

# RADIO TEST REPORT

**No. 1613926STO-001, Ed. 2**

## RF Performance

### EQUIPMENT UNDER TEST

Equipment: ConnectMe unit  
Type/Model: 331495  
Manufacturer: Permobil AB  
Tested by request of: Wireless System Integration Sweden AB

### SUMMARY

Referring to the emission limits, and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards:

47 CFR Part 15 (2015): Subpart C: Intentional radiators. Section 15.247  
47 CFR Part 15 (2015): subpart B: unintentional radiators Section 15.109

RSS-GEN Issue 4 (2014): General requirements of compliance of radio apparatus (2014)

RSS-247 Issue 1 (2015): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

For details, see clause 2 – 4.

Date of issue: 2017-01-23

Tested by:

  
Matti Virkki

Approved by:

  
Stefan Andersson

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## Revision History

Edition	Date	Description	Changes
1	2016-12-12	First release	Reference to 47 CFR Part 15 (2015): subpart B added
2	2017-01-23		

Version 1.00

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## 1 CLIENT INFORMATION

The EUT has been tested by request of

Company Wireless System Integration Sweden AB  
Finlandsgatan 60  
16474 Kista  
Sweden

Client observer Mattias Tullberg

## 2 EQUIPMENT UNDER TEST (EUT)

### 2.1 Identification of the EUT

Equipment: ConnectMe unit  
Type/Model: 331495  
Brand name: ConnectMe  
Serial number: No visible serial number on EUT  
Manufacturer: Permobil AB  
Per Uddéns väg 20  
86123, Timrå  
Sweden

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Transmitter frequency range: 2402 – 2480 MHz  
Receiver frequency range: 2402 – 2480 MHz  
Frequency agile or hopping: ☐ Yes ☒ No  
Antenna: ☒ Internal antenna ☐ External antenna  
Antenna connector: ☒ None, integrated antenna ☐ Yes  
Antenna gain: +0.5 dBi  
Rating RF output power: +3 dBm  
Type of modulation: GFSK  
Temperature range: ☒ Category I (General): -20°C to +55°C  
☐ Category II (Portable equipment): -10°C to +55°C  
☐ Category III (Equipment for normal indoor use): +5°C to +35°C  
☐ Other: <-20°C to +55°C  
Transmitter standby mode supported: ☒ Yes ☐ No

## 2.2 Additional information about the EUT

The ConnectMe (acronym to PermoCell) unit is part of the Permobil wheel chair, and supports the Permobil with a direct access to cloud services via the cellular network, GPS positioning and Bluetooth Low energy connectivity towards Smartphones.

The EUT consists of the following units:

Unit	Type	Serial number
ConnectMe unit	331495	No serial on EUT
Wheelchair	F3 Corpus	No serial on EUT
ConnectMe unit with temporary antenna connector	331495	No serial on EUT

## 2.3 Test signals and operation modes

Continuous signal with GFSK modulation

Continuous Receive mode

Tested operating frequencies: 2402 MHz, 2440 MHz and 2480 MHz

During the radiated emission testing the EUT was installed in Permobil F3 Corpus wheelchair.

### 3 TEST SPECIFICATIONS

#### 3.1 Standards

Requirements:

47 CFR Part 15 (2015): Subpart C: Intentional radiators. Section 15.247  
47 CFR Part 15 (2015): subpart B: unintentional radiators Section 15.109

RSS-GEN Issue 4 (2014): General requirements of compliance of radio apparatus (2014).

RSS-247 Issue 1 (2015): Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Test methods:

ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

#### 3.2 Additions, deviations and exclusions from standards and accreditation

No additions, deviations or exclusions have been made from standards and accreditation.

#### 3.3 Test site

Measurements were performed at:

Intertek Semko AB.  
Torshamnsgatan 43,  
P.O. Box 1103  
SE-164 22 Kista

Intertek Semko AB is a FCC listed test site with site registration number 90913  
Intertek Semko AB is a FCC accredited conformity assessment body with designation number SE0002  
Intertek Semko AB is an Industry Canada listed test facility with IC assigned code 2042G

Measurement chamber

Measurement Chamber	Type of chamber	IC Site filing #
STORA HALLEN	Semi-anechoic 10 m and 3 m	2042G-2

#### 4 TEST SUMMARY

The results in this report apply only to sample tested:

Requirement	Description	Result
<b>FCC §15.203 RSS-GEN 8.3</b>	<b>Antenna requirement</b> The EUT has integrated non detachable antenna which can't be remove without breaking the EUT.	<b>PASS</b>
<b>FCC §15.207, 15.107 RSS-GEN 8.8 table 3</b>	<b>Conducted continuous emission in the frequency range 150 kHz to 30 MHz, AC Power input port</b>  Battery operated equipment.	<b>NA</b>
<b>FCC §15.247 (d), 15.209(a) RSS-GEN 8.9 RSS-247 5.5</b>	<b>Radiated emission of electromagnetic fields in the frequency range 30 – 1000 MHz</b> The EUT complies with the limits. The margin to the limit was at least 9.2 dB at 150.5 MHz.	<b>PASS</b>
<b>FCC §15.247(d), 15.209(a) RSS-GEN 8.9 RSS-247 5.5</b>	<b>Radiated emission of electromagnetic fields in the frequency range above 1 GHz</b> The EUT complies with the limits. The margin to the limit was at least 10.3 dB at 2484.0 MHz.	<b>PASS</b>
<b>FCC §15.247(a)(2) RSS-GEN 6.6 RSS-247 5.2(1)</b>	<b>Occupied bandwidth</b> The EUT complies with the limits. The margin to the limit is at least 184 kHz	<b>PASS</b>
<b>FCC §15.247(b) RSS-247 5.4(4)</b>	<b>Conducted output power</b> The EUT complies with the limits. The margin to the limit was at least 27.6 dB at 2440 MHz.	<b>PASS</b>
<b>FCC §15.247(e) RSS-247 5.2(2)</b>	<b>Peak power spectral density</b> The EUT complies with the limits. The margin to the limit was at least 18.9 dB at 2440 MHz.	<b>PASS</b>
<b>FCC §15.247(e) RSS-247 5.5</b>	<b>Band edge</b> The EUT complies with the limits. The margin to the limit was at least 22.4 dB at 2487.7 MHz.	<b>PASS</b>

**5 RADIATED RF EMISSION IN THE FREQUENCY-RANGE 30 MHZ TO 26 GHZ**

<b>Date of test:</b>	2016-11-16/17	<b>Test location:</b>	Stora Hallen
<b>EUT Serial:</b>	No serial on EUT	<b>Ambient temp:</b>	20 – 21°C
<b>Tested by:</b>	MTV	<b>Relative humidity:</b>	25 – 29%
<b>Test result:</b>	Pass	<b>Margin:</b>	9.2 dB

**5.1 Test set-up and test procedure.**

The test method is in accordance with ANSI C63.10-2013.

The EUT was set up in order to emit maximum disturbances.

EUT was installed in wheelchair which was placed on turntable which is part of the reference ground plane

Above 1 GHz measurements the EUT was placed on an insulating support 1m above the turntable

EUT was then at 1,3m above the ground plane.

Overview sweeps were performed with the measurement receiver in max-hold mode and the peak detector activated in the frequency-range 30 – 1000 MHz. Above 1 GHz additionally the average detector was activated.

**5.2 Test conditions****Test set-up:****30 MHz to 1000 MHz**

Test receiver set-up:

Preview test:

Peak, RBW 120 kHz VBW 1 MHz

Final test:

Quasi-Peak, RBW 120 kHz VBW 1 MHz

EUT height above ground plane:

0.1 m

Measuring distance:

10 m

Measuring angle:

0 – 359°

Antenna

Height above ground plane:

1 – 4 m

Polarisation:

Vertical and Horizontal

Type:

Bilog

**Test set-up:****1 GHz – 26.5 GHz**

Test receiver set-up:

Preview test:

Peak, RBW 1 MHz VBW 3 MHz

Average, RBW 1 MHz VBW 3 MHz

Final test:

Peak, RBW 1 MHz VBW 3 MHz

Average, RBW 1 MHz VBW 3 MHz

EUT antenna height above ground plane: 1.3 m

Measuring distance: 3 m

Measuring angle: 0 – 359°

Antenna

Height above ground plane: 1 – 4 m

Polarisation: Vertical and Horizontal

Type: Horn

Antenna tilt: Activated



### 5.3 Requirements

Within restricted bands:

Reference: CFR 47, §15.209, RSS-Gen section 8.9

Field strength of emissions must comply with limits shown in table below

Frequency range [MHz]	Field strength at 3 m (dB $\mu$ V/m)	Field strength at 10 m (dB $\mu$ V/m)	Detector (dB $\mu$ V/m)
30 – 88	40.0	29.5	Quasi Peak
88 – 216	43.5	33.0	Quasi Peak
216 – 960	46.0	35.5	Quasi Peak
960 – 1000	54.0	43.5	Quasi Peak
Above 1000	54.0 / 74.0	43.5 / 63.5	Average / Peak

The values for 10 m measuring distance are calculated by subtracting 10.5 dB from the 3 m limit. (i.e. an extrapolation factor of 20 dB/decade according to CFR 47 §15.31(f)(1))

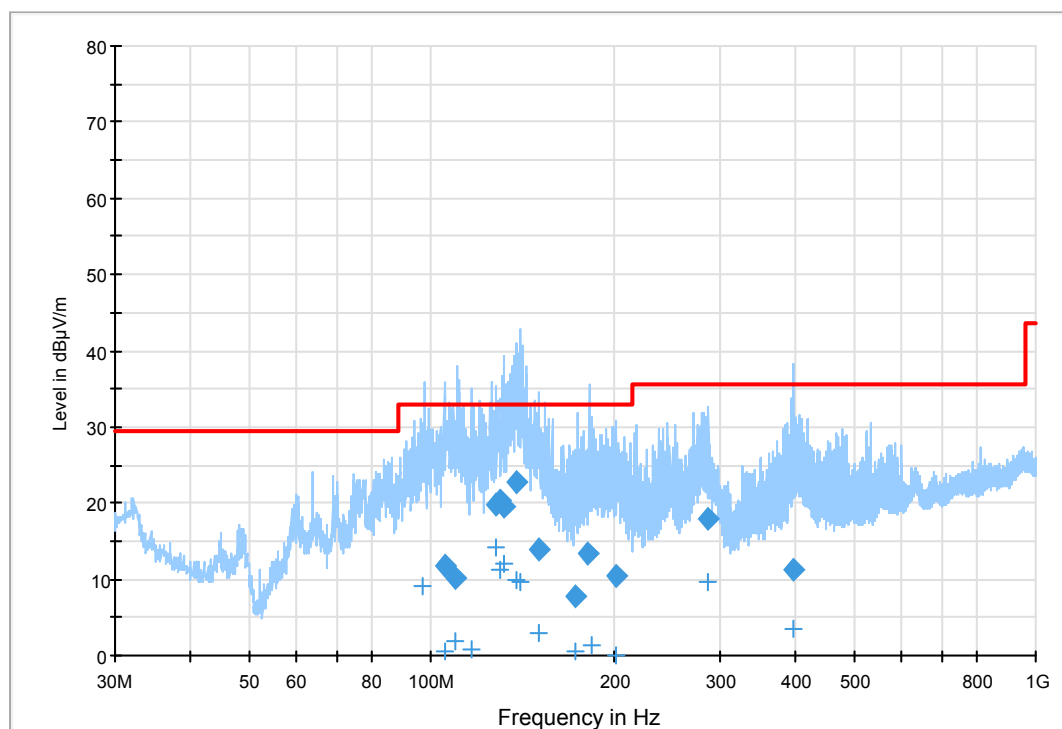
Outside the restricted bands:

