RADIO TEST REPORT

No. 1516281STO-002, Ed. 1

RF Performance

EQUIPMENT UNDER TEST

Equipment:	Bluetooth Low Energy Module
Type/Model:	MBM1CC2640
Manufacturer:	ASSA ABLOY AB
Tested by request of:	ASSA ABLOY 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 (2014): Subpart C: Intentional radiators. Section 15.247

47 CFR Part 15 (2014): Subpart B: Unintentional radiators.

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 License-Exempt Local Area Network (LE-LAN) Devices

For details, see clause 2 – 4.

Date of issue: 2015-11-23

Tested by: Daniel Nilsson

Approved by: Matti Virkki

Revision History

Edition	Date	Description	Changes
1	2015-11-23	First release	

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1 CLIENT INFORMATION

The EUT has been tested by request of

Company	ASSA ABLOY AB Förmansvägen 11 SE-117 43 Stockholm SVERIGE
Name of contact	Petter Olsen Phone +46 (0)8 5064 6284
Client observers	John Ljungberg and Hugo Kurtsson

2 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT

Equipment:	Bluetooth Low Energy Module	
Type/Model:	MBM1CC2640	
Brand name:	ASSA ABLOY AB	
Serial number:	121590354 / 1215390431 (Host)	
Manufacturer:	ASSA ABLOY AB	
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, internal antenna	☐ Yes
Antenna gain:	1.1 dBi peak	
Rating RF output power:	5 dBm	
Type of modulation:	GFSK	
Transmitter standby mode supported:	☒ Yes	☐ No

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2.2 Additional information about the EUT

The module is tested mounted within a host, the MobilPD BLE.

The EUT consists of the following units:

Unit	Type	Serial number	Note
Key programming device	MobilPD BLE	121590354	
Key programming device	MobilPD BLE	1215390431	Internal antenna replaced with SMA connector

2.3 Test signals and operation modes

Continuous signal with GFSK modulation on low channel (2402 MHz), middle channel (2440 MHz) and high channel (2480 MHz).

Duty cycle measurement is made with EUT sending a continuous stream of packages at a maximum theoretical rate.

2.4 Modifications made to improve EMC-characteristics

No modifications have been made during the tests.

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3 TEST SPECIFICATIONS

3.1 Standards

Requirements:

47 CFR Part 15 (2014): Subpart C: Intentional radiators. Section 15.247

47 CFR Part 15 (2014): Subpart B: Unintentional radiators.

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 License-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

RSS-GEN Issue 4 (2014) and RSS-247 Issue 1 (2015) are not within Intertek's scope of accreditation.

No other 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 chambers

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

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4 TEST SUMMARY

The results in this report apply only to sample tested:

Requirement	Description	Result
FCC §15.203 **RSS-GEN, section 8.3**	**Antenna requirement** The EUT has integrated non detachable antenna which can't be remove without breaking the EUT	**PASS**
FCC §15.207 **RSS-GEN, section 8.8 table 3**	**Conducted continuous emission in the frequency range 150 kHz to 30 MHz, AC Power input port** Battery operated equipment.	**NA**
FCC §15.247 (b)(4), (c) **RSS-247 5.4(4), 5.4(5)**	**Field strength of fundamental and antenna gain** The EUT complies with the limits. Antenna gain is less than 6 dBi.	**PASS**
FCC §15.247 (d), 15.209(a) **RSS-GEN 8.9** **RSS-247 5.5**	**Radiated emission of electromagnetic fields in the frequency range 30 – 1000 MHz** The EUT complies with the limits. The margin to the limit was at least 18 dB. See clause 6.4 and 6.5.	**PASS**
FCC §15.247(d), 15.209(a) **RSS-GEN 8.9** **RSS-247 5.5**	**Radiated emission of electromagnetic fields in the frequency range above 1 GHz** The EUT complies with the limits. The margin to the limit was at least 10 dB. See clause 6.6 and 6.7.	**PASS**
FCC §15.247(a)(2) **RSS-GEN, section 6.6** **RSS-247 5.2(1)**	**Occupied bandwidth** The EUT complies with the limits. The margin to the limit is at 203 kHz. See clause 7.4 and 8.3.	**PASS**
FCC §15.247(b) **RSS-247 5.4(4)**	**Conducted output power** The EUT complies with the limits. The margin to the limit was at least 34.6 dB See clause 9.4.	**PASS**
FCC §15.247(e) **RSS-247 5.2(2)**	**Peak power spectral density** The EUT complies with the limits. The margin to the limit was at least 20.1 dB. See clause 10.4.	**PASS**

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5 FIELD STRENGTH OF FUNDAMENTAL AND RADIATED BAND EDGE

Date of test:	2015-10-07	**Test location:**	Stora Hallen
EUT Serial:	121590354	**Ambient temp:**	22 °C
Tested by:	Kajsa From	**Relative humidity:**	26 %
Test result:	Pass	**Margin:**	13.1 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 and placed on an insulating support 1.5 m above the turntable which is part of the reference ground plane.
The EUT was evaluated in three orthogonal orientations.

5.2 Test conditions

Test receiver set-up:

Preview test:	Peak,	RBW 1 MHz	VBW 3 MHz
Final test:	Peak,	RBW 1 MHz/100kHz	VBW 3 MHz/300 kHz
	Average	Peak value + 20 x LOG (Duty cycle)	
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 Requirement

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.

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 (dBµV/m)	Field strength at 10 m (dBµV/m)	Detector (dBµV/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

