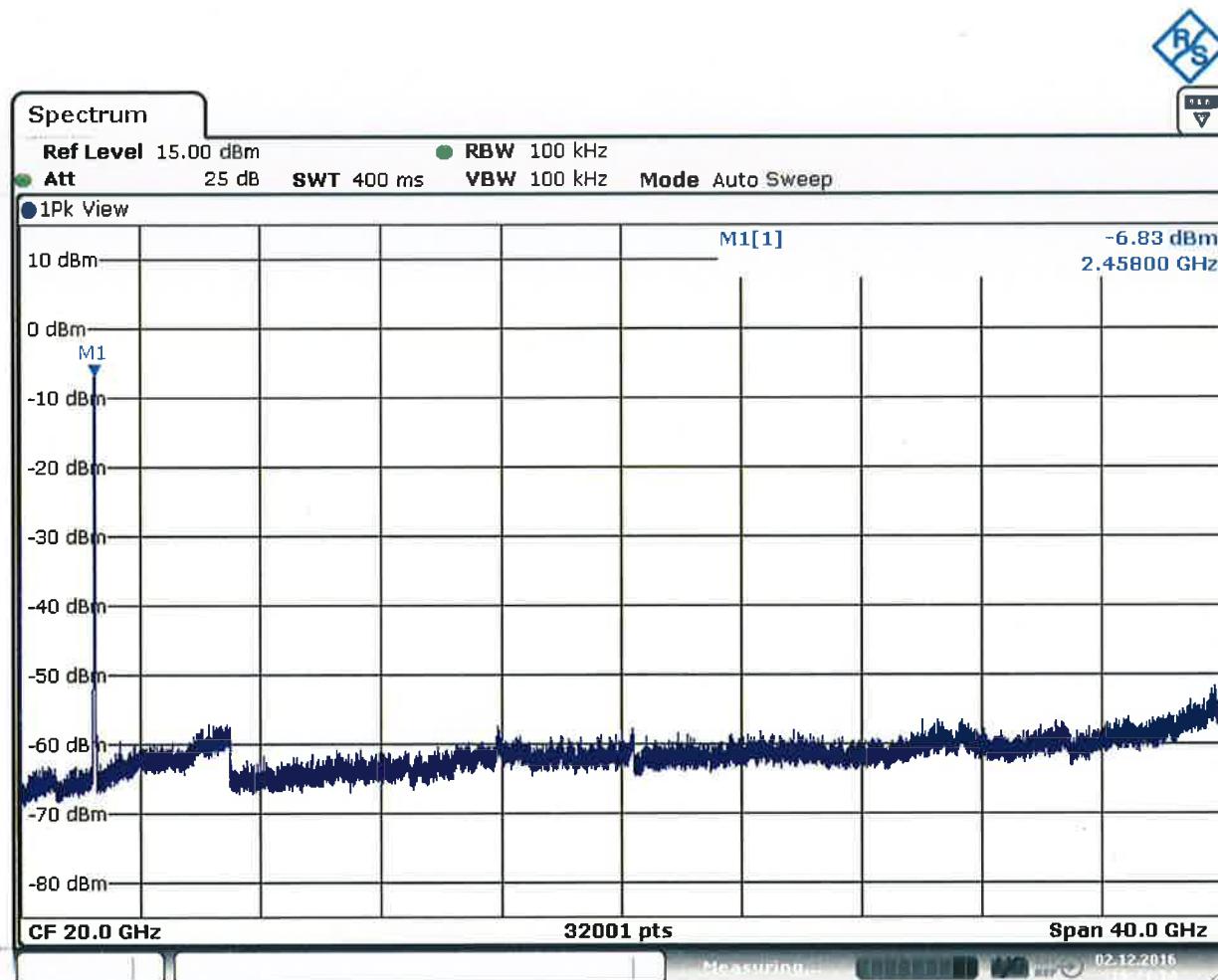
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 1

Setup: CH 7 + 11: 2452 MHz



Date: 2.DEC.2016 13:21:14

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

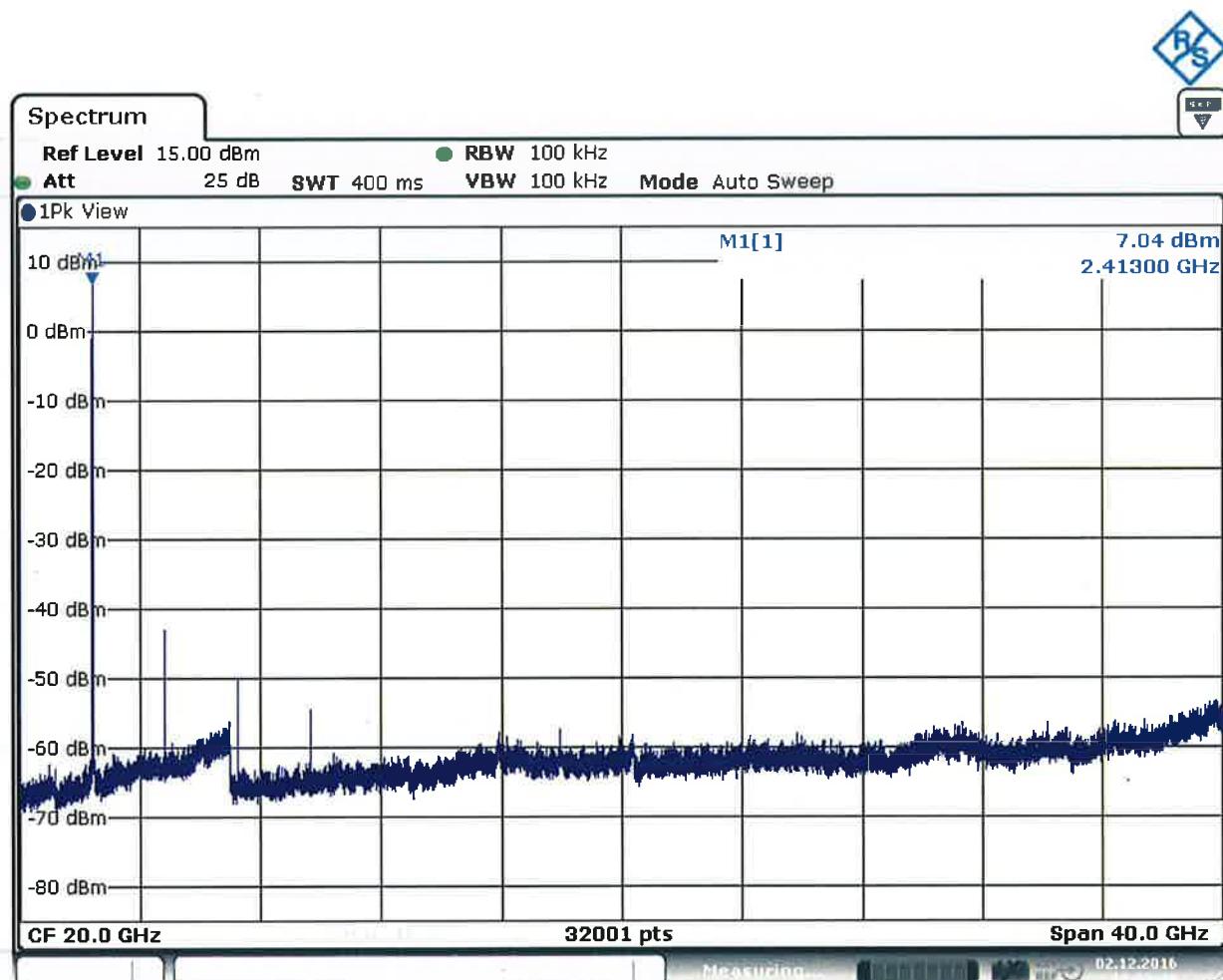
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 1: 2412 MHz – DSSS



Date: 2.DEC.2016 13:22:49

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

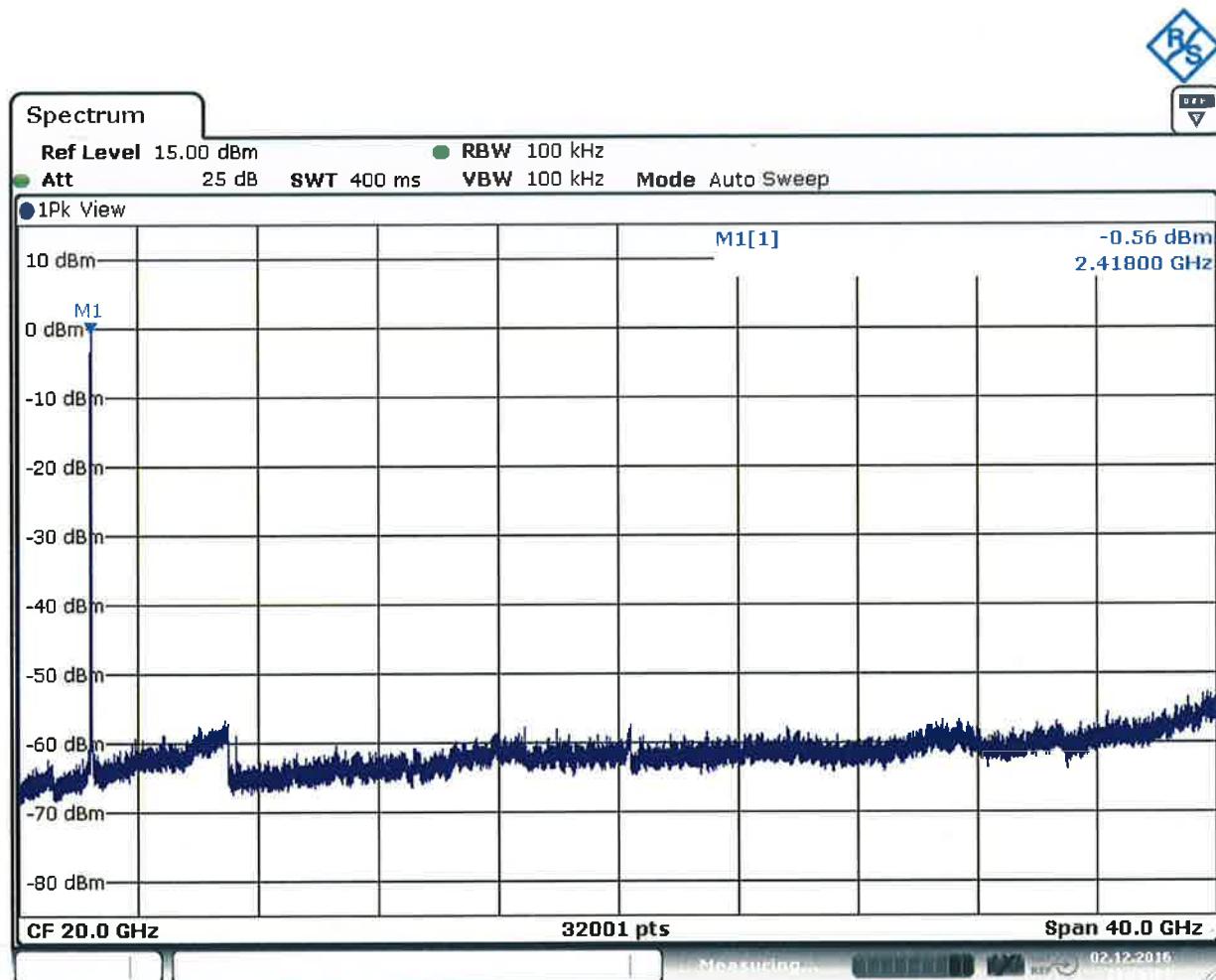
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 1: 2412 MHz – OFDM



Date: 2.DEC.2016 13:26:12

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

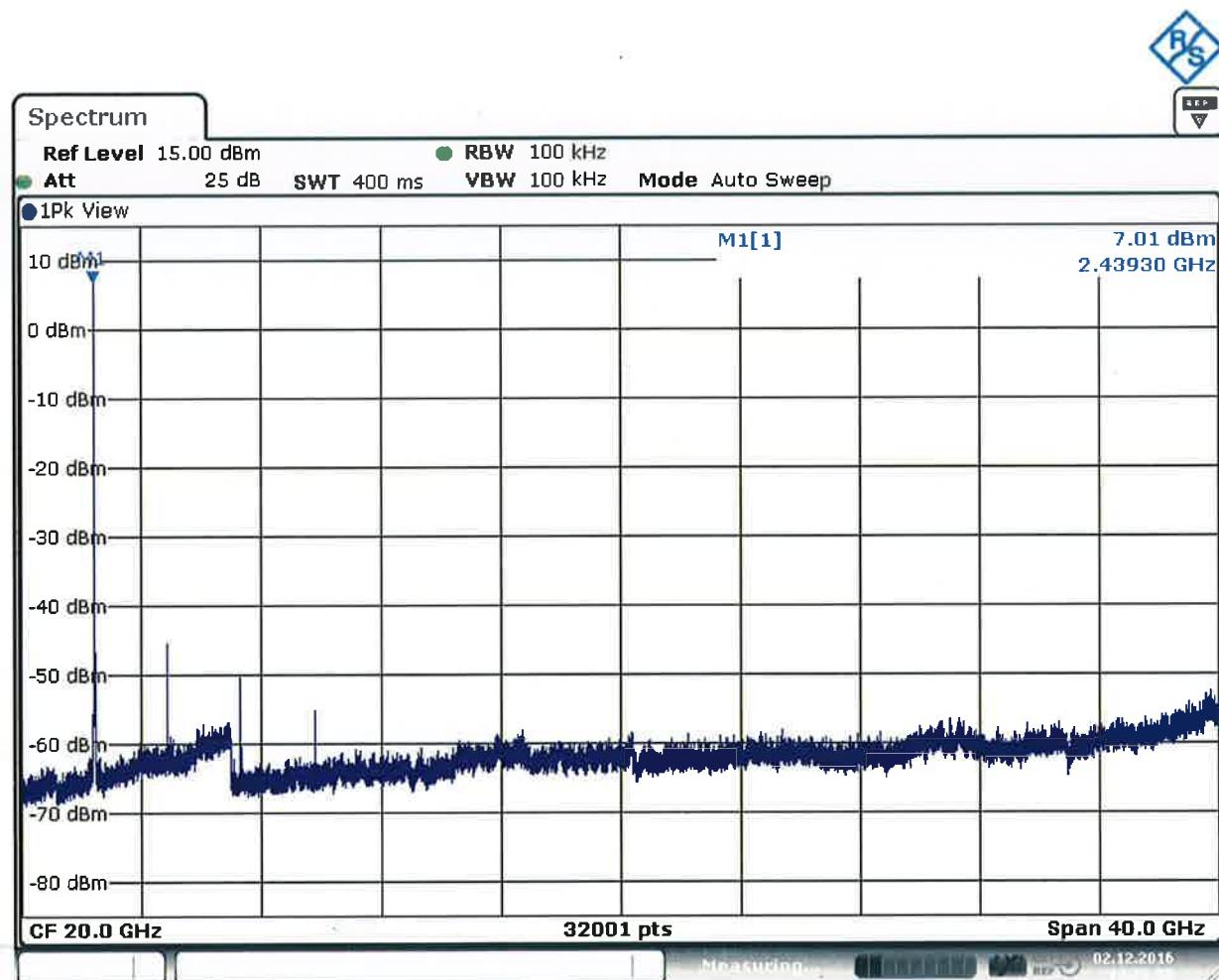
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 6: 2437 MHz – DSSS