Reference: CFR 47 §15.247(d), RSS-247 5.5,

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

### 5.4 Test results 30 MHz – 1000 MHz

EN 55011 Class B 30 - 1000 MHz



**Diagram, Peak overview sweep, 30 – 1000 MHz at 10 m distance. Wheelchair motor running full speed**

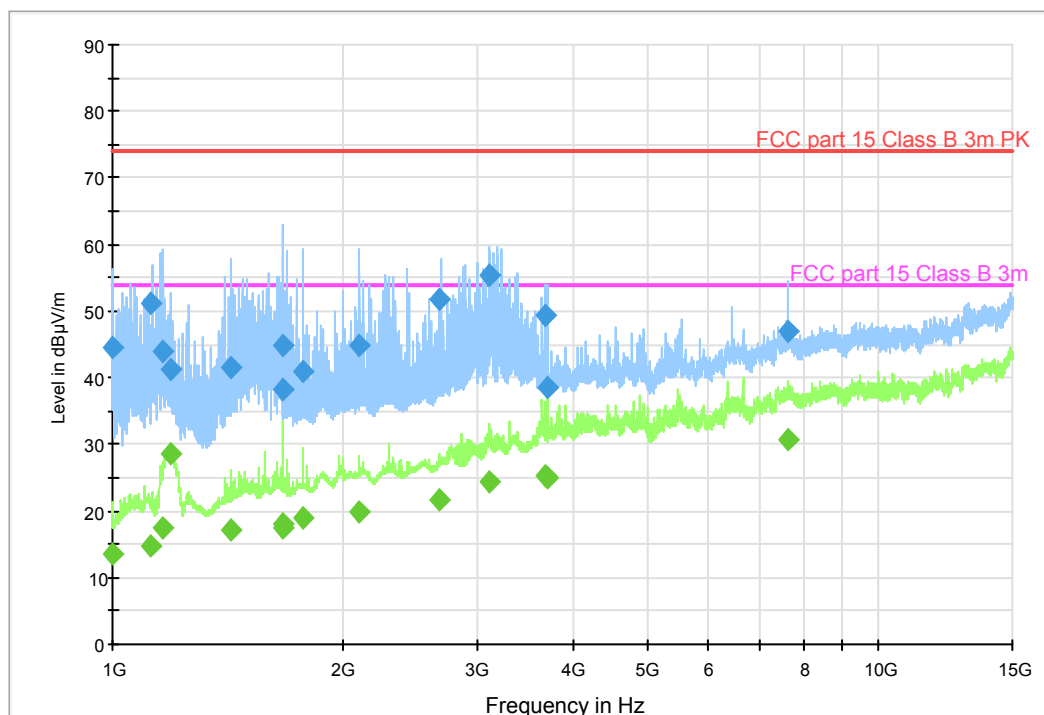
## Measurement results, Quasi Peak

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Polarization H/V	Margin [dB]
105.3	11.9	33.0	V	21.1
109.8	10.2	33.0	V	22.8
128.4	19.7	33.0	V	13.3
130.3	20.3	33.0	V	12.7
132.2	19.5	33.0	V	13.5
138.0	22.6	33.0	V	10.4
150.5	13.8	33.0	V	9.2
173.7	7.8	33.0	V	25.2
182.2	13.3	33.0	V	19.7
202.8	10.5	33.0	V	22.5
287.6	17.9	35.5	V	17.6
397.8	11.2	35.5	V	24.3

Result [dBμV/m] = Analyser reading [dBμV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

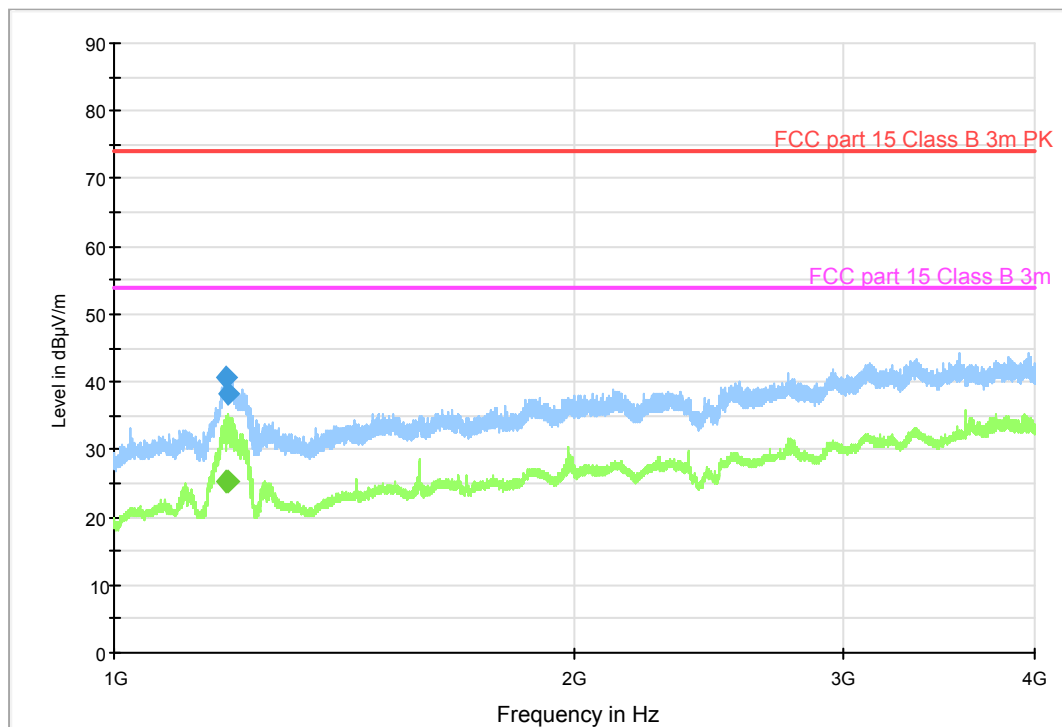
## 5.5 Test results 1 GHz – 26 GHz,

FCC 1 G - 15 G class B 3m ESU40 Continuous TT rotation



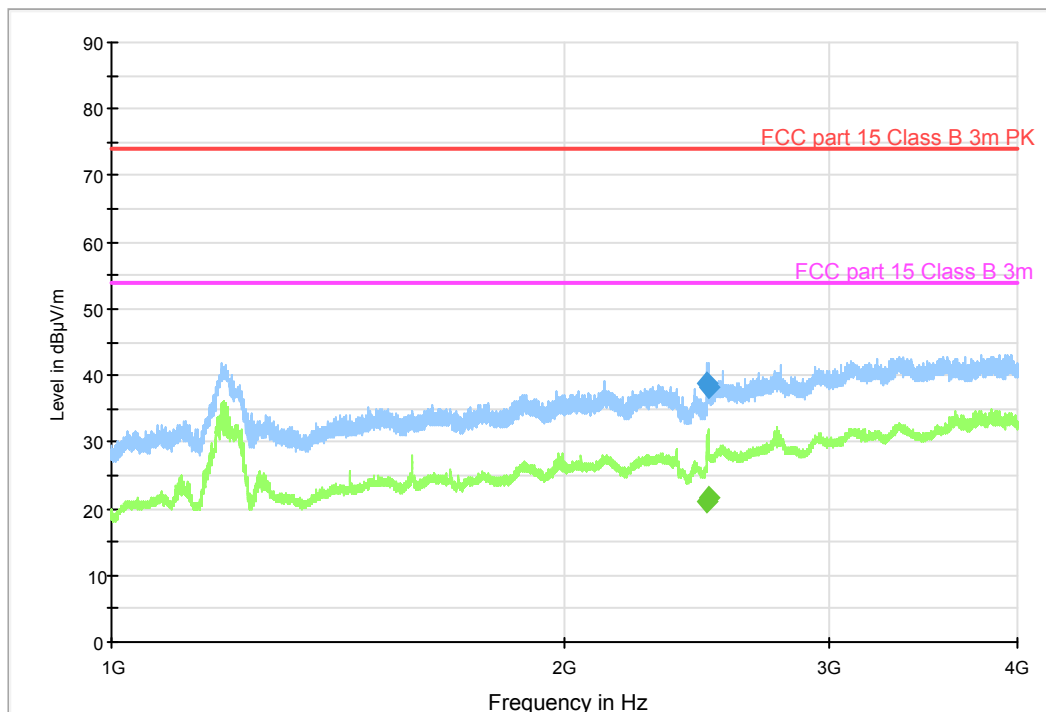
Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. Transmitters off Wheelchair motor running full speed