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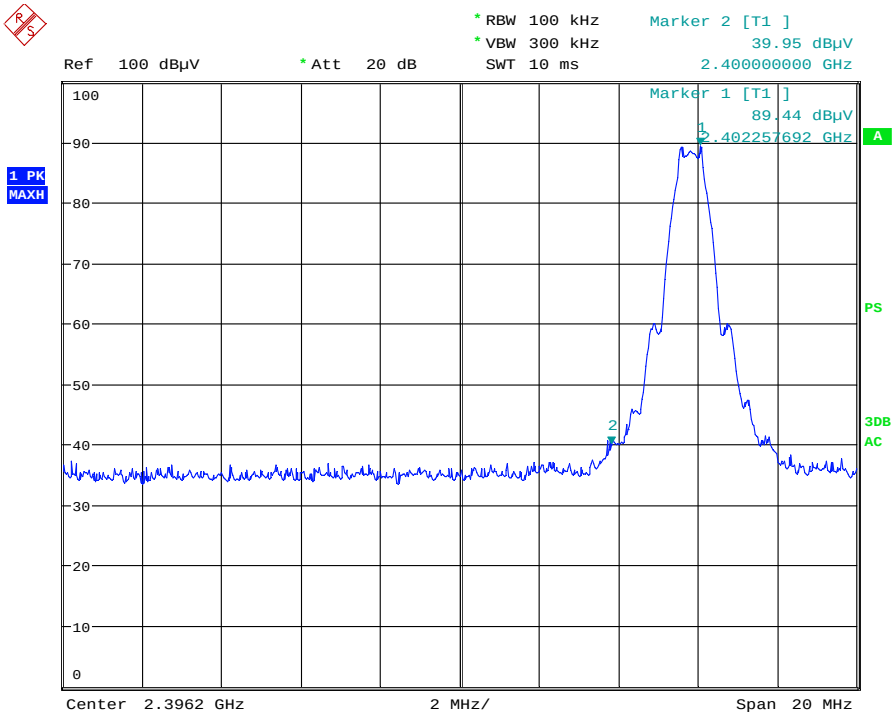
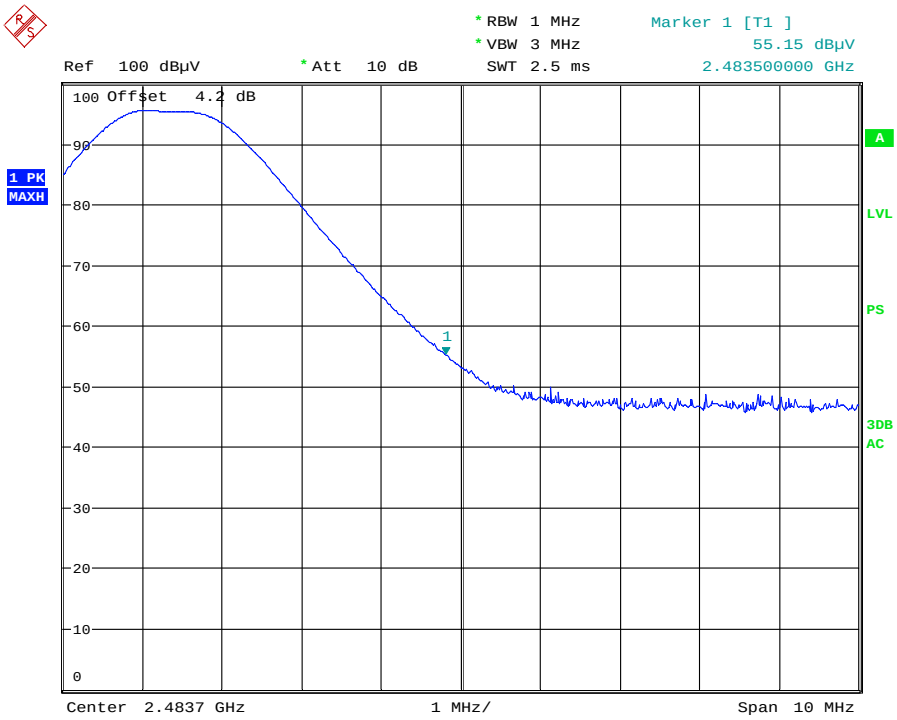
5.4 Test results



Diagram, lower band edge sweep, peak, EUT orientation X.

Field strength of fundamental and band edge, low channel

Frequency [MHz]	Level [dBµV/m]	Delta [dBc]	Limit [dBc]	Detector	EUT Orientation	Polarization H/V	Margin [dB]
2402.3	89.4	--	--	Peak	X	H	--
2400.0	40.0	49.4	20.0	Peak	X	H	29.4



Diagram, higher band edge sweep, peak, EUT orientation X.

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Field strength of fundamental and band edge, high channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Detector	EUT Orientation	Polarization H/V	Margin [dB]
2483.5	55.2	74.0	Peak	X	H	18.8
2483.5	40.9	54.0	Avg	X	H	13.1

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

Date of test:	2015-10-08	**Test location:**	Stora Hallen
EUT Serial:	1215900354	**Ambient temp:**	21 – 22 °C
Tested by:	Kajsa From	**Relative humidity:**	26 – 31 %
Test result:	Pass	**Margin:**	>10 dB

6.1 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 and was placed on an insulating support 0.8 or 1.5 m above the turntable which is part of the reference 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.

Pre scan was made in three orthogonal EUT orientations on one channel. Measurements are continued with EUT in worst case orientation.

6.2 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
EUT height above ground plane: 0.8 m
Measuring distance: 3 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
Final test: Peak, RBW 1 MHz
Average Peak value + 20 x LOG (Duty cycle)
EUT height above ground plane: 1.5 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

6.3 Radiated Emission requirements

Within restricted bands and receive mode:
Reference: 47 CFR §15.209, §15.109, RSS-Gen section 8.9

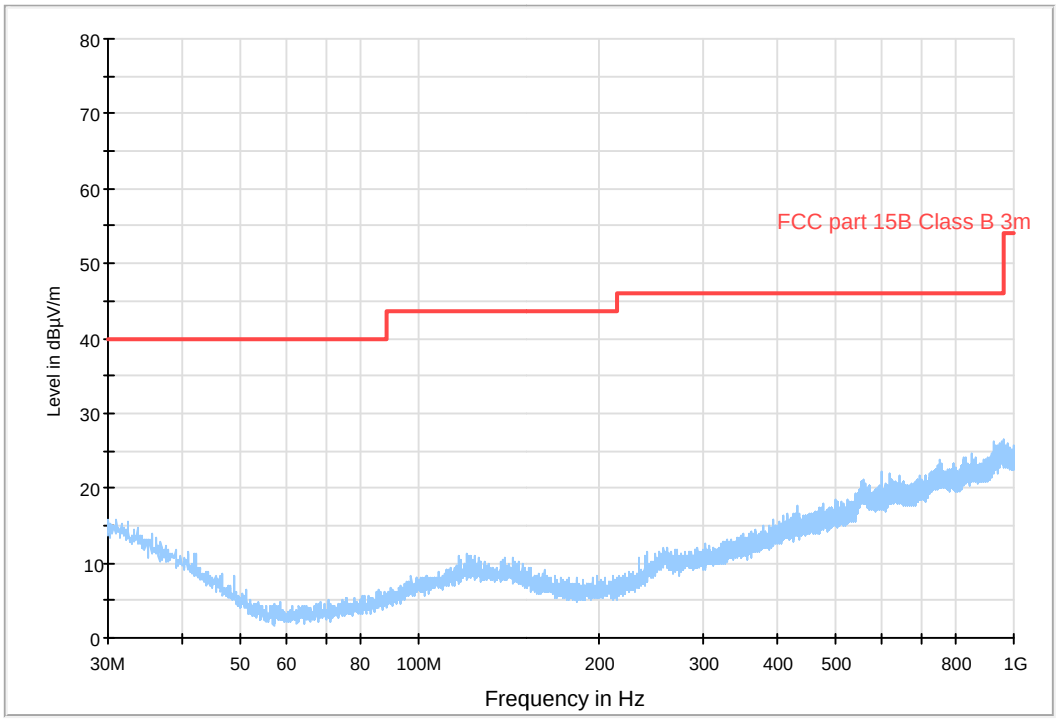
Frequency range [MHz]	Field strength at 3 m (dBµV/m)	Field strength at 10 m (dBµV/m)	Detector (dBµV/m)
30 – 88	40.0	29.5	Quasi Peak
88 – 216	43.5	33.0	Quasi Peak
216 – 960	46.0	35.5	Quasi Peak
960 – 1000	54.0	43.5	Quasi Peak
Above 1000	54.0 / 74.0	43.5 / 63.5	Average / Peak

