



TEST REPORT

of the accredited test laboratory

TÜV Nr.: 2023-IN-AT-TICL-E-EX-0-000131-FG-001-Rev2

Applicant: YUNEX GmbH
Otto-Hahn-Ring 6
D-81739 München

Tested Product: ITS On Board Unit 'OBU2X'
Test report for Bluetooth and BLE part only

FCC ID 2BGULOB2X

IC ID Not decided yet

Manufacturer: Yunex LLC
9225 Bee Cave Road
Austin, TX 78733

Output power 7,41 mW eirp. **power supply:** 12 - 24 VDC

Frequency range: 2402 - 2480 MHz **Channel separation:** 1 / 2 MHz

Accredited Standards: FCC: 47 CFR Part 15 (eCFR 19.06.2023)
RSS-247 Issue 3, August 2023
ANSI C63.10-2013

TÜV AUSTRIA GMBH
Test laboratory for EMC

Ing. Andreas Malek

examined by / Testing
Laboratory
TÜV AUSTRIA GMBH

09.09.2024

Ing. Michael Emminger

approved by / Testing
Laboratory
TÜV AUSTRIA GMBH

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

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1. Applicant

Company: YUNEX GmbH

Department: ---

Address: Otto-Hahn-Ring 6; D- 81739 München

Contact person: Mr. Thomas Jatschka

EUT received on: 19.06.2023

Tests were performed on: 20.06.2023 till 21.06.2023

2. Description of EUT

EUT: ITS On Board Unit 'OBU2X'

Manufacturer: Yunex LLC
9225 Bee Cave Road
Austin, TX 78733

Description: YUNEX GmbH provided the following configuration for the measurements:

Prototype

Operating mode: The measurements were carried out at the following running states:
Transmitting Bluetooth/BLE (see page 6 and 7)

Technical data EUT: Rated voltage: 12 – 24 VDC
Rated current: max 1,5A
Rated frequency: DC

Mains voltage during the tests: 24VDC

Climatic conditions in the emc laboratory: Relative humidity: 58%
Temperature: 23°C

3. Standards / Final result

Name	Title	Deviation	Result
FCC: 47 CFR Part 15 (eCFR 19.06.2023)	RADIO FREQUENCY DEVICES	none	OK
RSS-247 Issue 3, August 2023	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	none	OK
ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	none	OK
Result: Opinions and interpretation of testing laboratory OK: EUT passed NOK: EUT failed			

4. TEST RESULTS

4.1. TEST OBJECT DATA

General EUT Description – Bluetooth

This On Board Unit for C-V2X Operation contains various transmitter parts:
C-V2X at 5915 MHz center frequency with 20 MHz channel bandwidth (see test report [2023-IN-AT-TICL-E-EX-0-000131-FG-002-Rev3](#))
Bluetooth/BLE (this test report) and
an LTE module FCC-ID: RI7ME910G1W3
For simultaneous transmission tests of all three radios and Part 15B compliance see test report [2023-IN-AT-TICL-E-EX-0-000131-FG-003-Rev2](#).

2.1033 (c) Technical description

2.1033 (4) Type of emission: Basic datarate: 876KF1D – Channel spacing 1 MHz
Enhanced datarate: 1M24F1D – Channel spacing 1 MHz > 2/3 of channel
bandwidth - > maximum power should be 125 mW.

2.1033 (5) Frequency range: 2402 to 2480 MHz (channel center frequencies).

2.1033 (6) Power range and Controls: The maximum peak output power is 4,27 mW and there is no power regulation.

2.1033 (7) Maximum output power rating: 4,68 mW.

2.1033 (8) DC Voltage and Current: 12V – 24V DC
maximum current consumption: 1,5A

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

Worst case Spurious Emissions: 45,9 dBµV/m Average at 7,44GHz.

Tests were performed June 20th and June 21st, 2023.

General EUT Description – BLE

2.1033 (c) Technical description

2.1033 (4) Type of emission: 1M04F1D – Channel spacing 2 MHz

2.1033 (5) Frequency range: 2402 to 2480 MHz (channel center frequencies).

2.1033 (6) Power range and Controls: The maximum peak output power is 7,41 mW and there is no power regulation.

2.1033 (7) Maximum output power rating: 7,41 mW.

2.1033 (8) DC Voltage and Current: 12V – 24V DC
maximum current consumption: 1,5A

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

Worst case Spurious Emissions: 46,82 dBµV/m Average at 4,8035GHz.

Tests were performed June 20th and June 21st, 2023.

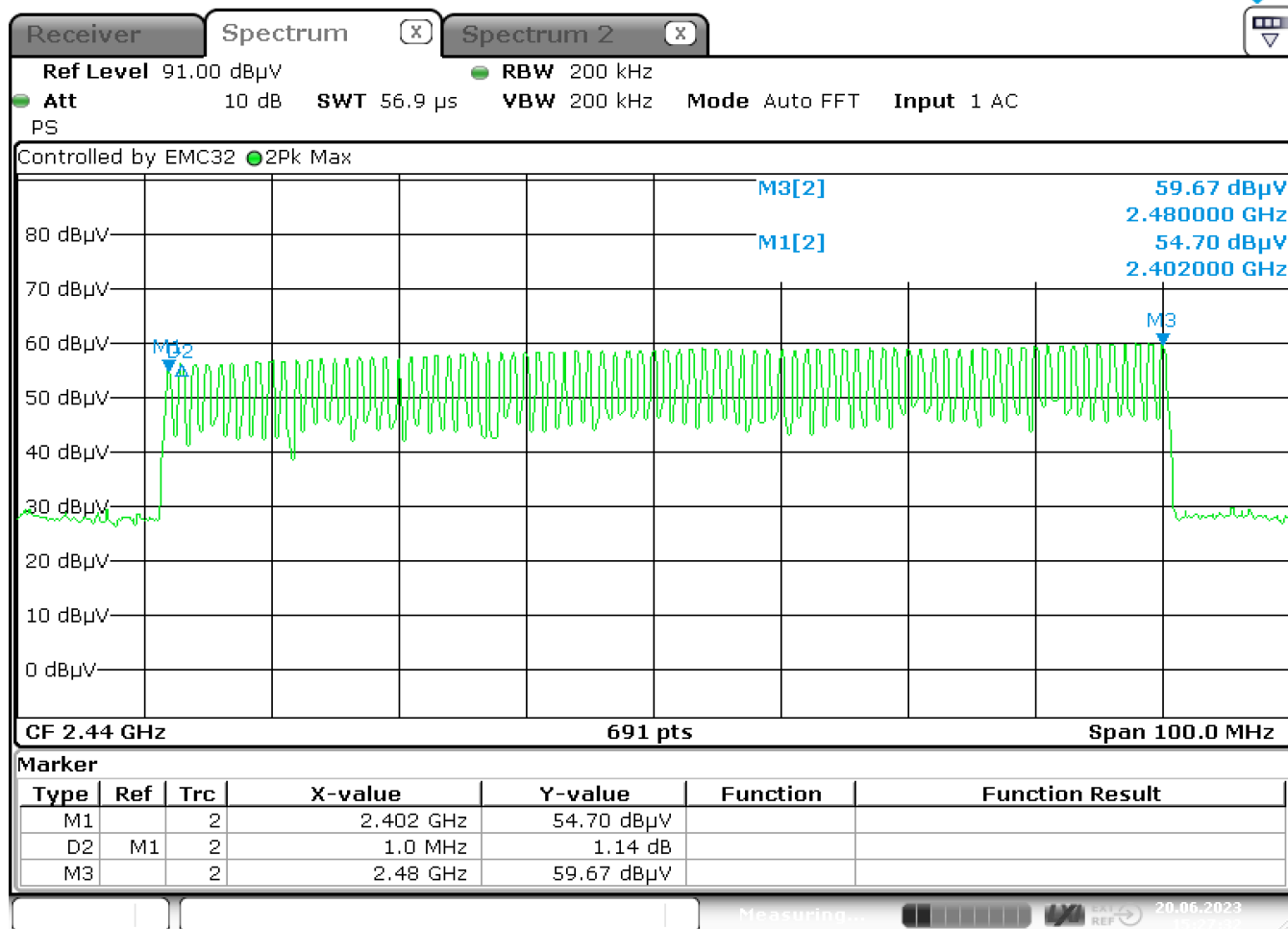
4.2. Number of channels and channel spacing

FCC, § 15.247 (a) (1)
ISED, 5.1

Mode: Bluetooth

Radiated Measurement

Rated output power: 4,68 mW



Date: 20. JUN. 2023 15:27:32

There are 79 Channels used, starting at 2402 till 2480 each spaced by 1 MHz channel spacing.

LIMIT SUBCLAUSE 15.247(a) (1) – 5.1

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

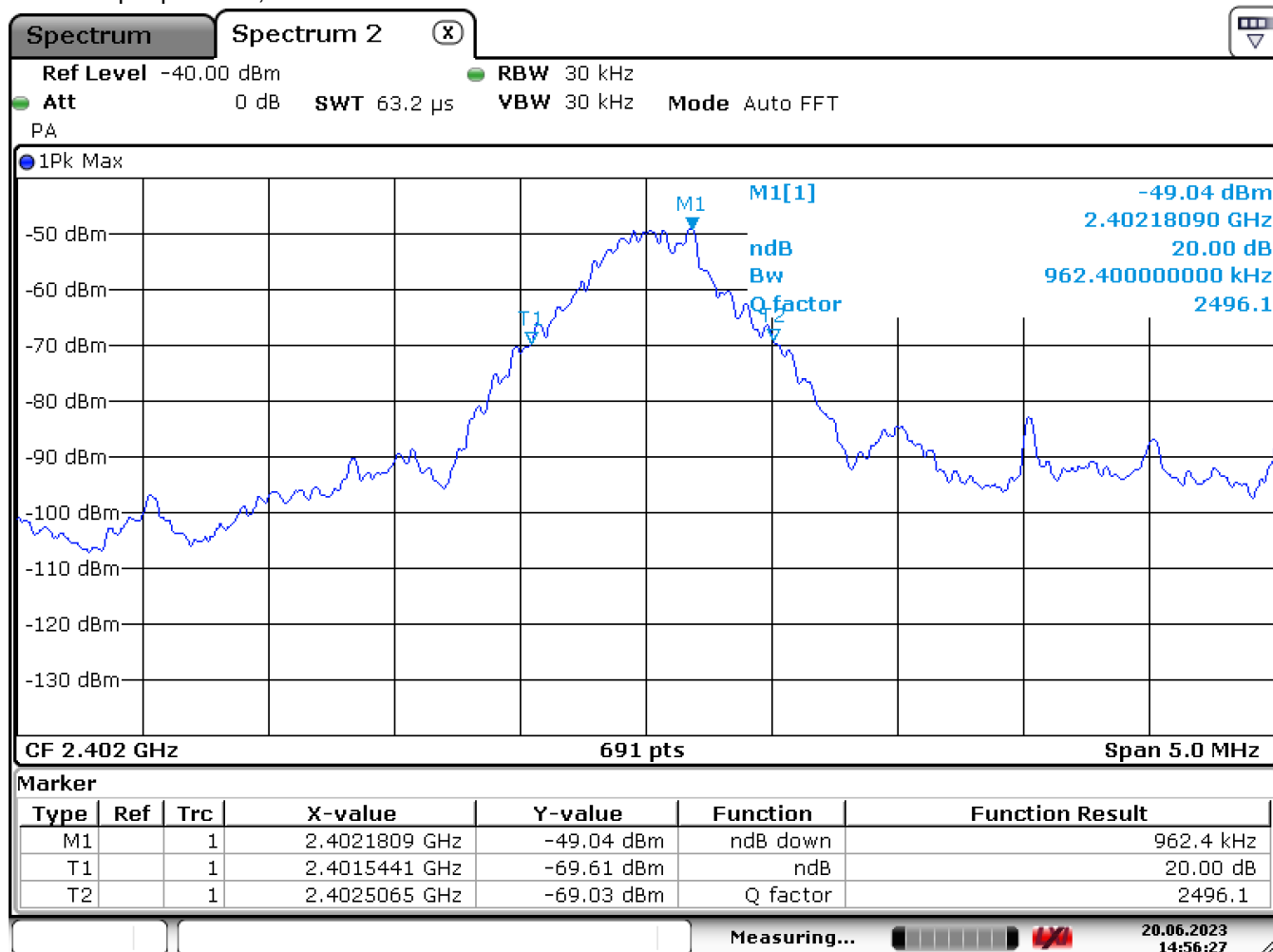
Test Equipment used: NT-207/1

4.3. 20dB Bandwidth

FCC, § 15.247 (a) (1)
ISED, 5.1

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2402 MHz



Date: 20.JUN.2023 14:56:27

20dB Bandwidth: 962 kHz

LIMIT SUBCLAUSE 15.247(a) (1) – 5.1(2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

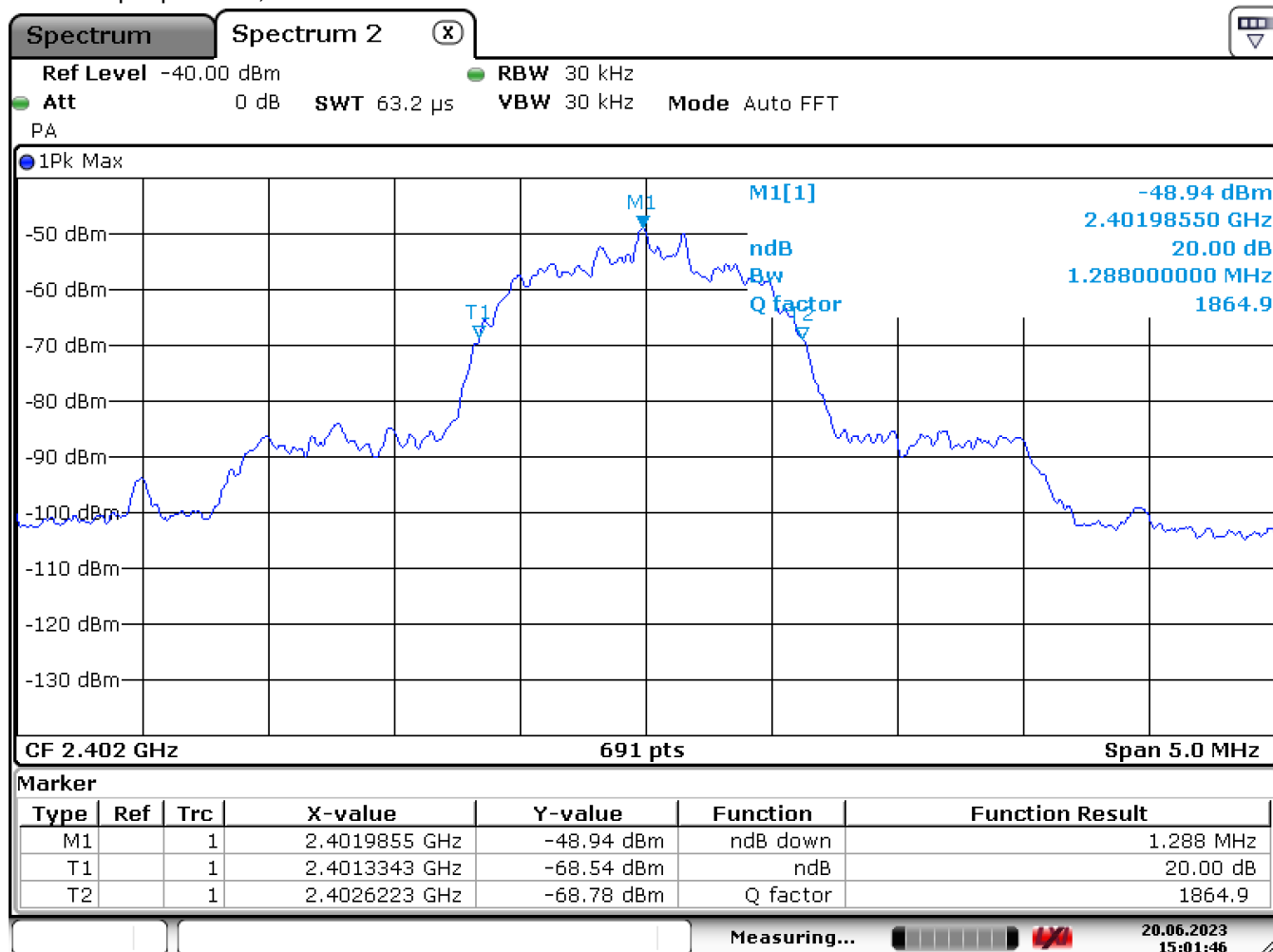
Test Equipment used: EMV-205

20dB Bandwidth

FCC, § 15.247 (a) (1)
ISED, 5.1 (2)

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 4,68 mW 2402 MHz



Date: 20.JUN.2023 15:01:47

20dB Bandwidth: 1288 kHz

LIMIT SUBCLAUSE 15.247(a) (1) – 5.1(2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

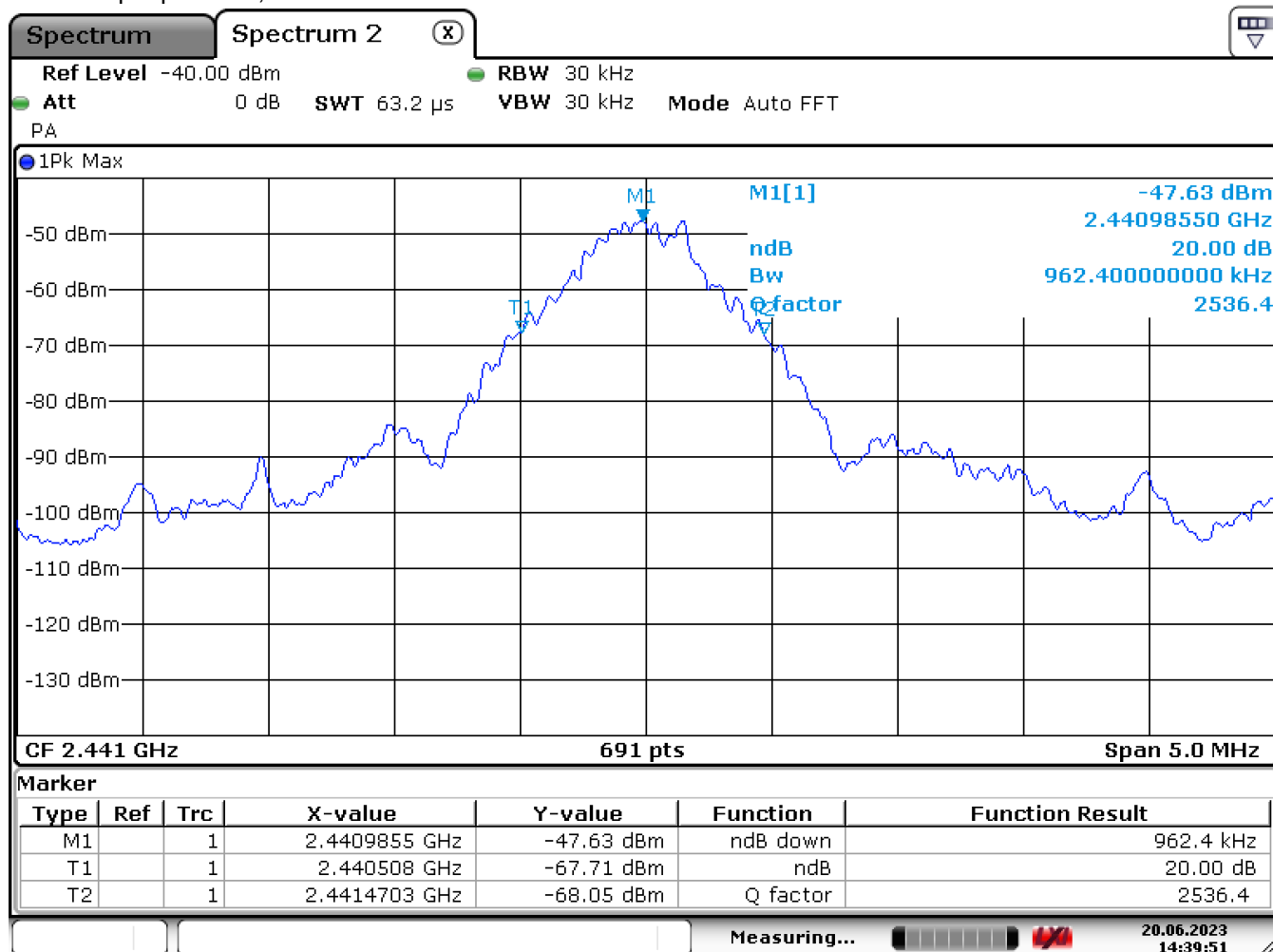
Test Equipment used: EMV-205

20dB Bandwidth

FCC, § 15.247 (a) (1)
ISED, 5.1 (2)

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2441 MHz



Date: 20.JUN.2023 14:39:51

20dB Bandwidth: 962 kHz

LIMIT SUBCLAUSE 15.247(a) (1) – 5.1(2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

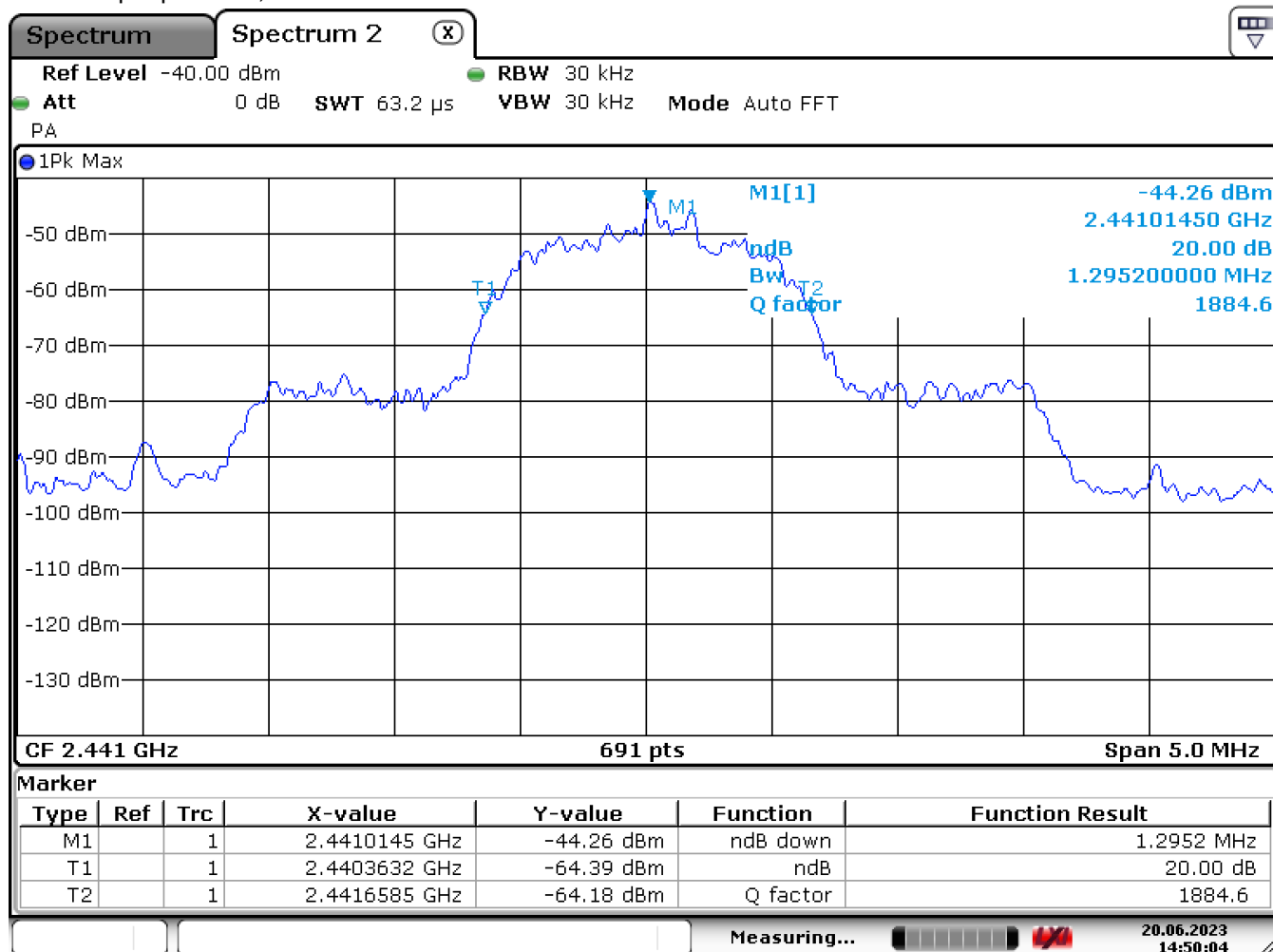
Test Equipment used: EMV-205

20dB Bandwidth

FCC, § 15.247 (a) (1)
ISED, 5.1 (2)