Date: 2.DEC.2016 13:23:56

LIMIT

SUBCLAUSE 15.247(d) – 5.5

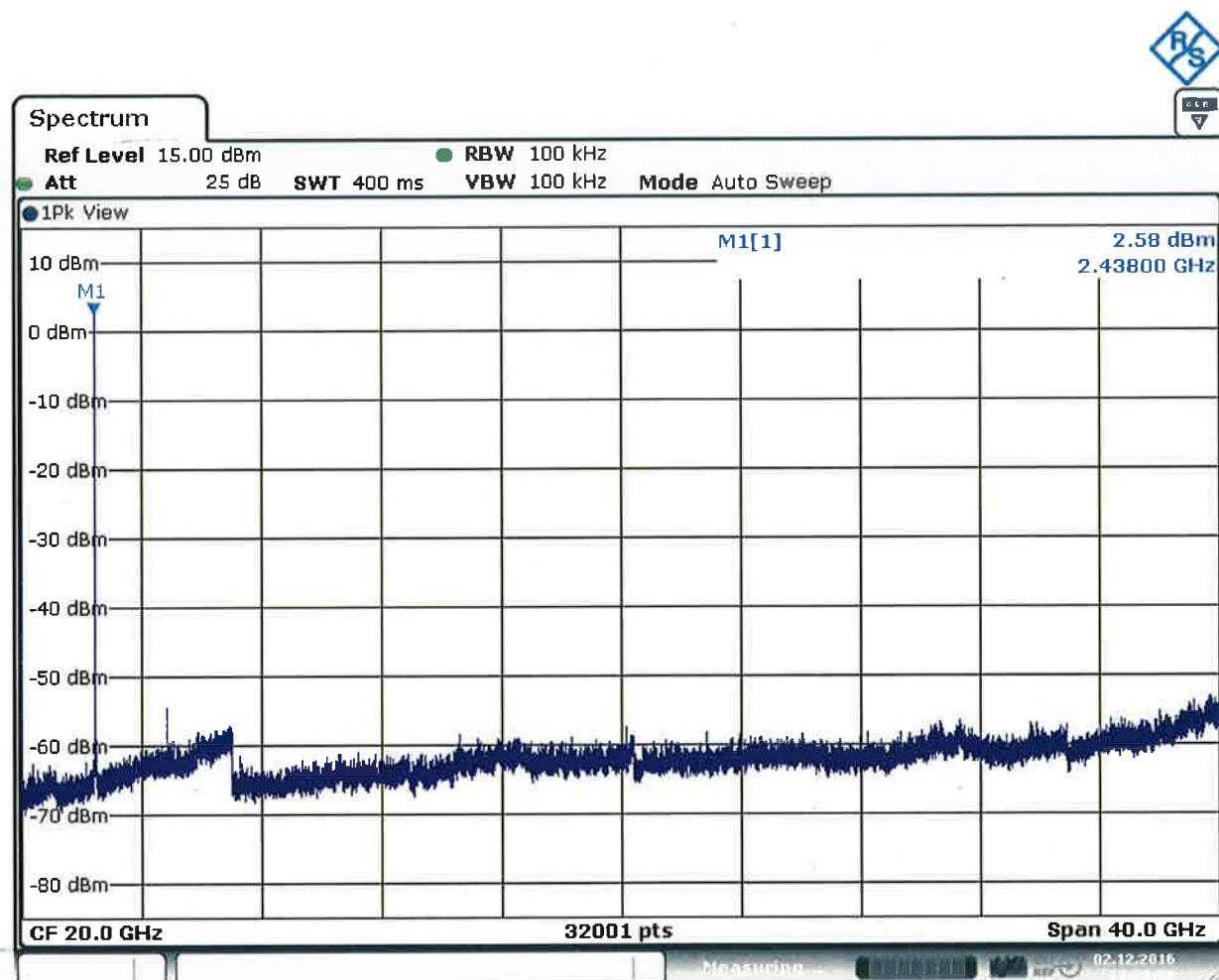
In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions** § 15.247(d)
5.5

Conducted Measurement – Antenna 2

Setup: CH 6: 2437 MHz – OFDM



Date: 2.DEC.2016 13:26:59

LIMIT SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

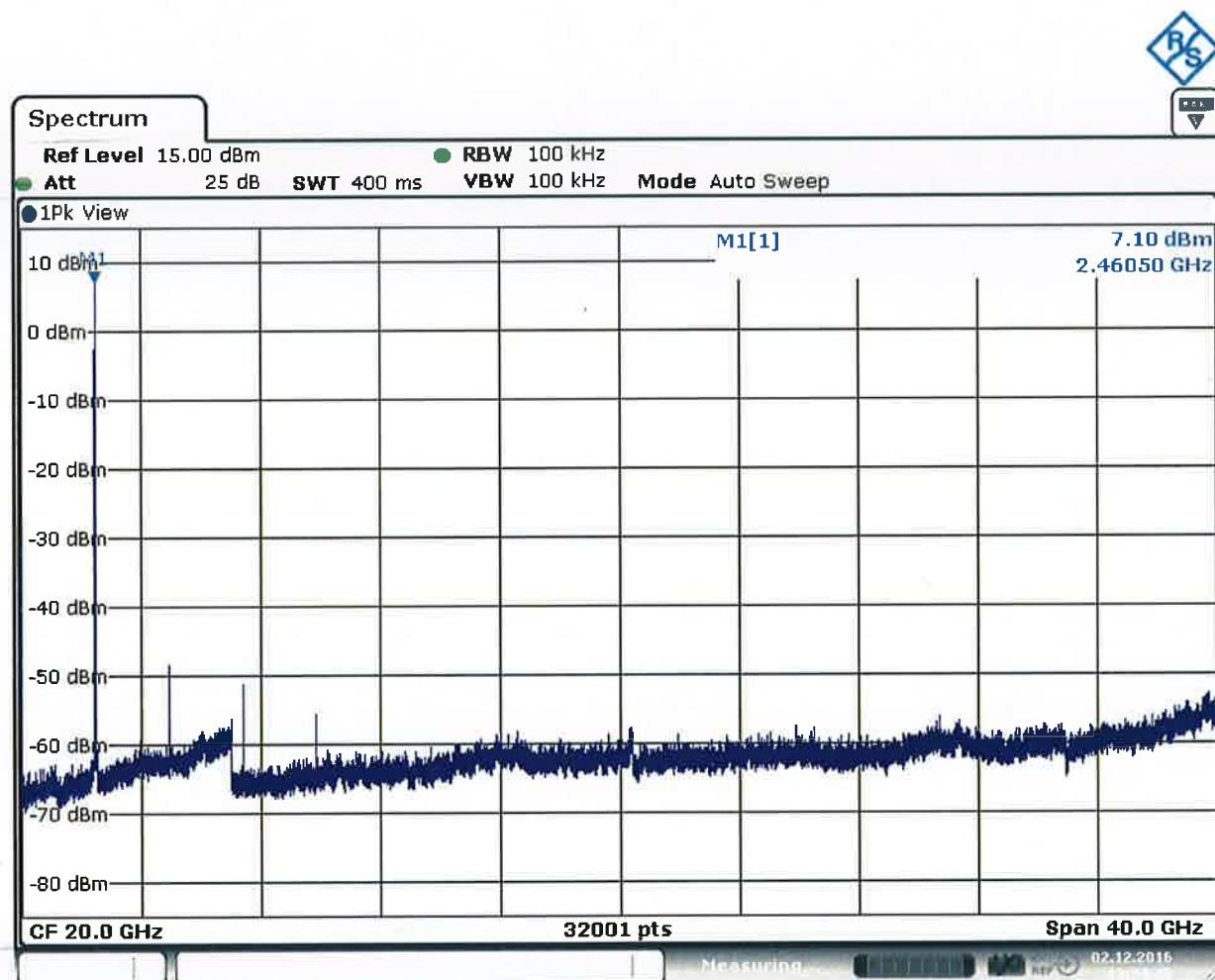
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 11: 2462 MHz – DSSS



Date: 2.DEC.2016 13:24:46

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

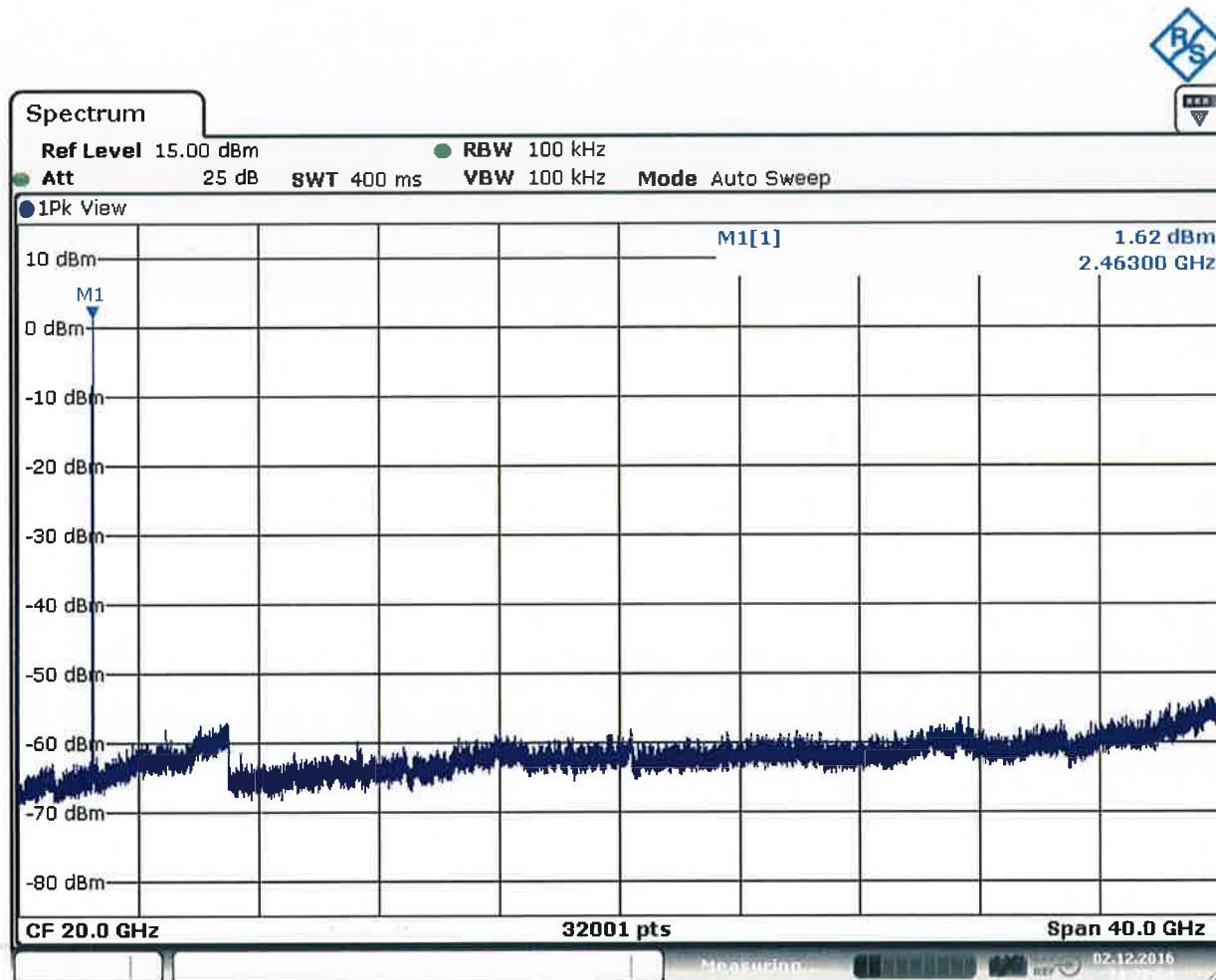
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 11: 2462 MHz – OFDM