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 §15.31(f)(1))

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

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 30 MHz – 1000 MHz, TX



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX low channel, EUT orientation X.

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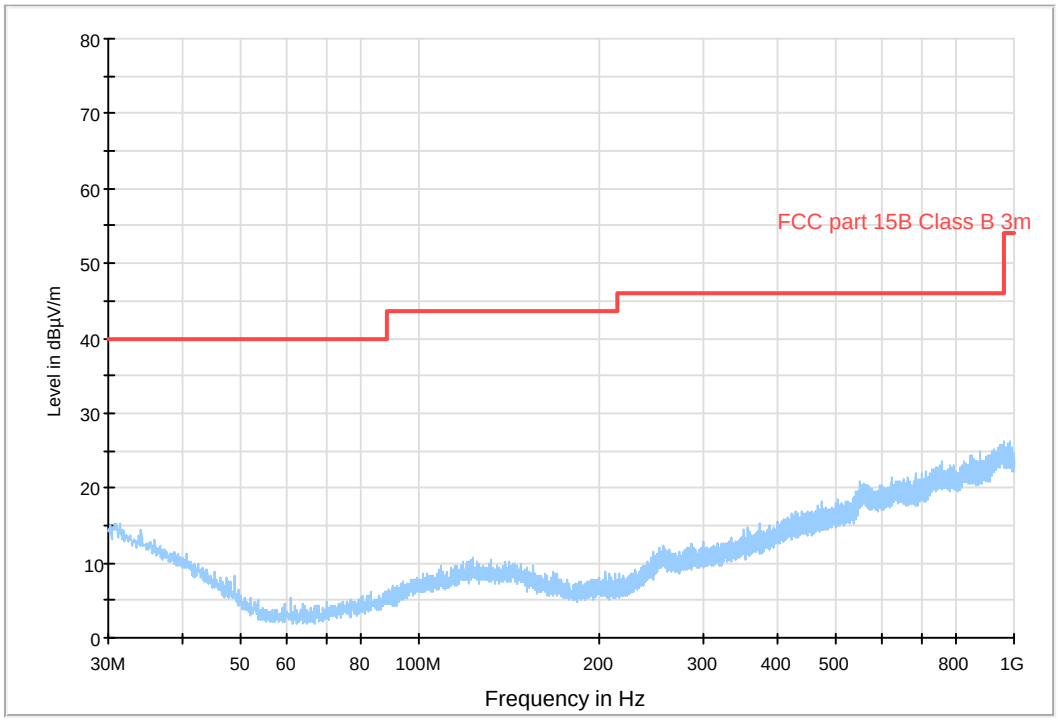
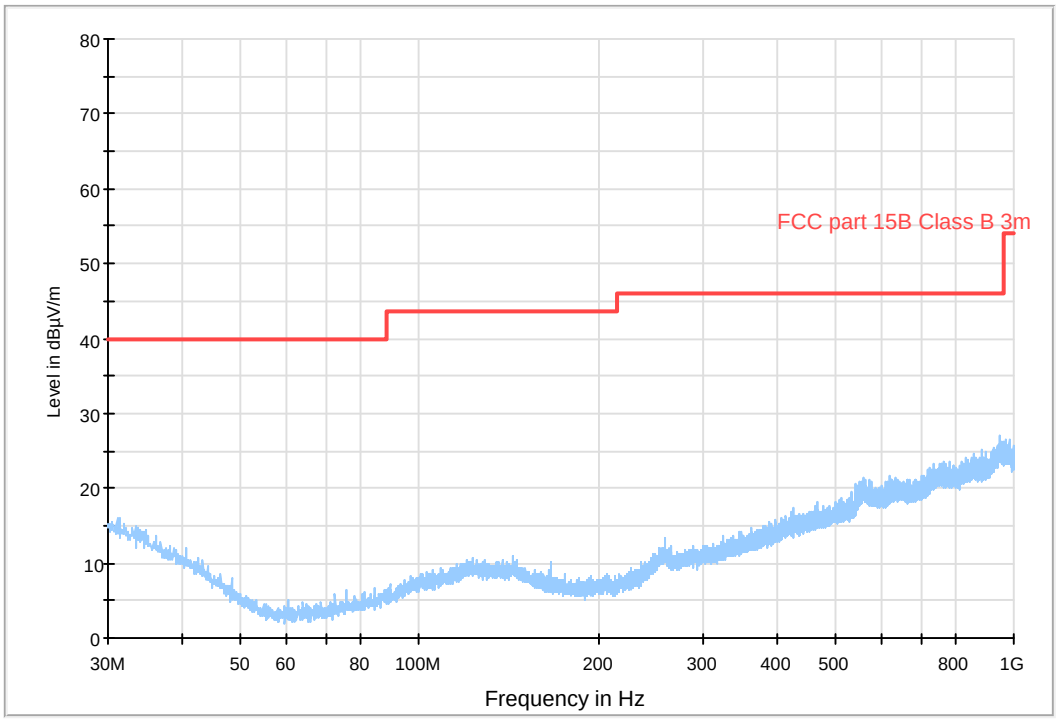


Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX low channel, EUT orientation Y.



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX low channel, EUT orientation Z.