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 4,68 mW 2441 MHz



Date: 20.JUN.2023 14:50:04

20dB Bandwidth: 1295 kHz

LIMIT SUBCLAUSE 15.247(a) (1) – 5.1(2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

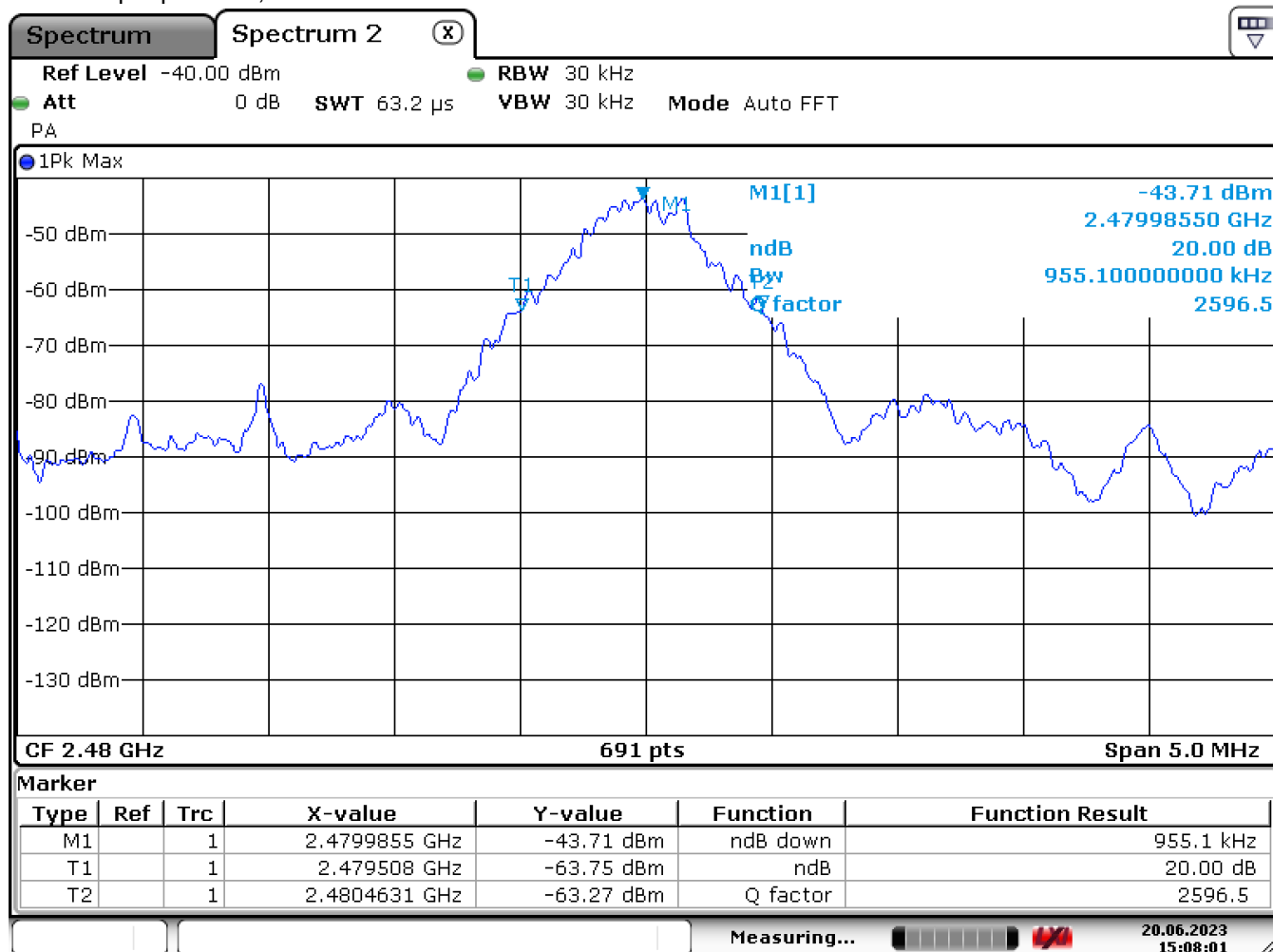
Test Equipment used: EMV-205

20dB Bandwidth

FCC, § 15.247 (a) (1)
ISED, 5.1 (2)

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2480 MHz



Date: 20.JUN.2023 15:08:00

20dB Bandwidth: 955 kHz

LIMIT SUBCLAUSE 15.247(a) (1) – 5.1(2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

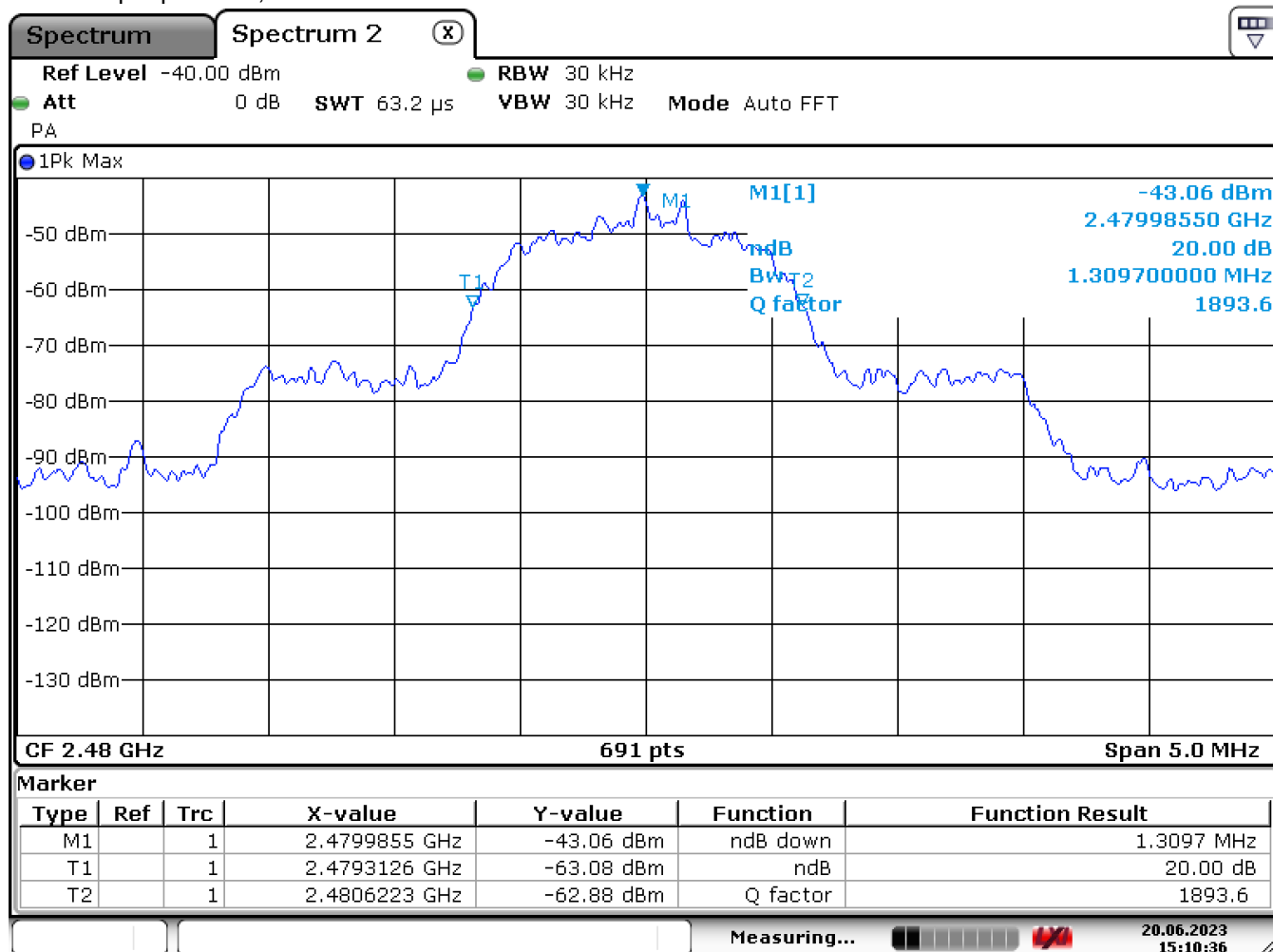
Test Equipment used: EMV-205

20dB Bandwidth

FCC, § 15.247 (a) (1)
ISED, 5.1 (2)

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 4,68 mW 2480 MHz



Date: 20.JUN.2023 15:10:37

20dB Bandwidth: 1310 kHz

LIMIT SUBCLAUSE 15.247(a) (1) – 5.1(2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