Date: 2.DEC.2016 13:27:55

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

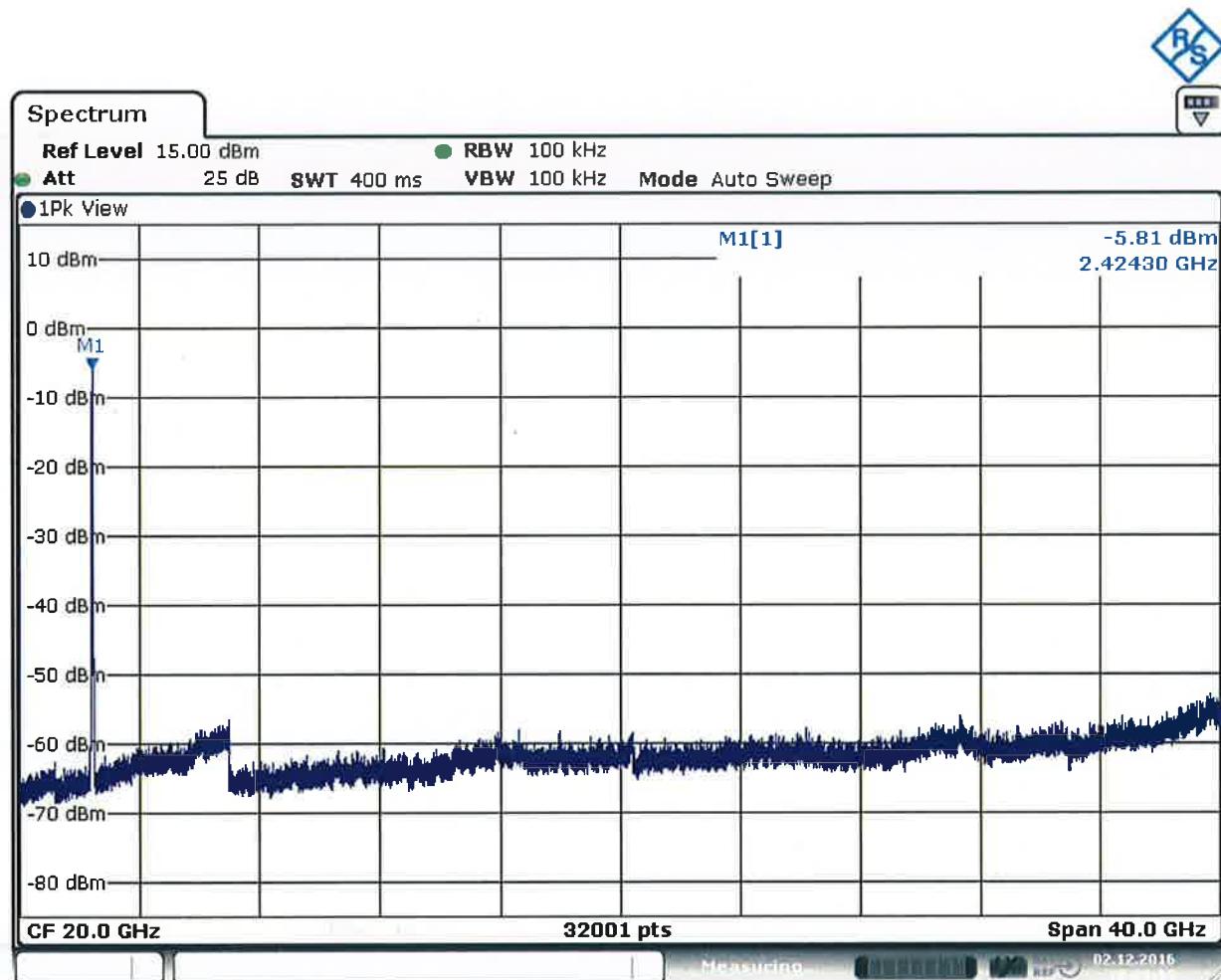
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 1 + 5: 2422 MHz



Date: 2.DEC.2016 13:29:15

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

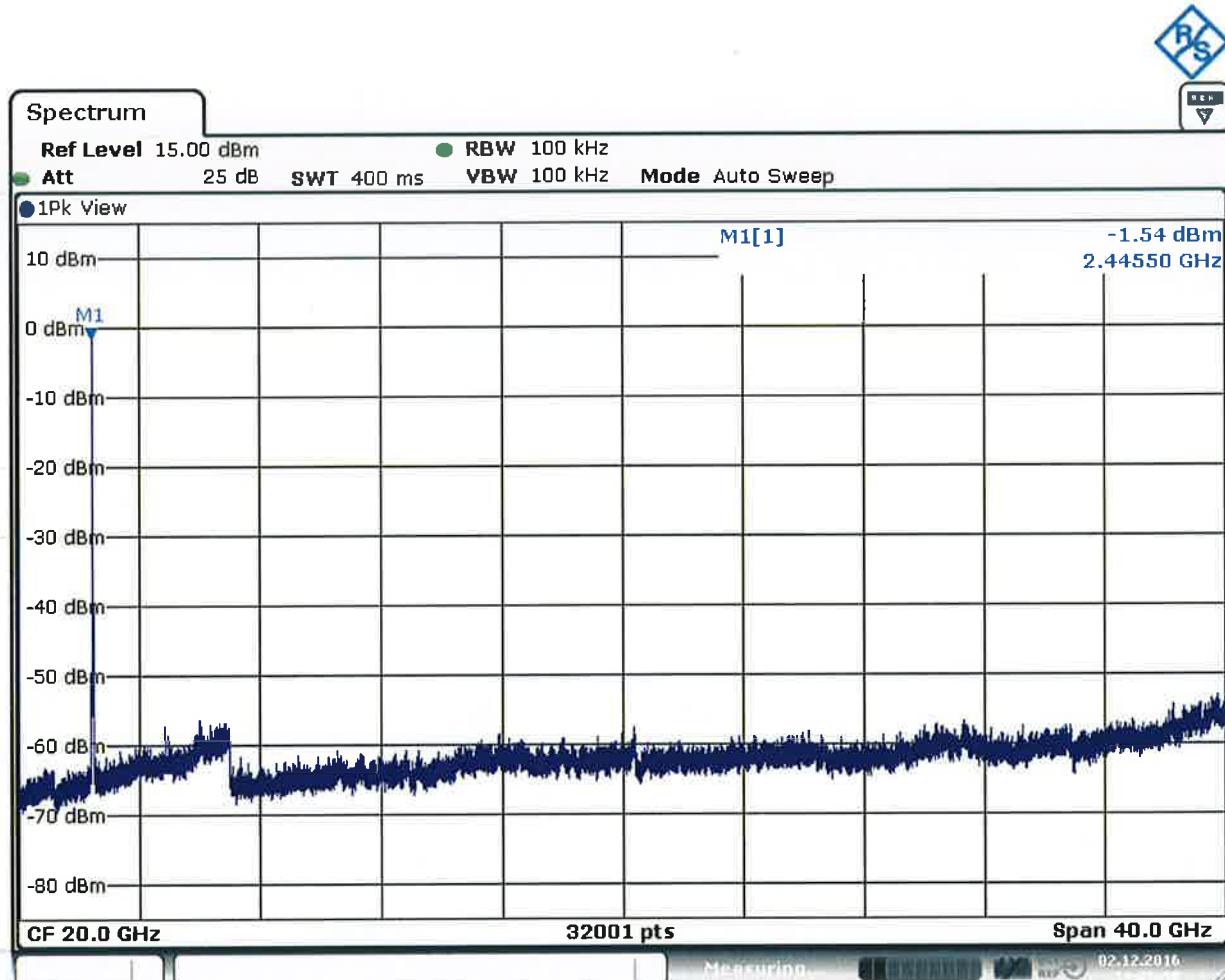
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 4 + 8: 2437 MHz



Date: 2.DEC.2016 13:30:00

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.

At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

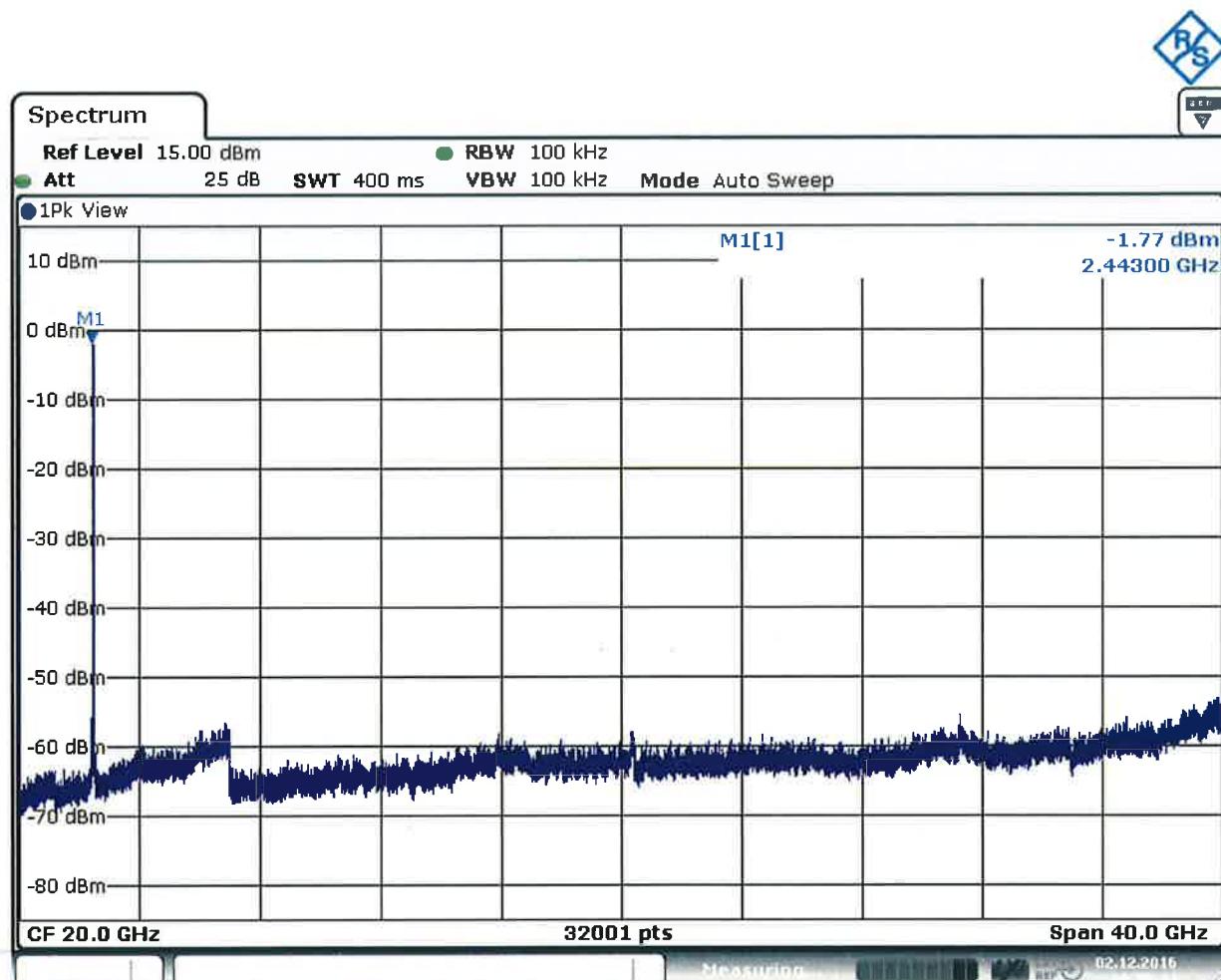
Test Equipment used: EMV-205

**Out-of-band Emission
Unwanted Emissions**

**§ 15.247(d)
5.5**

Conducted Measurement – Antenna 2

Setup: CH 7 + 11: 2452 MHz



Date: 2.DEC.2016 13:30:45

LIMIT

SUBCLAUSE 15.247(d) – 5.5

In any 100 kHz bandwidth outside the frequency band in which the radio device is operating.	At least 20dB below the power in the 100 kHz bandwidth within the band that contains the highest level of the desired power.
---------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

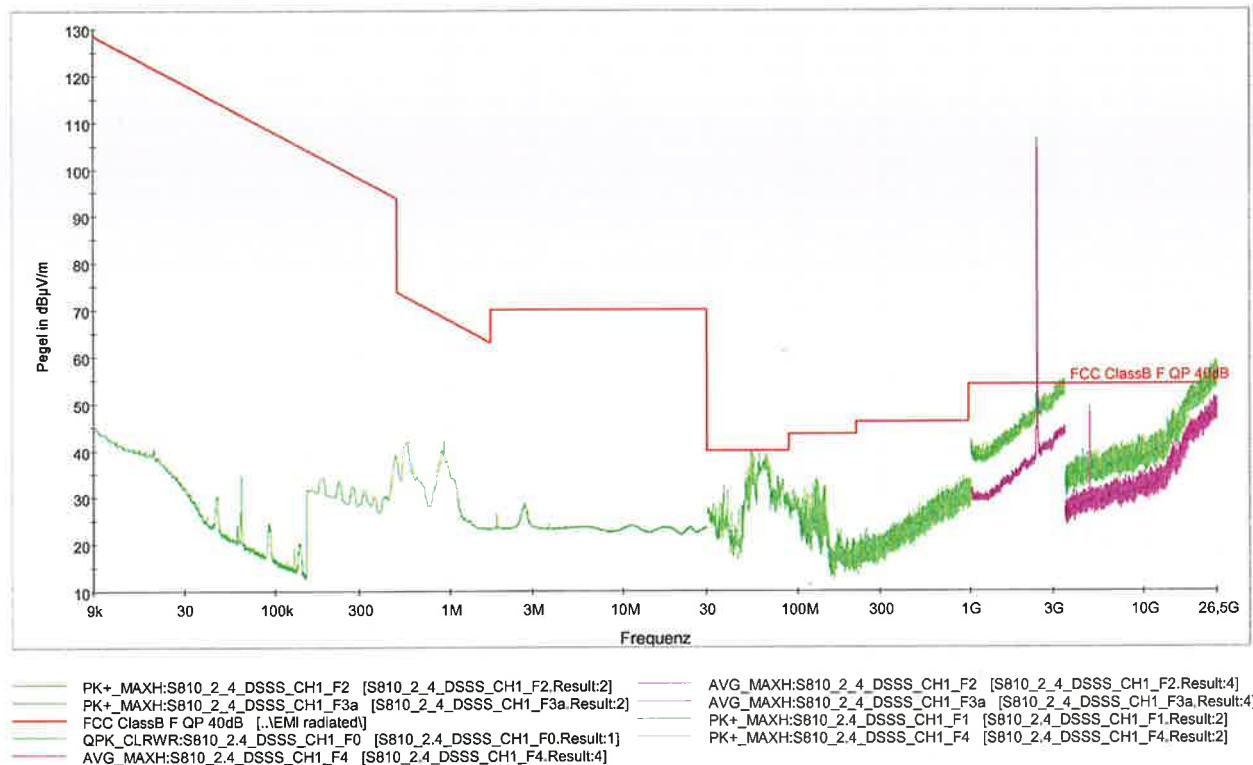
Test Equipment used: EMV-205

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 1: 2412 MHz – DSSS



Worst case emission: 48,2 dB μ V/m @ 4824 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