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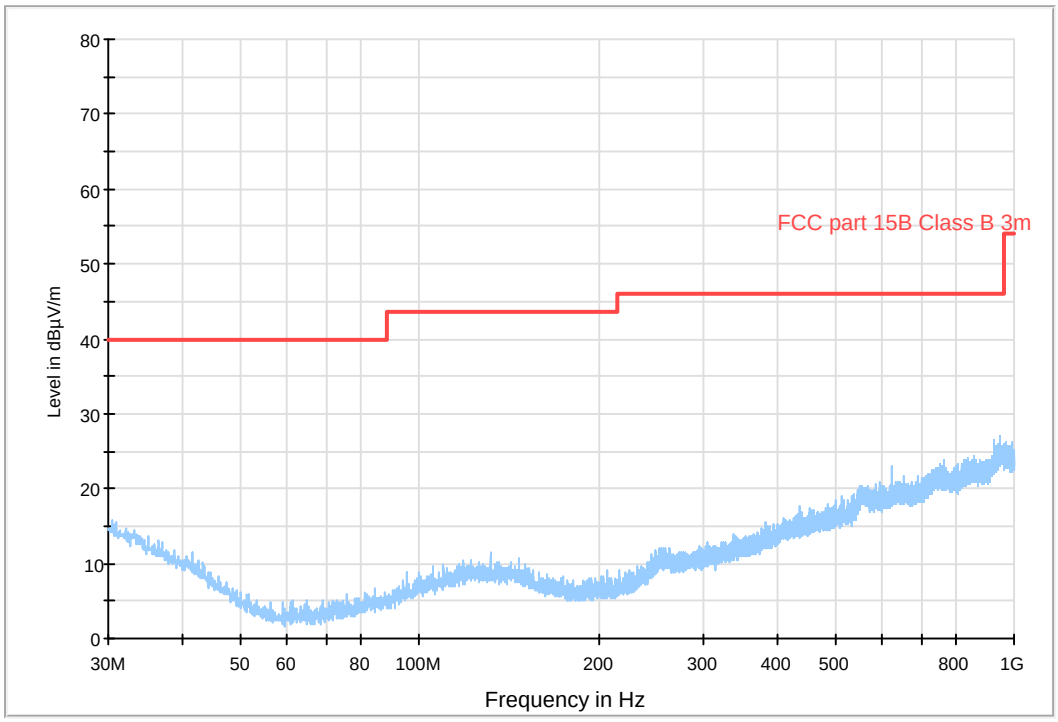
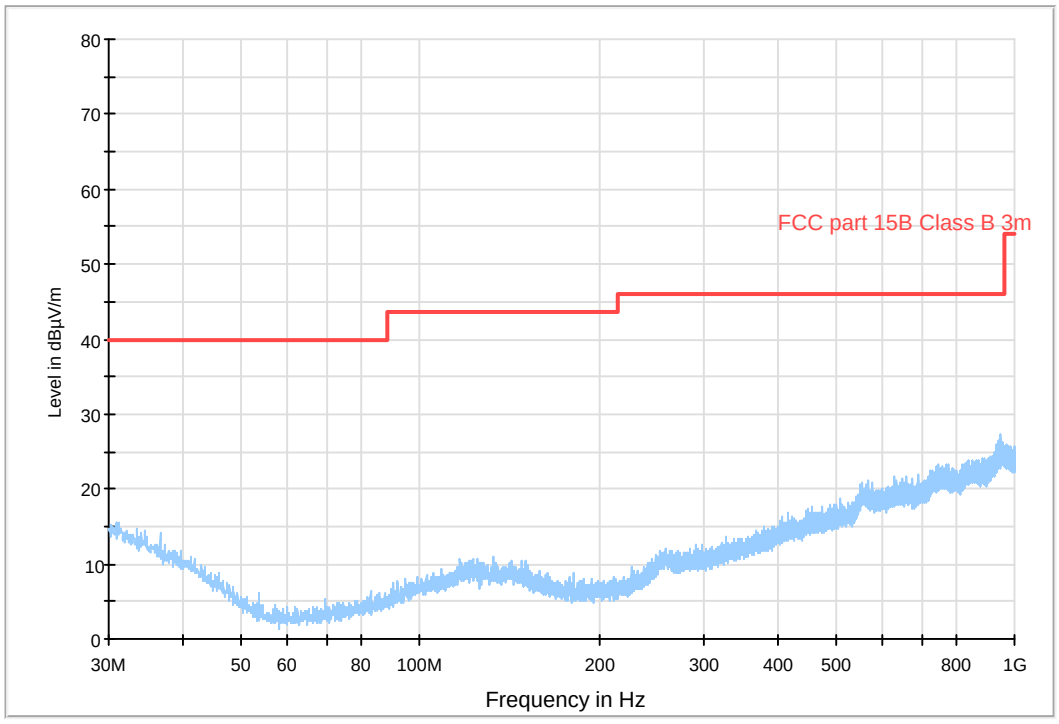


Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX middle channel, EUT orientation Z.



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX high channel, EUT orientation Z.

Measurement results, Quasi Peak

No emissions are found above noise floor or closer than 20 dB from limit. Margin to noise floor is at least 18 dB.