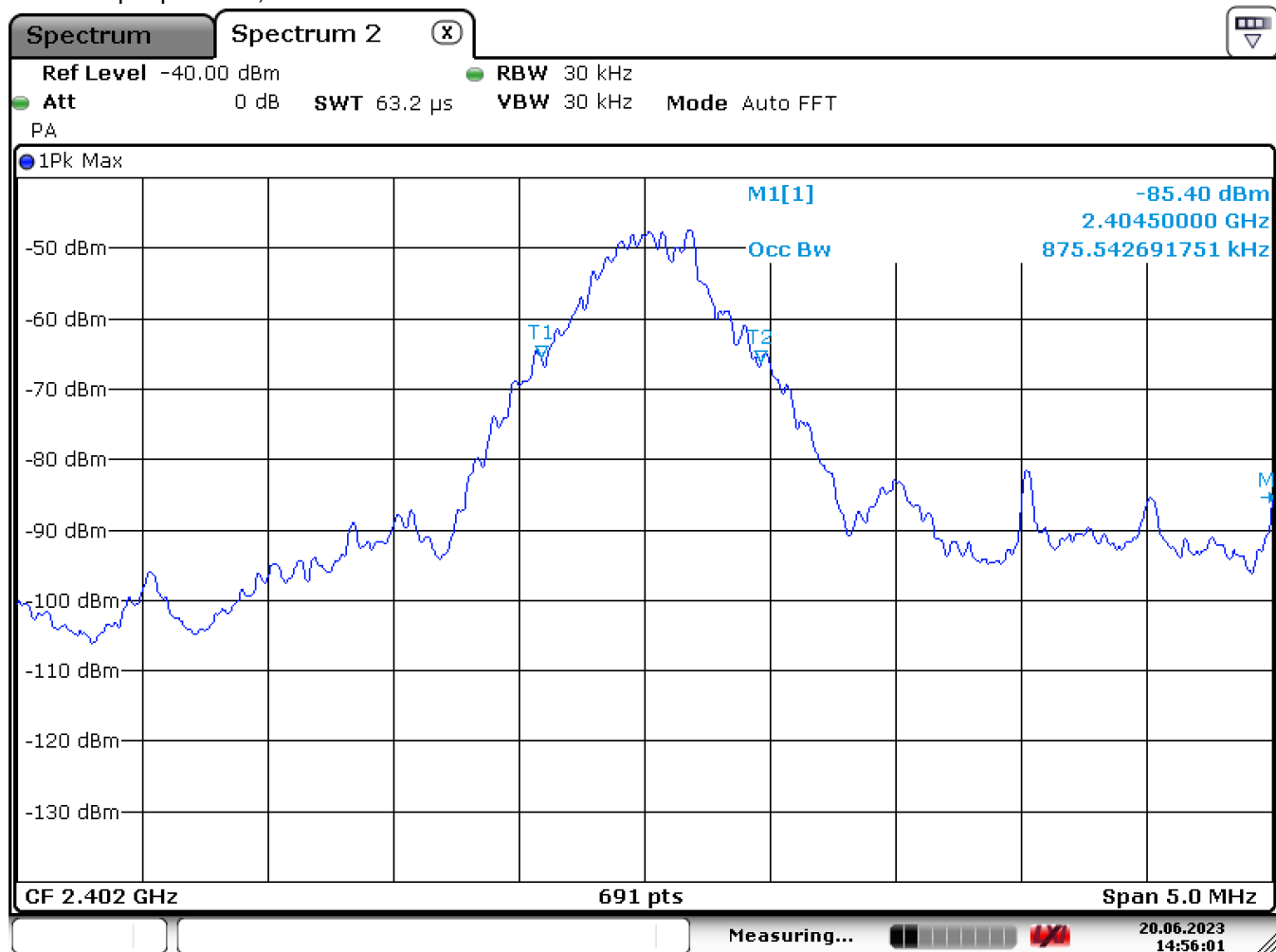
Test Equipment used: EMV-205

4.4. 99%dB Bandwidth

ISED, RSS 247

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2402 MHz



Date: 20.JUN.2023 14:56:02

99% Bandwidth: 876 kHz

LIMIT RSS 247

None; for IC reporting purposes only

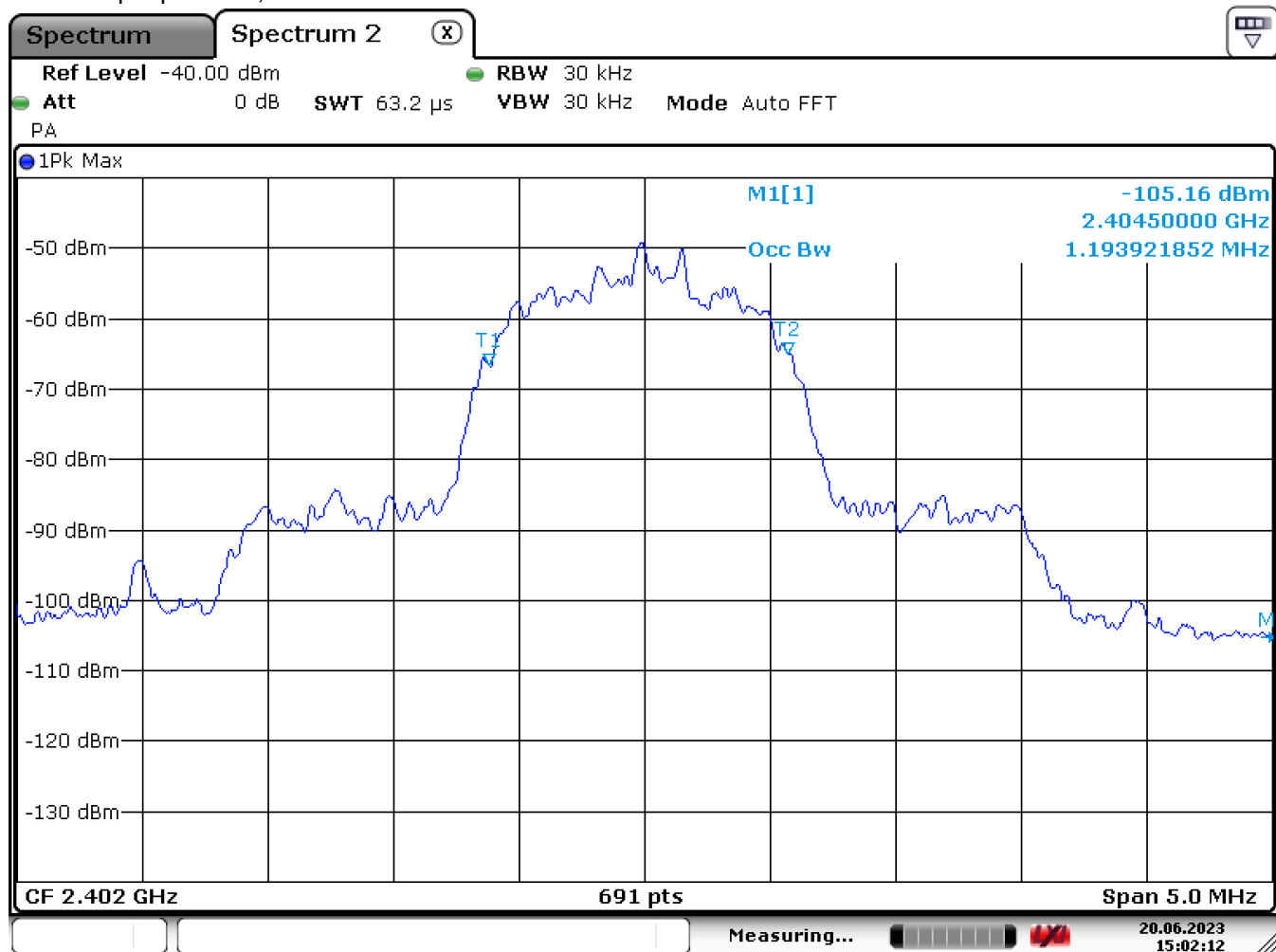
Test Equipment used: EMV-205

99% Bandwidth

ISED, RSS 247

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 4,68 mW 2402 MHz



Date: 20.JUN.2023 15:02:12

99% Bandwidth: 1194 kHz

LIMIT RSS 247

None; for IC reporting purposes only

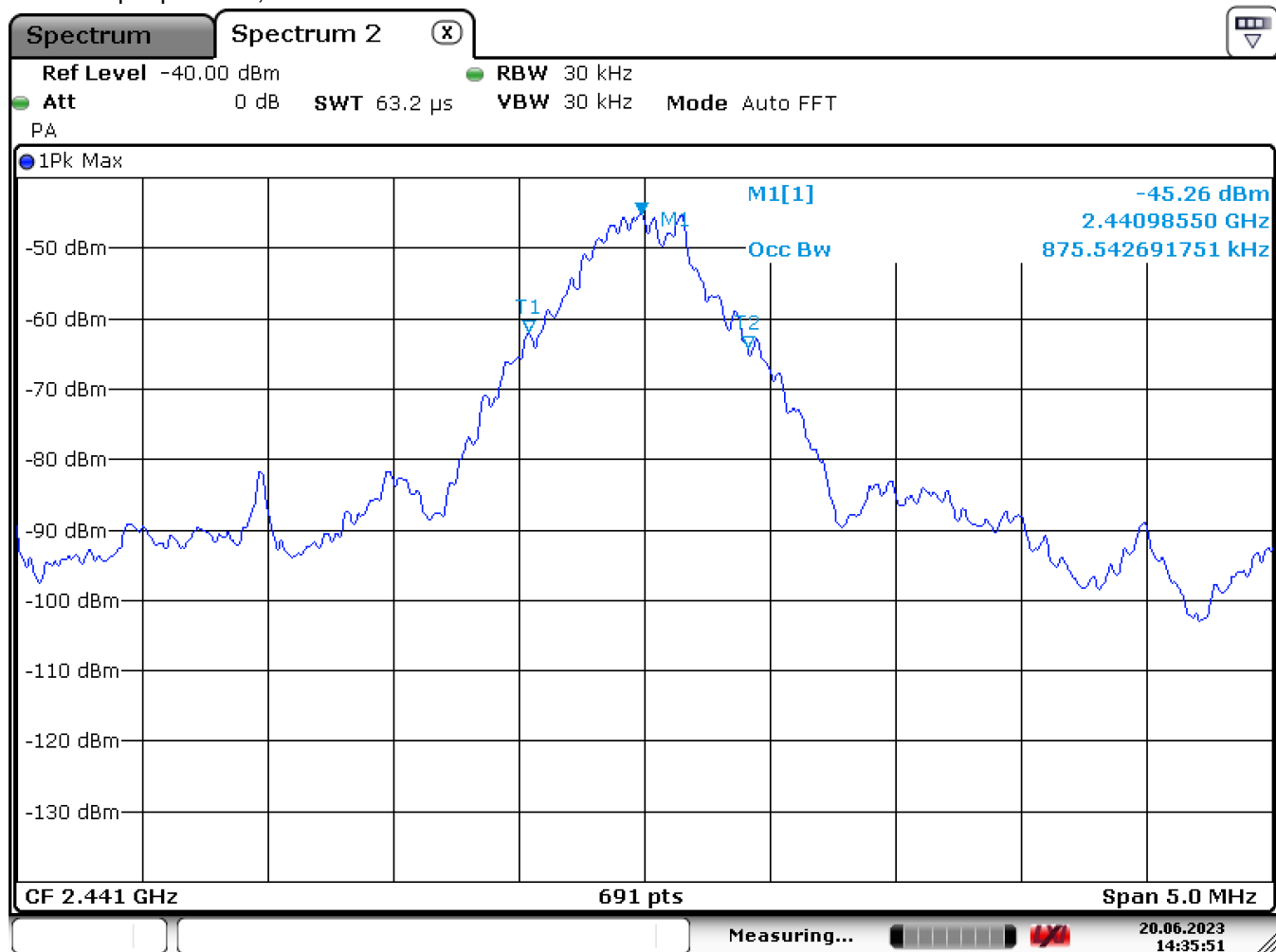
Test Equipment used: EMV-205

99% Bandwidth

ISED, RSS 247

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2441 MHz



Date: 20.JUN.2023 14:35:51

99% Bandwidth: 876 kHz

LIMIT RSS 247

None; for IC reporting purposes only

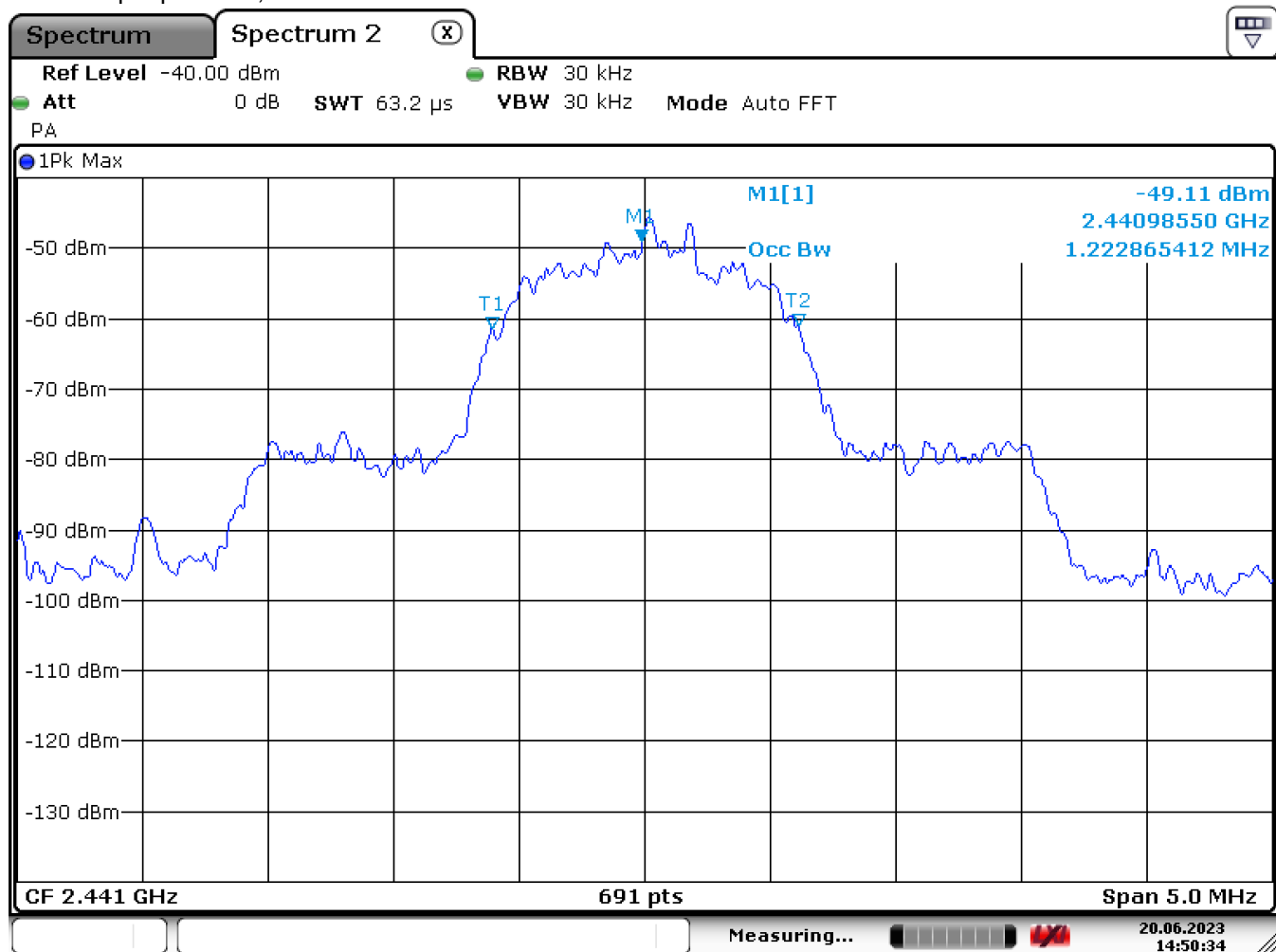
Test Equipment used: EMV-205

99% Bandwidth

ISED, RSS 247

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 4,68 mW 2441 MHz



Date: 20.JUN.2023 14:50:35

99% Bandwidth: 1223 kHz

LIMIT **RSS 247**

None; for IC reporting purposes only

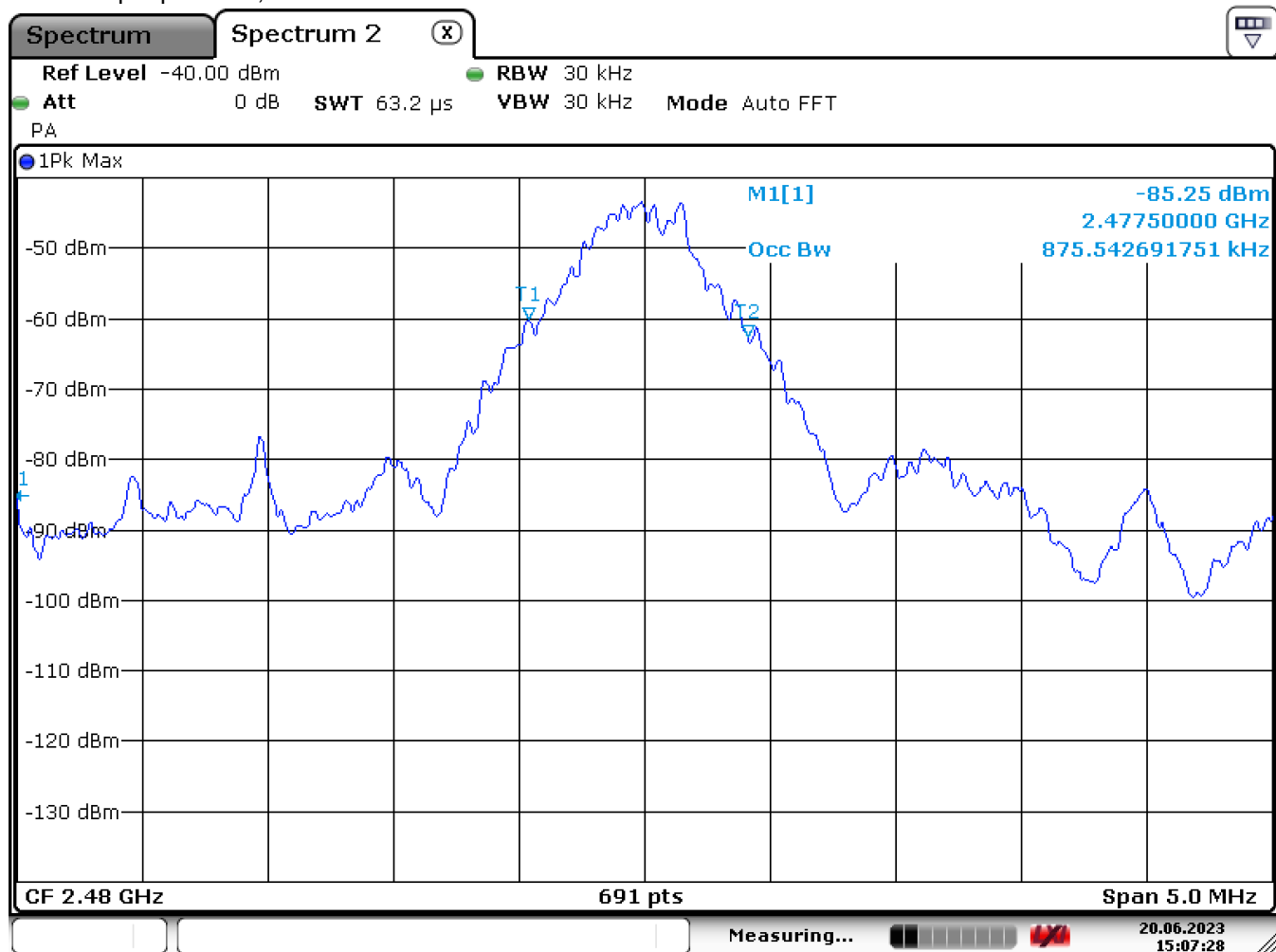
Test Equipment used: EMV-205

99% Bandwidth

ISED, RSS 247

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2480 MHz



Date: 20.JUN.2023 15:07:29

99% Bandwidth: 876 kHz

LIMIT RSS 247

None; for IC reporting purposes only

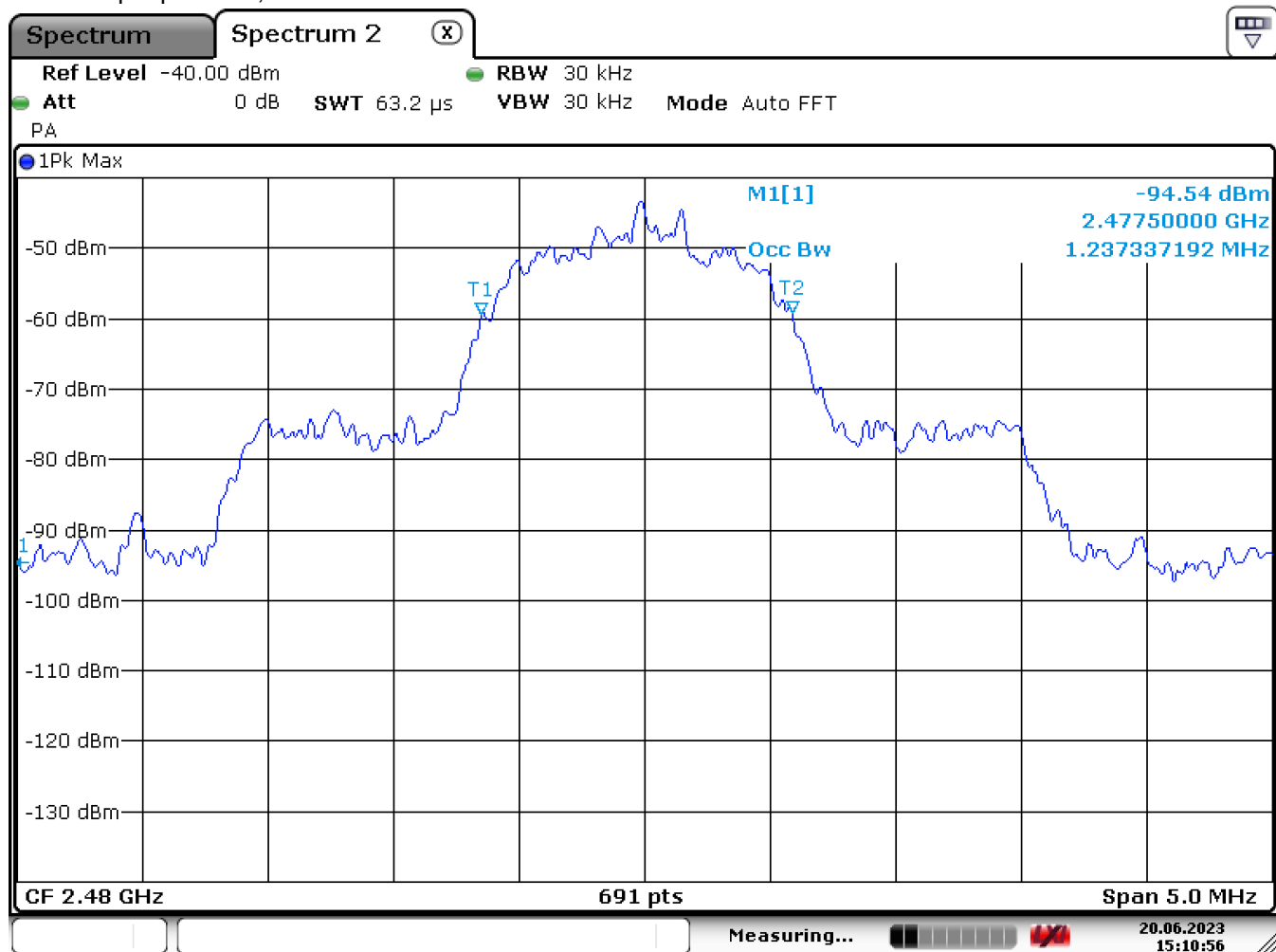
Test Equipment used: EMV-205

99% Bandwidth

ISED, RSS 247

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 4,68 mW 2480 MHz



Date: 20.JUN.2023 15:10:56

99% Bandwidth: 1237 kHz

LIMIT **RSS 247**

None; for IC reporting purposes only

Test Equipment used: EMV-205

4.5. Maximum Peak RF Power Output (EIRP)

FCC, § 15.247(b)(1)
ISED, 5.4(2)

Radiated Measurement – Mode: Bluetooth BDR

Rated output power: 4,68 mW

Test conditions		Transmitter power eirp (mW)		
		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} (24) V	1,95	3,16	4,68
Maximum deviation from rated output power under normal test conditions (dB)		-3,8	-1,7	0
Measurement uncertainty		± 0,75 dB		

LIMIT SUBCLAUSE 15.247(b)(1) – 5.4(2)

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

Test Equipment used: NT-100; NT-139; NT-207/1

Maximum Peak RF Power Output (EIRP)

FCC, § 15.247(b)(1)
ISED, 5.4(2)

Radiated Measurement – Mode: Bluetooth EDR

Rated output power: 3,80 mW

Test conditions		Transmitter power (mW)		
		2402 MHz	2441 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} (24) V	1,26	2,95	3,80
Maximum deviation from rated output power under normal test conditions (dB)		-4,8	-1,1	0
Measurement uncertainty		± 0,75 dB		

LIMIT SUBCLAUSE 15.247(b)(1) – 5.4(2)

Under normal test conditons	1W radiated (4W eirp)
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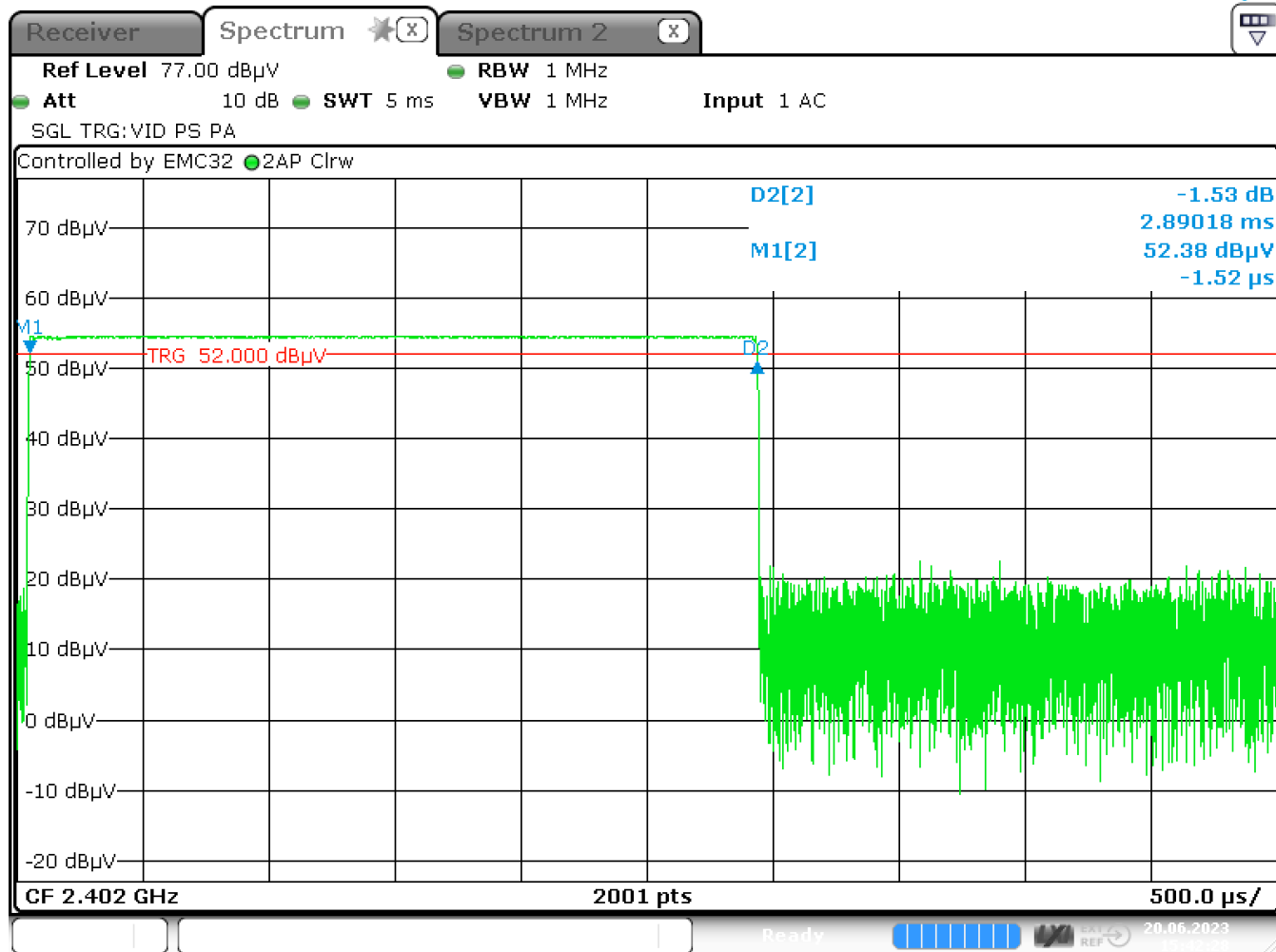
Test Equipment used: NT-100; NT-139; NT-207/1

4.6. Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2402 MHz



Date: 20.JUN.2023 15:42:28

The maximum dwell time is 2,9 ms.

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

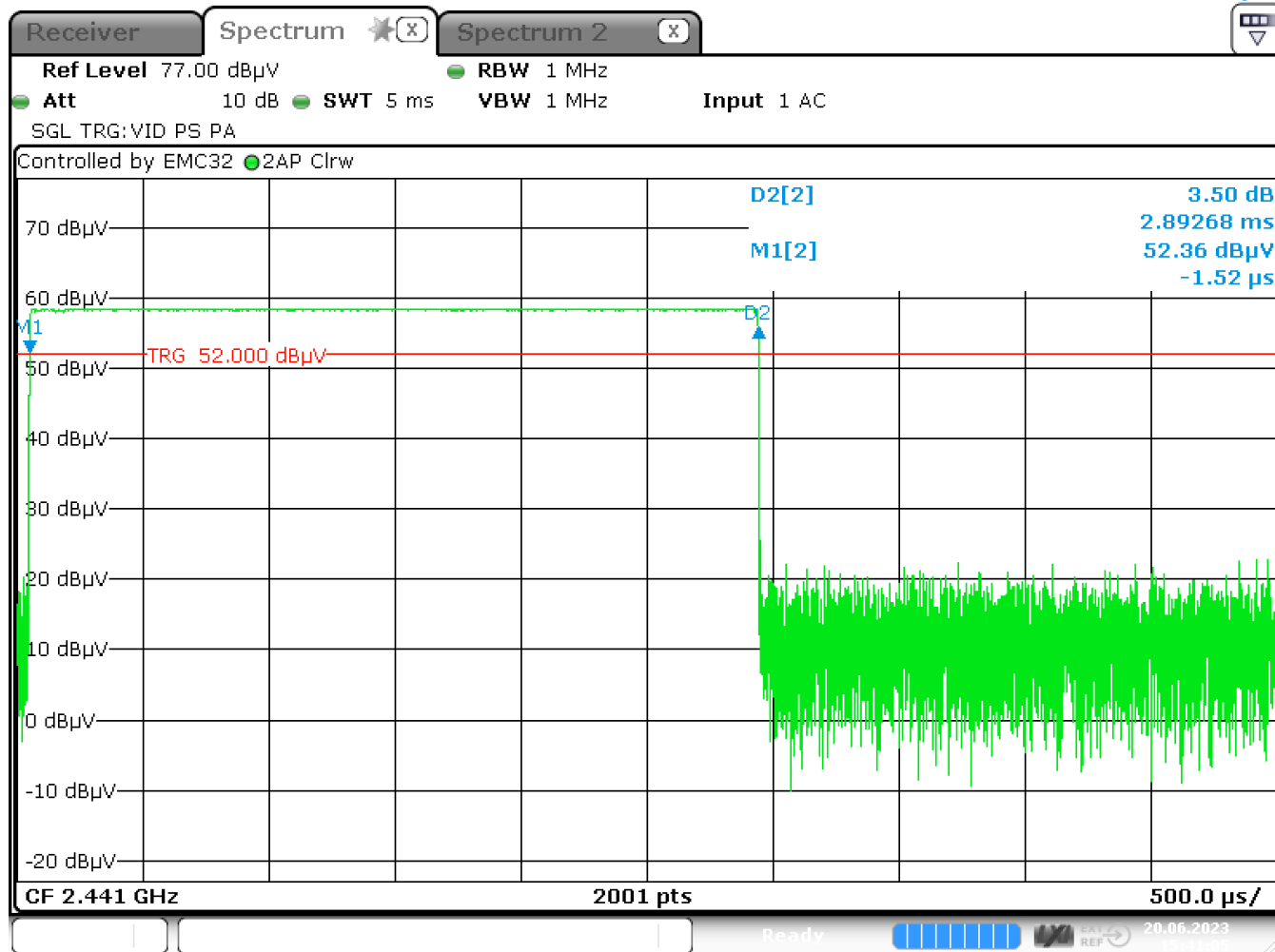
Test Equipment used: NT-100; NT-139; NT-207/1

Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2441 MHz



Date: 20.JUN.2023 15:41:05

The maximum dwell time is 2,9 ms.

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

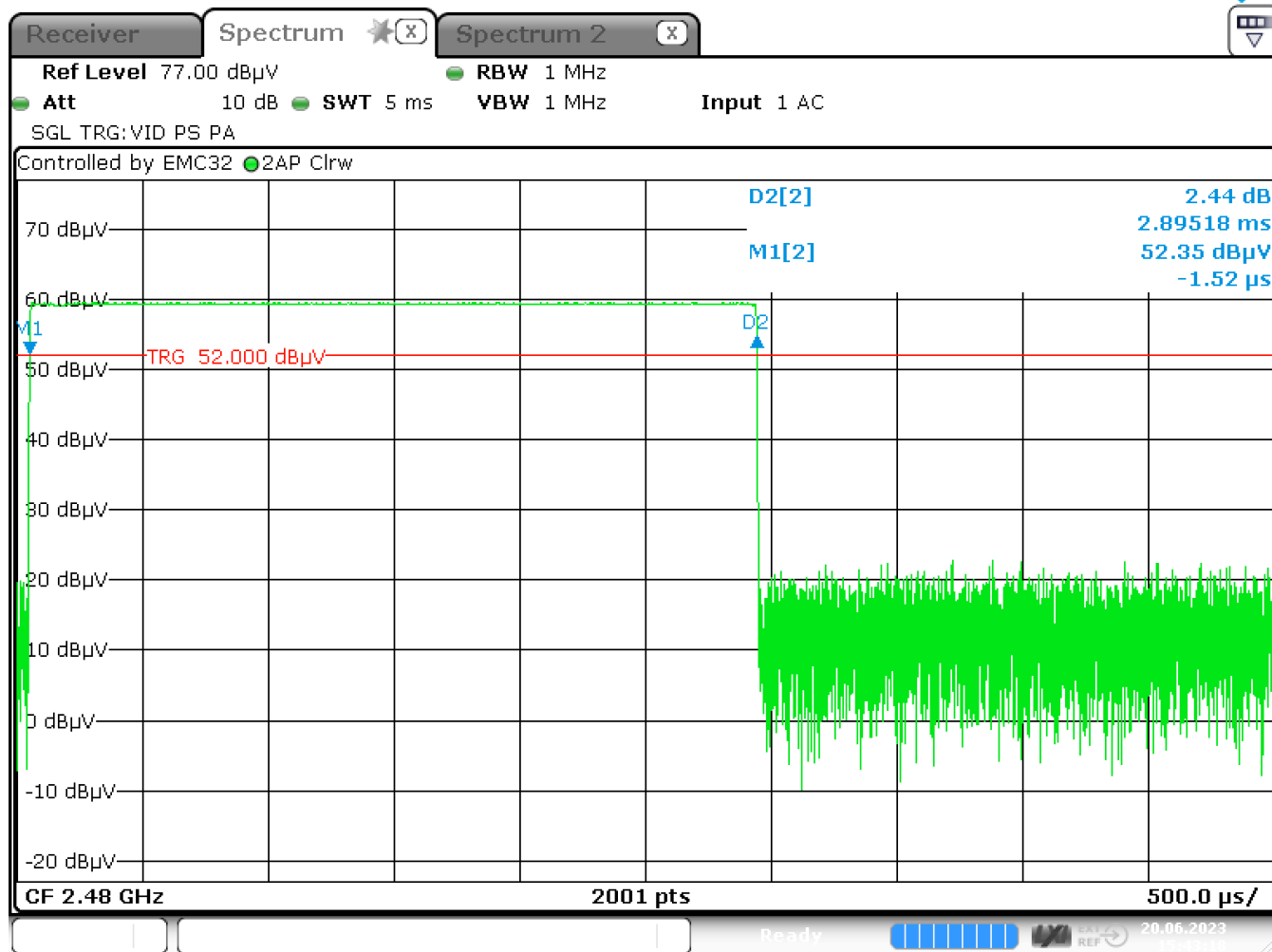
Test Equipment used: NT-100; NT-139; NT-207/1

Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW 2480 MHz



Date: 20.JUN.2023 15:43:18

The maximum dwell time is 2,9 ms.