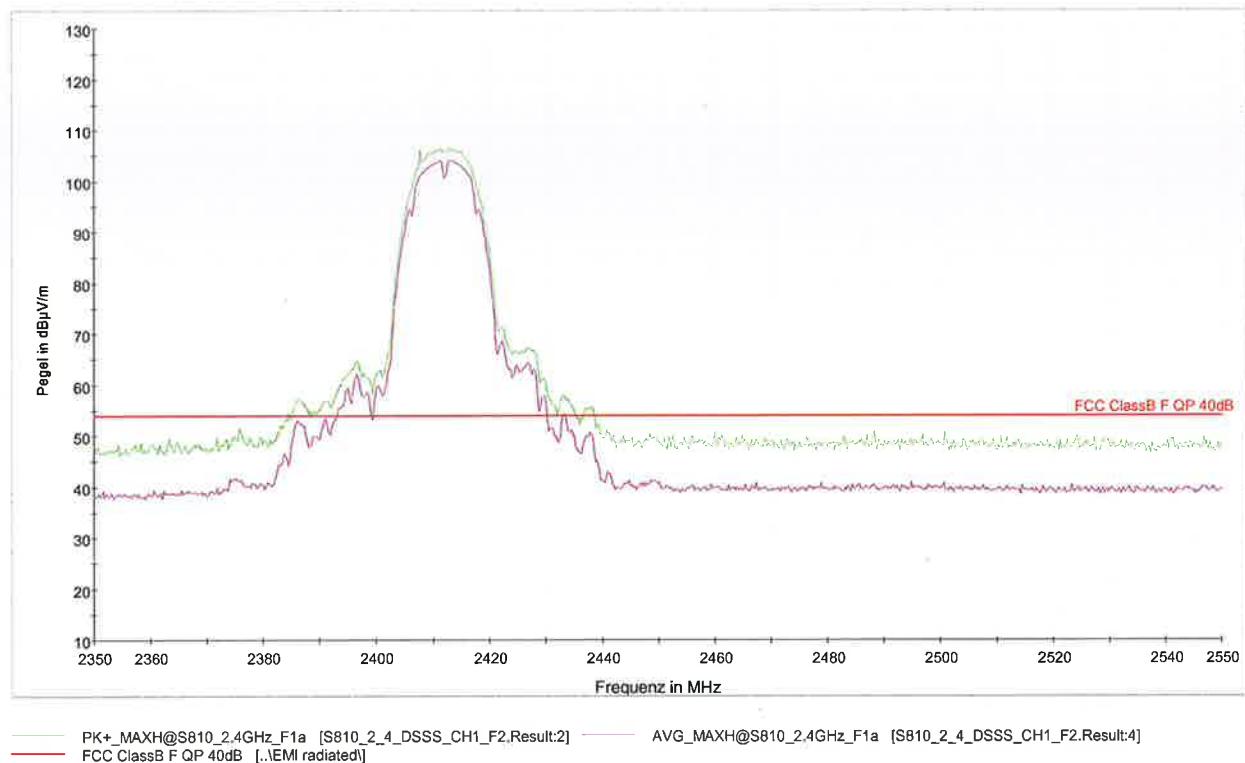
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112; EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line): Band Edge requirement

Setup: CH 1: 2412 MHz – DSSS



LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Band edges of the nearest restricted bands: 2390 MHz and 2483,5 MHz.

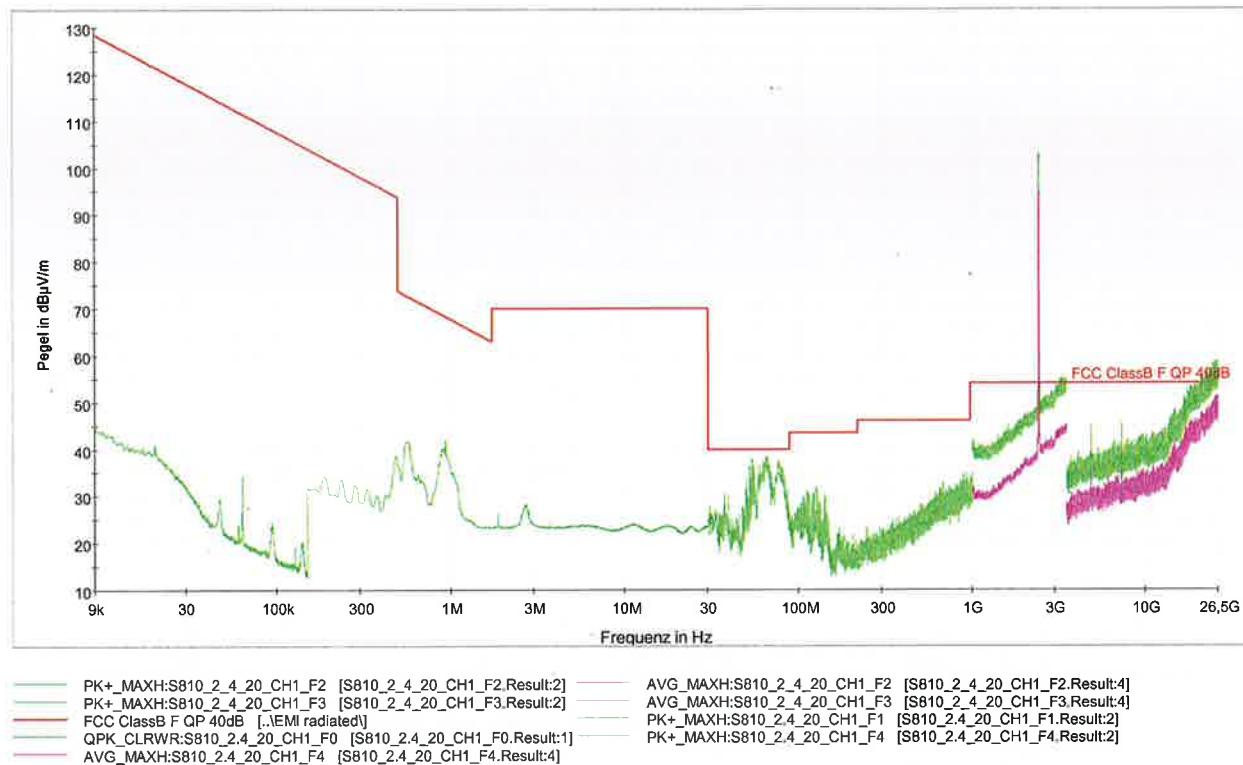
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 1: 2412 MHz – OFDM



Worst case emission: 37,8 dB μ V/m @ 64,00 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

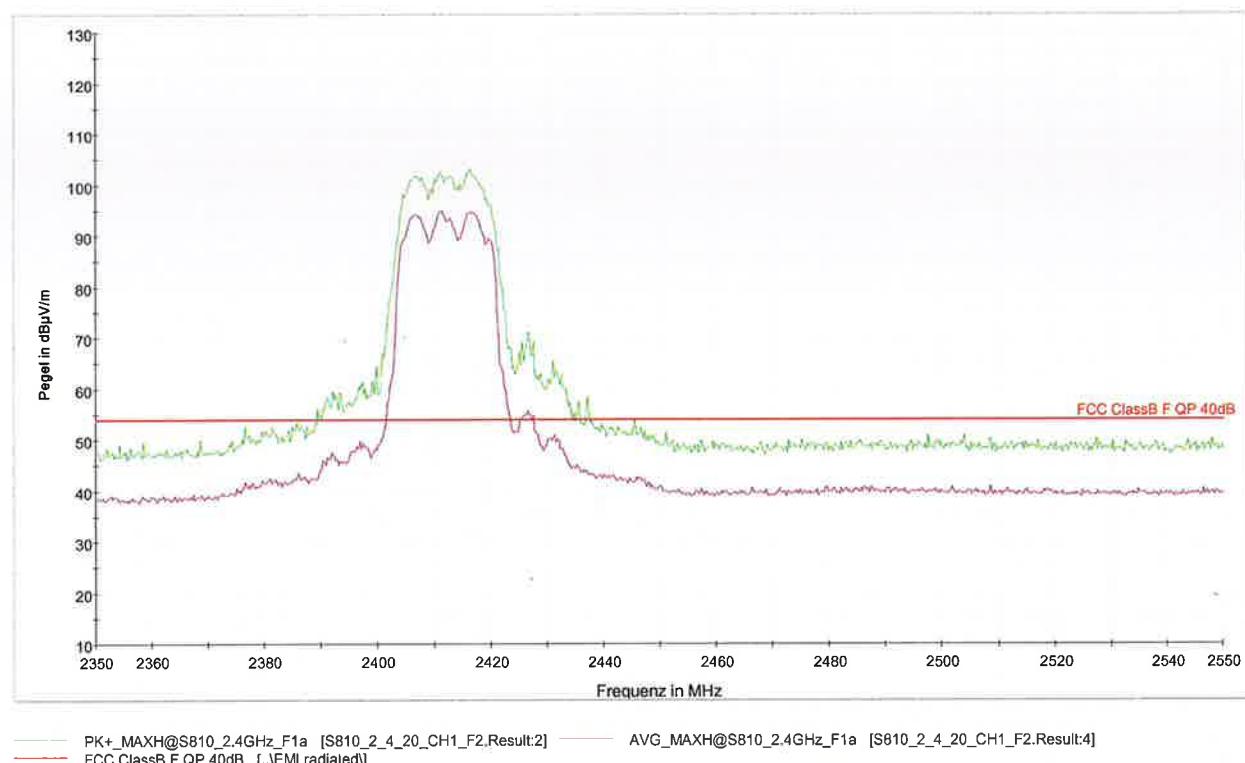
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112;
EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line): Band Edge requirement

Setup: CH 1: 2412 MHz – OFDM



LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Band edges of the nearest restricted bands: 2390 MHz and 2483,5 MHz.

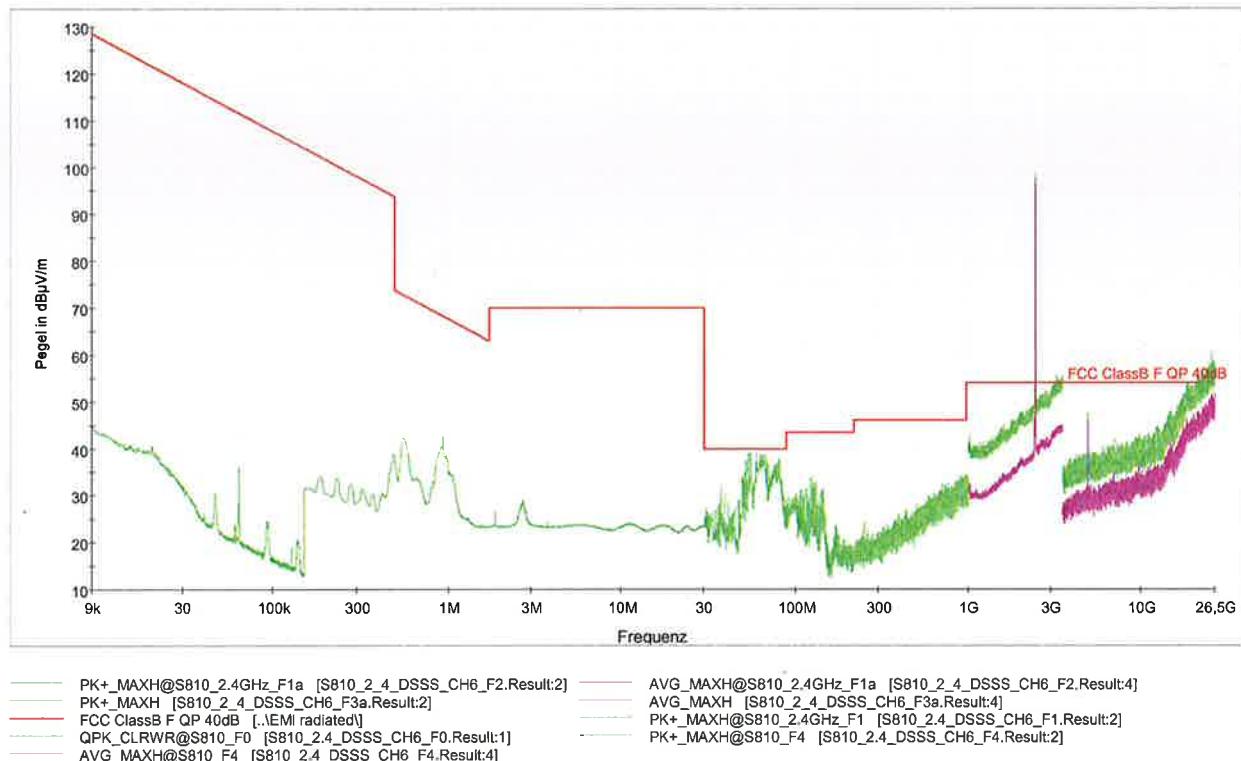
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 6: 2437 MHz – DSSS



Worst case emission: 46,1 dB μ V/m @ 4874 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

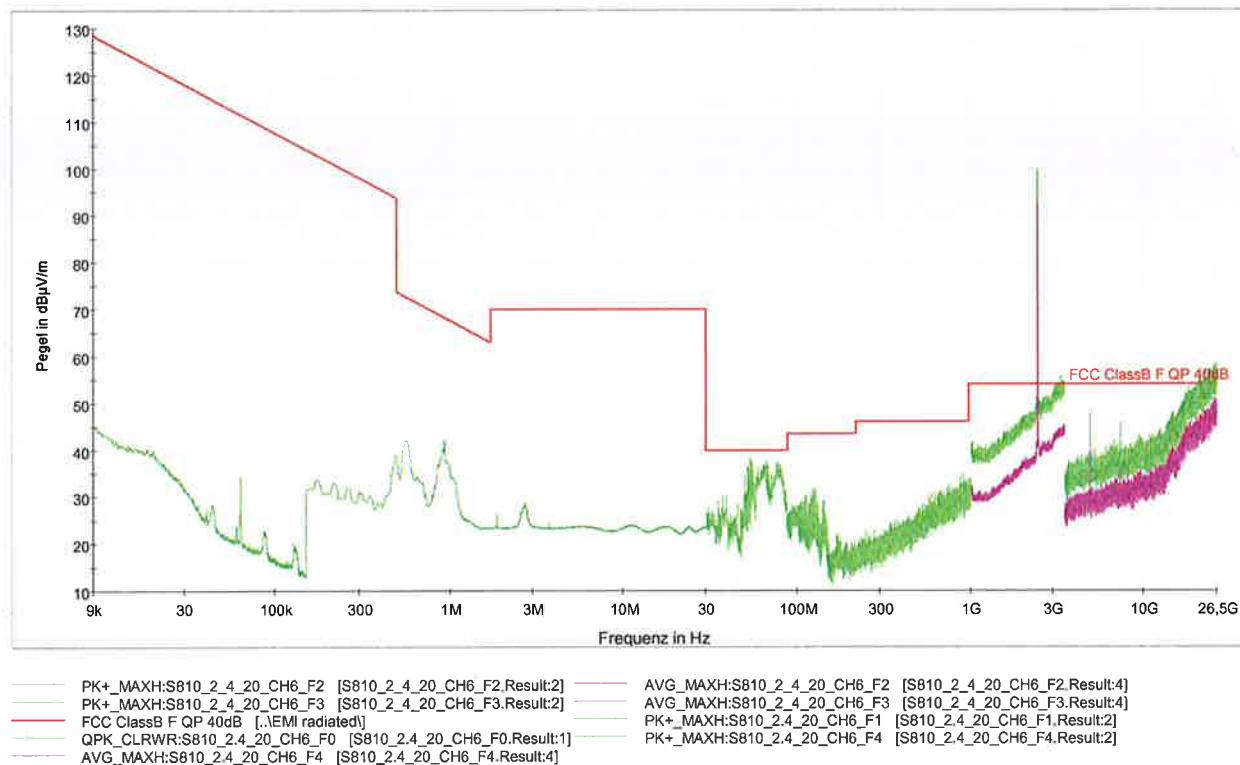
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112;
EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 6: 2437 MHz – OFDM