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

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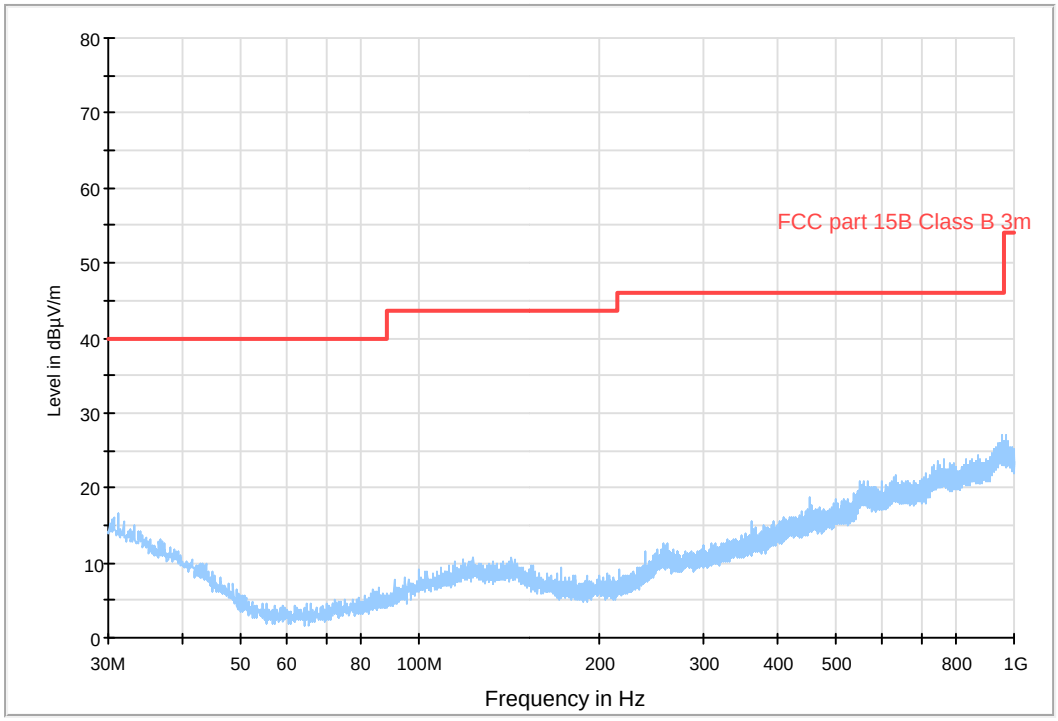
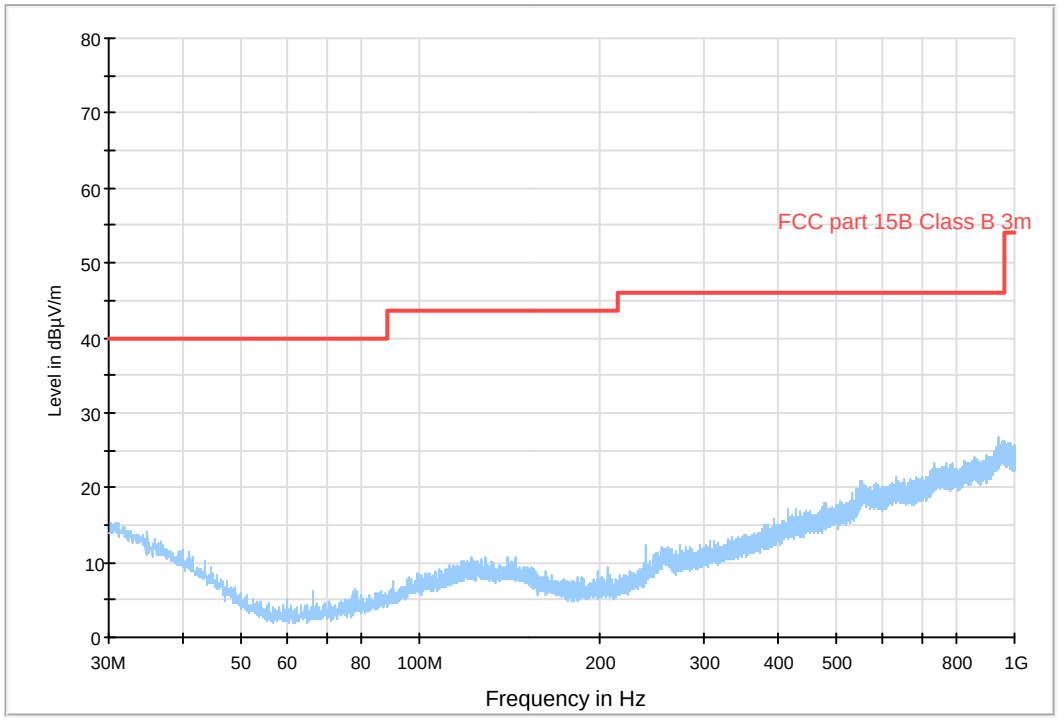
6.5 Test results 30 MHz – 1000 MHz, RX



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. RX low channel, EUT orientation Z.



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. RX mid channel, EUT orientation Z.

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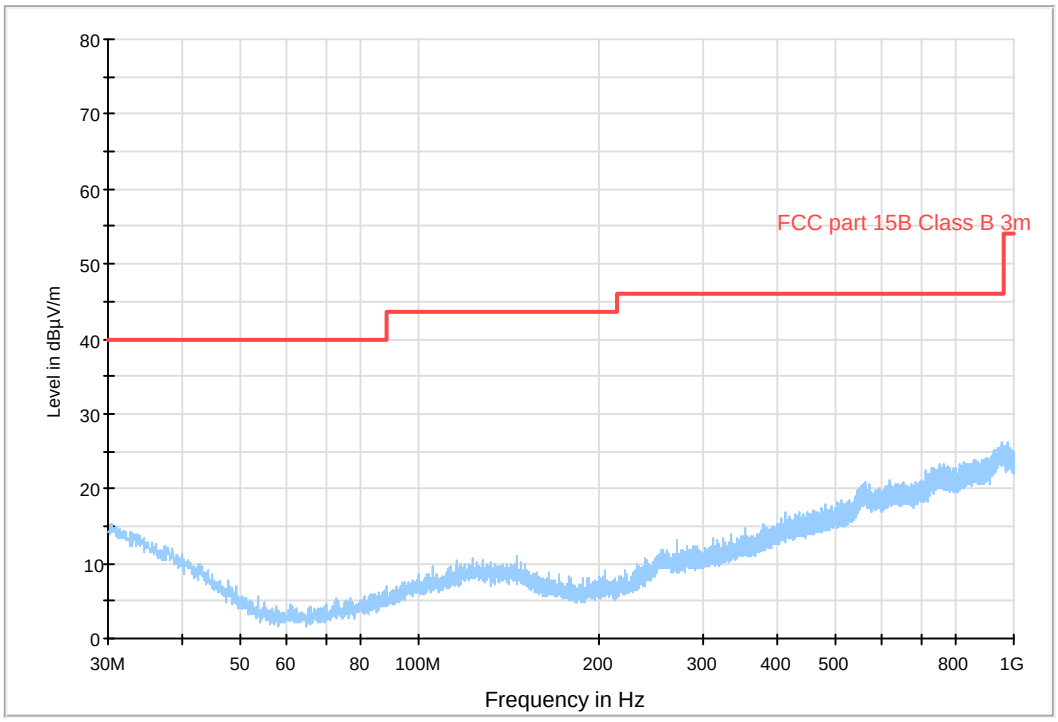

Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. RX high channel, EUT orientation Z.

Measurement results, Quasi Peak

No emissions are found above noise floor or closer than 20 dB from limit. Margin to noise floor is at least 18 dB.