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test Equipment used: NT-100; NT-139; NT-207/1

Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth BDR

Rated output power: 4,68 mW

	Channel 0 (2402 MHz)	Channel 39 (2441 MHz)	Channel 78 (2480 MHz)
Observed time period	79 times 0,4 Seconds = 31,6 seconds		
Time of each individual transmission	2,9 ms	2,9 ms	2,9 ms
Observed number of transmissions	107	113	110
Average time of occupancy	0,3103 seconds	0,3277 seconds	0,319 seconds

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

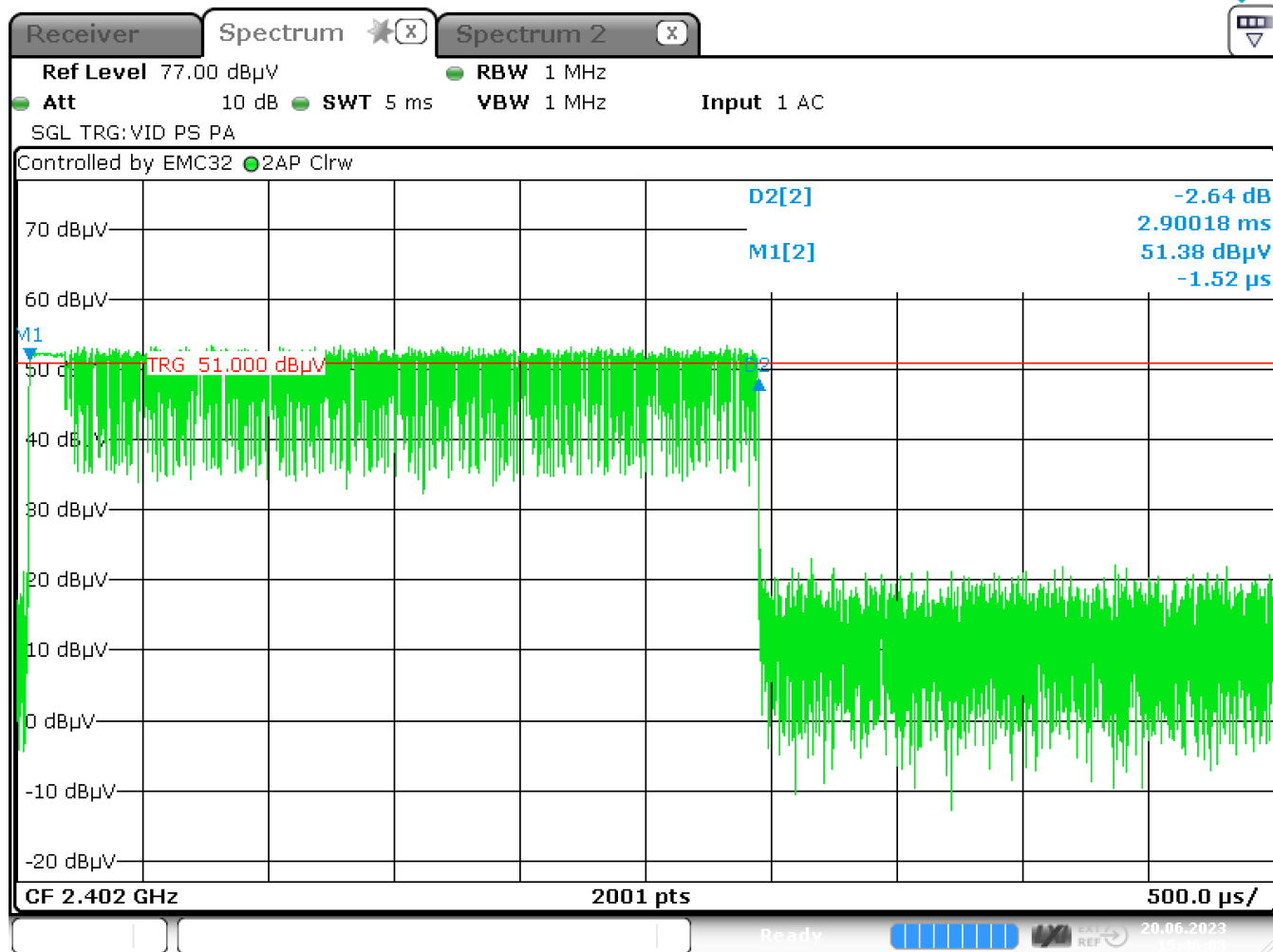
Test Equipment used: NT-100; NT-139; NT-207/1

Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 3,80 mW 2402 MHz



Date: 20.JUN.2023 15:46:04

The maximum dwell time is 2,9 ms.

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

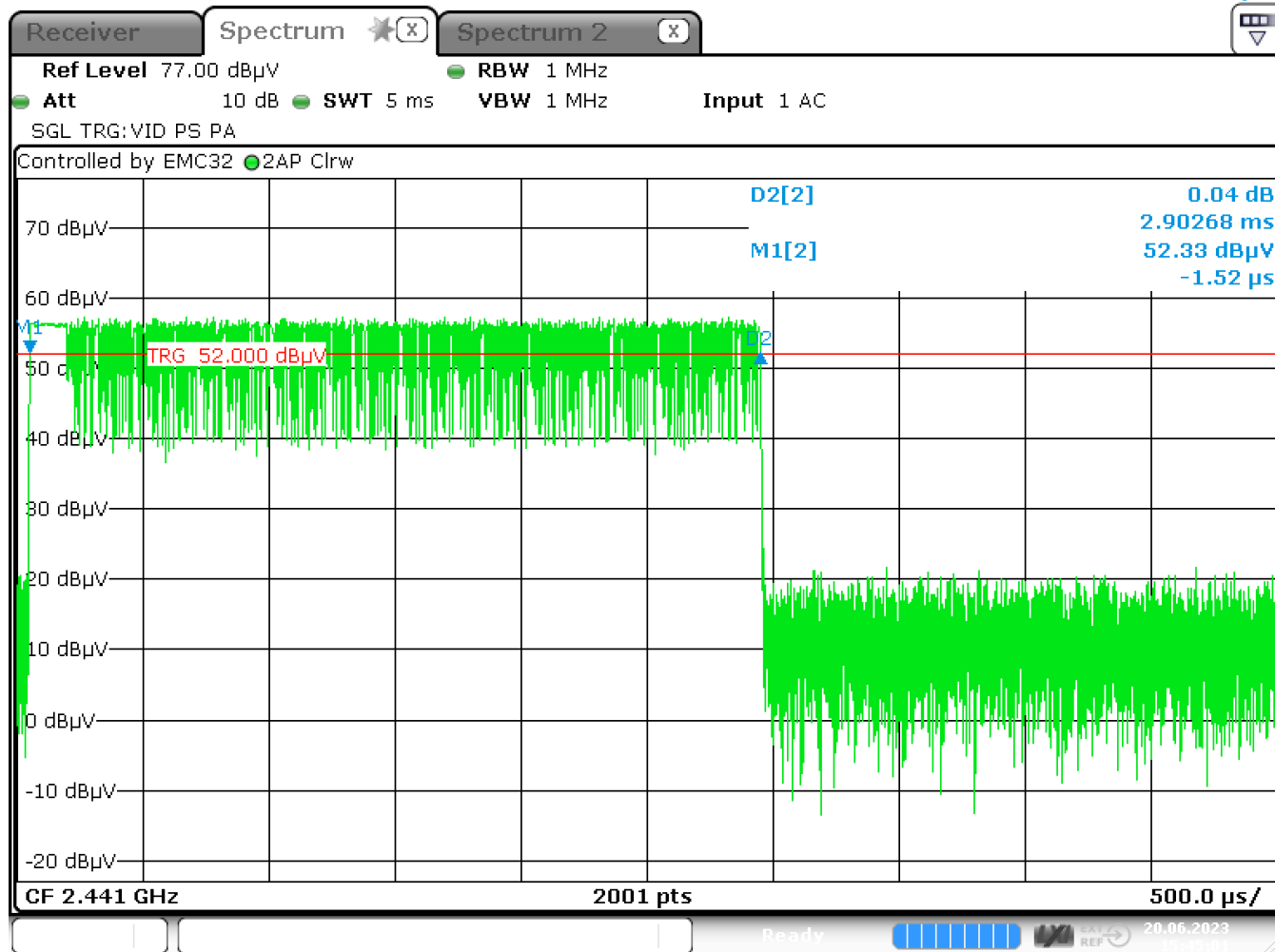
Test Equipment used: NT-100; NT-139; NT-207/1

Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 3,80 mW 2441 MHz



Date: 20.JUN.2023 15:45:02

The maximum dwell time is 2,9 ms.

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

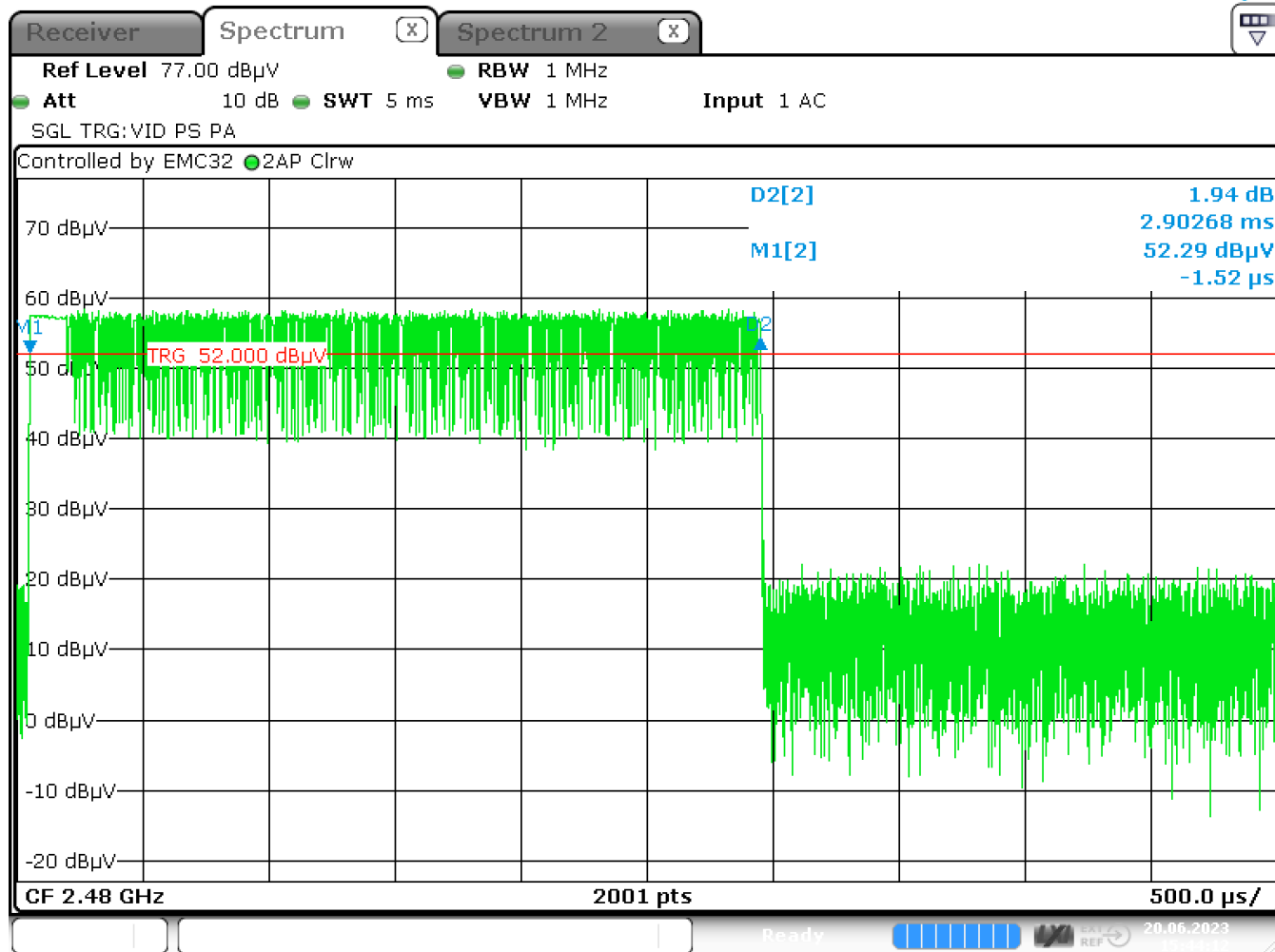
Test Equipment used: NT-100; NT-139; NT-207/1

Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 3,80 mW 2480 MHz



Date: 20.JUN.2023 15:44:12

The maximum dwell time is 2,9 ms.

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test Equipment used: NT-100; NT-139; NT-207/1

Average Time of Occupancy

FCC, § 15.247(a)(1)(iii)
ISED, 5.1(4)

Radiated Measurement - Mode: Bluetooth EDR

Rated output power: 4,68 mW

	Channel 0 (2402 MHz)	Channel 39 (2441 MHz)	Channel 78 (2480 MHz)
Observed time period	79 times 0,4 Seconds = 31,6 seconds		
Time of each individual transmission	2,9 ms	2,9 ms	2,9 ms
Observed number of transmissions	111	120	115
Average time of occupancy	0,3219 seconds	0,348 seconds	0,3335 seconds

LIMIT SUBCLAUSE 15.247(a)(1)(iii) – 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test Equipment used: NT-100; NT-139; NT-207/1

4.7. Out-of-band Emission

FCC, § 15.247(d)
ISED, 5.5

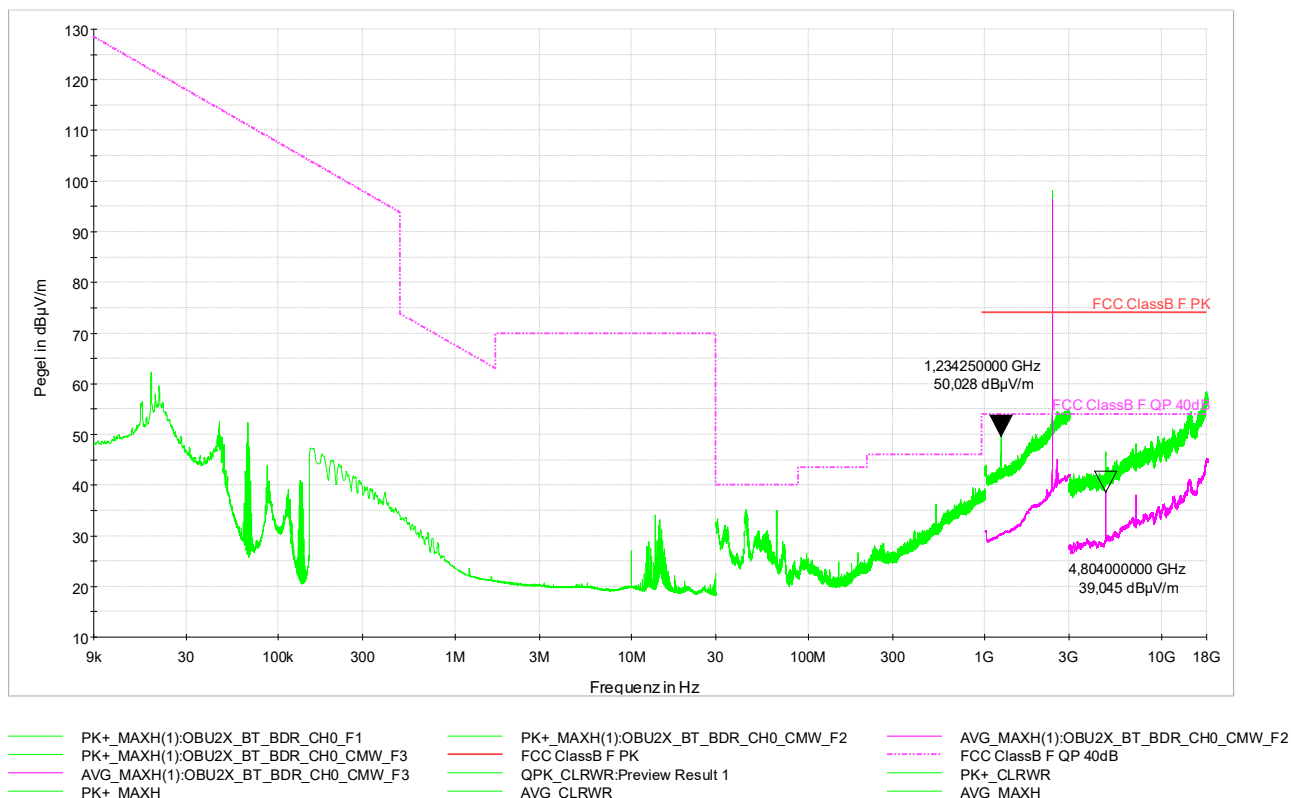
As the 15.209 Limit was kept during transmission (see chapter 4.8 of this test report), no additional tests were performed.

4.8. Emissions in restricted bands Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Mode: Bluetooth BDR – Channel 0 – 2402 MHz



Worst case emission: Average @ 4804,0 MHz: 39,05 dBμV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

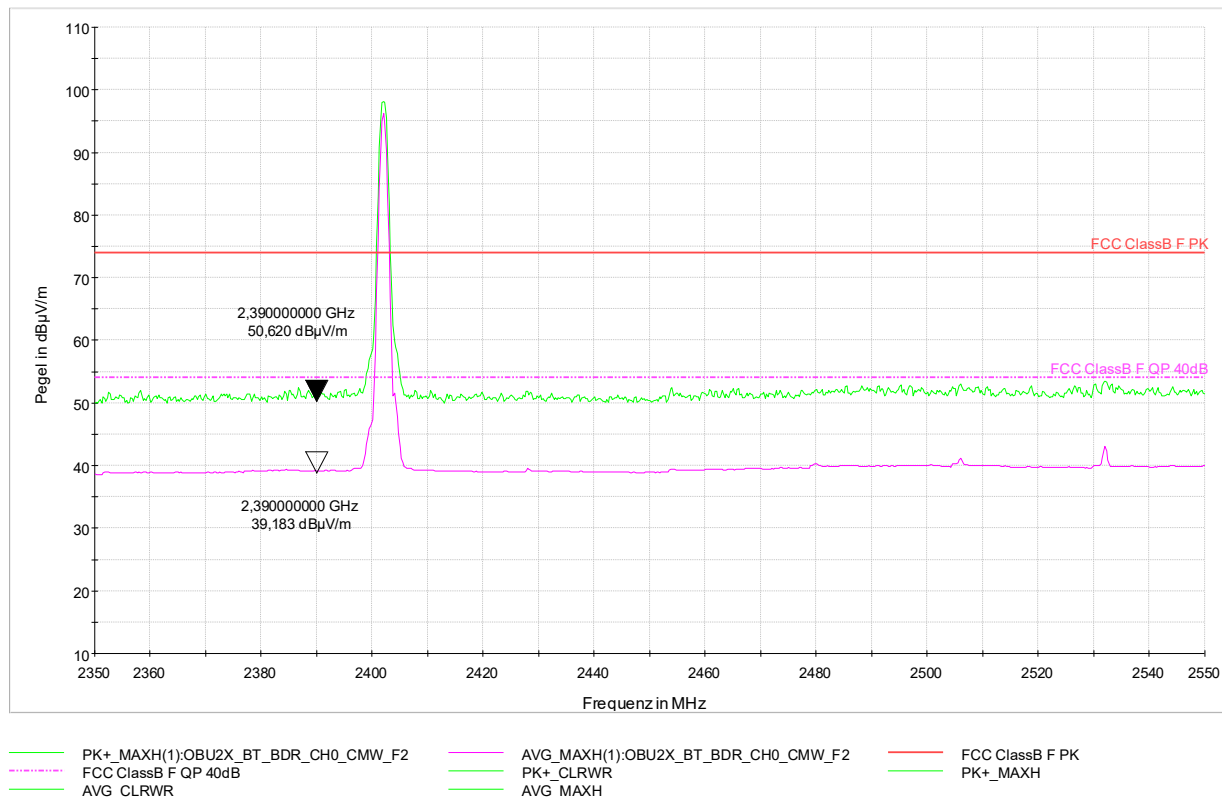
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: Bluetooth BDR – CH 0: 2402 MHz



The emission at above the limit line is the Bluetooth intended transmission for which the displayed limit is not applicable. Device PASSED the test.

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.