Worst case emission: 40,1 dB μ V/m @ 4874 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

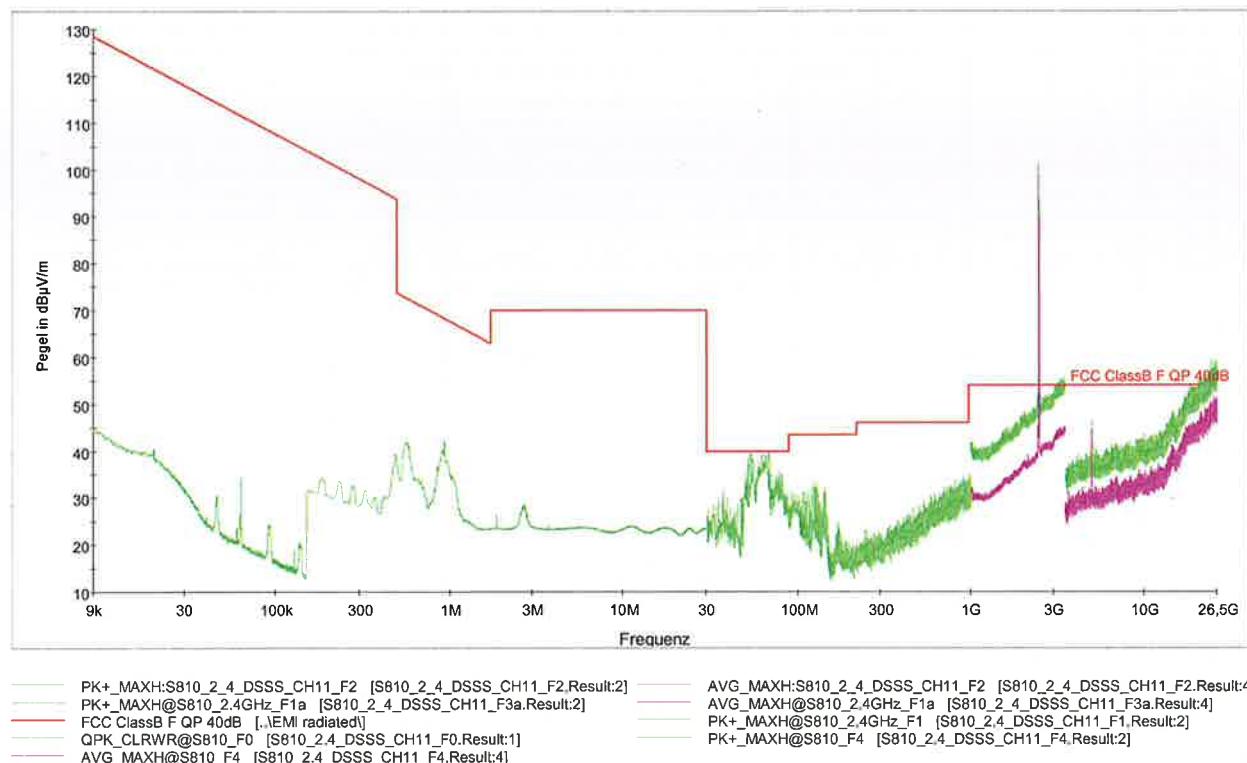
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112;
EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 11: 2462 MHz – DSSS



Worst case emission: 44,9 dB μ V/m @ 4924 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

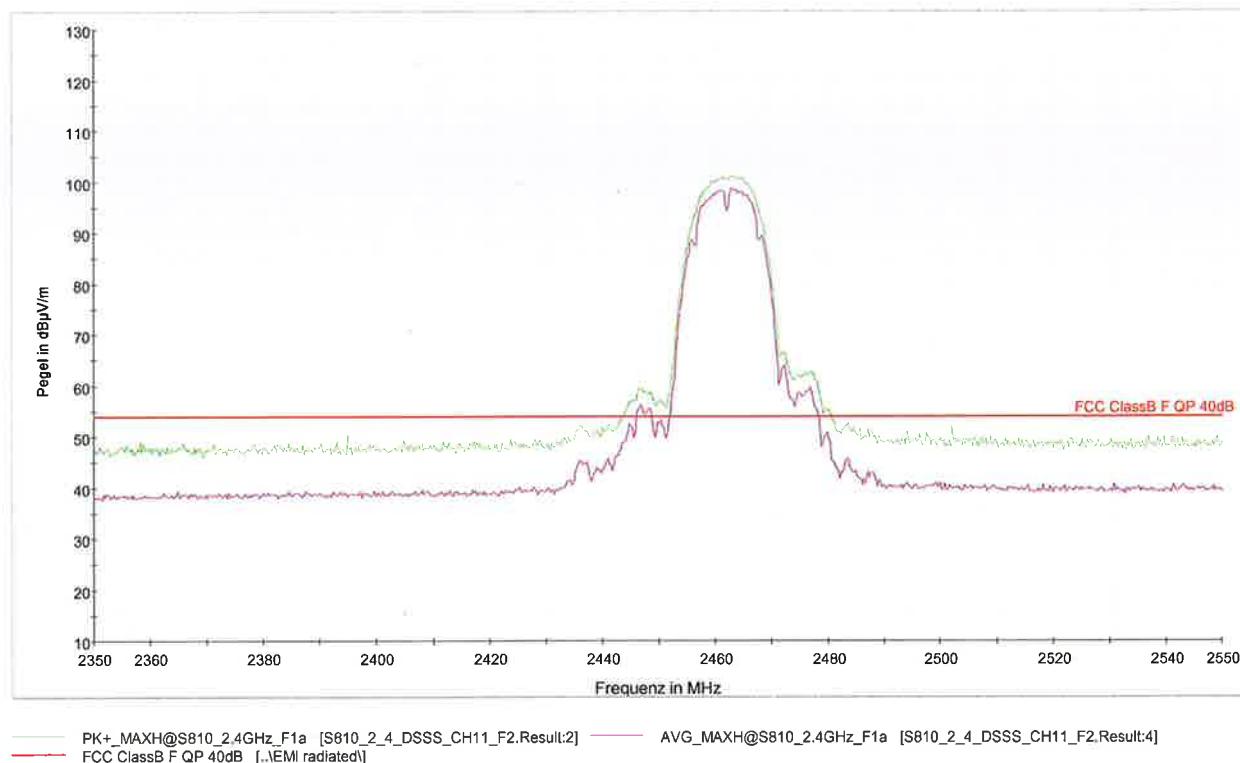
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112;
EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line): Band Edge requirement

Setup: CH 11: 2462 MHz – DSSS



LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Band edges of the nearest restricted bands: 2390 MHz and 2483,5 MHz.

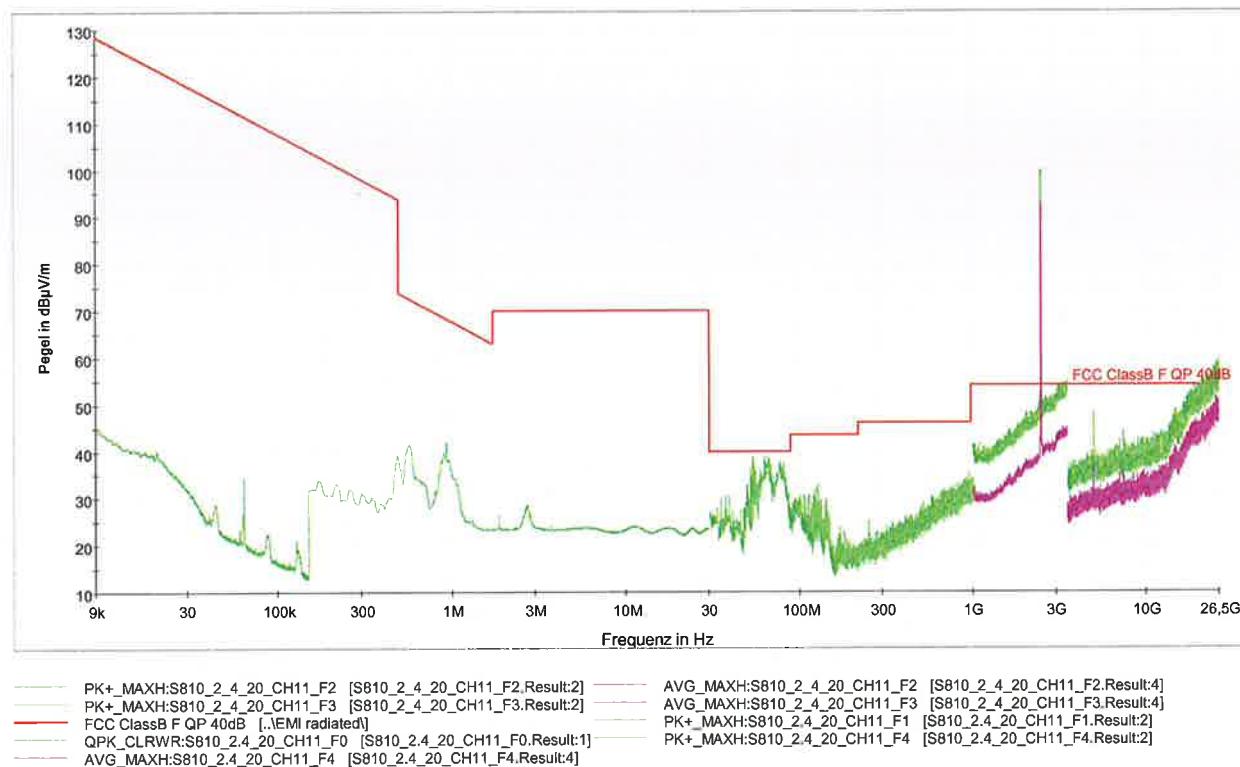
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 11: 2462 MHz – OFDM



Worst case emission: 38,0 dB μ V/m @ 64,00 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

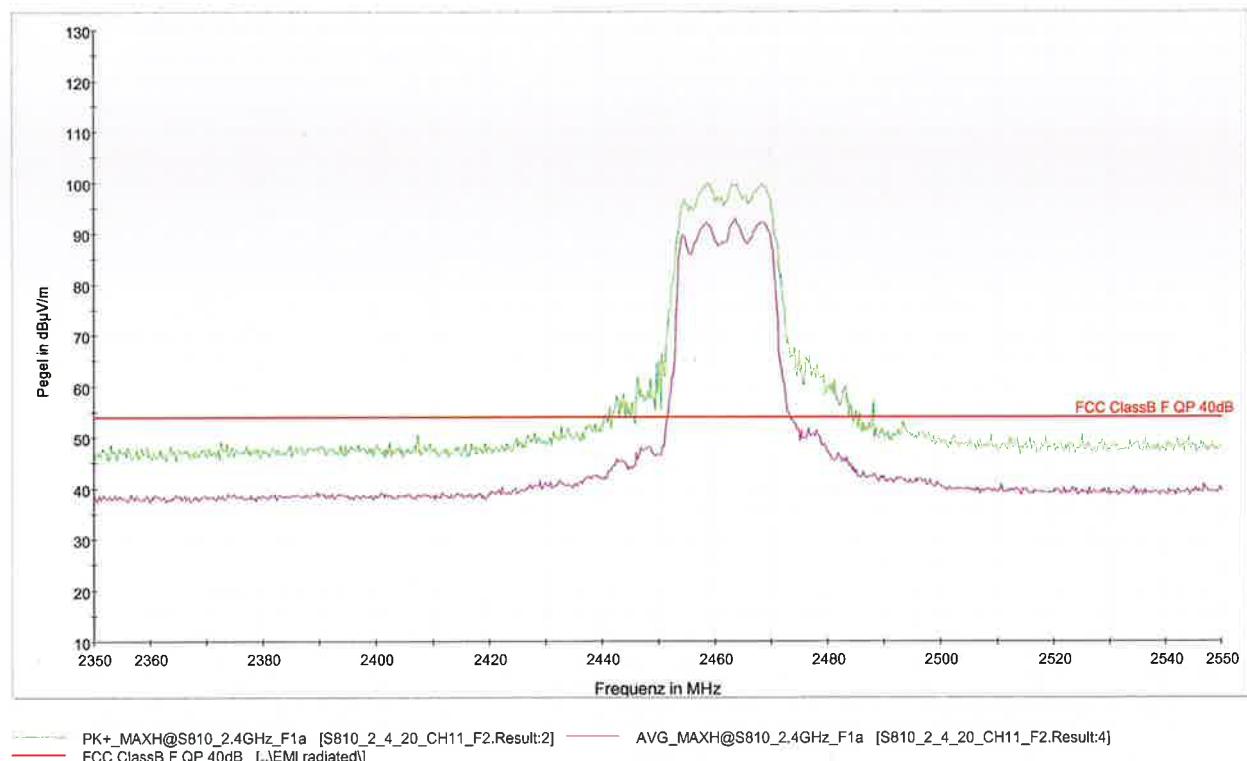
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112;
EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line): Band Edge requirement

Setup: CH 11: 2462 MHz – OFDM



LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Band edges of the nearest restricted bands: 2390 MHz and 2483,5 MHz.