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

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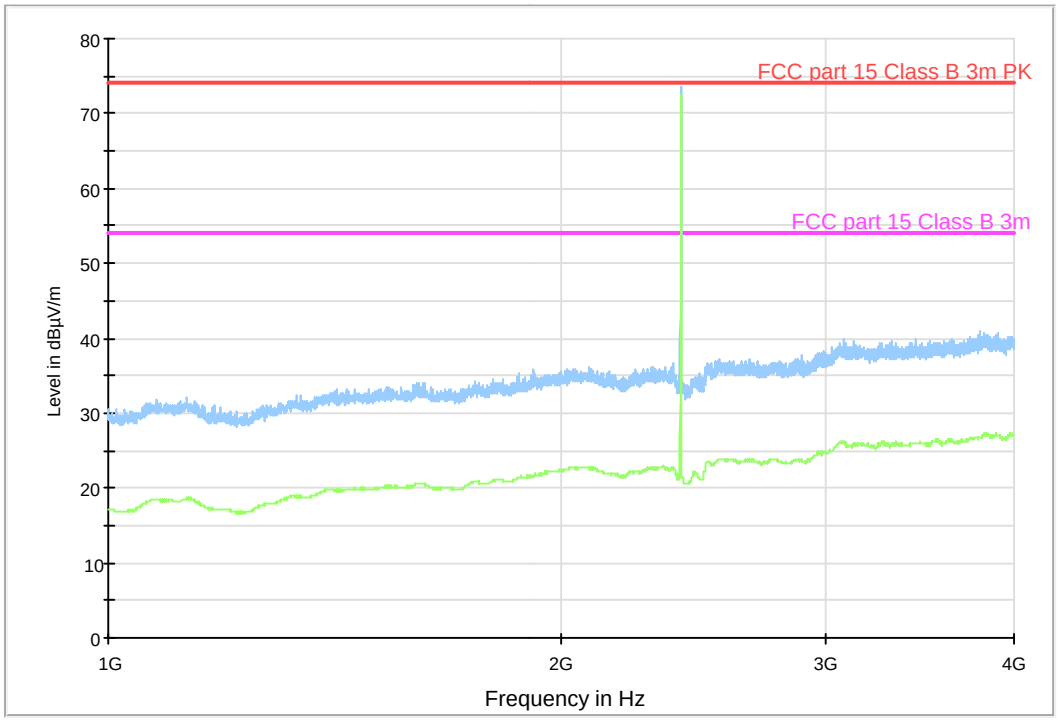
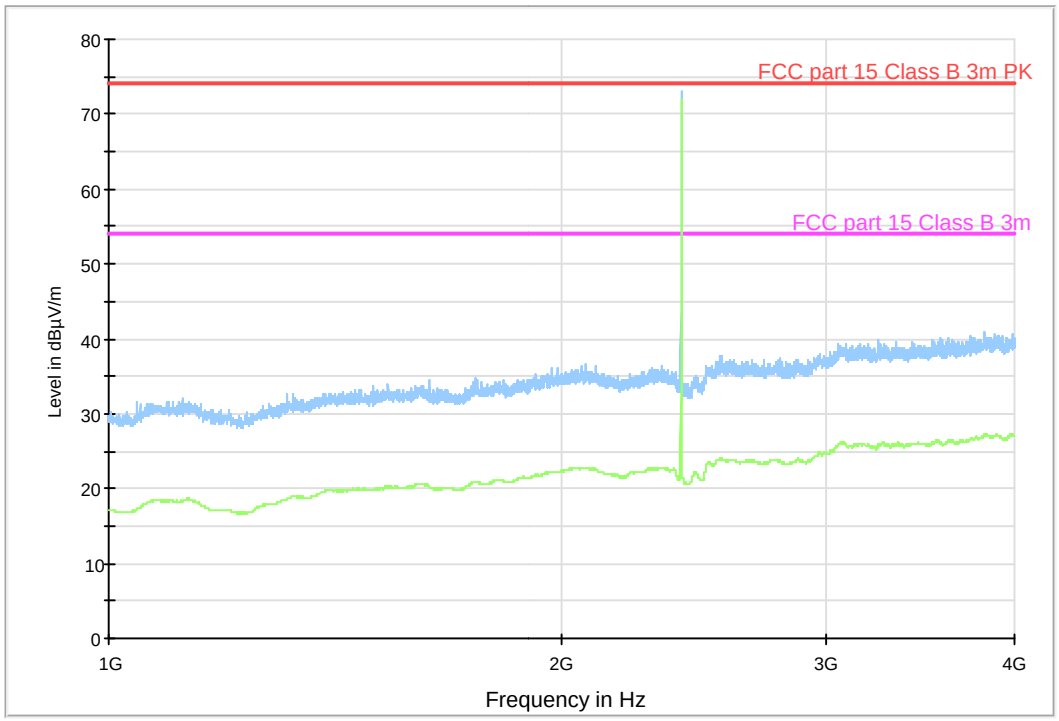
6.6 Test results 1 GHz – 26 GHz, TX