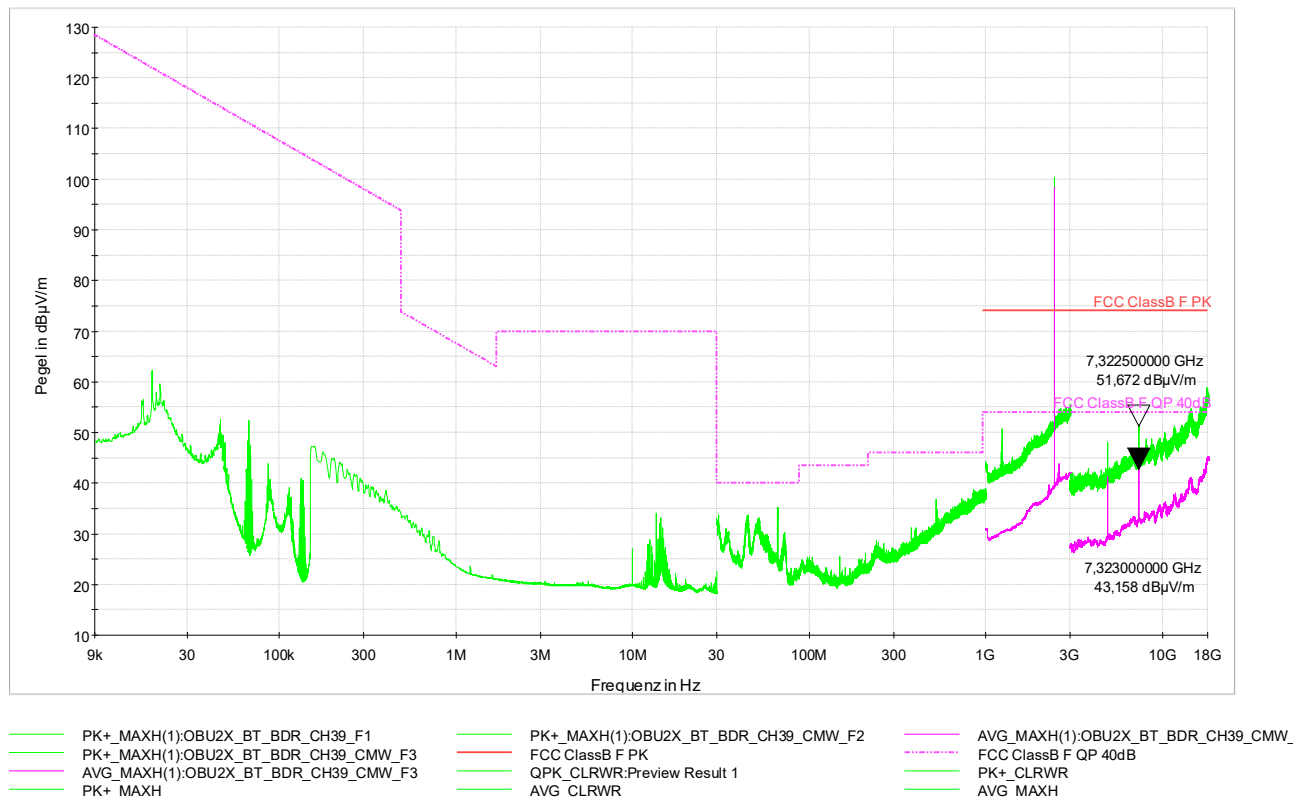
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Mode: Bluetooth BDR – Channel 39 – 2441 MHz



Worst case emission: Average @ 7323,0 MHz: 43,16 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

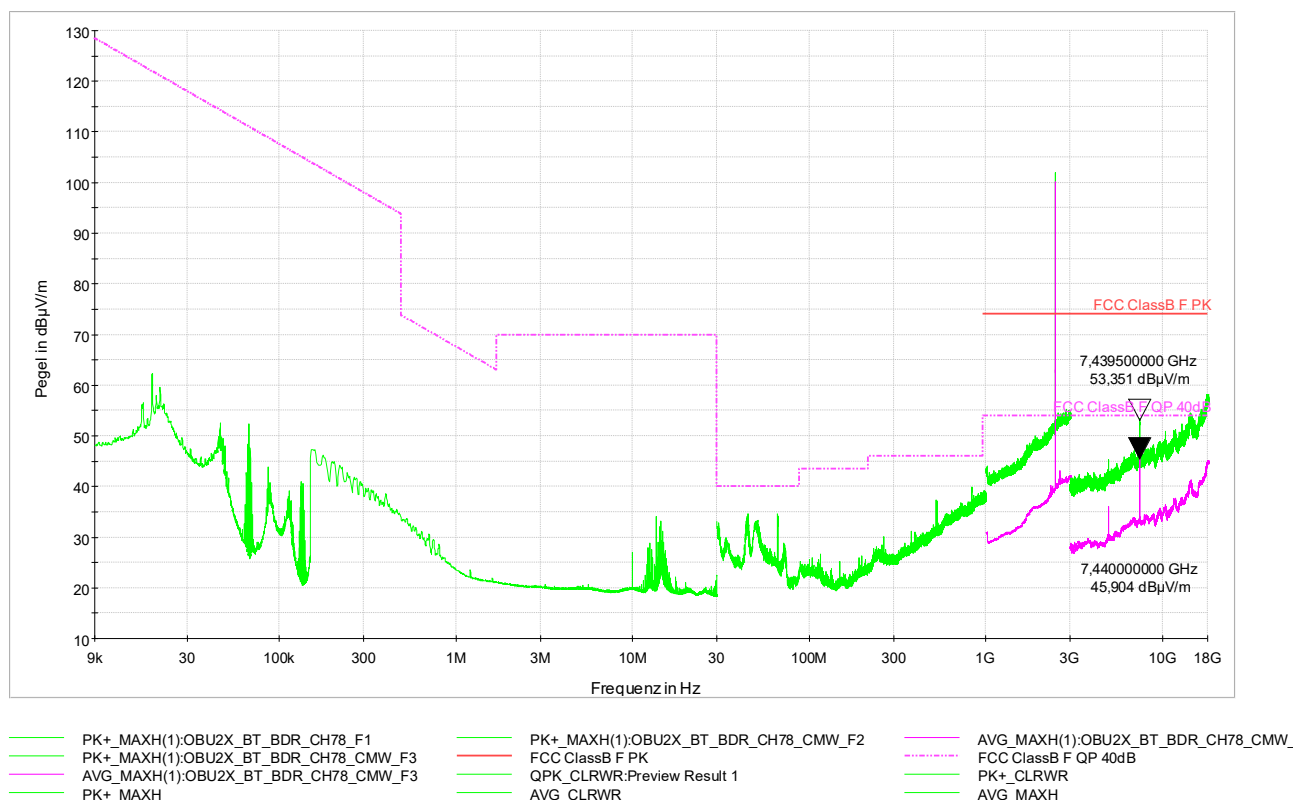
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Mode: Bluetooth BDR – Channel 78 – 2480 MHz



Worst case emission: Average @ 7440,0 MHz: 45,9 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

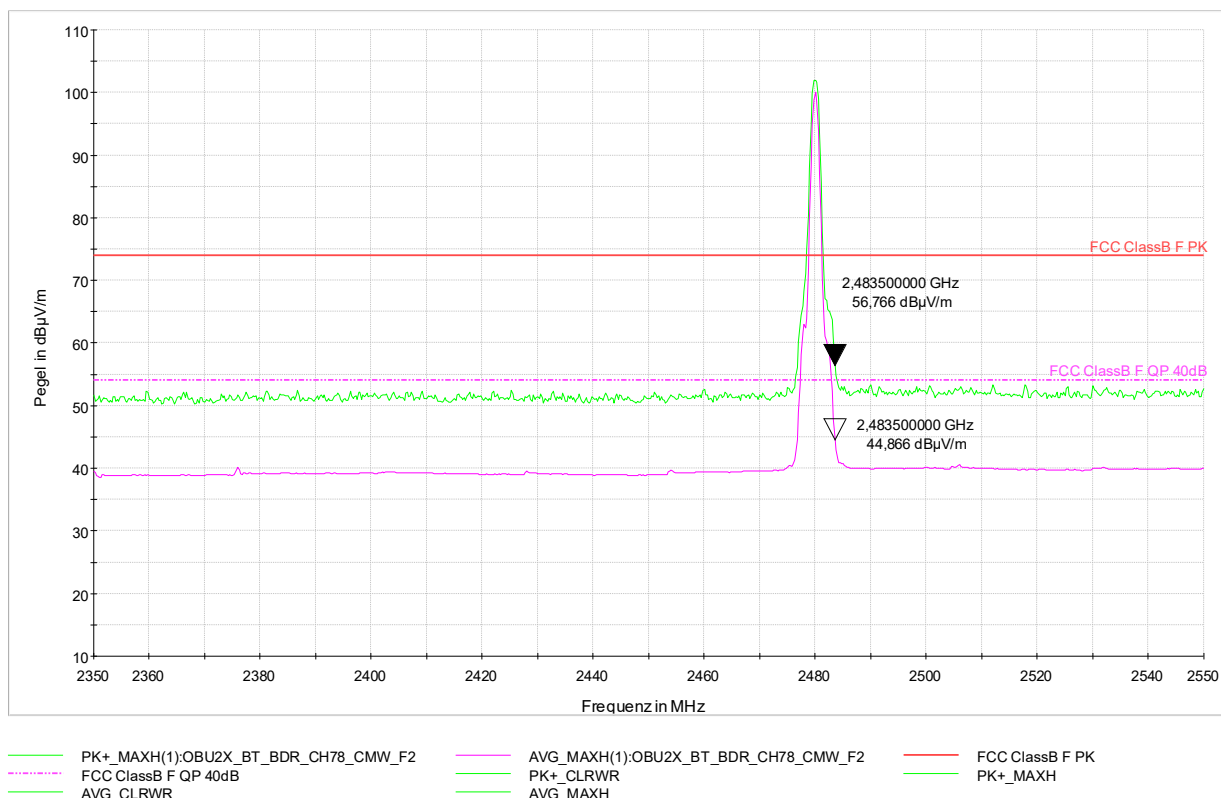
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: Bluetooth BDR – CH 78: 2480 MHz



The emission at above the limit line is the Bluetooth intended transmission for which the displayed limit is not applicable. Device PASSED the test.

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.

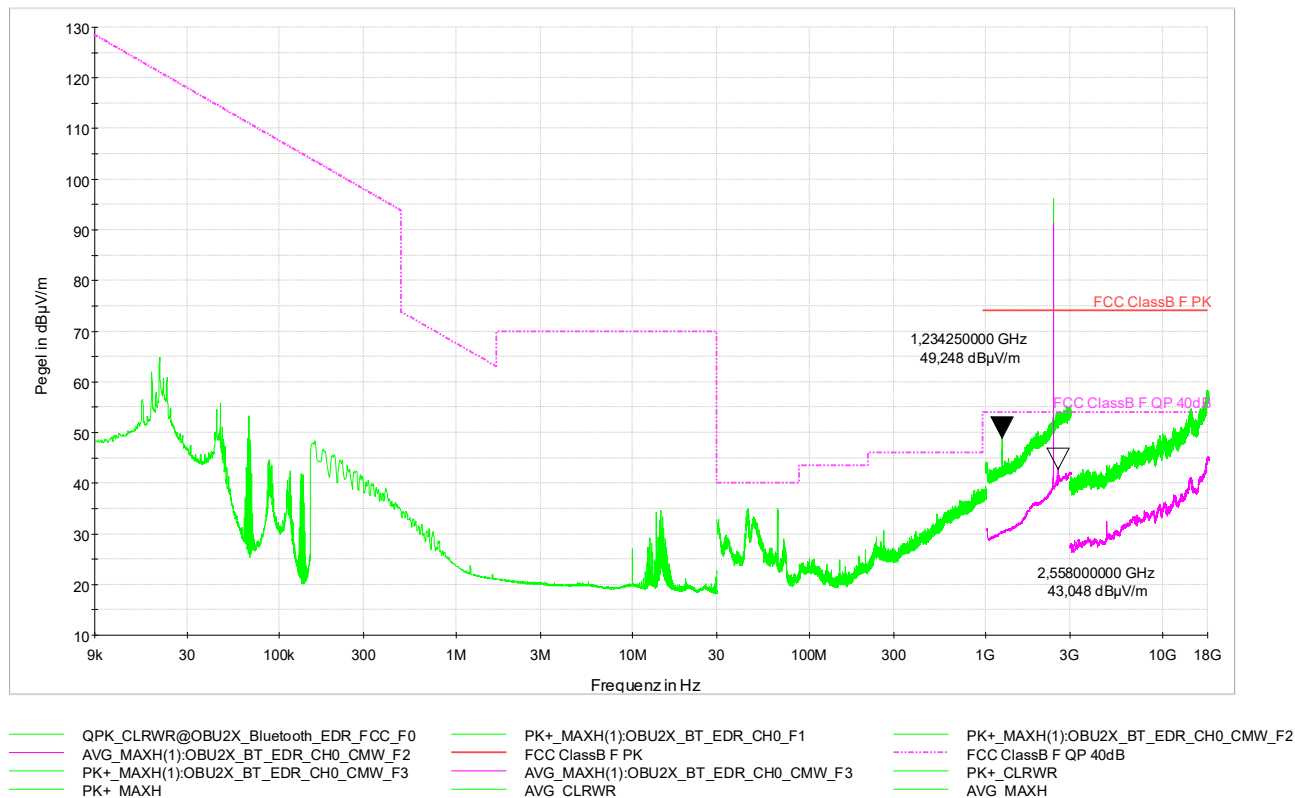
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Mode: Bluetooth EDR – Channel 0 – 2402 MHz



Worst case emission: Average @ 2558,0 MHz: 43,05 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

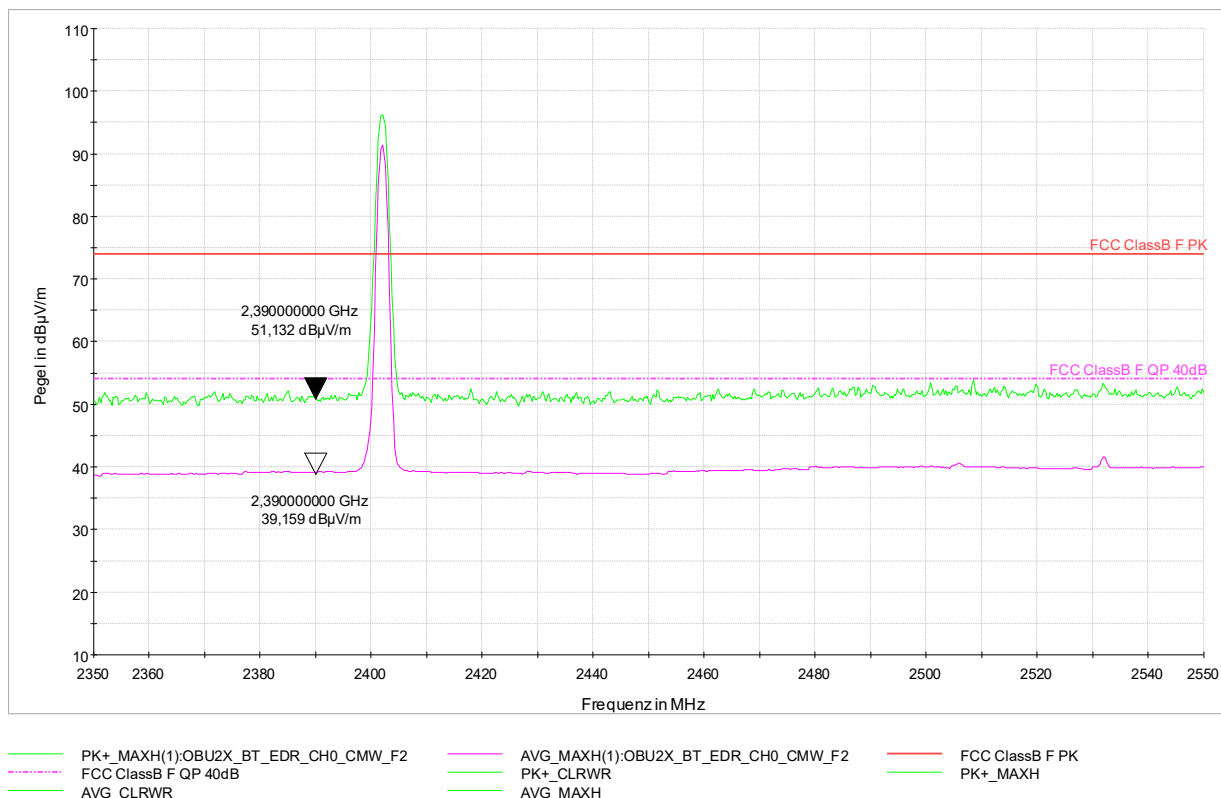
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: Bluetooth EDR – CH 0: 2402 MHz



The emission at above the limit line is the Bluetooth intended transmission for which the displayed limit is not applicable. Device PASSED the test.

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.

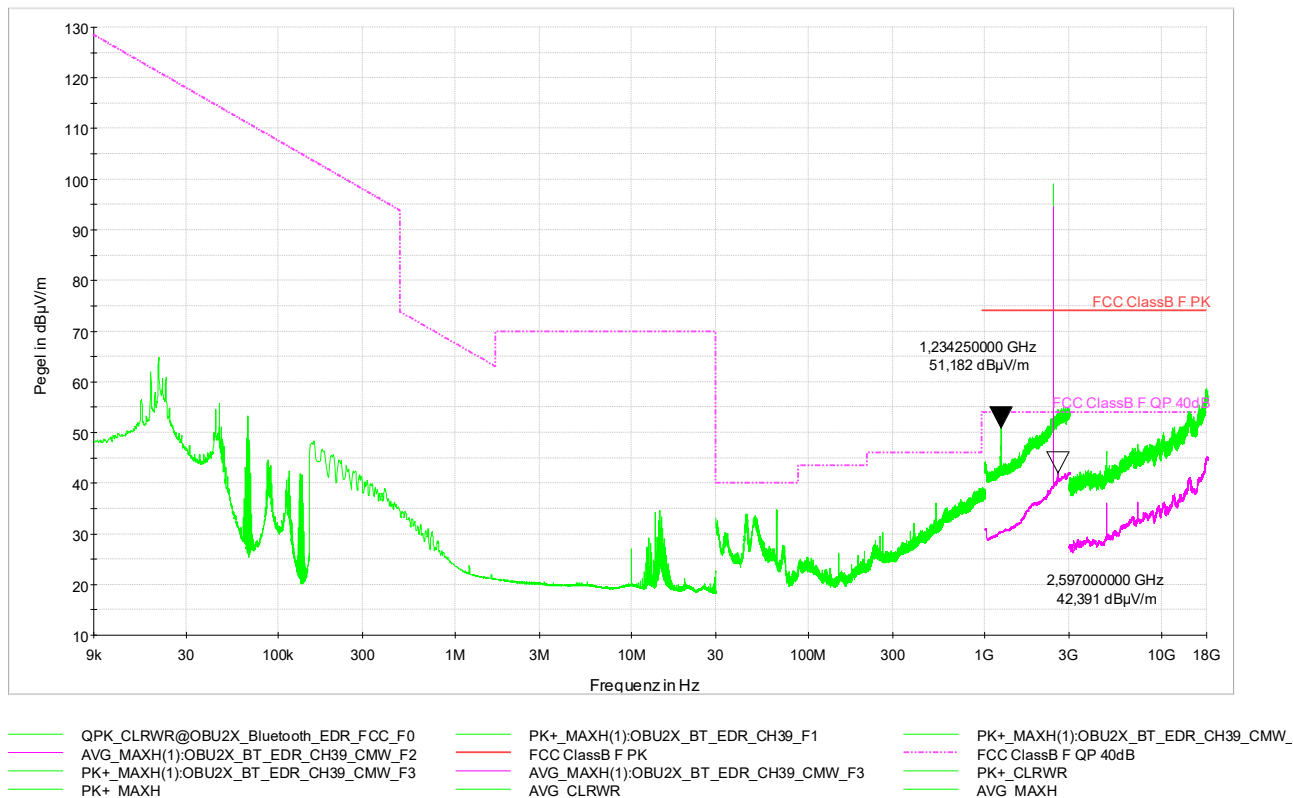
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Mode: Bluetooth EDR – Channel 39 – 2441 MHz



Worst case emission: Average @ 2597,0 MHz: 42,39 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

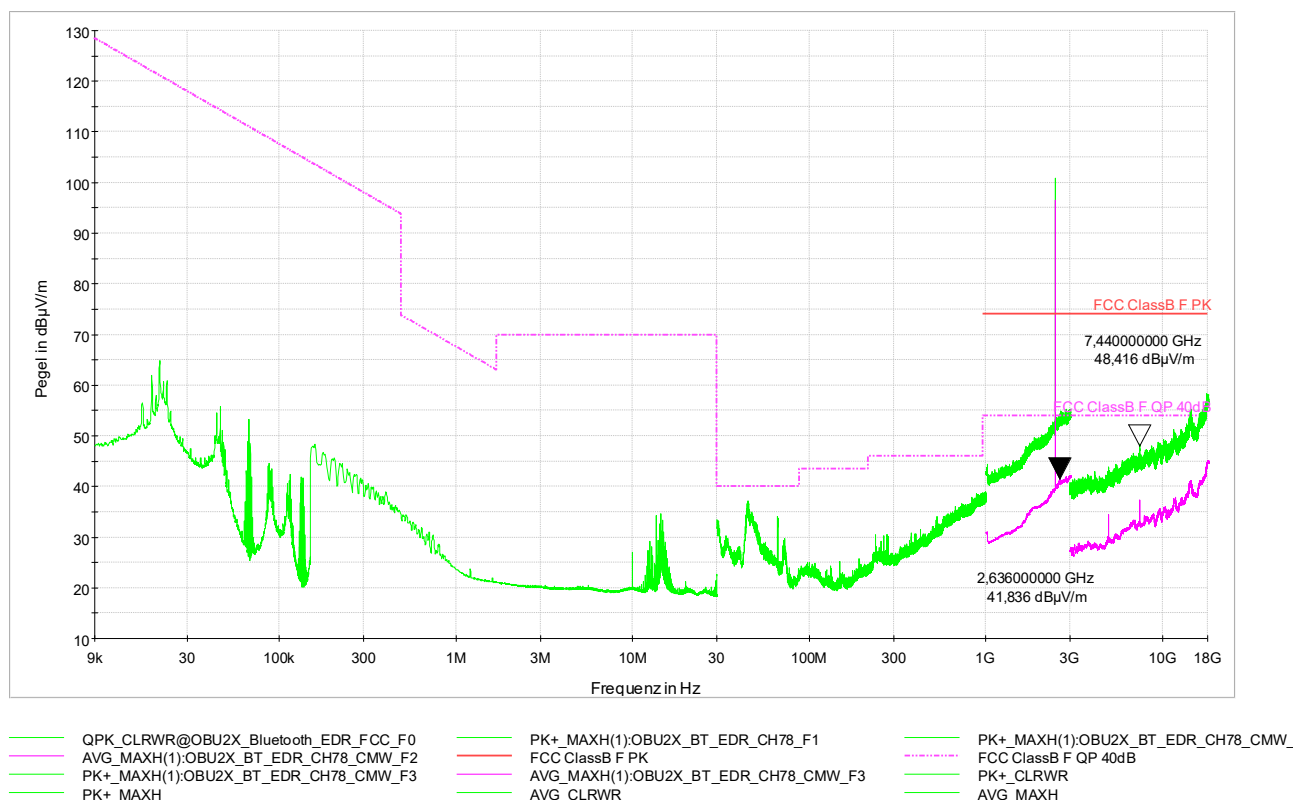
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Mode: Bluetooth EDR – Channel 78 – 2480 MHz



Worst case emission: Average @ 2636,0 MHz: 41,84 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands

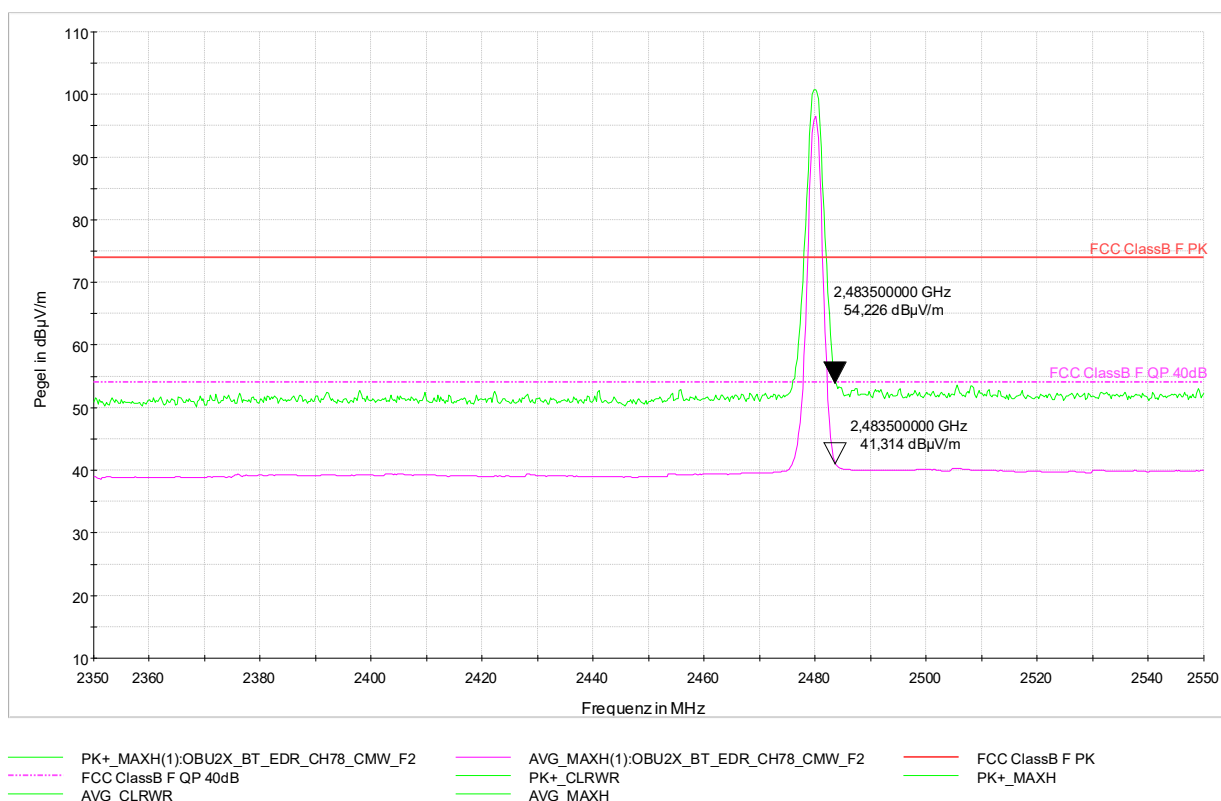
Emissions falling within restricted frequency bands

FCC, § 15.209(a)

ISED, RSS-Gen

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

Setup: Bluetooth EDR – CH 78: 2480 MHz



The emission at above the limit line is the Bluetooth intended transmission for which the displayed limit is not applicable. Device PASSED the test.