FCC 1 G - 4 G class B 3m ESU40 Continuous TT rotation



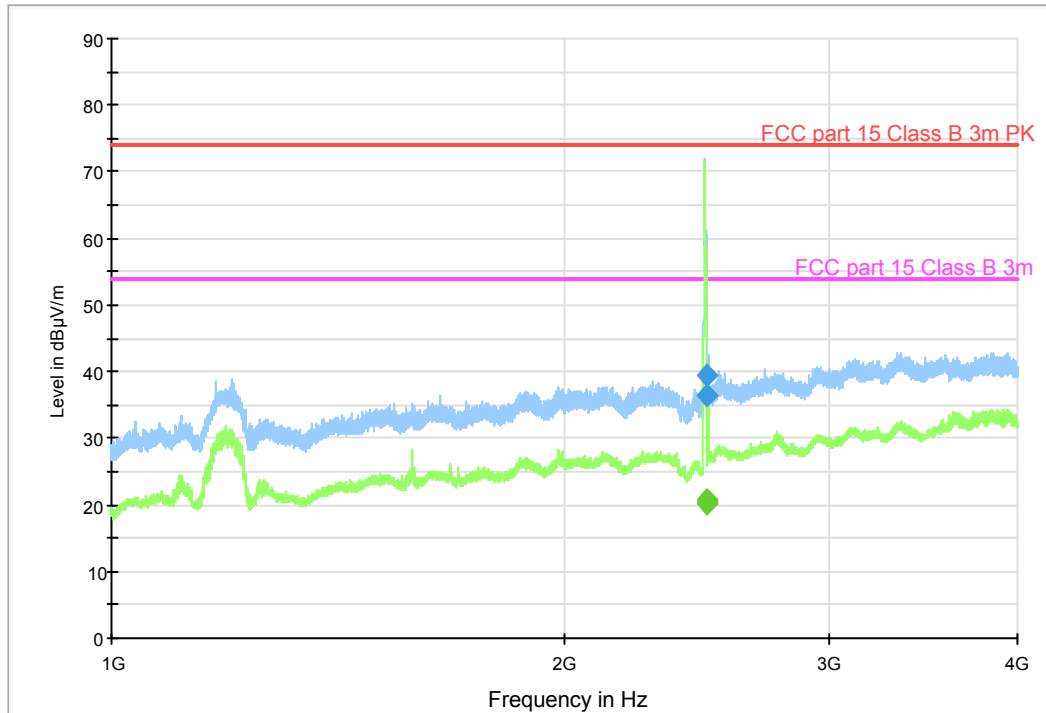
**Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX low channel. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.**

FCC 1 G - 4 G class B 3m ESU40 Continuous TT rotation



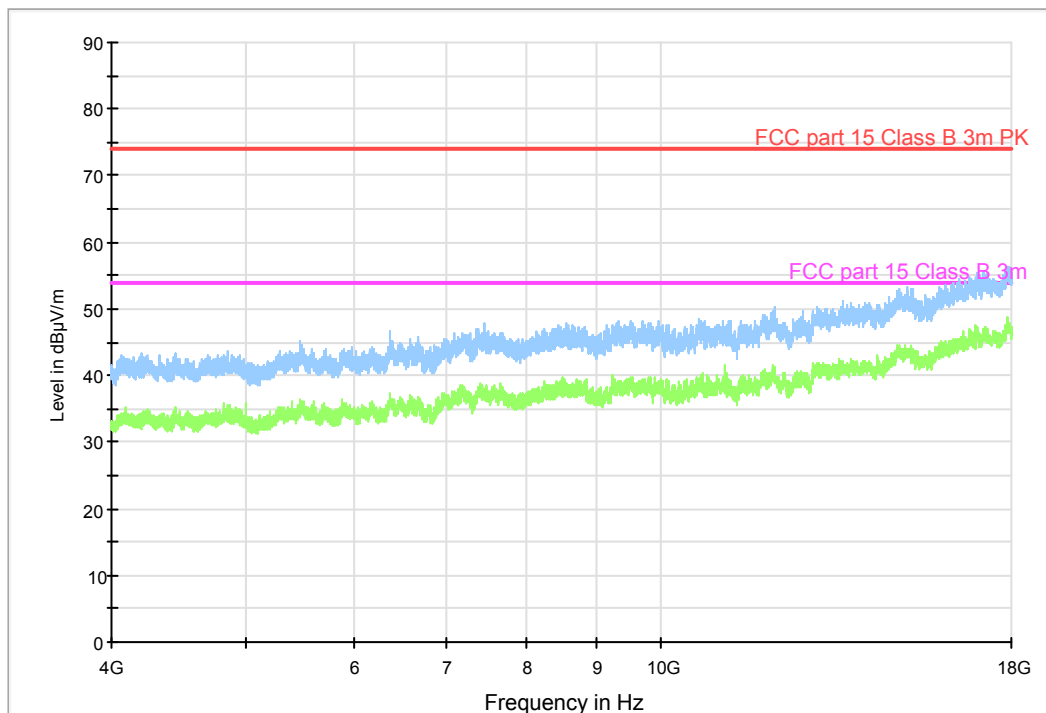
**Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX middle channel. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.**

FCC 1 G - 4 G class B 3m ESU40 Continuous TT rotation



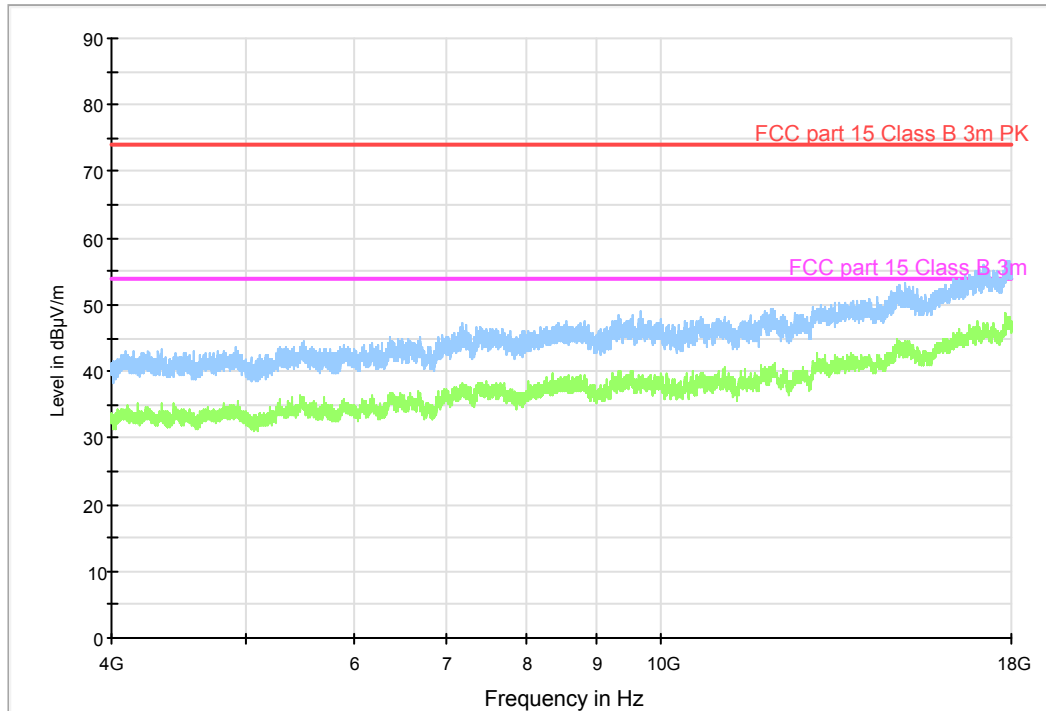
**Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX high channel. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.**

FCC 4 G - 18 G class B 3m ESU40 Continuous TT rotation



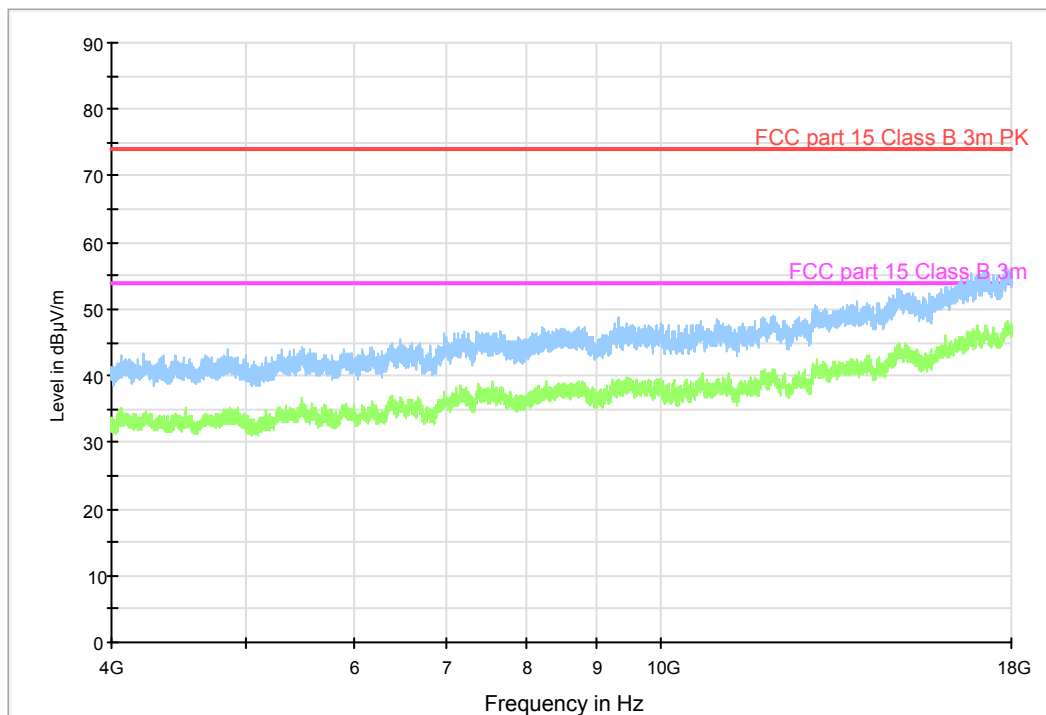
**Diagram, Peak overview sweep, 4– 18 GHz at 3 m distance. TX low channel, Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0.**

FCC 4 G - 18 G class B 3m ESU40 Continuous TT rotation



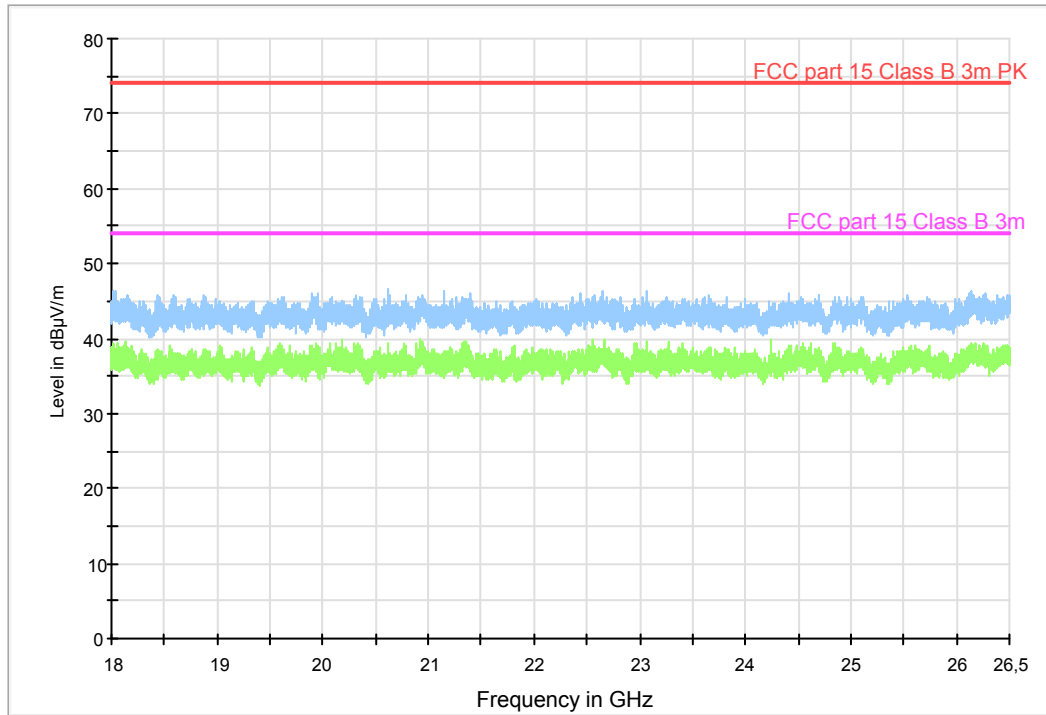
**Diagram, Peak overview sweep, 4– 18 GHz at 3 m distance. TX middle channel,. Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0.**