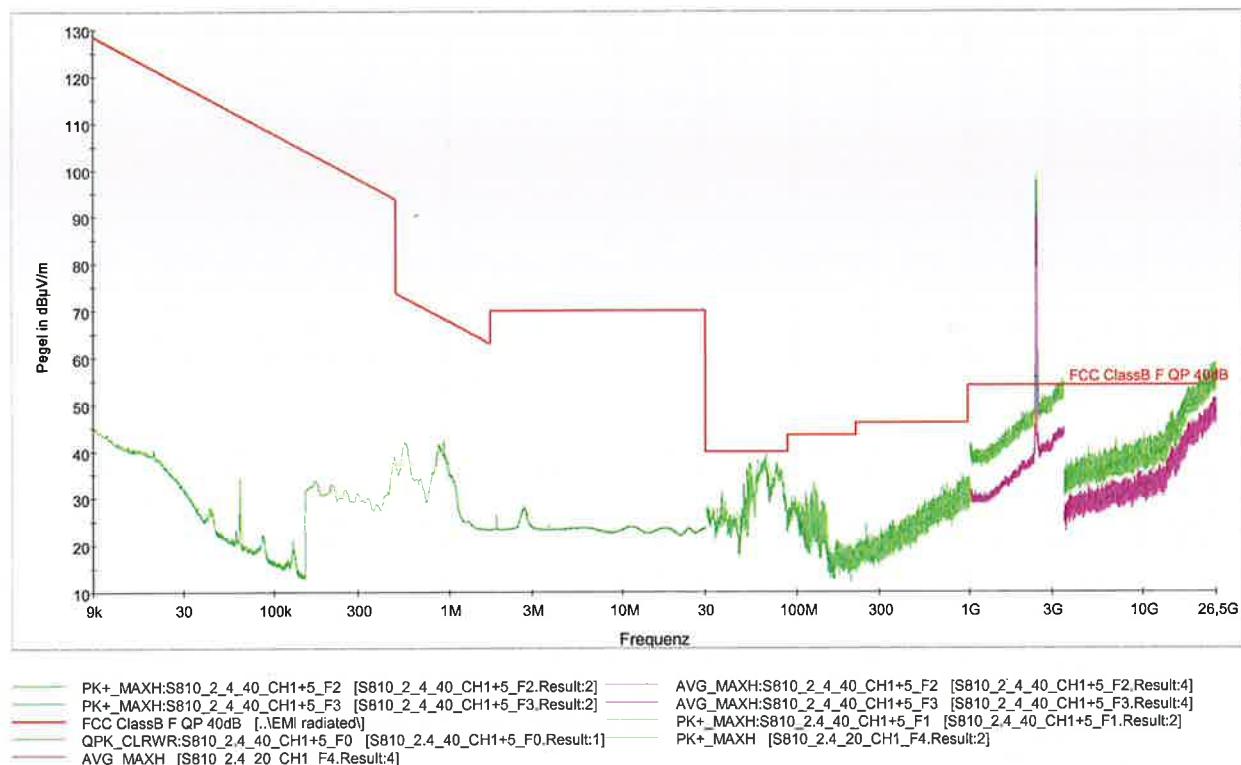
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 1 + 5: 2422 MHz



Worst case emission: 38,8 dB μ V/m @ 64,00 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

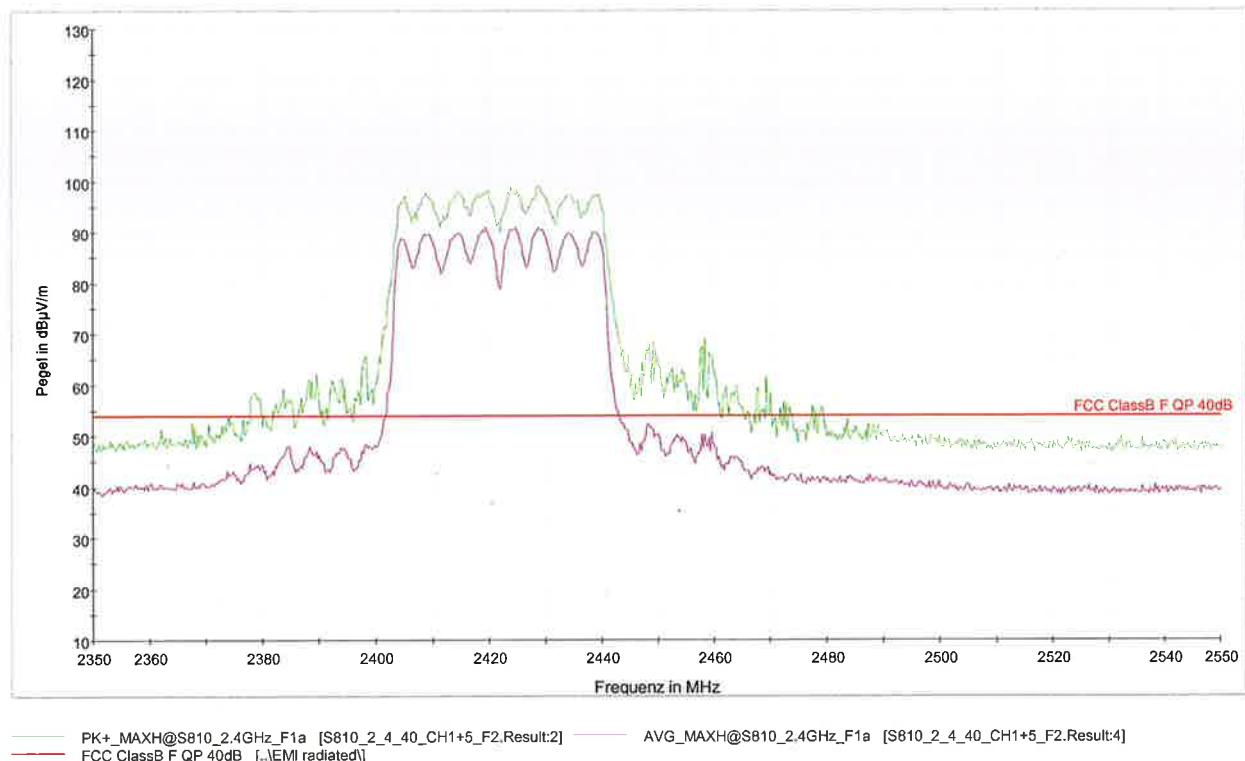
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112;
EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line): Band Edge requirement

Setup: CH 1 + 5: 2422 MHz



LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Band edges of the nearest restricted bands: 2390 MHz and 2483,5 MHz.

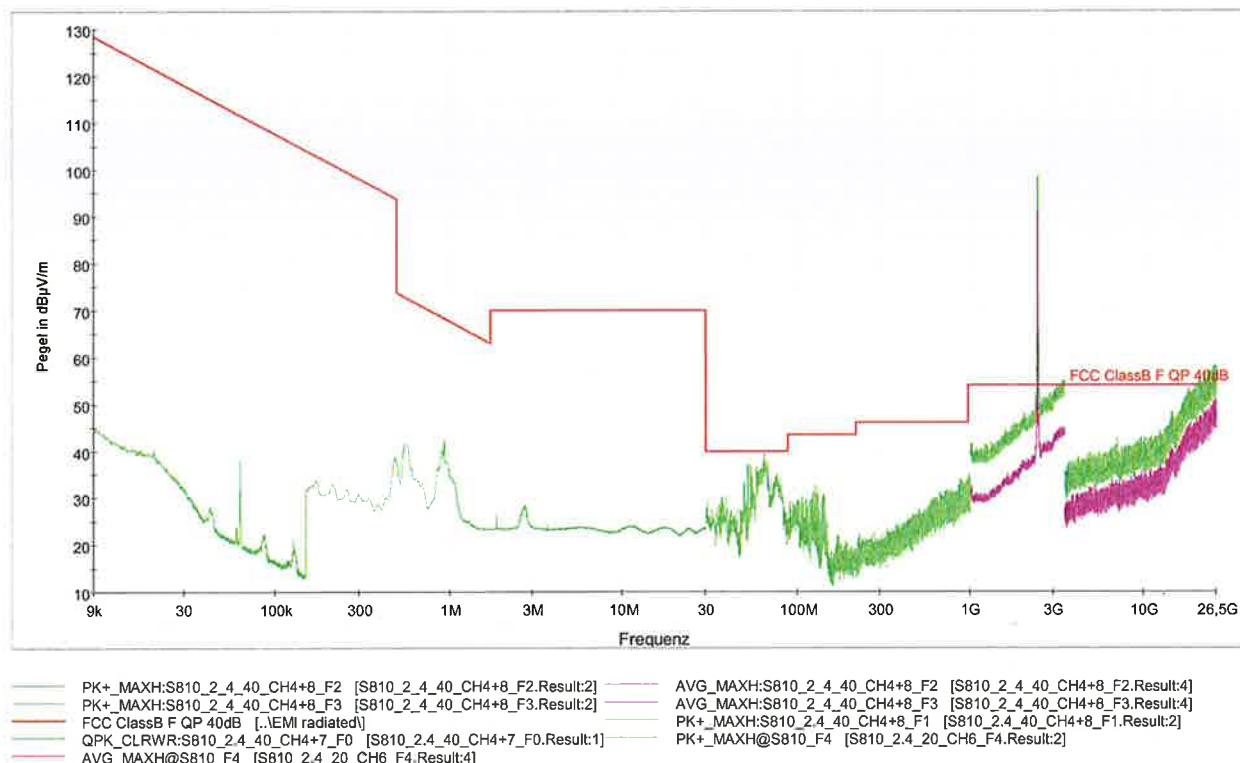
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 4 + 8: 2437 MHz



Worst case emission: 38,9 dBµV/m @ 64,00 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

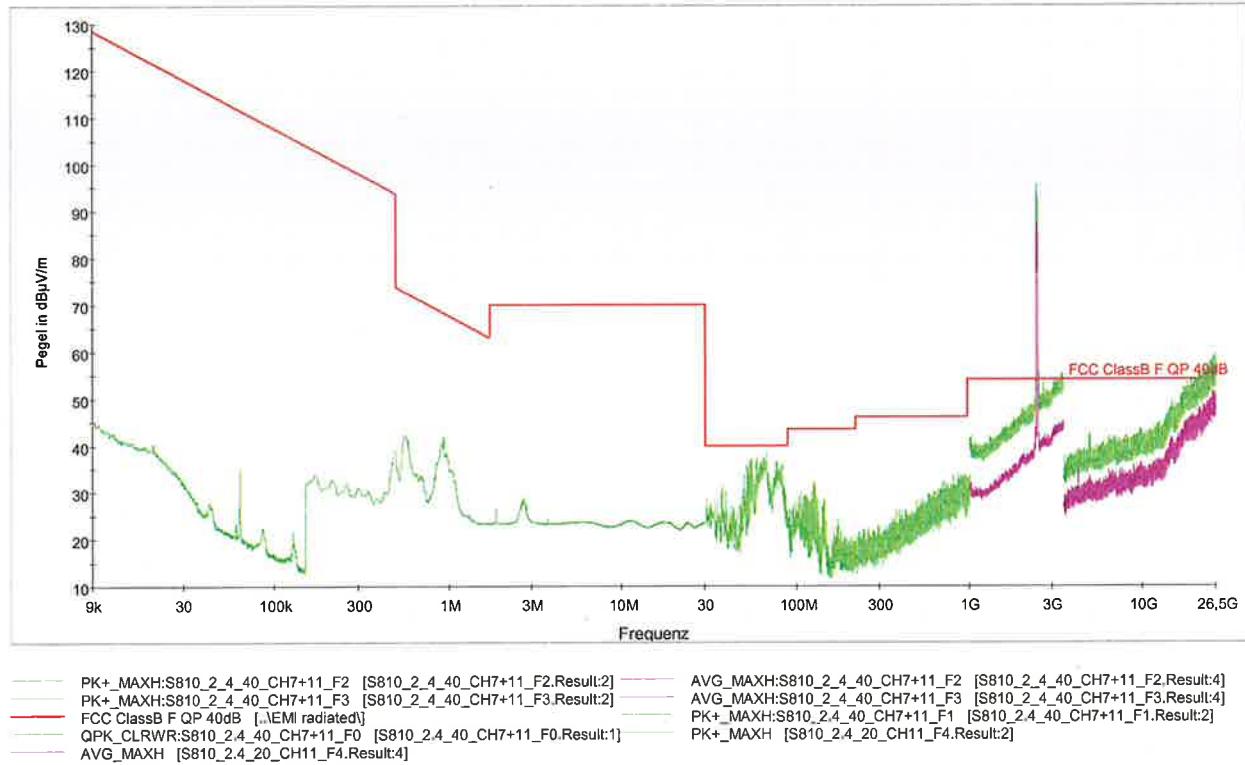
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112; EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 7 + 11: 2452 MHz



Worst case emission: 38,8 dB μ V/m @ 64,00 MHz

LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

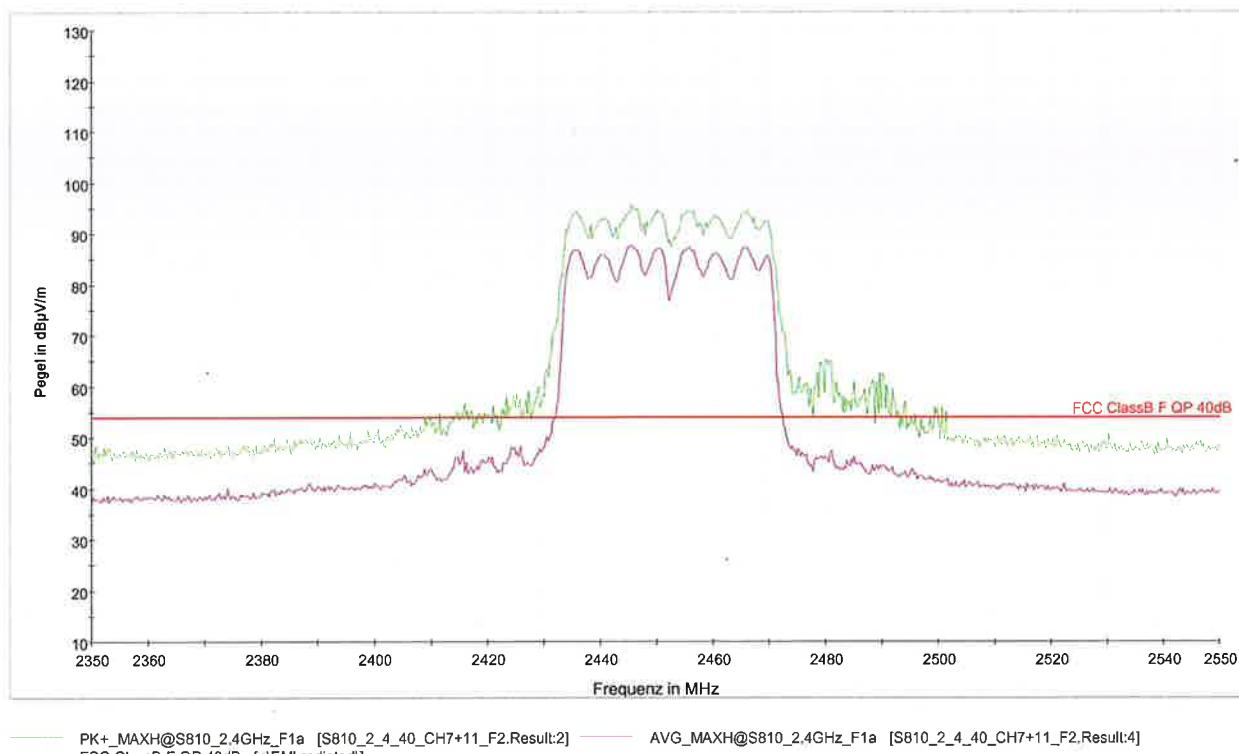
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112; EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

Emissions in restricted bands
Emissions falling within restricted frequency bands

§ 15.209(a)
RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line): Band Edge requirement

Setup: CH 7 + 11: 2452 MHz



LIMIT

SUBCLAUSE 15.209(a) – RSS-Gen

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

Band edges of the nearest restricted bands: 2390 MHz and 2483,5 MHz.