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: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

4.9. Number of channels and channel spacing **FCC, § 2.1033**

Radiated Measurement

Rated output power: 7,41 mW

There are 40 Channels used starting at 2402 till 2480 MHz each separated by 2 MHz channel spacing.

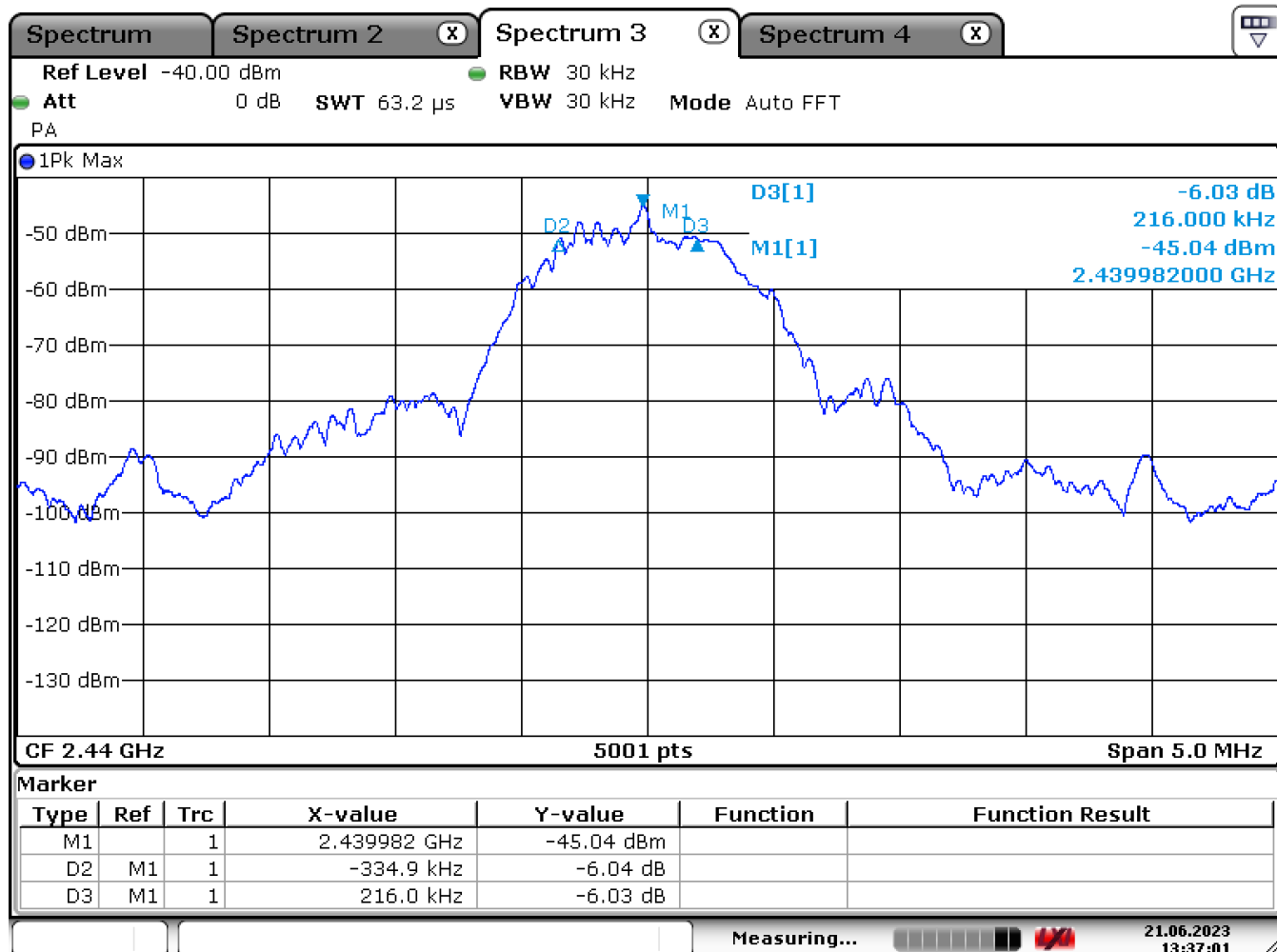
Test Equipment used: N/A

6 dB Bandwidth

FCC, § 15.247(a)(2)
ISED, 5.2.a)

Radiated Measurement

Rated output power: 7,41 mW Channel 19 (2440 MHz center frequency)



Date: 21.JUN.2023 13:37:01

6dB Bandwidth: 551 kHz

LIMIT **SUBCLAUSE 15.247(e) – 5.2.a)**

Under normal test conditons	6 dB Bandwidth at least 500 kHz
-----------------------------	---------------------------------

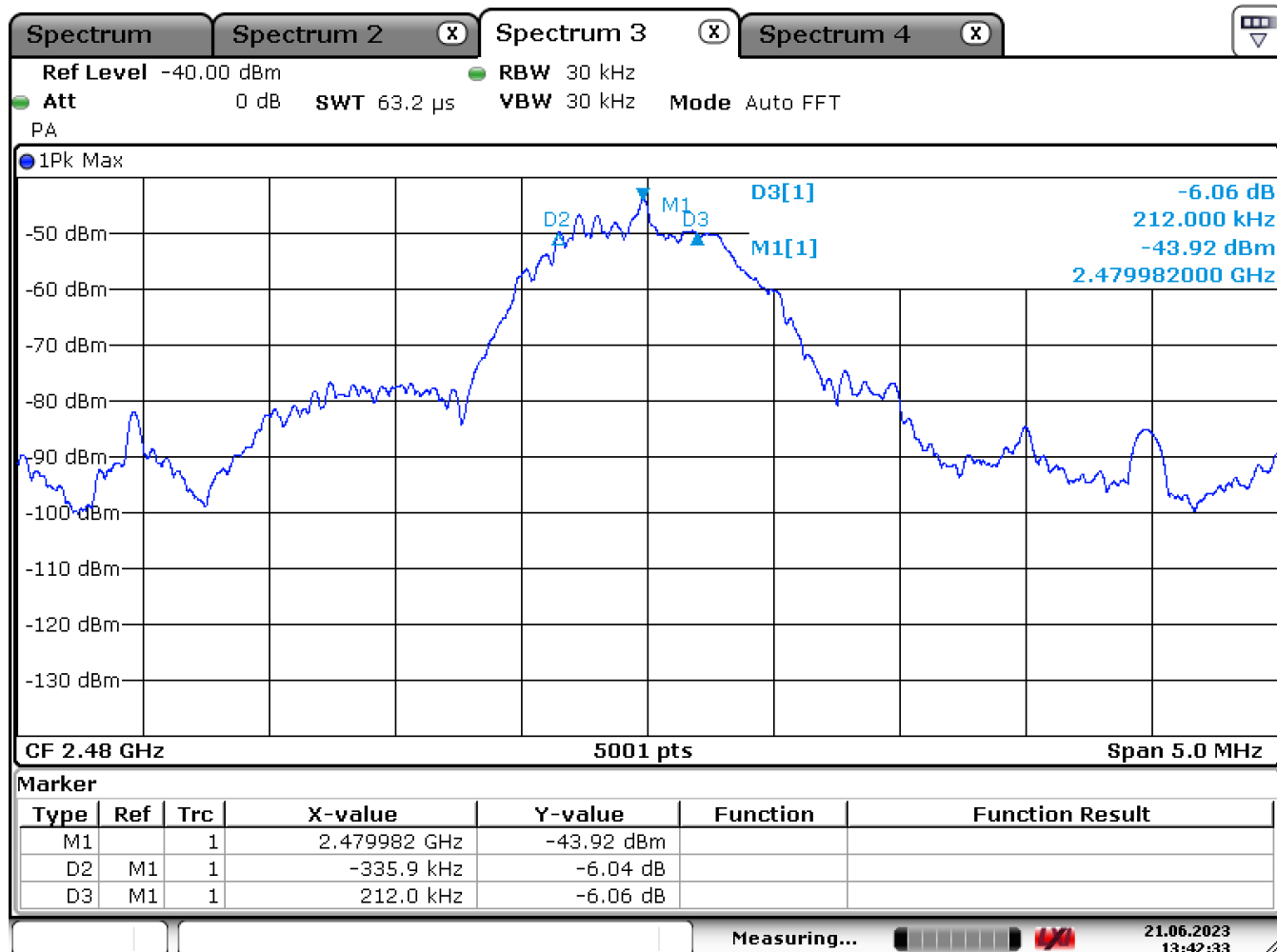
Test Equipment used: EMV-205

6 dB Bandwidth

FCC, § 15.247(a)(2)
ISED, 5.2.a)

Radiated Measurement

Rated output power: 7,41 mW Channel 39 (2480 MHz center frequency)



Date: 21.JUN.2023 13:42:33

6dB Bandwidth: 548 kHz

LIMIT SUBCLAUSE 15.247(e) – 5.2.a)

Under normal test conditons	6 dB Bandwidth at least 500 kHz
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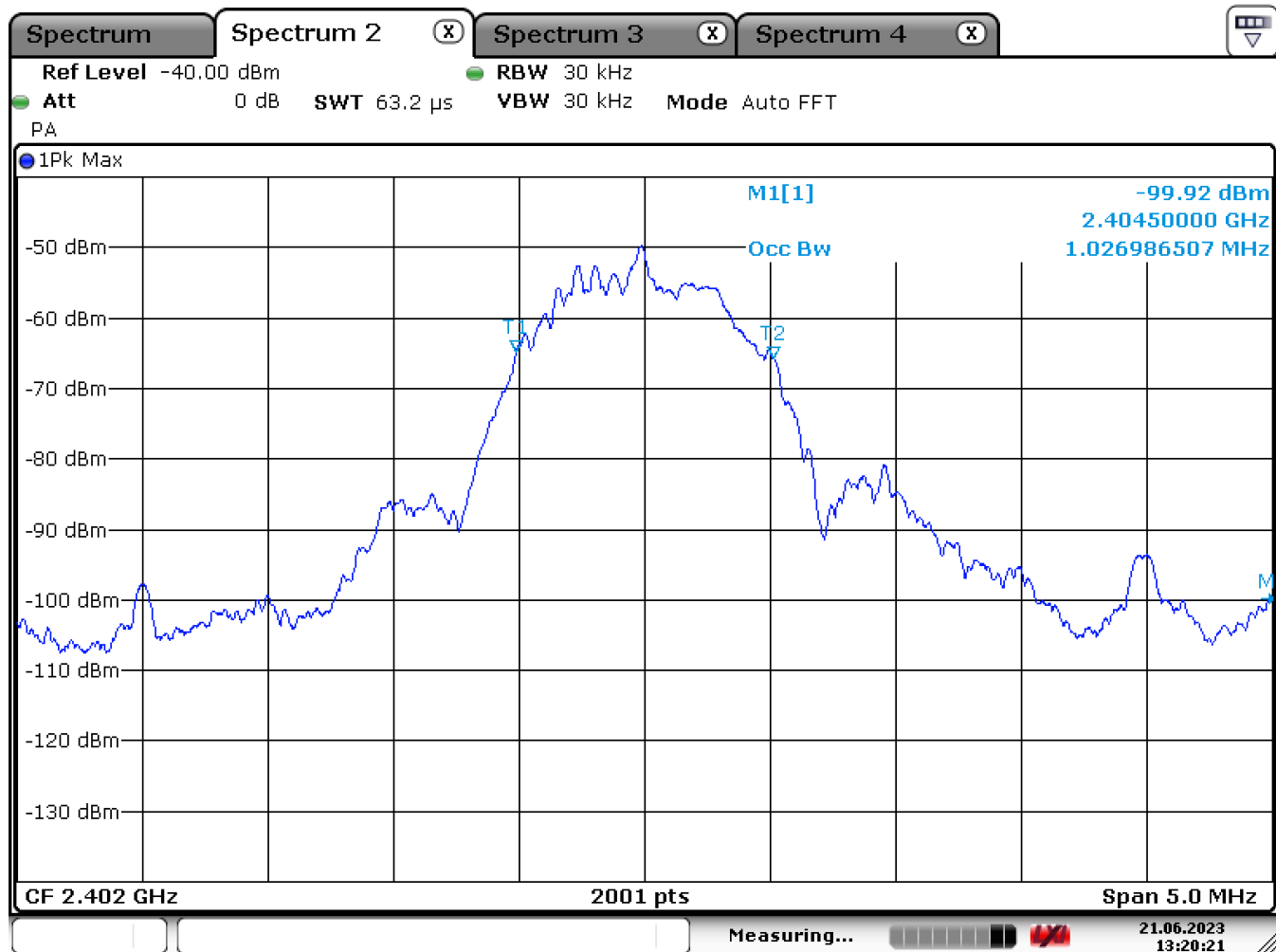
Test Equipment used: EMV-205

4.11. 99% Bandwidth

ISED, RSS 247

Radiated Measurement

Rated output power: 7,41 mW Channel 0 (2402 MHz center frequency)



Date: 21.JUN.2023 13:20:22

99% Bandwidth: 1027 kHz

LIMIT **RSS 247**

None; for IC reporting purposes only

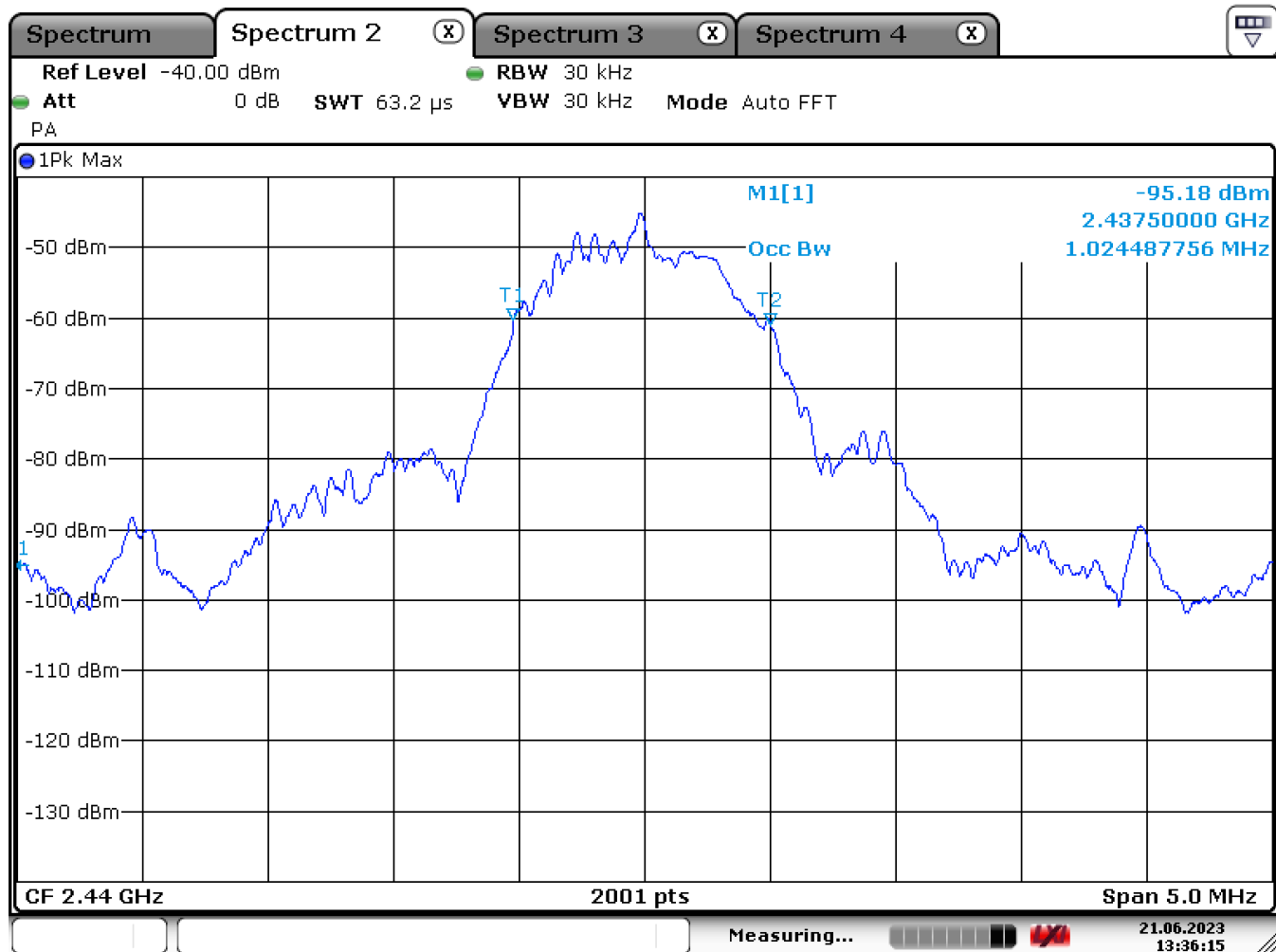
Test Equipment used: EMV-205

99% Bandwidth

ISED, RSS 247

Radiated Measurement

Rated output power: 7,41 mW Channel 19 (2440 MHz center frequency)



Date: 21.JUN.2023 13:36:15

99% Bandwidth: 1025 kHz

LIMIT **RSS 247**

None; for IC reporting purposes only

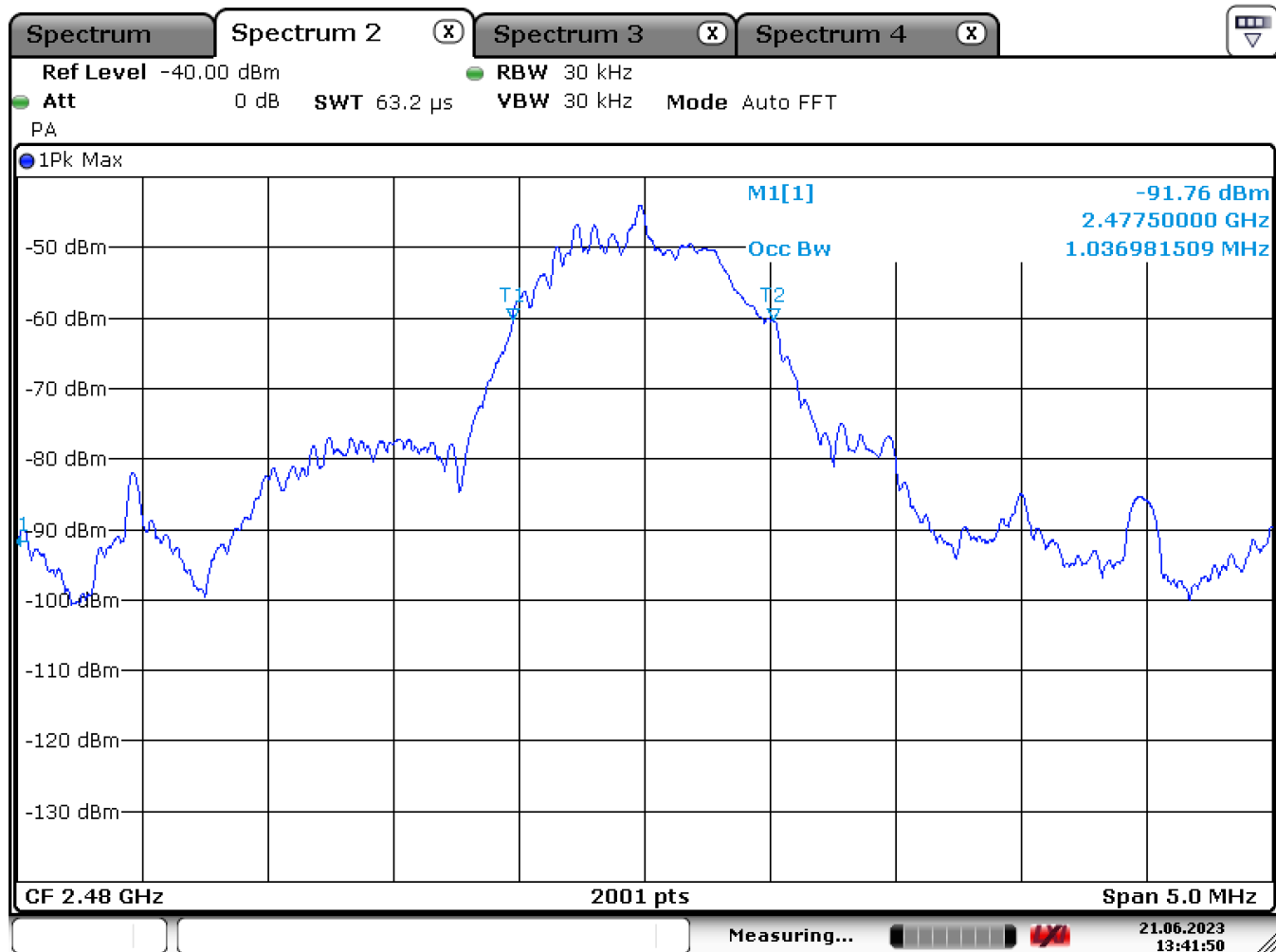
Test Equipment used: EMV-205

99% Bandwidth

ISED, RSS 247

Radiated Measurement

Rated output power: 7,41 mW Channel 39 (2480 MHz center frequency)