FCC 4 G - 18 G class B 3m ESU40 Continuous TT rotation



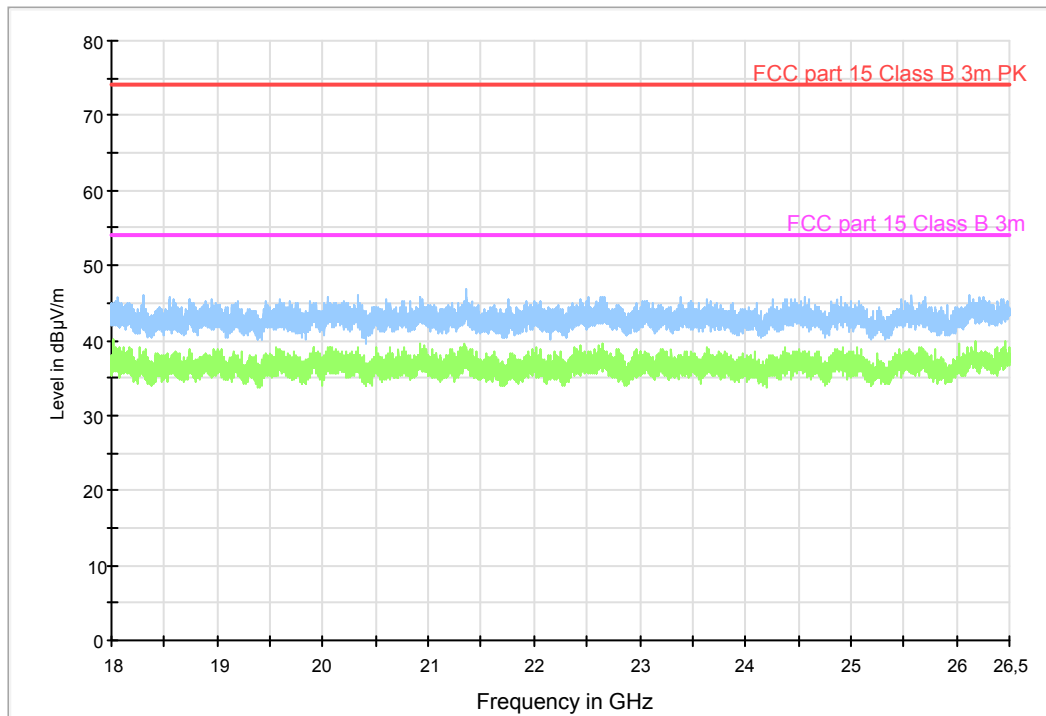
**Diagram, Peak overview sweep, 4– 18 GHz at 3 m distance. TX high channel,. Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0.**

FCC 18 G -26 G 3m ESU 40 Continuous TT rotation



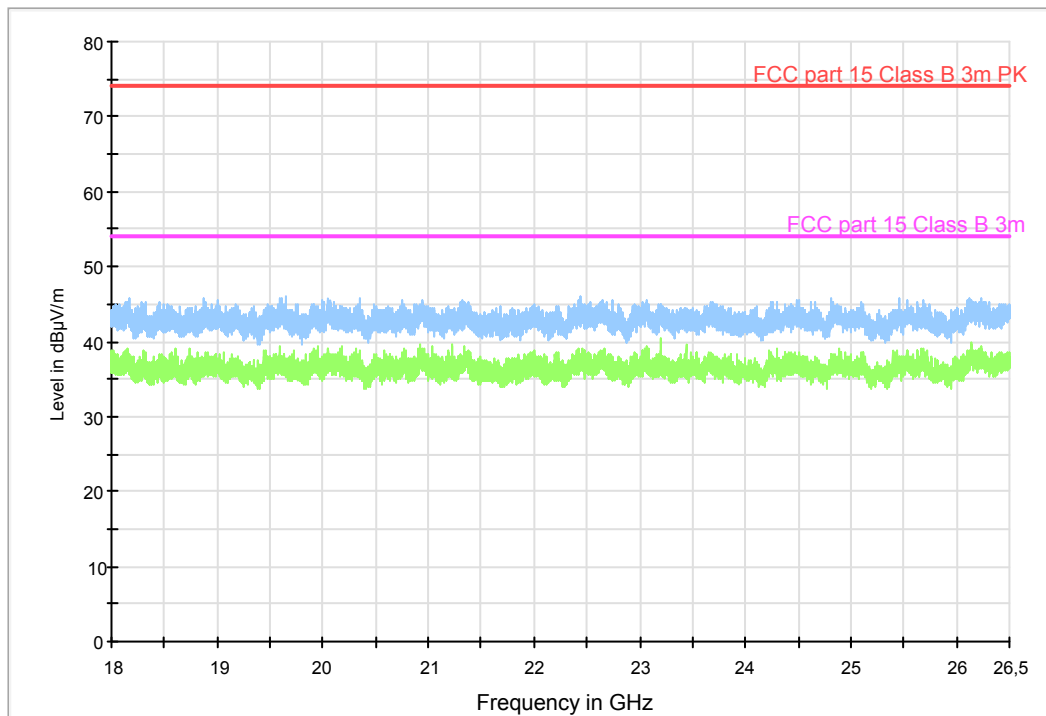
**Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. TX low channel.**

FCC 18 G -26 G 3m ESU 40 Continuous TT rotation



**Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. TX middle channel.**

FCC 18 G -26 G 3m ESU 40 Continuous TT rotation



**Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. TX high channel.**

**Measurement results Peak Wheelchair motors running transmitters off**

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Polarization H/V	Margin [dB]
1000.4	44.5	74	V	29.5
1121.9	51.2	74	V	22.8
1164.2	43.9	74	V	30.2
1188.0	41.4	74	H	32.6
1424.8	41.4	74	V	32.6
1672.5	38.3	74	V	35.7
1674.5	45.0	74	V	29.0
1770.6	40.8	74	V	33.2
2105.1	44.7	74	V	29.3
2677.4	51.9	74	H	22.1
3104.2	55.3	74	V	18.7
3686.1	49.4	74	V	24.6
3691.5	38.5	74	V	35.5
7614.5	47.1	74	V	26.9

**Measurement results Peak Wheelchair motors running transmitters off**

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Polarization H/V	Margin [dB]
3104.2	24.3	54	V	29.7

On all other measured frequencies peak result is under average limit and average result has not been reported



**Measurement results, Peak, TX low channel**

Frequency [MHz]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Polarization H/V	Margin [dB]
1184.0	40.5	74	H	33.5
1187.3	38.1	74	H	35.9

**Measurement results, Average, TX low channel**

All measured peak levels are under average limit

**Measurement results, Peak, TX middle channel**

Frequency [MHz]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Polarization H/V	Margin [dB]
2489.8	40.6	74	V	35.2
2490.7	43.0	74	V	35.6

**Measurement results, Average, TX middle channel**

All measured peak levels are under average limit

**Measurement results, Peak, TX high channel**

Frequency [MHz]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Polarization H/V	Margin [dB]
2484.0	43.7	74	V	30.3
2485.0	39.8	74	V	34.2
2488.9	39.2	74	V	34.8

**Measurement results, Average, TX high channel**

All measured peak levels are under average limit

Result [dB $\mu$ V/m] = Analyser reading [dB $\mu$ V] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB] + Filter loss [dB]

## 6 CONDUCTED BAND EDGE MEASUREMENT

<b>Date of test:</b>	2016-11-09	<b>Test location:</b>	Wireless Center
<b>EUT Serial:</b>	No serial on EUT	<b>Ambient temp:</b>	21°C
<b>Tested by:</b>	MTV	<b>Relative humidity:</b>	40%
<b>Test result:</b>	Pass	<b>Margin:</b>	22.4 dB

### 6.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 6.10.4.

The EUT was connected to spectrum analyser via rf-cable.

The EUT was set up in order to emit maximum disturbances.