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



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

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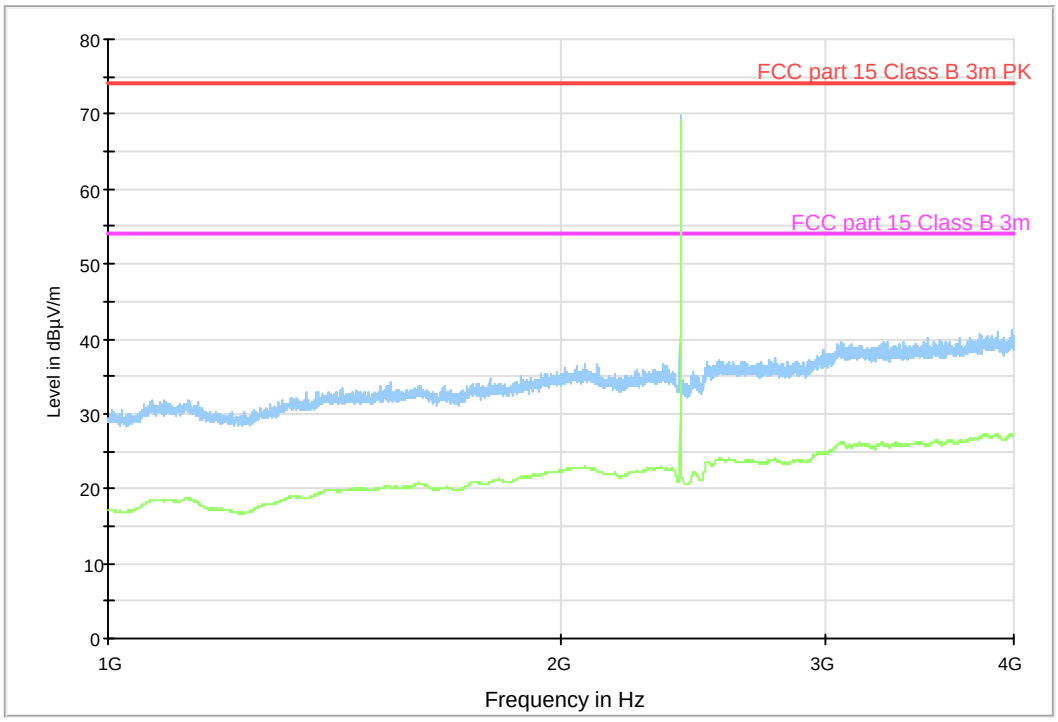
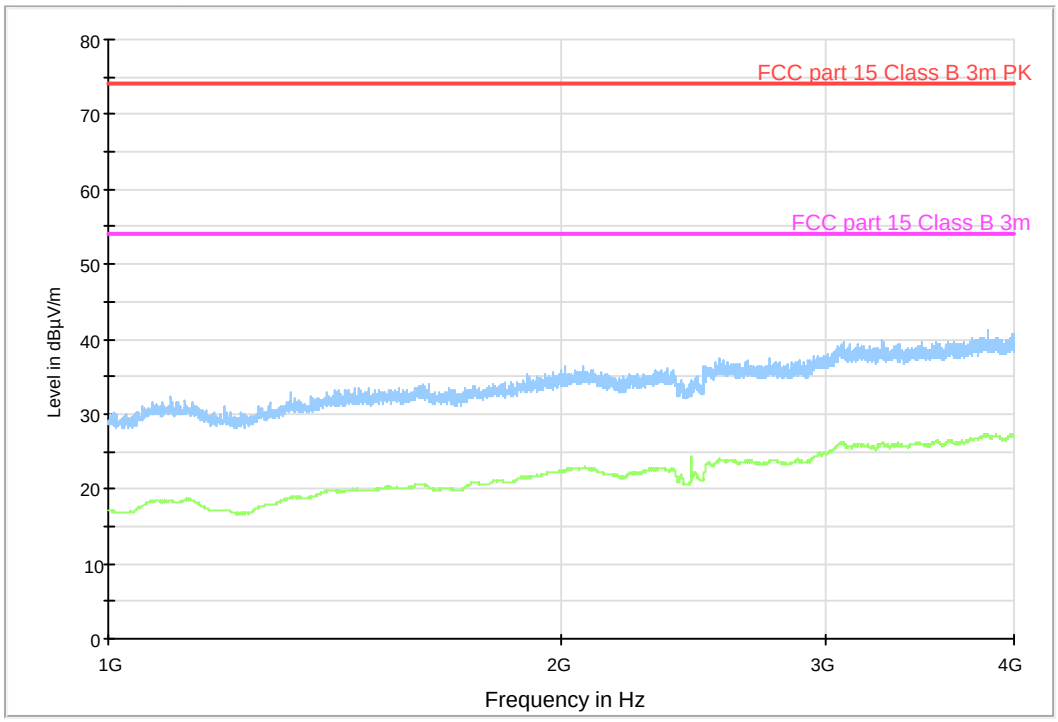


Diagram, Peak overview sweep, 1 – 4 GHz at 3 m distance. TX low channel, EUT orientation Z. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.



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

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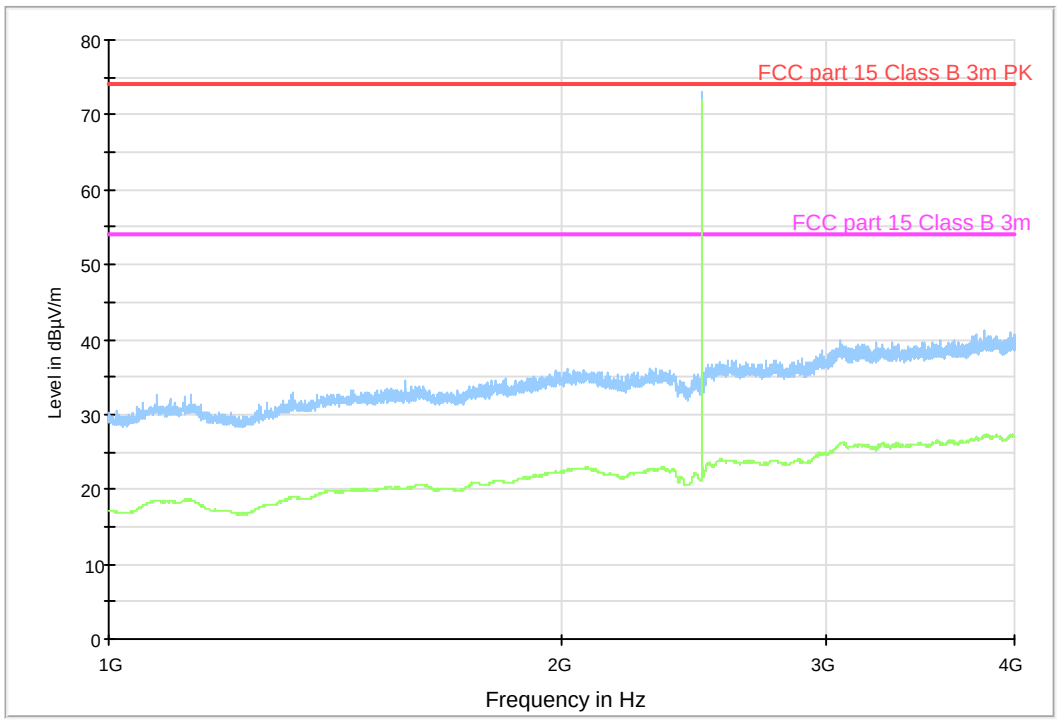
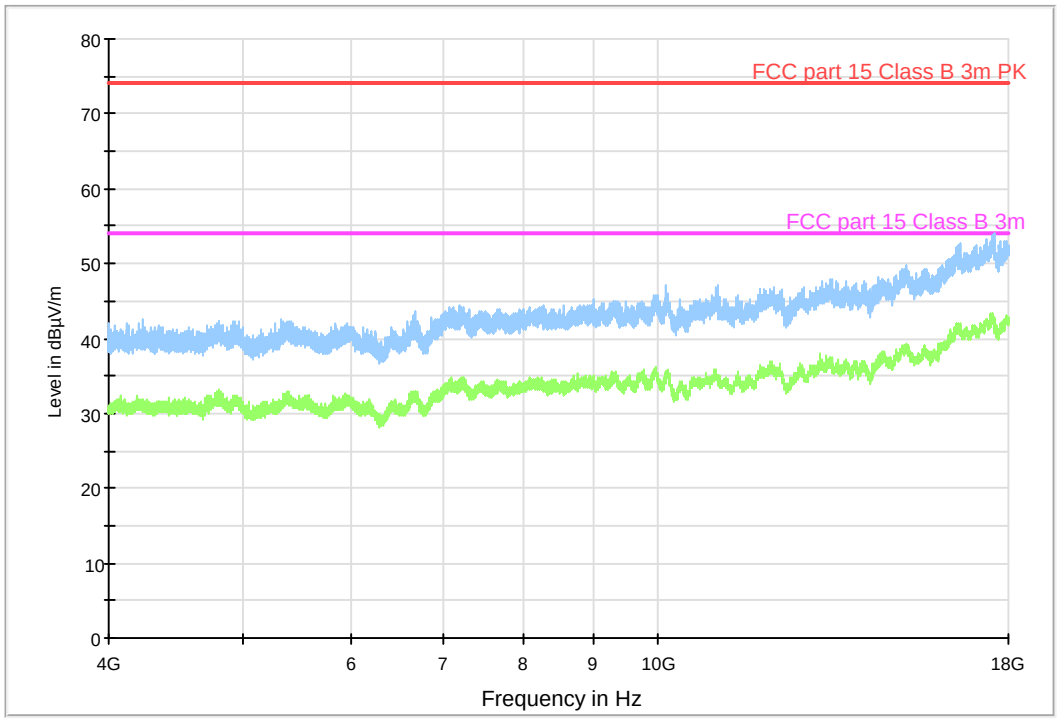