Date: 21.JUN.2023 13:41:50

99% Bandwidth: 1037 kHz

LIMIT **RSS 247**

None; for IC reporting purposes only

Test Equipment used: EMV-205

4.12. Maximum Peak RF Power Output (radiated)

FCC, § 15.247(b)(3)
ISED, 5.4.4

Radiated Measurement - EIRP

Rated output power: 7,41 mW

Test conditions		Transmitter power (mW)		
		2402 MHz	2440 MHz	2480 MHz
T _{nom} (23)°C	V _{nom} (24) V	2,19	3,80	7,41
Maximum deviation from rated output power under normal test conditions (dB)		-5,3	-2,9	0
Measurement uncertainty		± 0,75 dB		

LIMIT SUBCLAUSE 15.247(b)(3) – 5.4.4

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

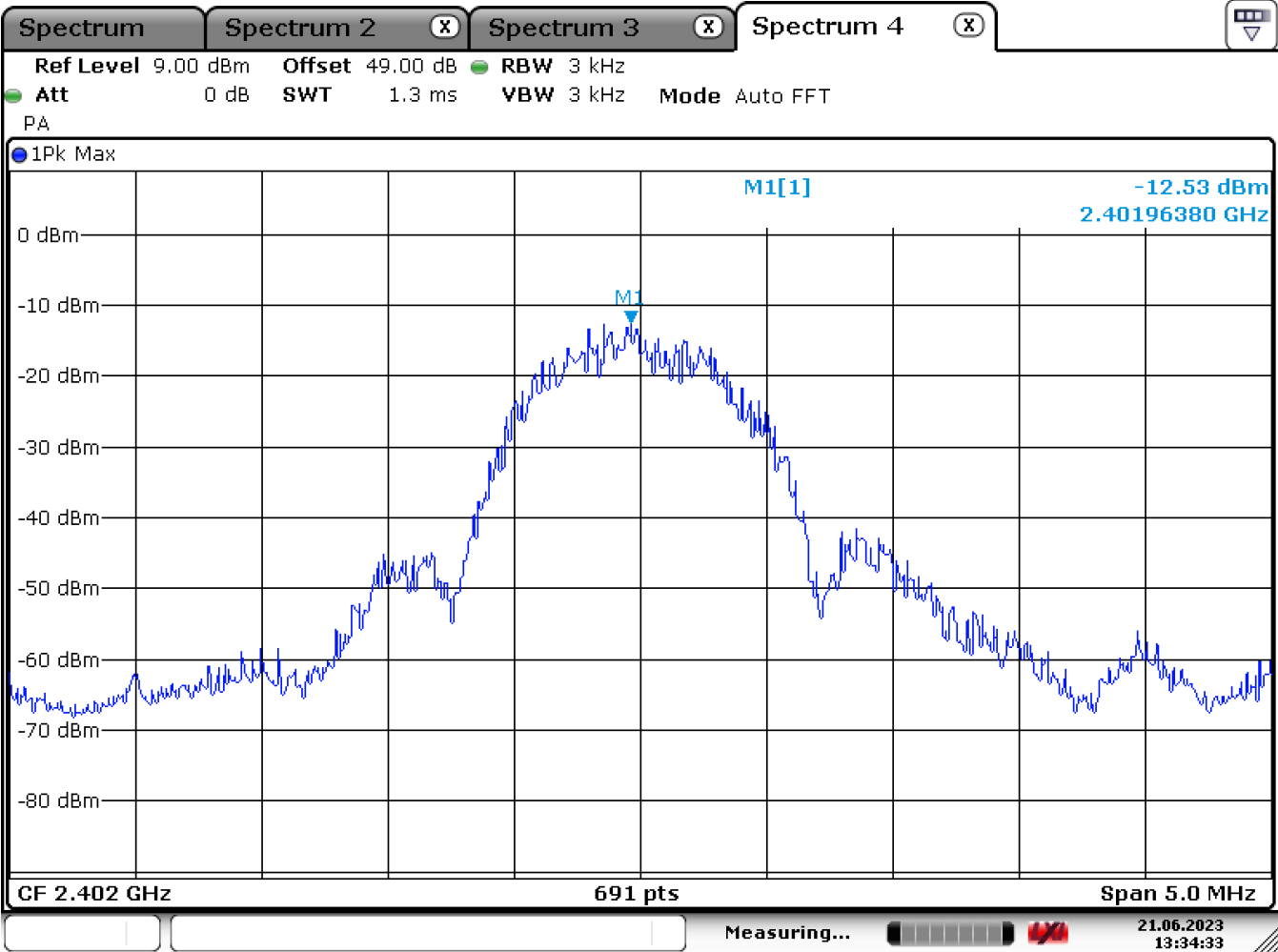
Test Equipment used: NT-100; NT-139; NT-207/1

4.13. Power spectral density (radiated)

FCC, § 15.247(e)
ISED, 5.2.2

Radiated Measurement

Rated output power: 7,41 mW Channel 0 (2402 MHz center frequency)



Date: 21.JUN.2023 13:34:34

Power Spectral density: -12,53 dBm @ 2401,964 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2 b)

Under normal test conditons	+8dBm in any 3 kHz band
-----------------------------	-------------------------

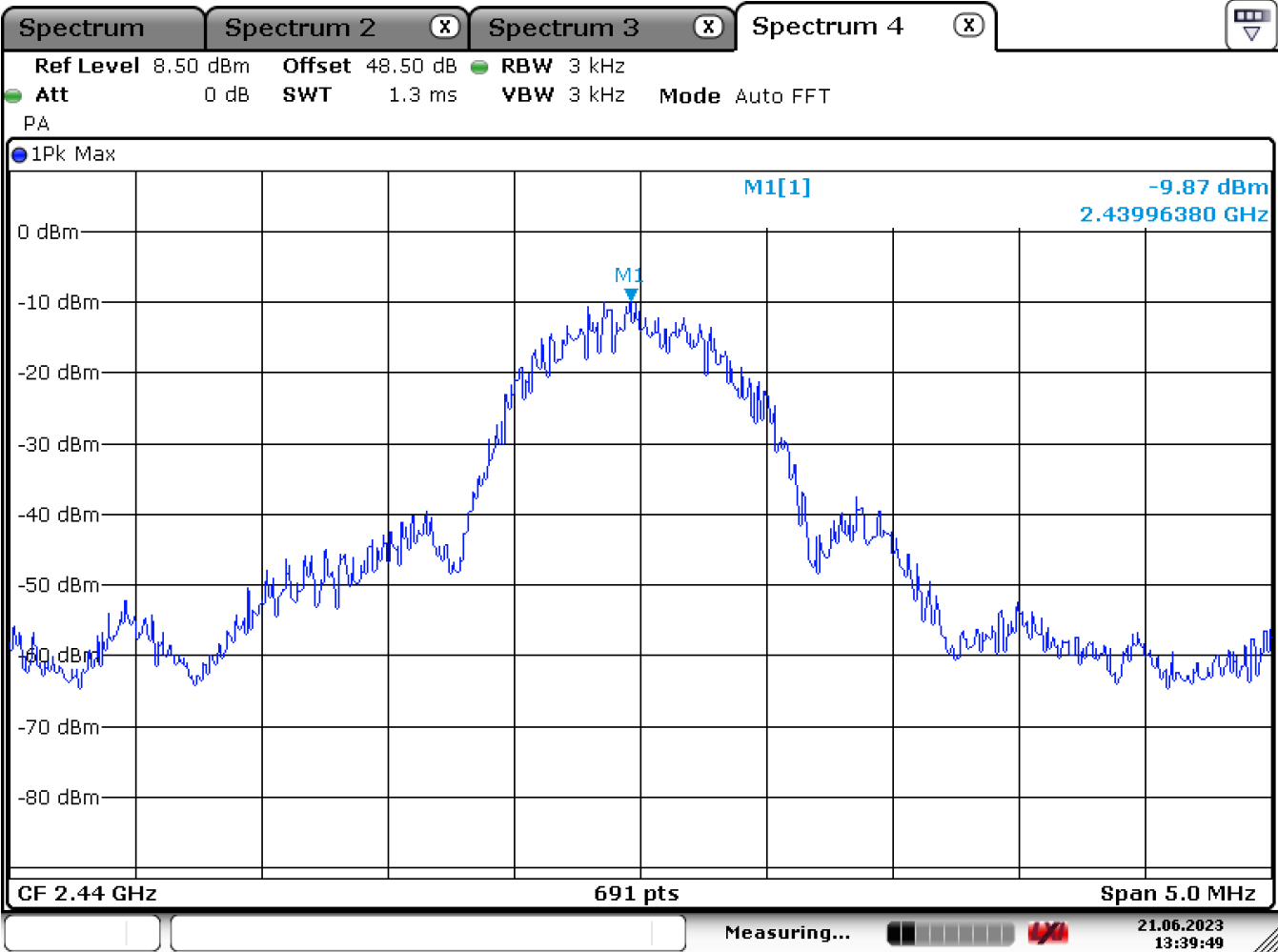
Test Equipment used: EMV-205

Power spectral density (radiated)

FCC, § 15.247(e)
ISED, 5.2 b)

Radiated Measurement

Rated output power: 7,41 mW Channel 19 (2440 MHz center frequency)



Date: 21.JUN.2023 13:39:49

Power Spectral density: -9,87 dBm @ 2439,964 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2 b)

Under normal test conditons	+8dBm in any 3 kHz band
-----------------------------	-------------------------

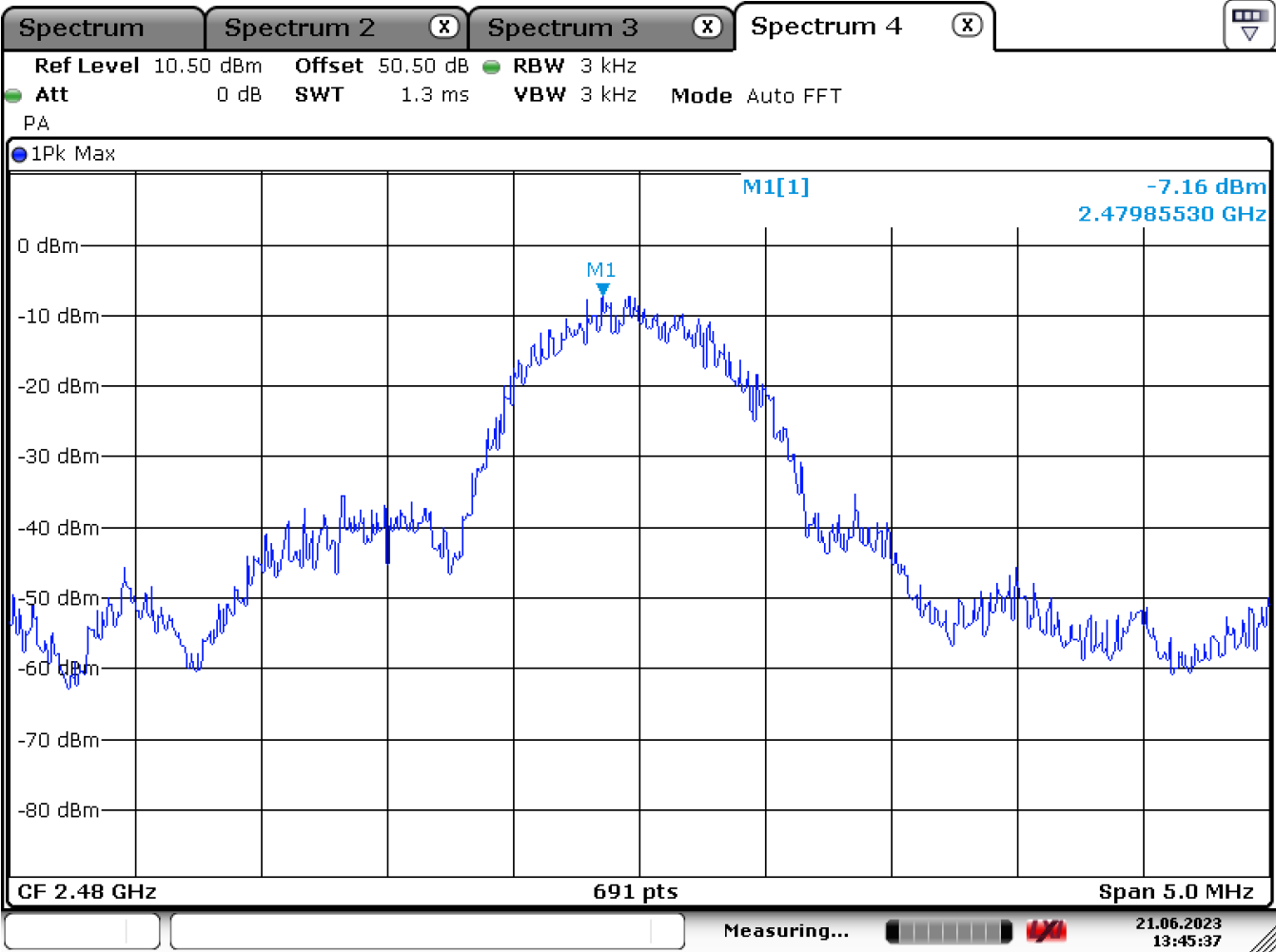
Test Equipment used: EMV-205

Power spectral density (radiated)

FCC, § 15.247(e)
ISED, 5.2 b)

Radiated Measurement

Rated output power: 7,41 mW Channel 39 (2480 MHz center frequency)



Date: 21.JUN.2023 13:45:38

Power Spectral density: -7,16 dBm @ 2479,855 MHz

LIMIT SUBCLAUSE 15.247(e) – 5.2 b)

Under normal test conditons	+8dBm in any 3 kHz band
-----------------------------	-------------------------

Test Equipment used: EMV-205

4.14. Out-of-band Emission Unwanted Emissions

FCC, § 15.247(d)
ISED, 5.5

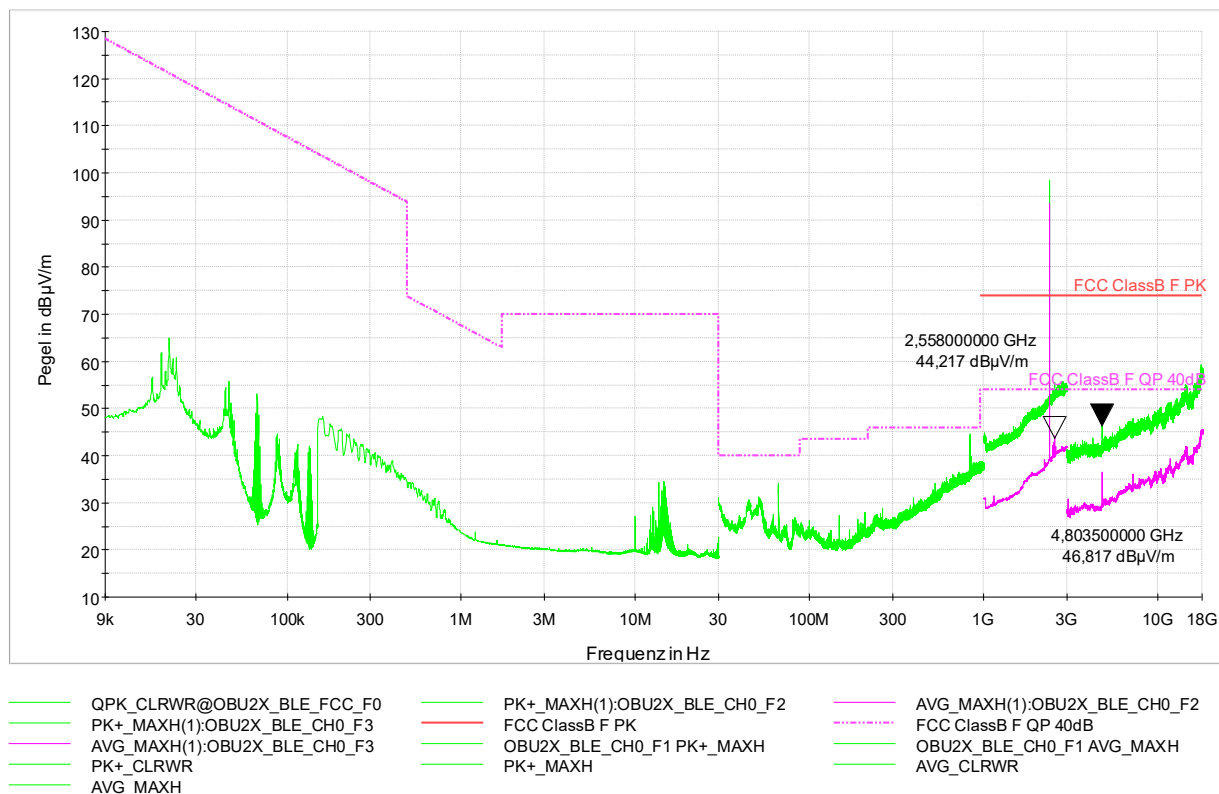
As the 15.209 Limit was kept during transmission (see chapter 4.15 of this test report), no additional tests were performed.

4.15. Emissions in restricted bands Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: CH 0: 2402 MHz



Worst case emission: Average @ 4803,5 MHz: 46,82 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

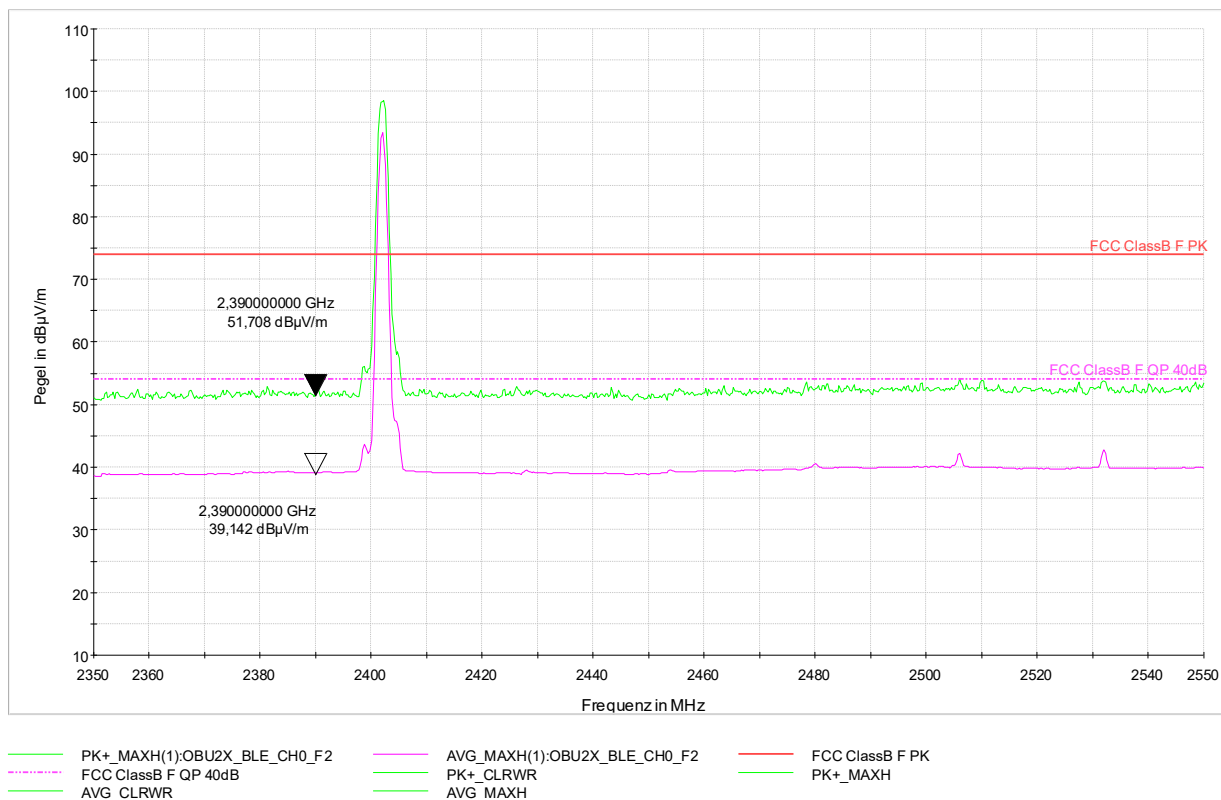
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: CH 0: 2402 MHz



The emission at above the limit line is the Bluetooth intended transmission for which the displayed limit is not applicable. Device PASSED the test.

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.