### 6.2 Test conditions

Detector: Peak,  
RBW: 100 kHz  
VBW: 300 kHz  
Span: 10 MHz

### 6.3 Requirement

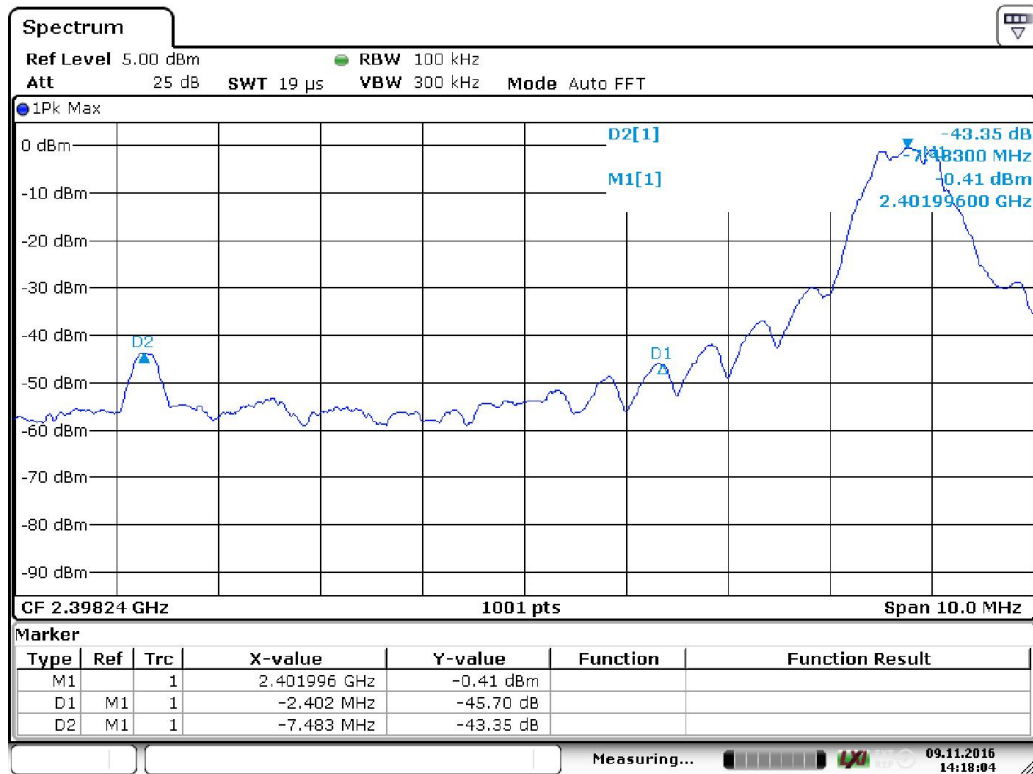
Reference: CFR 47 §15.247(d), RSS-247 5.5,

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

### 6.4 Test results

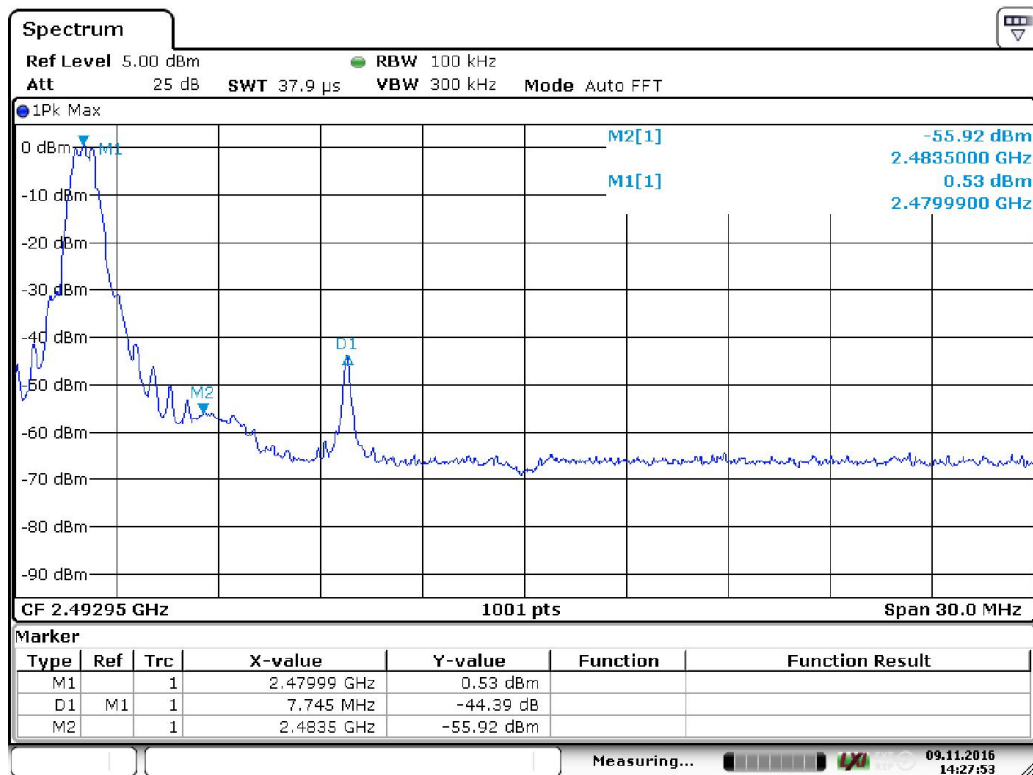
#### Test results

Band edge	Delta [dBc]	Limit [dBc]	Margin [dB]
Lower	43.35	20.0	23.4
Upper	44.4	20.0	22.4



Date: 9 NOV 2016 14:18:04

Screenshot: Lower band edge sweep, single channel



Date: 9 NOV 2016 14:27:53

Screenshot: Upper band edge sweep, single channel

## 7 PEAK CONDUCTED OUTPUT POWER

<b>Date of test:</b>	2016-11-09	<b>Test location:</b>	Wireless Center
<b>EUT Serial:</b>	No serial on EUT	<b>Ambient temp:</b>	21°C
<b>Tested by:</b>	MTV	<b>Relative humidity:</b>	40%
<b>Test result:</b>	Pass	<b>Margin:</b>	27.6 dB

### 7.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 11.9.1.1.

The EUT was connected to spectrum analyser via rf-cable.

### 7.2 Test conditions

Detector: Peak,  
RBW: >OBW  
VBW: 3 x RBW  
Span: >3 x OBW

The EUT was set up in order to emit maximum disturbances.

### 7.3 Requirements

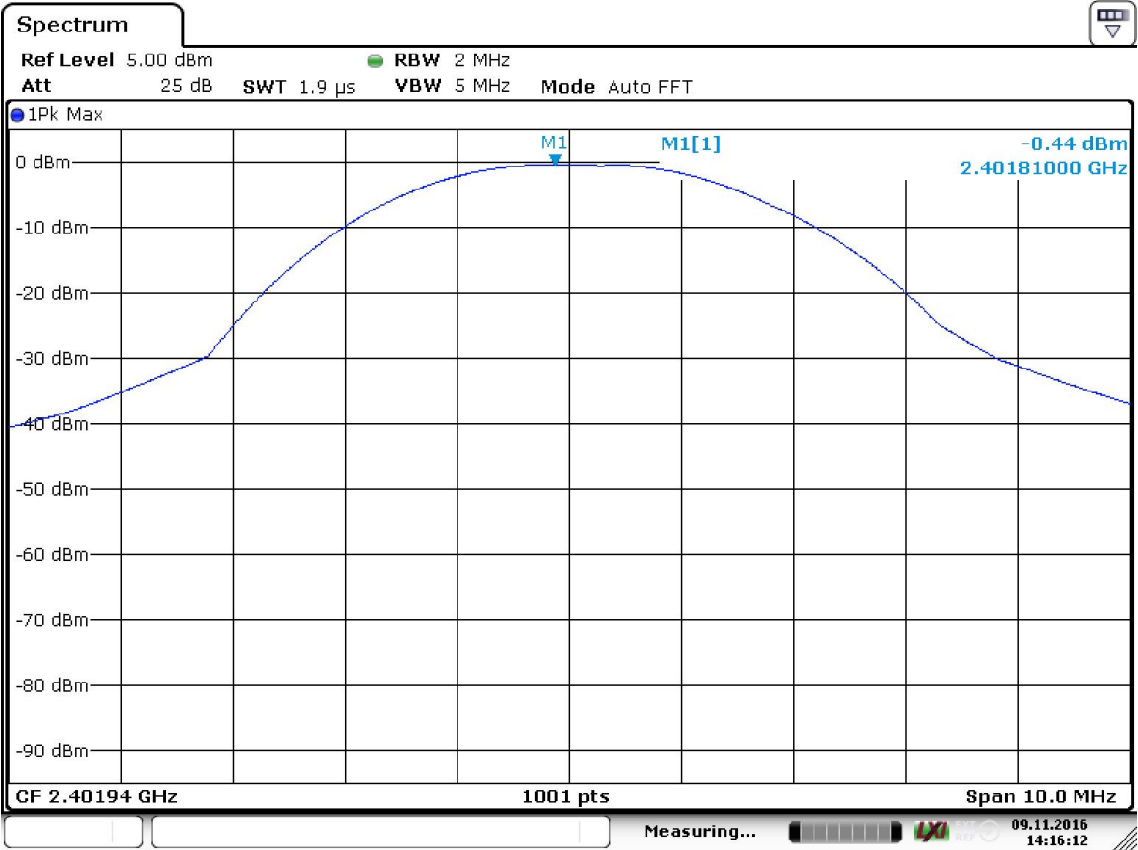
Reference: CFR 47§15.247(b)(3), RSS-247 5.4

For DTSSs employing digital modulation techniques operating in the bands 902 – 128 MHz, 2400 – 2483.5 MHz and 5725 – 5850 MHz, the maximum peak conducted output power shall not exceed 1W.

### 7.4 Test results

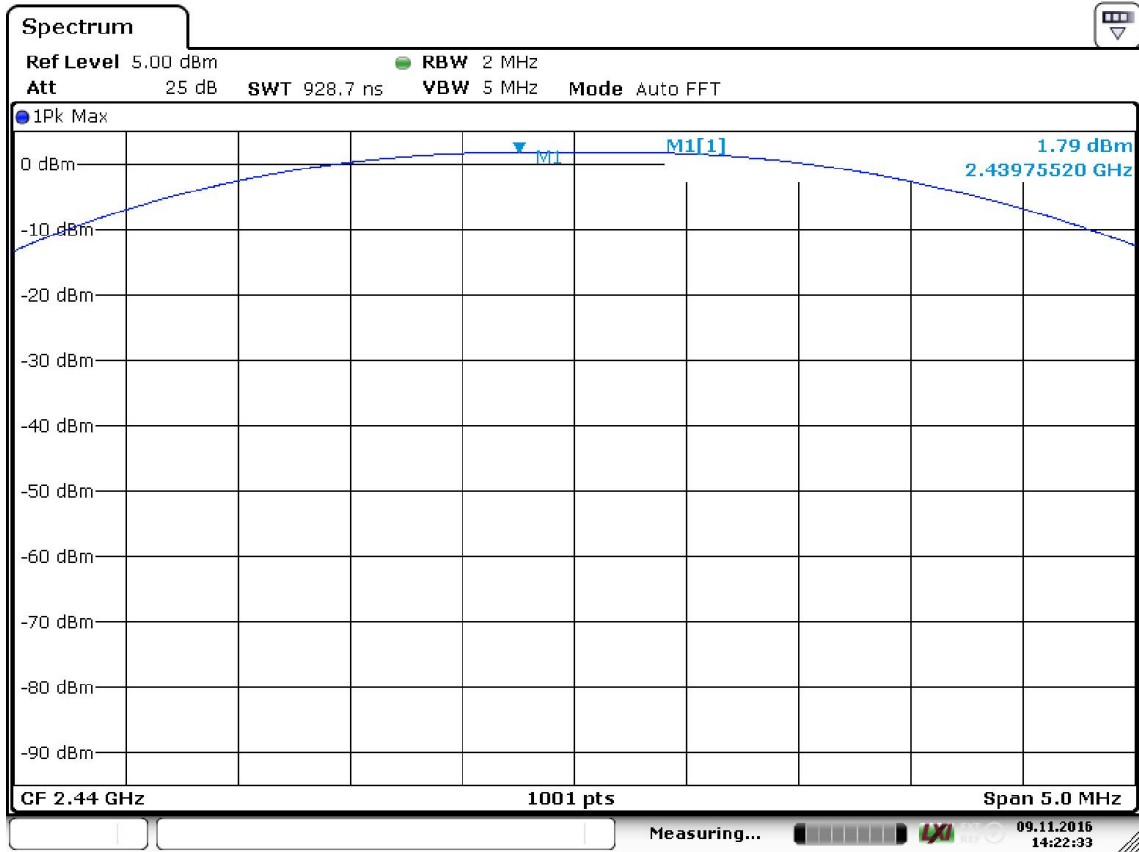
#### Test result

Channel [MHz]	SA value [dBm]	Pathloss [dB]	Output power [dBm]
2405	-0.44	0.6	0,2
2440	1.79	0.6	2.4
2480	0.57	0.6	1,2