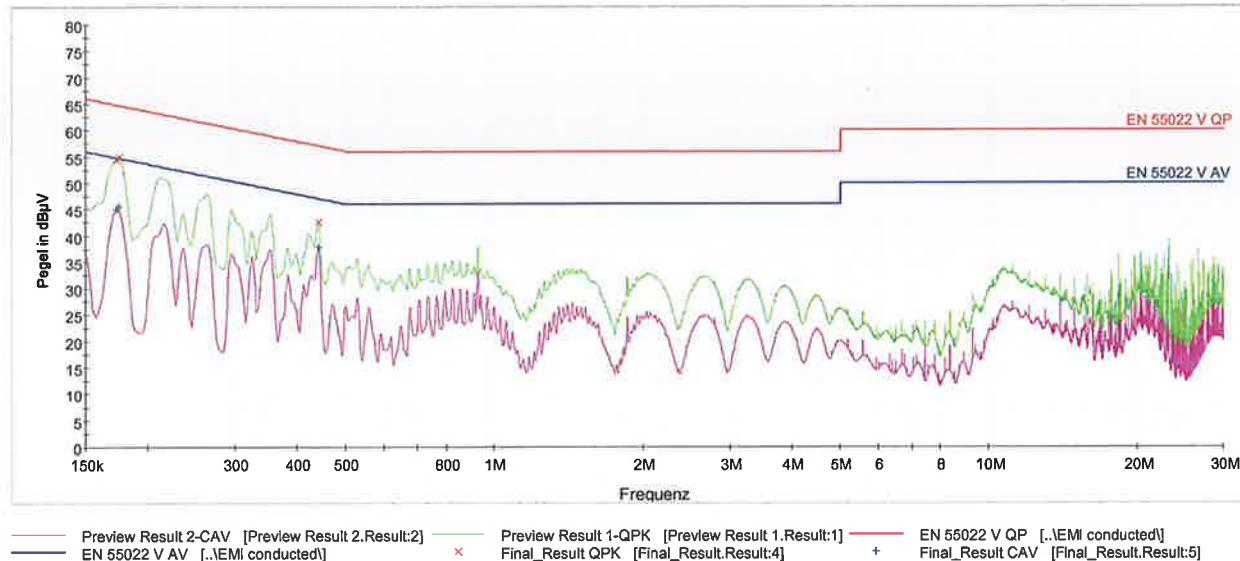
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-200

Conducted Limits

**§ 15.207
RSS-Gen 8.8**

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 6: 2437 MHz – DSSS



LIMIT

SUBCLAUSE 15.207(a) – RSS-Gen 8.8

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

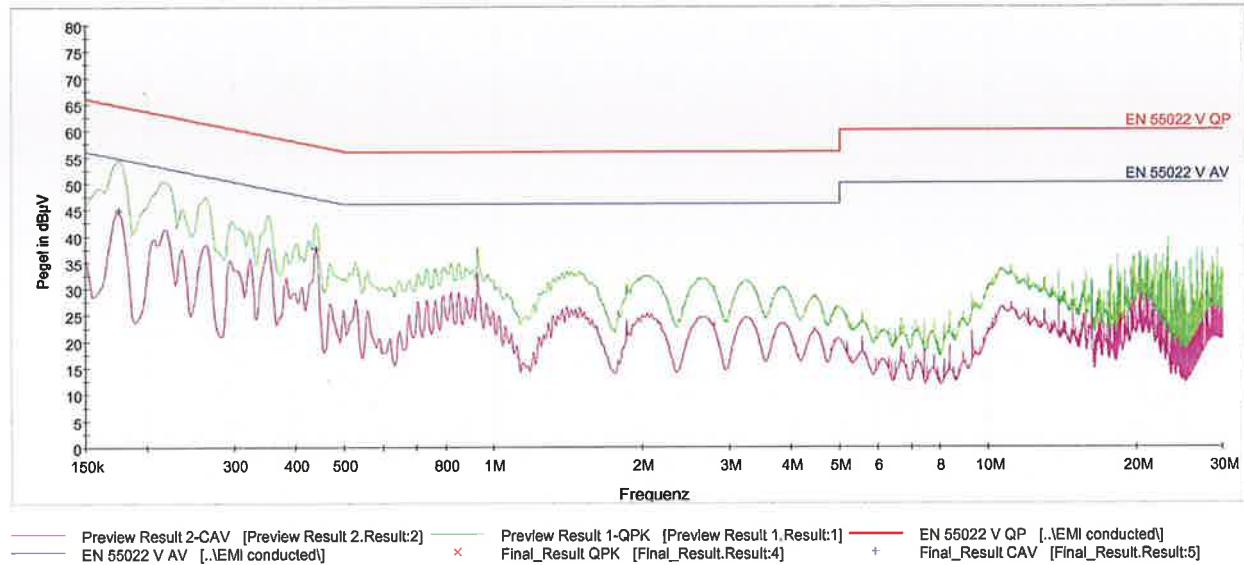
Test Equipment used: EMV-105; EMV-151; EMV-200; EMV-405

Conducted Limits

§ 15.207
RSS-Gen 8.8

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 6: 2437 MHz – OFDM



LIMIT

SUBCLAUSE 15.207(a) – RSS-Gen 8.8

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

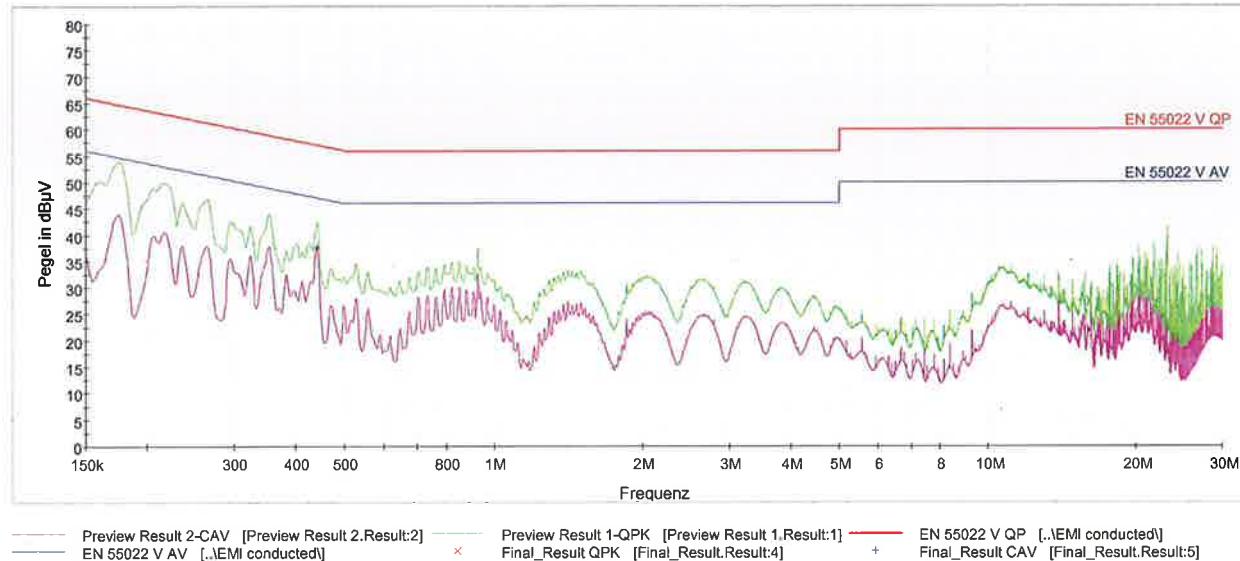
Test Equipment used: EMV-105; EMV-151; EMV-200; EMV-405

Conducted Limits

**§ 15.207
RSS-Gen 8.8**

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: CH 4 + 8: 2437 MHz – OFDM



LIMIT

SUBCLAUSE 15.207(a) – RSS-Gen 8.8

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

Test Equipment used: EMV-105; EMV-151; EMV-200; EMV-405

Maximum permissible Exposure

§ 15.247(i)

This kind of radio equipment is categorically excluded from routine environmental evaluation.

Appendix 1

Test equipment used

				Division: Industry & Energy
<input type="checkbox"/> Anechoic Chamber with 3m measurement distance	NT-100	<input type="checkbox"/> Power quality analyzer Fluke 1760 (complete set)	NT-160 - NT-173	
<input type="checkbox"/> Stripline according to ISO 11452-5	NT-108	<input type="checkbox"/> Spectrumanalyzer – FSP7 9 kHz – 7 GHz	NT-200	Department: FG
<input type="checkbox"/> MA4000 - Antenna mast 1 - 4 m height	NT-110/1	<input type="checkbox"/> ESCI - Test receiver 9 kHz - 7 GHz	NT-203/1	Test report number: M/FG-16/135
<input type="checkbox"/> DS - Turntable 0 - 400 ° Azimuth	NT-111/1	<input type="checkbox"/> ESI26 – Test receiver 20 Hz – 26,5 GHz	NT-207	Page: 1 of 4
<input type="checkbox"/> CO3000 Controller Mast+Turntable	NT-112/1	<input type="checkbox"/> Digital Radio Tester CTS55	NT-208	Date: 19.12.2016
<input type="checkbox"/> HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	<input type="checkbox"/> Noise-gen., ITU-R 559-2 20 Hz – 20 kHz	NT-209	Checked by:
<input type="checkbox"/> HFH-Z2 - Loop Antenna 9 kHz - 30 MHz	NT-122	<input type="checkbox"/> CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz	NT-210	
<input type="checkbox"/> HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	<input type="checkbox"/> 3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211	
<input type="checkbox"/> 3121C - Dipole Antenna 28 - 1000 MHz	NT-124	<input type="checkbox"/> Digital Radio Tester Aeroflex 3920	NT-212/1	
<input type="checkbox"/> 3115 - Horn Antenna 1 - 18 GHz (immunity)	NT-125	<input type="checkbox"/> Mixer M28HW 26,5 GHz - 40 GHz	NT-214	
<input type="checkbox"/> 3116 - Horn Antenna 18 - 40 GHz	NT-126	<input type="checkbox"/> RubiSource T&M Timing reference	NT-216	
<input type="checkbox"/> SAS-200/543 - Bicon. Antenna 20 MHz - 300 MHz	NT-127	<input type="checkbox"/> Radiocommunicationanalyzer SWR 1180 MD	NT-217	
<input type="checkbox"/> AT-1080 - Log. Per. Antenna 80 - 1000 MHz	NT-128	<input type="checkbox"/> Mixer M19HWD 40 GHz – 60 GHz	NT-218	
<input type="checkbox"/> HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-129	<input type="checkbox"/> Mixer M12HWD 60 GHz – 90 GHz	NT-219	
<input type="checkbox"/> HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-130	<input type="checkbox"/> DSO9104 Digital scope	NT-220/1	
<input type="checkbox"/> 3146 - Log. Per. Antenna 200 – 1000 MHz	NT-131	<input type="checkbox"/> TPS 2014 Digital scope	NT-222	
<input type="checkbox"/> VULB 9163 Trilog Antenna 30 – 3000 MHz	NT-131/1	<input type="checkbox"/> Artificial Ear according to IEC 60318	NT-224	
<input type="checkbox"/> Loop Antenna H-Field	NT-132	<input type="checkbox"/> 1 kHz Sound calibrator	NT-225	
<input type="checkbox"/> Horn Antenna 500 MHz - 2900 MHz	NT-133	<input type="checkbox"/> B10 - Harmonics and flicker analyzer	NT-232	
<input type="checkbox"/> Horn Antenna 500 MHz - 6000 MHz	NT-133/1	<input type="checkbox"/> SRM-3000 Spectrumanalyzer	NT-233	
<input type="checkbox"/> Log. per. Antenna 800 MHz - 2500 MHz	NT-134	<input type="checkbox"/> SRM-3006 Spectrumanalyzer	NT-233/1a	
<input type="checkbox"/> Log. per. Antenna 800 MHz - 2500 MHz	NT-135	<input type="checkbox"/> E-field probe SRM 75 MHz – 3 GHz	NT-234	
<input type="checkbox"/> BiConiLog Antenna 26 MHz – 2000 MHz	NT-137	<input type="checkbox"/> Field Meter NBM-500 incl. E- and H-Field probes	NT-240a-d	
<input type="checkbox"/> Conical Dipol Antenna PCD8250	NT-138	<input type="checkbox"/> Hall-Teslameter ETM-1	NT-241	
<input type="checkbox"/> HF 906 - Horn Antenna 1 - 18 GHz (emission)	NT-139	<input type="checkbox"/> EFA-3 H-field- / E-field probe	NT-243	
<input type="checkbox"/> HZ-1 Antenna tripod	NT-150	<input type="checkbox"/> Field Meter EMR-200 100 kHz – 3 GHz	NT-244	
<input type="checkbox"/> BN 1500 Antenna tripod	NT-151	<input type="checkbox"/> E-field probe 100 kHz – 3 GHz	NT-245	
<input type="checkbox"/> Ant. tripod for EN61000-4-3 Model TP1000A	NT-156	<input type="checkbox"/> H-field probe 300 kHz – 30 MHz	NT-246	

Appendix 1 (continued)