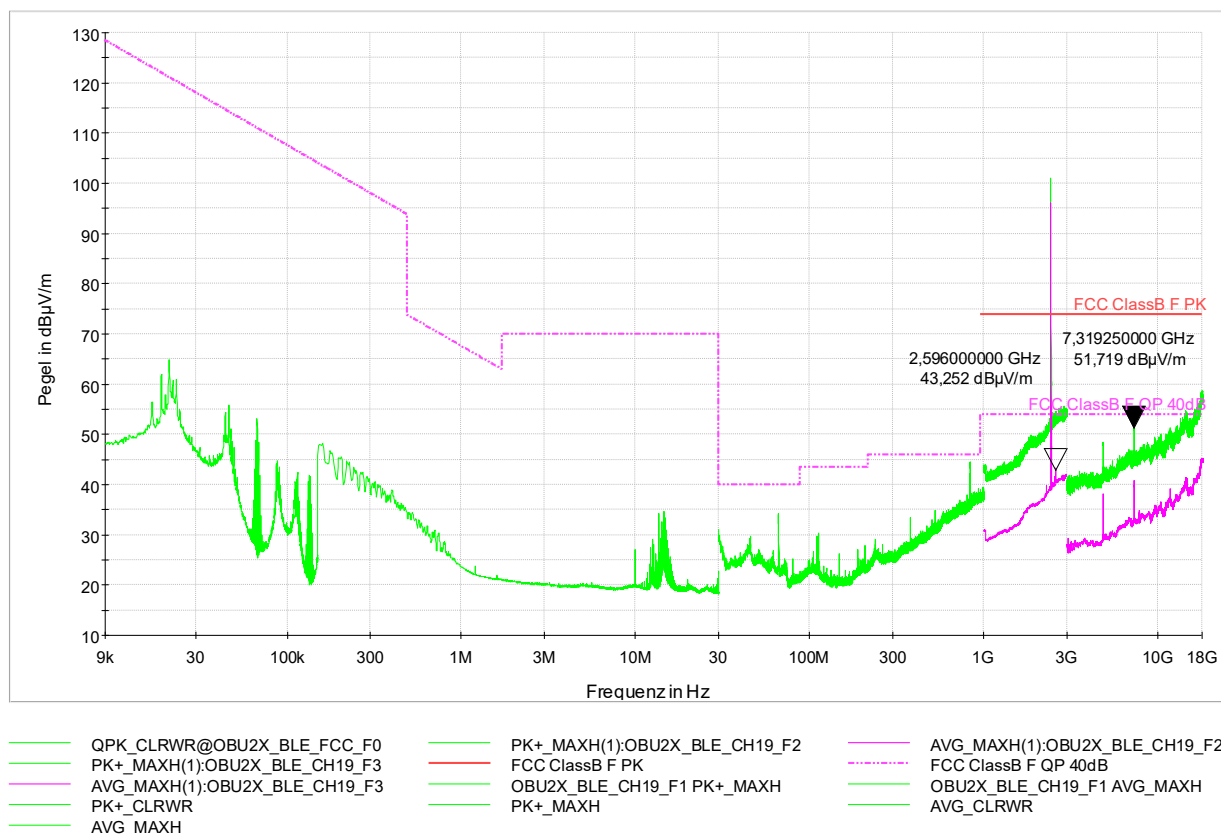
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: CH 19: 2440 MHz



Worst case emission: Average @ 2596,0 MHz: 43,25 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

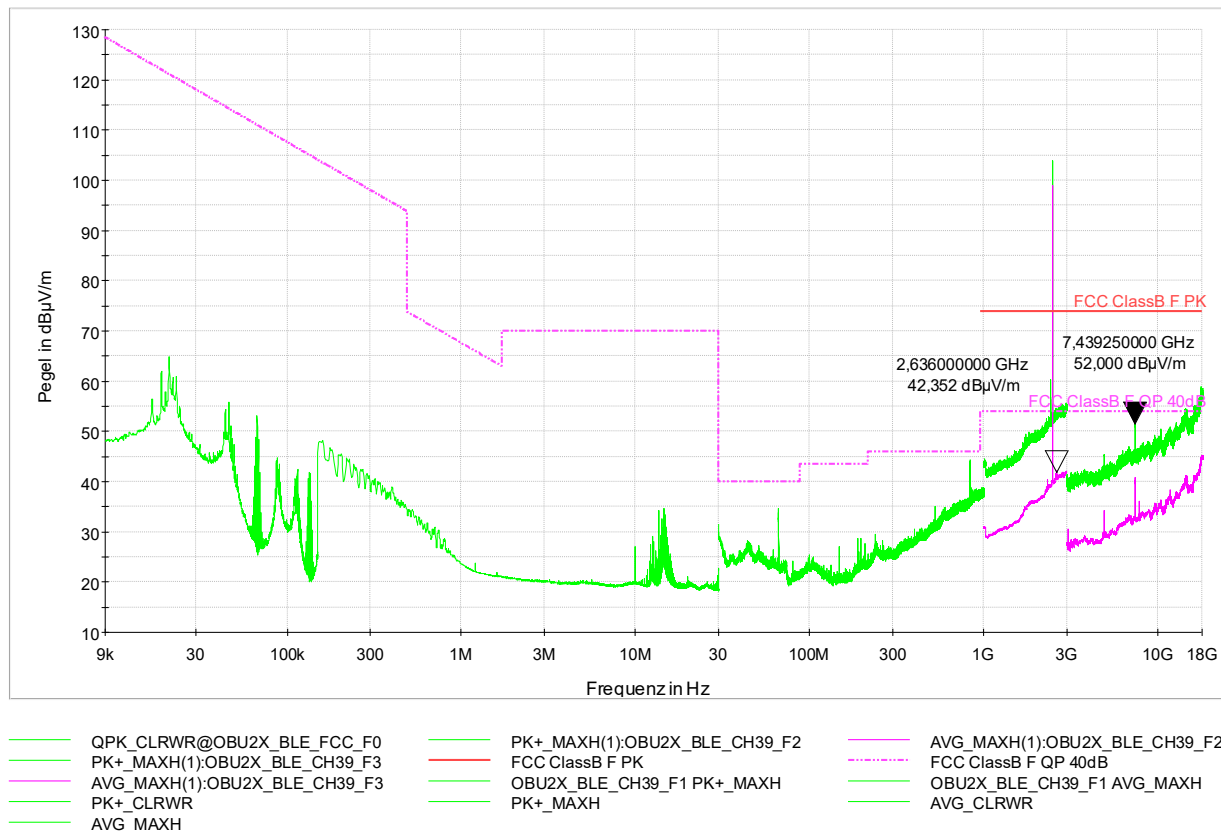
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands
Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: CH 39: 2480 MHz



Worst case emission: Average @ 2636,0 MHz: 42,35 dBµV/m

Remark: Although the measurement above ends at 18 GHz, all measurements were performed up to the tenth harmonics of the transmitter frequency.

The emission at 2,4 GHz is the Bluetooth intended transmission for which the displayed limit is not applicable.
Device PASSED the test.

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

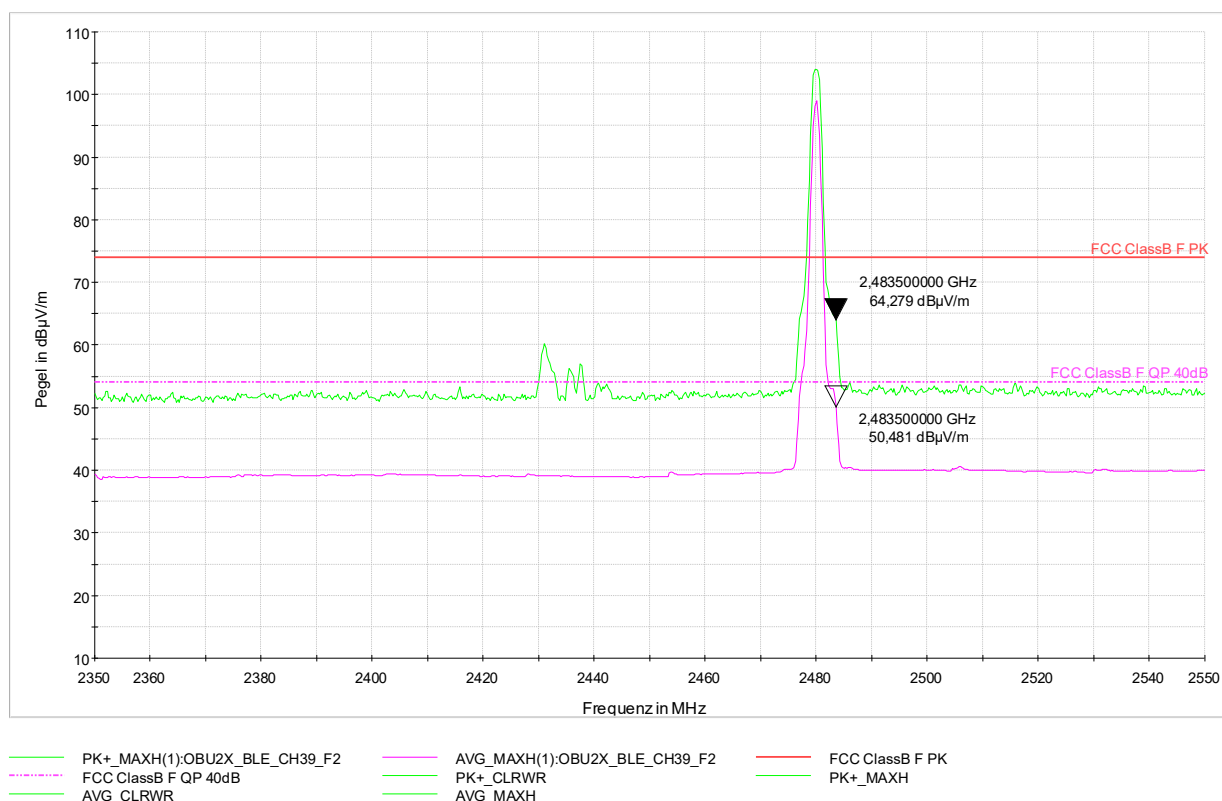
Test Equipment used: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Emissions in restricted bands Emissions falling within restricted frequency bands

FCC, § 15.209(a)
ISED, RSS-Gen

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

Setup: CH 39: 2480 MHz



The emission at above the limit line is the Bluetooth intended transmission for which the displayed limit is not applicable. Device PASSED the test.

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: NT-100; NT-131/1; NT-139; NT-207/1; NT-337/1; NT-472

Appendix 1

Test equipment used

☐ Anechoic Chamber with 3m measurement distance	NT-100	☐ Ant. tripod for EN61000-4-3 Model TP1000A	NT-156
☐ Stripline according to ISO 11452-5	NT-108	☐ Power quality analyzer Fluke 1760 (complete set)	NT-160 - NT-173
☐ MA4000 - Antenna mast 1 - 4 m height	NT-110/1	☐ Spectrumanalyzer – FSP7 9 kHz – 7 GHz	NT-200
☐ DS - Turntable 0 - 400 ° Azimuth	NT-111/1	☐ ESCI - Test receiver 9 kHz - 7 GHz	NT-203/1
☐ CO3000 Controller Mast+Turntable	NT-112/1	☐ ESR – Test receiver 20 Hz – 26,5 GHz	NT-207/1
☐ HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	☐ Digital Radio Tester CMW500	NT-208/1
☐ FMZB1513 - Loop Antenna 9 kHz - 30 MHz	NT-122/1	☐ Noise-gen., ITU-R 559-2 20 Hz – 20 kHz	NT-209
☐ HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	☐ CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz	NT-210
☐ Dipole Antenna VHA9103 30 - 300 MHz	NT-124/1a	☐ 3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211
☐ Dipole Antenna UHA9105 300 - 1000 MHz	NT-124/1b	☐ Digital Radio Tester Aeroflex 3920	NT-212/1
☐ 3115 - Horn Antenna 1 - 18 GHz (immunity)	NT-125	☐ Mixer M28HW 26,5 GHz - 40 GHz	NT-214
☐ 3116 - Horn Antenna 18 - 40 GHz	NT-126	☐ RubiSource T&M Timing reference	NT-216
☐ SAS-200/543 - Bicon. Antenna 20 MHz - 300 MHz	NT-127	☐ Radiocommunicationanalyzer SWR 1180 MD	NT-217
☐ AT-1080 - Log. Per. Antenna 80 - 1000 MHz	NT-128	☐ Mixer FS-Z60 40 GHz – 60 GHz	NT-218/1
☐ HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-129	☐ Mixer FS-Z90 60 GHz – 90 GHz	NT-219/1
☐ HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-130	☐ DSO9104 Digital scope	NT-220/1
☐ 3146 - Log. Per. Antenna 200 – 1000 MHz	NT-131	☐ TPS 2014 Digital scope	NT-222
☐ VULB 9163 Trilog Antenna 30 – 3000 MHz	NT-131/1	☐ Artificial Ear according to IEC 60318	NT-224
☐ Loop Antenna H-Field	NT-132	☐ 1 kHz Sound calibrator	NT-225
☐ Horn Antenna 500 MHz - 2900 MHz	NT-133	☐ SRM-3006 Spectrumanalyzer	NT-233/1a
☐ Horn Antenna 500 MHz - 6000 MHz	NT-133/1	☐ E-field probe SRM 75 MHz – 3 GHz	NT-234
☐ Log. per. Antenna 800 MHz - 2500 MHz	NT-134	☐ Field Meter NBM-500 incl. E- and H-Field probes	NT-240a-e
☐ Log. per. Antenna 800 MHz - 2500 MHz	NT-135	☐ Magnetometer HP-01	NT-241/1
☐ BiConiLog Antenna 26 MHz – 2000 MHz	NT-137	☐ EFA-3 H-field- / E-field probe	NT-243
☐ Conical Dipol Antenna PCD8250	NT-138	☐ EHP-50F H-field- / E-field probe	NT-243/1
☐ HF 906 - Horn Antenna 1 - 18 GHz (emission)	NT-139	☐ Field Meter EMR-200 100 kHz – 3 GHz	NT-244
☐ HZ-1 Antenna tripod	NT-150	☐ E-field probe 100 kHz – 3 GHz	NT-245
☐ BN 1500 Antenna tripod	NT-151	☐ H-field probe 300 kHz – 30 MHz	NT-246

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☐ E-field probe 3 MHz – 18 GHz	NT-247	☐ Prana N-MT 500 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332/1
☐ H-field probe 27 MHz – 1 GHz	NT-248	☐ BBA150 RF-Amplifier 1 GHz - 6 GHz	NT-333/1
☐ ELT-400 1 Hz – 400 kHz	NT-249	☐ APA01 – RF-Amplifier 0,5 GHz – 2,5 GHz	NT-334
☐ MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250	☐ Preamplifier 1 GHz - 4 GHz	NT-335
☐ FCC-203I EM Injection clamp	NT-251	☐ Preamplifier for GPS MKU 152 A	NT-336
☐ FCC-203I-DCN Ferrite decoupling network	NT-252	☐ Preamplifier 1 GHz – 18 GHz	NT-337/1
☐ PR50 Current Probe	NT-253	☐ DC Block 10 MHz – 18 GHz Model 8048	NT-338
☐ i310s Current Probe	NT-254/1	☐ 2-97201 Electronic load	NT-341
☐ Fluke 87 V True RMS Multimeter	NT-260	☐ TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344
☐ Model 2000 Digital Multimeter	NT-261	☐ TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345
☐ Fluke 87 V Digital Multimeter	NT-262/1	☐ VDS 200 Mobil-impuls-generator	NT-350
☐ ESH2-Z5-U1 Artificial mains network 4x25A	NT-300	☐ LD 200 Mobil-impuls-generator	NT-351
☐ ESH3-Z5-U1 Artificial mains network 2x10A	NT-301	☐ MPG 200 Mobil-Impuls-Generators	NT-352
☐ ESH3-Z6-U1 Artificial mains network 1x100A	NT-302	☐ EFT 200 Mobil-impuls-generator	NT-353
☐ ESH3-Z6-U1 Artificial mains network 1x100A	NT-302a	☐ AN 200 S1 Artificial Network	NT-354
☐ EZ10 T-Artificial Network	NT-305	☐ FP-EFT 32M 3 ph. Coupling filter (Burst)	NT-400/1
☐ SMG - Signal generator 0,1 - 1000 MHz	NT-310	☐ PHE 4500 - Mains impedance network	NT-401
☐ SMA100A - Signal generator 9 kHz - 6 GHz	NT-310/1	☐ IP 6.2 Coupling filter for data lines (Surge)	NT-403
☐ RefRad Reference generator	NT-312	☐ TK 9421 High Power Volt. Probe 150 kHz - 30 MHz	NT-409
☐ SMP 02 Signal generator 10 MHz - 20 GHz	NT-313	☐ ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410
☐ 40 MHz Arbitrary Generator TGA1241	NT-315	☐ CN-EFT1000 - Capacitive clamp (Burst)	NT-411/1
☐ Artificial mains network NSLK 8127-PLC	NT-316	☐ Highpass-Filter 100 MHz – 3 GHz	NT-412
☐ PSURGE 4.1 Surge generator	NT-324	☐ Highpass-Filter 600 MHz – 4 GHz	NT-413
☐ IMU4000 Immunity test system	NT-325/1a-e	☐ Highpass-Filter 1250 MHz – 4 GHz	NT-414
☐ VCS 500-M6 Surge-Generator	NT-326	☐ Highpass-Filter 1800 MHz – 16 GHz	NT-415
☐ Oscillatory Wave Simulator incl. Coupling networks	NT-328a+b+c		
☐ BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330		

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☐	RF-Attenuator 10 dB DC – 18 GHz / 50 W	NT-417/1	☐	SW 9605 - Current probe 150 kHz – 30 MHz	NT-465/1
☐	RF-Attenuator 6 dB DC – 18 GHz / 50 W	NT-418	☐	95242-1 – Current probe 1 MHz – 400 MHz	NT-468
☐	RF-Attenuator 3 dB DC – 18 GHz / 50 W	NT-419	☐	94106-1L-1 – Current probe 100 kHz – 450 MHz	NT-471
☐	RF-Attenuator 20 dB DC - 1000 MHz / 25 W	NT-421	☐	WHKX12-2700-3000-18000 3 GHz Highpass filter	NT-472
☐	RF-Attenuator 30 dB DC - 1000 MHz / 1 W	NT-423	☐	WHKX10-3870-4500-18000 4,5 GHz Highpass filter	NT-473
☐	RF-Attenuator 30 dB	NT-424	☐	CDN S9 USB3.0 Coupling decoupling network	NT-474
☐	RF-Attenuator 6 dB DC - 1000 MHz / 1 W	NT-425	☐	CDN S2 XLR3-1 Coupling decoupling network	NT-475
☐	RF-Attenuator 6 dB DC - 1000 MHz / 1 W	NT-426	☐	CDN S8 RJ45 Coupling decoupling network	NT-476
☐	RF-Attenuator 6 dB	NT-428	☐	GA 1240 Power amplifier according to EN 61000-4-16	NT-480
☐	RF-Attenuator 0 dB - 81 dB	NT-429	☐	Coupling networks according to EN 61000-4-16	NT-481 - NT-483
☐	WRU 27 - Band blocking 27 MHz	NT-430	☐	Van der Hoofden Test Head	NT-484
☐	WHJ450C9 AA - High pass 450 MHz	NT-431	☐	WRCJV12-5820-5850-5950-5980 5,9 GHz Band Reject Filter	NT-490
☐	WHJ250C9 AA - High pass 250 MHz	NT-432	☐	WHKX10-5670-6300-18000 6 GHz Highpass filter	NT-491
☐	RF-Load 150 W	NT-433	☐	WHK12-935-1000-7000 1 GHz Highpass filter	NT-492
☐	Impedance transducer 1:4 ; 1:9 ; 1:16	NT-435	☐	EMC Video/Audiosystem	NT-511/1
☐	RF-Attenuator DC – 18 GHz 6 dB	NT-436	☐	EMC32 Version 10.60.20 Test software	NT-520/1
☐	RF-Attenuator DC – 18 GHz 6 dB	NT-437	☐	SRM-TS Version 1.3 software for SRM-3000	NT-522
☐	RF-Attenuator DC – 18 GHz 10 dB	NT-438	☐	SRM-TS Version 1.3.1 software for SRM-3006	NT-522/1
☐	RF-Attenuator DC – 18 GHz 20 dB	NT-439	☐	Spitzenberger und Spies Test software V4.1	NT-525
☐	I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	☐	Vertical coupling plane (ESD)	NT-531
☐	ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz	NT-441	☐	Test cable #4 for EN 61000-4-6	NT-553
☐	Power Divider 6 dB/1 W/50 Ohm	NT-443	☐	Test cable #3 for conducted emission	NT-554
☐	Directional coupler 0,1 MHz – 70 MHz	NT-444	☐	Test cable #5+#6 ESD-cable (2x470k)	NT-555 + NT-556
☐	Directional coupler 0,1 MHz – 70 MHz	NT-445	☐	Test cable #8 Sucoflex 104EA	NT-559
☐	Tube imitations according to EN 55015	NT-450	☐	Test cable #9 (for outdoor measurements)	NT-580
☐	FCC-801-M3-16A Coupling decoupling network	NT-458	☐	Test cable #10 (for outdoor measurements)	NT-581
☐	FCC-801-M2-50A Coupling decoupling network	NT-459	☐	Test cable #13 Sucoflex 104PE	NT-584
☐	FCC-801-M5-25 Coupling decoupling network	NT-460	☐	Test cable #21 for SRM-3000	NT-592
☐	FCC-801-T4 Coupling decoupling network	NT-463	☐	Shield chamber	NT-600
☐	FCC-801-C1 Coupling decoupling network	NT-464	☐	Climatic chamber	M-1200

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☐	Anechoic Chamber 3 m / 5 m measuring distance	EMV-100	☐	HF- Amplifier 9 kHz-225 MHz BBL200	EMV-300/1
☐	Turntabel 6 m diameter	EMV-101	☐	HF- Amplifier 80 -1000 MHz BBA150	EMV-301
☐	Antenna mast + controller	EMV-102+ EMV-103	☐	HF- Amplifier 0,8 - 6 GHz BBA150	EMV-302
☐	EMC Video/Audiosystem	EMV-104	☐	High Power Ant. 20-200 MHz HPBA-2510	EMV-303/1
☐	EMC Software EMC32 Version 10.60.20	EMV-105	☐	High Power Ant. 20-200 MHz S12018-21	EMV-303/2
☐	Hornantenna 1 – 18 GHz HF 907	EMV-110	☐	Log.per Antenna 80-2700 MHz STLP 9128 E special	EMV-304
☐	Antennapre.amp. 1 – 18 GHz BBV 9718 D	EMV-111/1	☐	Log.per Antenna 0,7 – 9 GHz STLP9149	EMV-305
☐	Trilog Antenna 30-3000 MHz VULB9163	EMV-112	☐	HF- Amplifier 9 kHz-250 MHz BBA150 (low noise)	EMV-306
☐	Monopol 9 kHz – 30 MHz VAMP 9243	EMV-113	☐	ISO11451-2 TLS 10 kHz – 30 MHz	EMV-307
☐	Antennapre.amp 18 – 40 GHz BBV 9721	EMV-114	☐	Load Dump Generator LD 200N	EMV-350
☐	Hornantenna 200 – 2000 MHz AH-220	EMV-115	☐	Ultra Compact Symulator UCS 200N100	EMV-351
☐	DC Artificial Network PVDC 8300	EMV-150	☐	Automotive Power fail module PFM 200N100.1	EMV-352
☐	AC Artificial Network NNLK 8121 RC	EMV-151	☐	Voltage Drop Symulator VDS 200Q100	EMV-353
☐	AC Artificial Network NNLK 140	EMV- 153a-d	☐	Arb. Generator AutoWave	EMV-354
☐	EMI Receiver ESW44	EMV-200/1	☐	Ultra Compact Symulator UCS 500N7	EMV-355
☐	Signalgenerator 9 kHz – 40 GHz N5173B	EMV-201	☐	Coupling decoupling network CNI 503B7 / 32 A	EMV-356
☐	GPS Frequency normal B-88	EMV-202	☐	Coupling decoupling network CNI 503B7 / 63 A	EMV-357
☐	DC Power supply N5745A	EMV-203	☐	Telecom Surge Generator TSurge 7	EMV-358
☐	Spektrum Analyzator FSV40	EMV-205	☐	Coupling decoupling network CNI 508N2	EMV-359
☐	Thd Multimeter Model 2015	EMV-206	☐	Coupling decoupling network CNV 504N2.2	EMV-360
☐	Poweramplifier PAS15000	EMV- 207/abc	☐	Immunity generator NSG4060/NSG4060-1	EMV-361
☐	Inrush Current Source	EMV- 208/abc	☐	Coupling network CDND M316-2	EMV-362
☐	Arb.-generator Sycore	EMV-209	☐	Coupling network CT419-5	EMV-363
☐	Harmonics/Flicker analyzer ARS 16/3	EMV-210	☐	ESD Generator NSG 437	EMV-364
☐	Power Supply Regatron AC	EMV-214	☐	Pulse Limiter VTSD 9561-F BNC	EMV-405
☐	Power Supply Regatron DC	EMV-215	☐	Transient emission BSM200N40+BS200N100	EMV- 450+451
☐	Harmonics/Flicker analyser Zimmer	EMV-216	☐	Cap. Coupling Clamp HFK	EMV-455
☐	Flicker Impedanz Newtons4th 753	EMV-218	☐	Mag. Field System MS100N+MC26100+MC2630	EMV- 456-458
☐	Comemso	EMV-219			

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☐	Coupling network CDN M2-100A	EMV-459
☐	Coupling network CDN M3-32A	EMV-460
☐	Coupling network CDN M5-100A	EMV-461
☐	Current Clamp CIP 9136A	EMV-462
☐	DC Artificial Network HV-AN 150	EMV-464+465
☐	Coupling Clamp EM 101	EMV-466
☐	Decoupling Clamp FTC 101	EMV-467
☐	Power attenuator 10 dB / 250 Watt	EMV-469/2
☐	HV AMN NNHV 8123 800A	EMV-472
☐	HV AMN NNHV 8123 800A	EMV-473