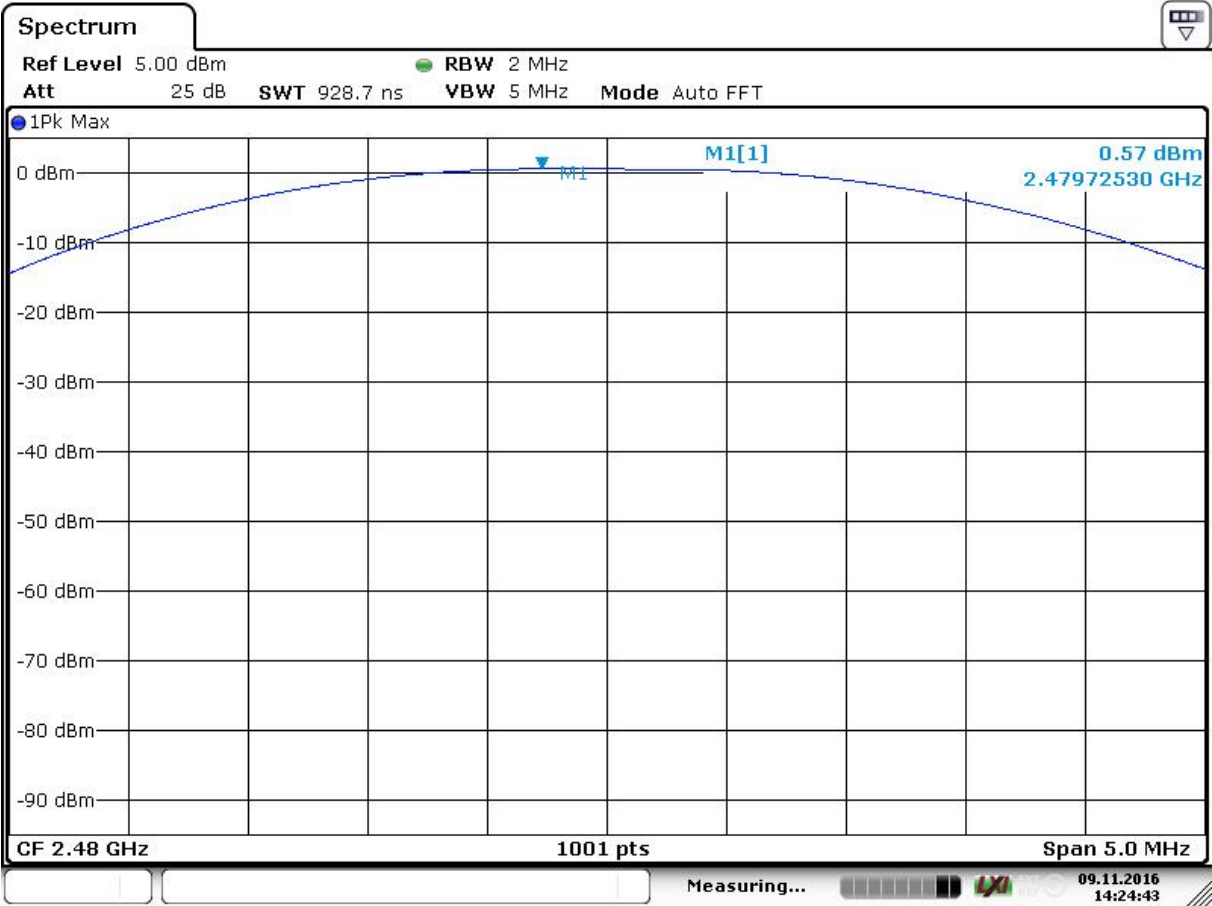
Date: 9 NOV 2016 14:16:12

**Screenshot: Output power, low channel**



Date: 9 NOV 2016 14:22:33

**Screenshot: Output power, middle channel**



Date: 9 NOV 2016 14:24:43

**Screenshot: Output power, high channel**

## 8 OCCUPIED 6 DB BANDWIDTH

<b>Date of test:</b>	2016-11-09	<b>Test location:</b>	Wireless Center
<b>EUT Serial:</b>	No serial on EUT	<b>Ambient temp:</b>	21°C
<b>Tested by:</b>	MTV	<b>Relative humidity:</b>	40%
<b>Test result:</b>	Pass	<b>Margin:</b>	184 kHz

### 8.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 11.8.1.  
The EUT was connected to spectrum analyser via rf-cable.

### 8.2 Test conditions

Detector: Peak,  
RBW: 100 kHz  
VBW: 3 x RBW  
Span: >1,5 x OBW

The EUT was set up in order to emit maximum disturbances.

### 8.3 Requirements

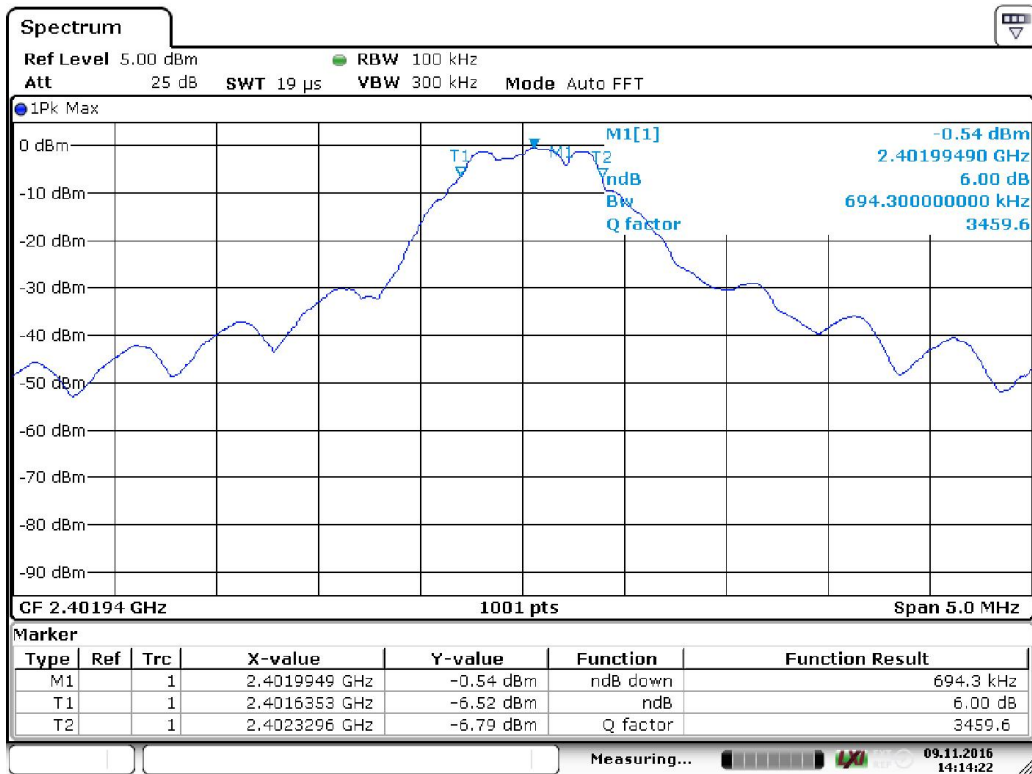
Reference: CFR 47§15.247(a)(2), RSS-247 5.2(1)  
The minimum 6 dB bandwidth shall be 500 kHz.

### 8.4 Test results

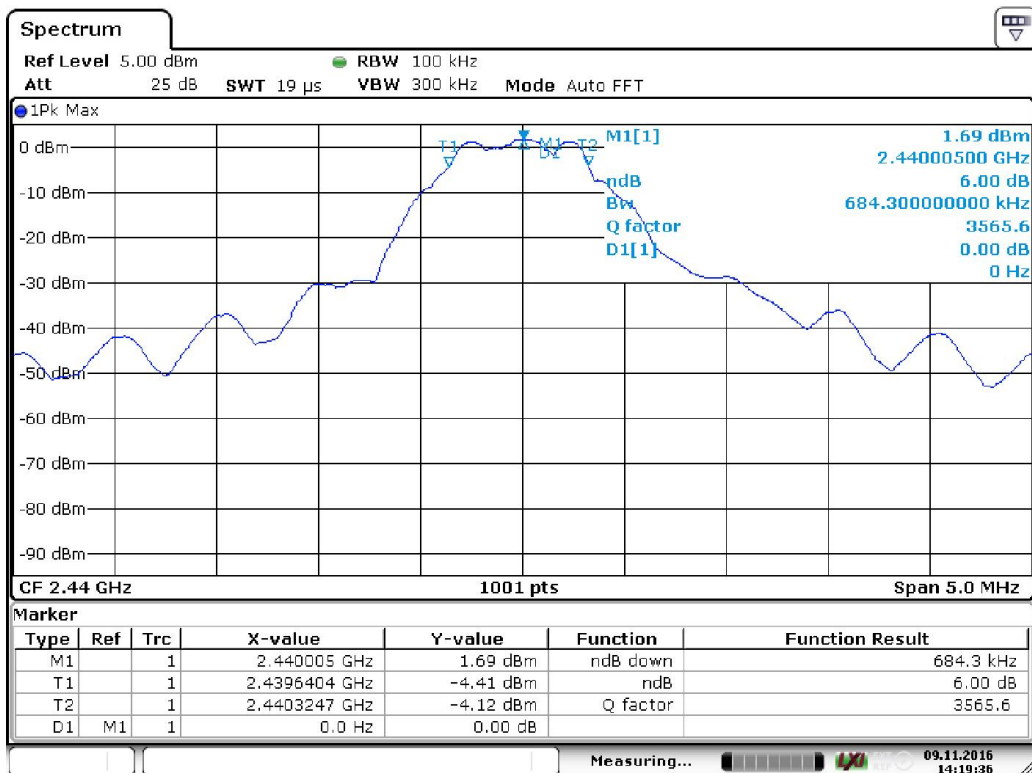
#### Test result

Channel [MHz]	6 dB BW [MHz]	Limit [kHz]	Margin [kHz]
2402	0.694	> 500	194
2444	0.684	> 500	184
2480	0.694	> 500	194