Test equipment used

<input type="checkbox"/> E-field probe 3 MHz – 18 GHz	NT-247	<input type="checkbox"/> Oscillatory Wave Simulator incl. Coupling networks	NT-328a+b+c	Division: Industry & Energy
<input type="checkbox"/> H-field probe 27 MHz – 1 GHz	NT-248	<input type="checkbox"/> BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330	Department: FG
<input type="checkbox"/> ELT-400 1 Hz – 400 kHz	NT-249	<input type="checkbox"/> T82-50 RF-Amplifier 2 GHz – 8 GHz	NT-331	Test report number: M/FG-16/135
<input type="checkbox"/> MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250	<input type="checkbox"/> 500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332	Page: 2 of 4
<input type="checkbox"/> FCC-203I EM Injection clamp	NT-251	<input type="checkbox"/> AS0102-65R - RF-Amplifier 1 GHz - 2 GHz	NT-333	Date: 19.12.2016
<input type="checkbox"/> FCC-203I-DCN Ferrite decoupling network	NT-252	<input type="checkbox"/> APA01 – RF-Amplifier 0,5 GHz – 2,5 GHz	NT-334	Checked by: <u>M</u>
<input type="checkbox"/> PR50 Current Probe	NT-253	<input type="checkbox"/> Preamplifier 1 GHz - 4 GHz	NT-335	
<input type="checkbox"/> i310s Current Probe	NT-254/1	<input type="checkbox"/> Preamplifier for GPS MKU 152 A	NT-336	
<input type="checkbox"/> Fluke 87 V True RMS Multimeter	NT-260	<input type="checkbox"/> Preamplifier 100 MHz – 23 GHz	NT-337	
<input type="checkbox"/> Model 2000 Digital Multimeter	NT-261	<input type="checkbox"/> DC Block 10 MHz – 18 GHz Model 8048	NT-338	
<input type="checkbox"/> Fluke 87 V Digital Multimeter	NT-262/1	<input type="checkbox"/> 2-97201 Electronic load	NT-341	
<input type="checkbox"/> ESH2-Z5-U1 Artificial mains network 4x25A	NT-300	<input type="checkbox"/> TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344	
<input type="checkbox"/> ESH3-Z5-U1 Artificial mains network 2x10A	NT-301	<input type="checkbox"/> TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345	
<input type="checkbox"/> ESH3-Z6-U1 Artificial mains network 1x100A	NT-302	<input type="checkbox"/> VDS 200 Mobil-impuls-generator	NT-350	
<input type="checkbox"/> ESH3-Z6-U1 Artificial mains network 1x100A	NT-302a	<input type="checkbox"/> LD 200 Mobil-impuls-generator	NT-351	
<input type="checkbox"/> PHE 4500/B Power amplifier	NT-304	<input type="checkbox"/> MPG 200 Mobil-Impuls-Generators	NT-352	
<input type="checkbox"/> EZ10 T-Artificial Network	NT-305	<input type="checkbox"/> EFT 200 Mobil-impuls-generator	NT-353	
<input type="checkbox"/> SMG - Signal generator 0,1 - 1000 MHz	NT-310	<input type="checkbox"/> AN 200 S1 Artificial Network	NT-354	
<input type="checkbox"/> SMA100A - Signal generator 9 kHz - 6 GHz	NT-310/1	<input type="checkbox"/> FP-EFT 32M 3 ph. Coupling filter (Burst)	NT-400/1	
<input type="checkbox"/> RefRad Reference generator	NT-312	<input type="checkbox"/> PHE 4500 - Mains impedance network	NT-401	
<input type="checkbox"/> SMP 02 Signal generator 10 MHz - 20 GHz	NT-313	<input type="checkbox"/> IP 6.2 Coupling filter for data lines (Surge)	NT-403	
<input type="checkbox"/> 40 MHz Arbitrary Generator TGA1241	NT-315	<input type="checkbox"/> TK 9421 High Power Volt. Probe 150 kHz - 30 MHz	NT-409	
<input type="checkbox"/> Artificial mains network NSLK 8127-PLC	NT-316	<input type="checkbox"/> ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410	
<input type="checkbox"/> PEFT - Burst generator up to 4 kV	NT-320	<input type="checkbox"/> IP 4 - Capacitive clamp (Burst)	NT-411	
<input type="checkbox"/> ESD 30 System up to 25 kV	NT-321	<input type="checkbox"/> Highpass-Filter 100 MHz – 3 GHz	NT-412	
<input type="checkbox"/> PSURGE 4.1 Surge generator	NT-324	<input type="checkbox"/> Highpass-Filter 600 MHz – 4 GHz	NT-413	
<input type="checkbox"/> IMU4000 Immunity test system	NT-325/1	<input type="checkbox"/> Highpass-Filter 1250 MHz – 4 GHz	NT-414	
<input type="checkbox"/> VCS 500-M6 Surge-Generator	NT-326	<input type="checkbox"/> Highpass-Filter 1800 MHz – 16 GHz	NT-415	

Appendix 1 (continued)

Test equipment used

			Division: Industry & Energy
<input type="checkbox"/> Highpass-Filter 3500 MHz – 18 GHz	NT-416	<input type="checkbox"/> FCC-801-S25 Coupling decoupling network	NT-462
<input type="checkbox"/> RF-Attenuator 10 dB DC – 18 GHz / 50 W	NT-417	<input type="checkbox"/> FCC-801-T4 Coupling decoupling network	NT-463
<input type="checkbox"/> RF-Attenuator 6 dB DC – 18 GHz / 50 W	NT-418	<input type="checkbox"/> FCC-801-C1 Coupling decoupling network	NT-464
<input type="checkbox"/> RF-Attenuator 3 dB DC – 18 GHz / 50 W	NT-419	<input type="checkbox"/> SW 9605 - Current probe 150 kHz – 30 MHz	NT-465/1
<input type="checkbox"/> RF-Attenuator 20 dB DC - 1000 MHz / 25 W	NT-421	<input type="checkbox"/> 95242-1 – Current probe 1 MHz – 400 MHz	NT-468
<input type="checkbox"/> RF-Attenuator 30 dB DC - 1000 MHz / 1 W	NT-423	<input type="checkbox"/> 94106-1L-1 – Current probe 100 kHz – 450 MHz	NT-471
<input type="checkbox"/> RF-Attenuator 30 dB 30 dB	NT-424	<input type="checkbox"/> GA 1240 Power amplifier according to EN 61000-4-16	NT-480
<input type="checkbox"/> RF-Attenuator 6 dB DC - 1000 MHz / 1 W	NT-425	<input type="checkbox"/> Coupling networks according to EN 61000-4-16	NT-481 - NT-483
<input type="checkbox"/> RF-Attenuator 6 dB DC - 1000 MHz / 1 W	NT-426	<input type="checkbox"/> Van der Hoofden Test Head	NT-484
<input type="checkbox"/> RF-Attenuator 6 dB	NT-428	<input type="checkbox"/> PC P4 3 GHz .Test computer	NT-500
<input type="checkbox"/> RF-Attenuator 0 dB - 81 dB	NT-429	<input type="checkbox"/> PC P4 1700 MHz Notebook	NT-505
<input type="checkbox"/> WRU 27 - Band blocking 27 MHz	NT-430	<input type="checkbox"/> Monitoring camera with Monitor	NT-511
<input type="checkbox"/> WHJ450C9 AA - High pass 450 MHz	NT-431	<input type="checkbox"/> ES-K1 Version 1.71 SP2 Test software	NT-520
<input type="checkbox"/> WHJ250C9 AA - High pass 250 MHz	NT-432	<input type="checkbox"/> EMC32 Version 10.01 Test software	NT-520/1
<input type="checkbox"/> RF-Load 150 W	NT-433	<input type="checkbox"/> SRM-TS Version 1.3 software for SRM-3000	NT-522
<input type="checkbox"/> Impedance transducer 1:4 ; 1:9 ; 1:16	NT-435	<input type="checkbox"/> SRM-TS Version 1.3.1 software for SRM-3006	NT-522/1
<input type="checkbox"/> RF-Attenuator DC – 18 GHz 6 dB	NT-436	<input type="checkbox"/> Spitzenberger und Spies Test software V4.1	NT-525
<input type="checkbox"/> RF-Attenuator DC – 18 GHz 6 dB	NT-437	<input type="checkbox"/> Noise power test apparatus according to EN 55014	NT-530
<input type="checkbox"/> RF-Attenuator DC – 18 GHz 10 dB	NT-438	<input type="checkbox"/> Vertical coupling plane (ESD)	NT-531
<input type="checkbox"/> RF-Attenuator DC – 18 GHz 20 dB	NT-439	<input type="checkbox"/> Test cable #4 for EN 61000-4-6	NT-553
<input type="checkbox"/> I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	<input type="checkbox"/> Test cable #3 for conducted emission	NT-554
<input type="checkbox"/> ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz	NT-441	<input type="checkbox"/> Test cable #5+#6 ESD-cable (2x470k)	NT-555 + NT-556
<input type="checkbox"/> Power Divider 6 dB/1 W/50 Ohm	NT-443	<input type="checkbox"/> Test cable #8 Sucoflex 104EA	NT-559
<input type="checkbox"/> Directional coupler 0,1 MHz – 70 MHz	NT-444	<input type="checkbox"/> Test cable #9 (for outdoor measurements)	NT-580
<input type="checkbox"/> Directional coupler 0,1 MHz – 70 MHz	NT-445	<input type="checkbox"/> Test cable #10 (for outdoor measurements)	NT-581
<input type="checkbox"/> Tube imitations according to EN 55015	NT-450	<input type="checkbox"/> Test cable #13 Sucoflex 104PE	NT-584
<input type="checkbox"/> FCC-801-M3-16A Coupling decoupling network	NT-458	<input type="checkbox"/> Test cable #21 for SRM-3000	NT-592
<input type="checkbox"/> FCC-801-M2-50A Coupling decoupling network	NT-459	<input type="checkbox"/> Shield chamber	NT-600
<input type="checkbox"/> FCC-801-M5-25 Coupling decoupling network	NT-460	<input type="checkbox"/> Climatic chamber	M-1200
<input type="checkbox"/> FCC-801-AF10 Coupling decoupling network	NT-461		

Appendix 1 (continued)

Test equipment used

<input type="checkbox"/> Anechoic Chamber 3 m / 5 m measuring distance	EMV-100	<input type="checkbox"/> Log.per Antenna 80-2700 MHz STLP 9128 E special	EMV-304	Division: Industry & Energy
<input type="checkbox"/> Turntabel 6 m diameter	EMV-101	<input type="checkbox"/> Log.per Antenna 0,7 – 9 GHz STLP9149	EMV-305	Department: FG
<input type="checkbox"/> Antenna mast 1 – 4 m	EMV-102	<input type="checkbox"/> Load Dump Generator LD 200N	EMV-350	Test report number: M/FG-16/135
<input type="checkbox"/> Mast and Turntable controller FC-06	EMV-103	<input type="checkbox"/> Ultra Compact Simulator UCS 200N100	EMV-351	Page: 4 of 4
<input type="checkbox"/> EMC Video/Audiosystem	EMV-104	<input type="checkbox"/> Automotive Power fail module PFM 200N100.1	EMV-352	Date: 19.12.2016
<input type="checkbox"/> EMC Software EMC32 Version 10.01	EMV-105	<input type="checkbox"/> Voltage Drop Simulator VDS 200Q100	EMV-353	Checked by:
<input type="checkbox"/> Hornantenna 1 – 18 GHz HF 907	EMV-110	<input type="checkbox"/> Arb. Generator AutoWave	EMV-354	
<input type="checkbox"/> Antennapre.amp. 1 – 18 GHz ERZ-LNA0200-1800-30-2	EMV-111	<input type="checkbox"/> Ultra Compact Simulator UCS 500N7	EMV-355	
<input type="checkbox"/> Trilog Antenna 30-3000 MHz VULB9163	EMV-112	<input type="checkbox"/> Coupling decoupling network CNI 503B7 / 32 A	EMV-356	
<input type="checkbox"/> Monopol 9 kHz – 30 MHz VAMP 9243	EMV-113	<input type="checkbox"/> Coupling decoupling network CNI 503B7 / 63 A	EMV-357	
<input type="checkbox"/> Antennapre.amp 18 – 40 GHz BBV 9721	EMV-114	<input type="checkbox"/> Telecom Surge Generator TSurge 7	EMV-358	
<input type="checkbox"/> DC Artificial Network PVDC 8300	EMV-150	<input type="checkbox"/> Coupling decoupling network CNI 508N2	EMV-359	
<input type="checkbox"/> AC Artificial Network NNLK 8121 RC	EMV-151	<input type="checkbox"/> Coupling decoupling network CNV 504N2.2	EMV-360	
<input type="checkbox"/> EMI Receiver ESR26	EMV-200	<input type="checkbox"/> Immunity generator NSG4060/NSG4060-1	EMV-361	
<input type="checkbox"/> Signalgenerator 9 kHz – 40 GHz N5173B	EMV-201	<input type="checkbox"/> Coupling network CDND M316-2	EMV-362	
<input type="checkbox"/> GPS Frequency normal B-88	EMV-202	<input type="checkbox"/> Coupling network CT419-5	EMV-363	
<input type="checkbox"/> DC Power supply N5745A	EMV-203	<input type="checkbox"/> ESD Generator NSG 437	EMV-364	
<input type="checkbox"/> DC Power supply N5745A	EMV-204	<input type="checkbox"/> Pulse Limiter VTSD 9561-F BNC	EMV-405	
<input type="checkbox"/> Spektrum Analyzator FSV40	EMV-205	<input type="checkbox"/> Transient emission BSM200N40+BS200N100	EMV- 450+451	
<input type="checkbox"/> Thd Multimeter Model 2015	EMV-206	<input type="checkbox"/> Cap. Coupling Clamp HFK	EMV-455	
<input type="checkbox"/> Poweramplifier PAS15000	EMV- 207/abc	<input type="checkbox"/> Mag. Field System MS100N+MC26100+MC2630	EMV- 456-458	
<input type="checkbox"/> Inrush Current Source	EMV- 208/abc	<input type="checkbox"/> Coupling network CDN M2-100A	EMV-459	
<input type="checkbox"/> Arb.-generator Sycore	EMV-209	<input type="checkbox"/> Coupling network CDN M3-32A	EMV-460	
<input type="checkbox"/> Harmonics/Flicker analyzer ARS 16/3	EMV-210	<input type="checkbox"/> Coupling network CDN M5-100A	EMV-461	
<input type="checkbox"/> HF- Amplifier 9 kHz-250 MHz BBA150	EMV-300	<input type="checkbox"/> Current Clamp CIP 9136A	EMV-462	
<input type="checkbox"/> HF- Amplifier 80 -1000 MHz BBA150	EMV-301	<input type="checkbox"/> DC Artificial Network HV-AN 150	EMV- 464+465	
<input type="checkbox"/> HF- Amplifier 0,8 - 6 GHz BBA150	EMV-302	<input type="checkbox"/> Coupling Clamp EM 101	EMV-466	
<input type="checkbox"/> High Power Ant. 20-200 MHz VHBD 9134	EMV-303	<input type="checkbox"/> Decoupling Clamp FTC 101	EMV-467	
		<input type="checkbox"/> Power attenuator DG 250 W 6 GHz 6 dB	EMV-469	