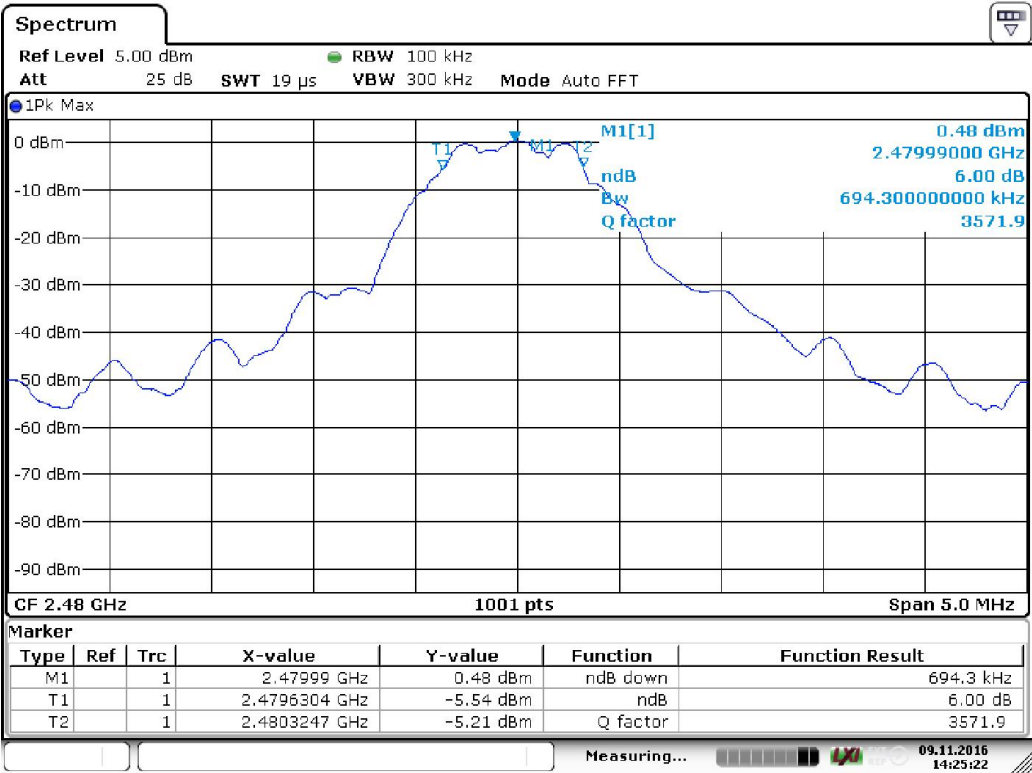


Date: 9 NOV 2016 14:14:22

**Screenshot: Occupied 6 dB bandwidth Measurement, low channel**

Date: 9 NOV 2016 14:19:36

**Screenshot: Occupied 6 dB bandwidth Measurement, middle channel**



Date: 9 NOV 2016 14:25:23

Screenshot: Occupied 6 dB bandwidth Measurement, high channel

**9 99 % BANDWIDTH**

<b>Date of test:</b>	2016-11-09	<b>Test location:</b>	Wireless Center
<b>EUT Serial:</b>	No serial on EUT	<b>Ambient temp:</b>	21°C
<b>Tested by:</b>	MTV	<b>Relative humidity:</b>	40%
<b>Test result:</b>	N/A	<b>Margin:</b>	N/A

**9.1 Test set-up and test procedure.**

The test method is in accordance with RSS-GEN section 6.6.

The EUT was connected to spectrum analyser via rf-cable. Spectrum analyser with occupied bandwidth measurement function is used to determine the occupied bandwidth.

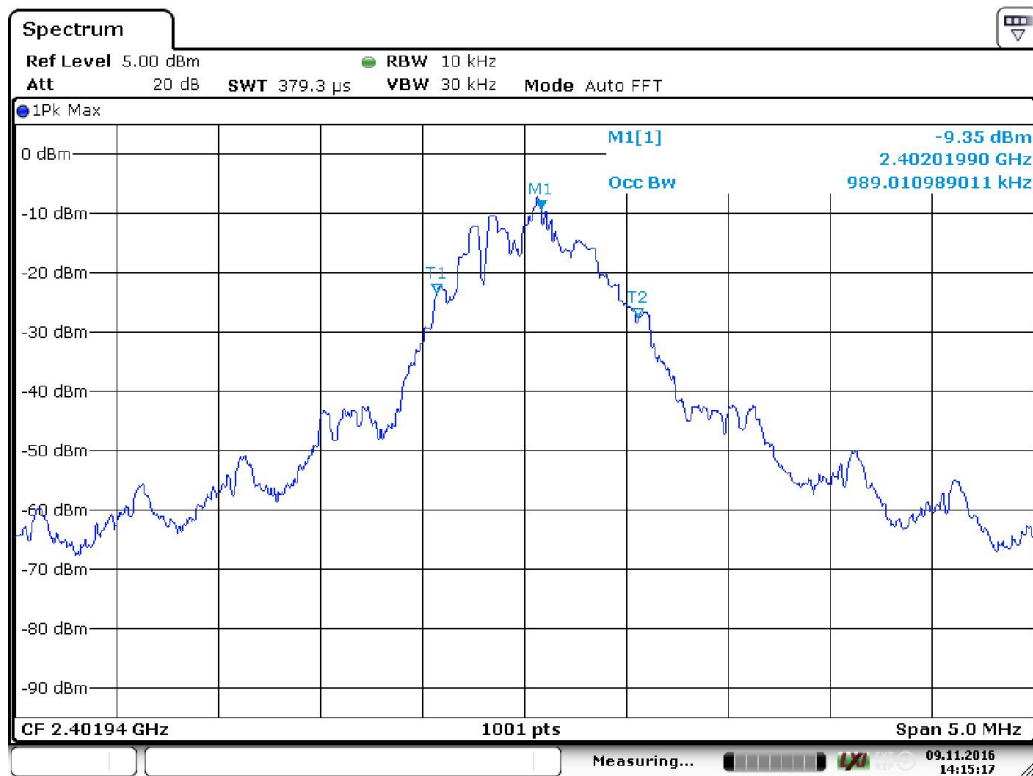
**9.2 Test conditions**

Detector: Peak,  
RBW: 1 – 5 % of OBW  
VBW: 3 x RBW

The EUT was set up in order to emit maximum disturbances.

**9.3 Test results****Test result**

<b>Channel [MHz]</b>	<b>99 % BW [MHz]</b>
2402	0.989
2444	0.974
2480	0.974



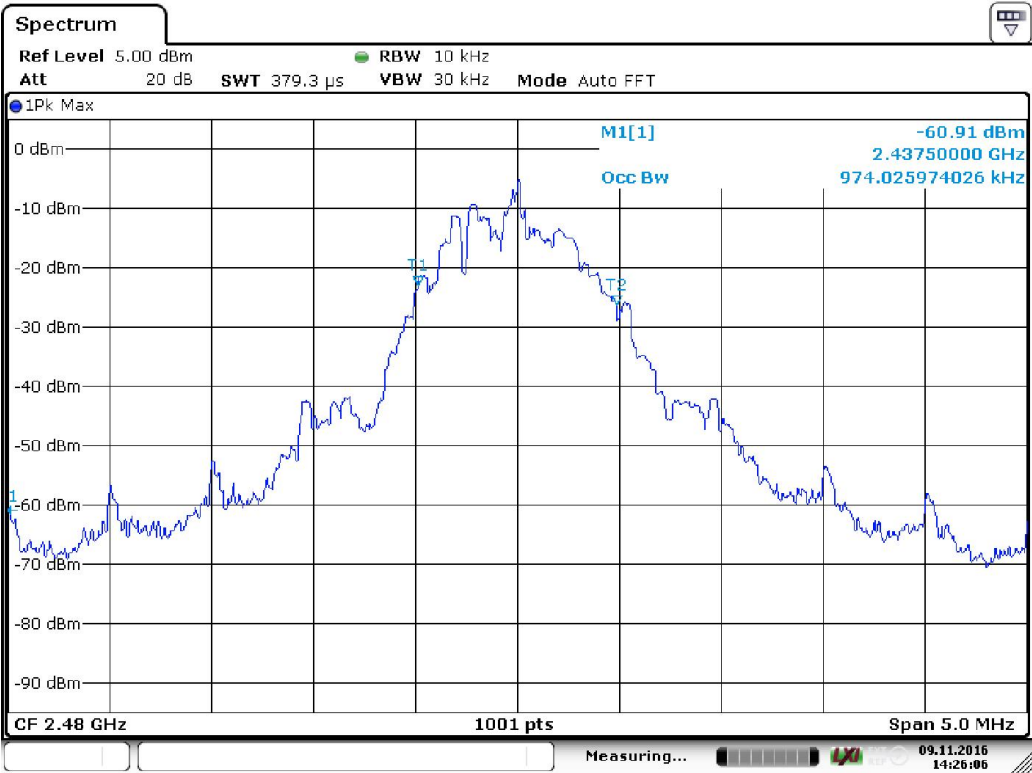
Date: 9 NOV 2016 14:15:17

Screenshot:

**99 % bandwidth Measurement, low channel**

Date: 9 NOV 2016 14:20:26

**Screenshot: 99 % bandwidth Measurement, middle channel**



Date: 9 NOV 2016 14:26:06

**Screenshot: 99 % bandwidth Measurement, high channel**

## 10 PEAK POWER SPECTRAL DENSITY

<b>Date of test:</b>	2016-11-09	<b>Test location:</b>	Wireless Center
<b>EUT number:</b>	No serial on EUT	<b>Ambient temp:</b>	21°C
<b>Tested by:</b>	MTV	<b>Relative humidity:</b>	40%
<b>Test result:</b>	Pass	<b>Margin:</b>	18.9 dB

### 10.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 11.10.2.

The EUT was connected to spectrum analyser via rf-cable.

### 10.2 Test conditions

Detector: Peak,  
RBW: 3 kHz  
VBW: >3 x RBW  
Span: 1.5 x 6 dB bandwidth

The EUT was set up in order to emit maximum disturbances.

### 10.3 Requirements

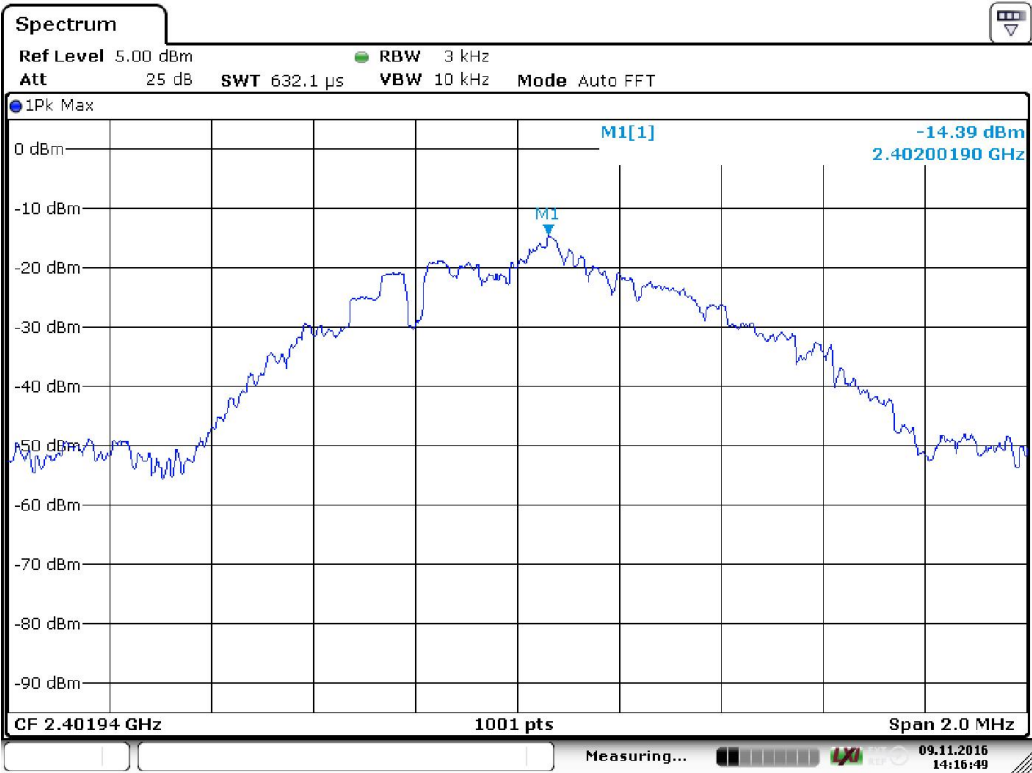
Reference: CFR 47§15.247(3), RSS-247 5.2(2)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 10.4 Test results

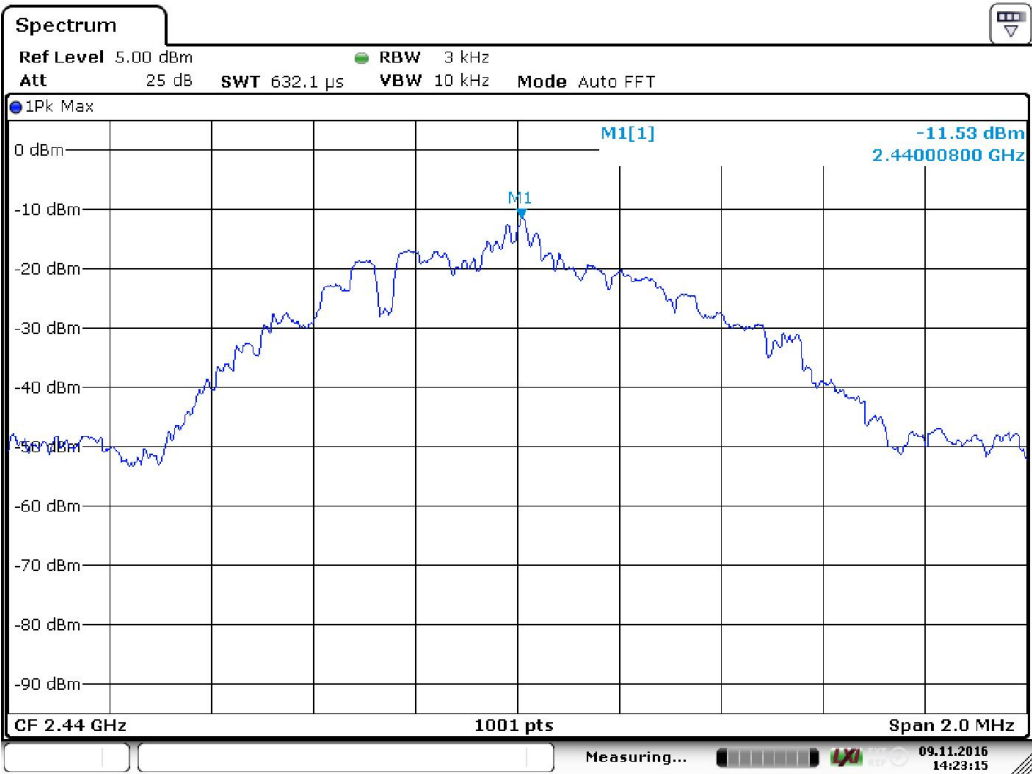
#### Test result

Channel [MHz]	SA value [dBm]	Pathloss [dB]	PSD [dBm/3kHz]
2402	-14.39	0.6	-13.8
2444	-11.53	0.6	-10.9
2480	-11.73	0.6	-11.1



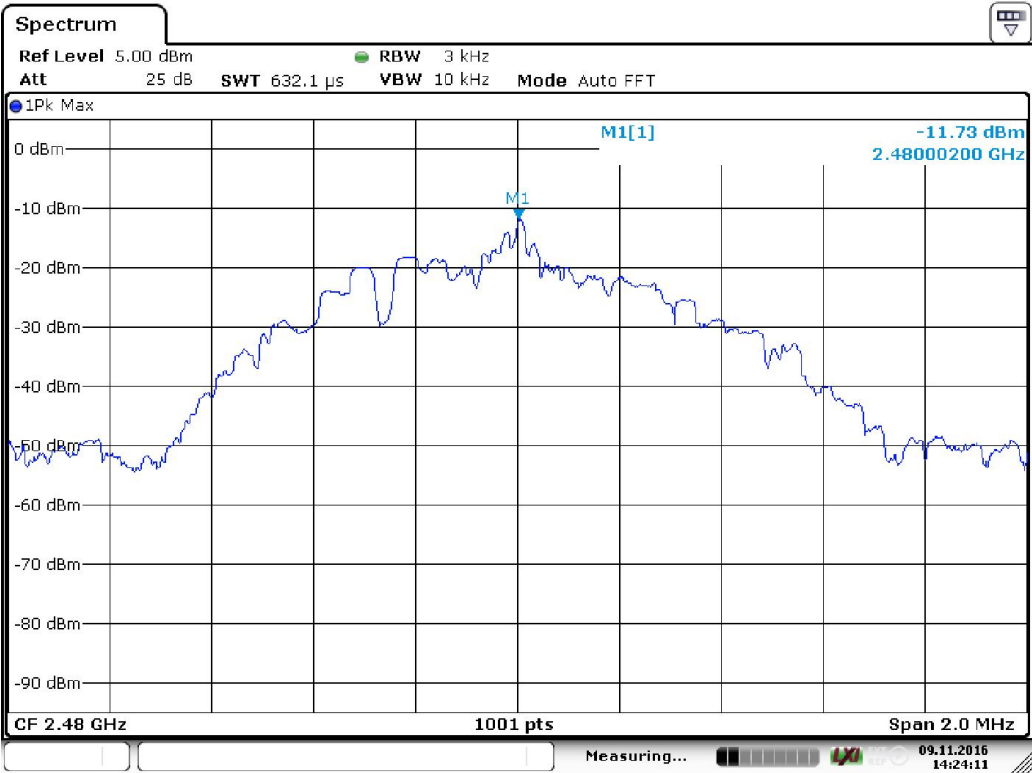
Date: 9 NOV 2016 14:16:49

**Screenshot: Peak power spectral density, low channel**



Date: 9 NOV 2016 14:23:15

**Screenshot: Peak power spectral density, middle channel**



Date: 9 NOV 2016 14:24:11

**Screenshot: Peak power spectral density, high channel**



## 11 TEST EQUIPMENT

### Stora Hallen

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32 - Version	--	--	--
Receiver	Rohde & Schwarz	ESU 8	12866	7/2016	1 year
Receiver	Rohde & Schwarz	ESU 40	13178	7/2016	1 year
BiLog antenna	Chase	CBL6110A	971		3 years
Preamplifier	Semko	AM-1331	30366	7/2016	1 year
Horn antenna	Rohde & Schwarz	HF 907	31245		3 years
Preamplifier	Bonn	BLMA0118-M	31246	7/2016	1 year
Horn antenna +Preamplifier	Bonn	BLMA1268-5A	31247	1/2014	3 years
2,4 GHz band reject filter:	K&L MICROWAVE INC	6N45-2450/T100-0/0	12389	7/2016	1 year
4 GHz high pass filter	K&L MICROWAVE INC	4410-X4500/18000-0/0	5133	7/2016	1 year
Communication tester	Rohde & Schwarz	CMW500	32597	1/2016	1 year
Measurement cable	Huber Suhner	Sucoflex 104	39033	7/2016	1 year
Measurement cable	Huber Suhner	Sucoflex 104	40036	7/2016	1 year
Measurement cable	Huber Suhner	Sucoflex 104	32710	7/2016	1 year
Measurement cable	Huber Suhner	Sucoflex 106	39078	7/2016	1 year

### Wireless center

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Spectrum analyzer	Rohde & Schwarz	FSV 30	32594	7/2016	1 year
Measurement cable	Huber Suhner	Sucoflex 104PE	39076	5/2016	1 year

## 12 MEASUREMENT UNCERTAINTY

Continuous conducted disturbances with AMN in the frequency range 9 kHz to 30 MHz  $\pm 3.7$  dB

Measurement uncertainty for radiated disturbance

Uncertainty for the frequency range 30 to 1000 MHz at 10 m	$\pm 5.0$ dB
Uncertainty for the frequency range 1.0 to 18 GHz at 3 m	$\pm 4.7$ dB
Uncertainty for the frequency range 18 to 26 GHz at 3 m	$\pm 4.8$ dB

Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2011.

The measurement uncertainty is given with a confidence of 95 %.

## 13 TEST SET UP AND EUT PHOTOS

EUT photos are in separate document 1613926STO-001 Annex 1.

Test set up photos are in separate document 1613926STO-001 Annex 2.