Diagram, Peak overview sweep, 1 – 4 GHz at 3 m distance. TX high channel, EUT orientation X. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.



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

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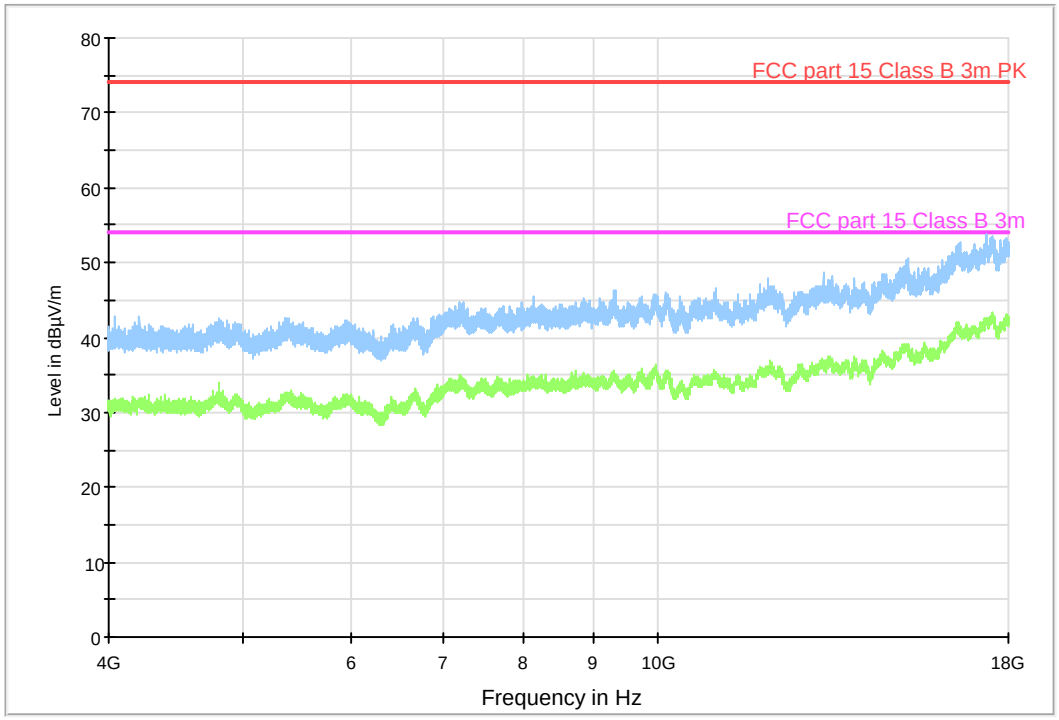
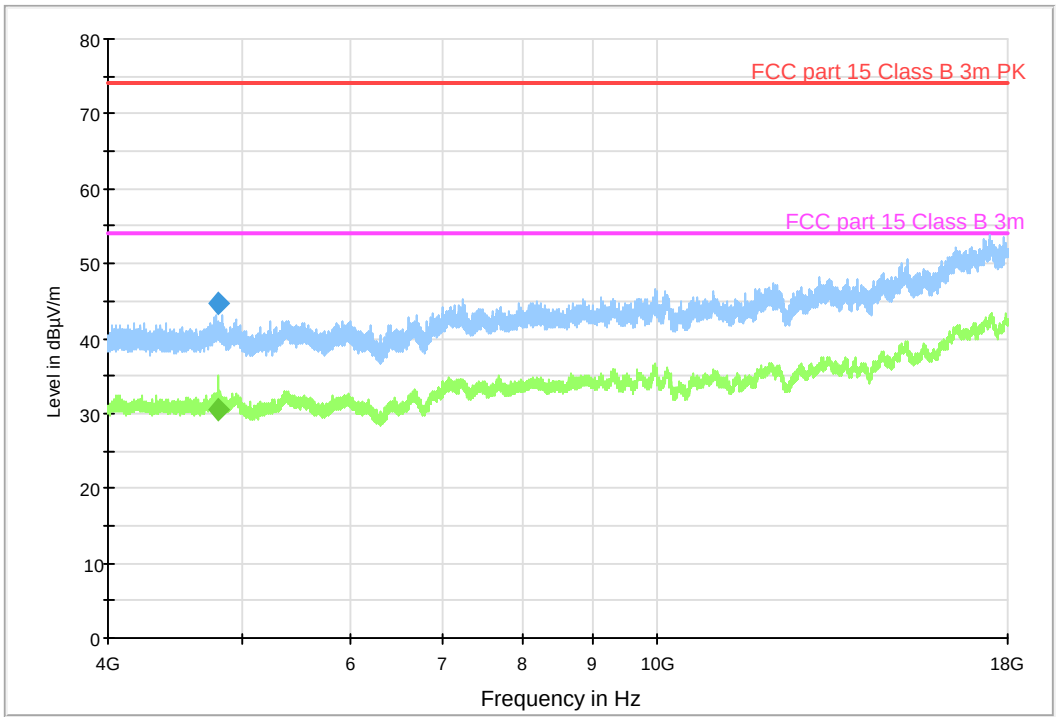


Diagram, Peak overview sweep, 4 – 18 GHz at 3 m distance. TX low channel, EUT orientation Y. Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0.



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

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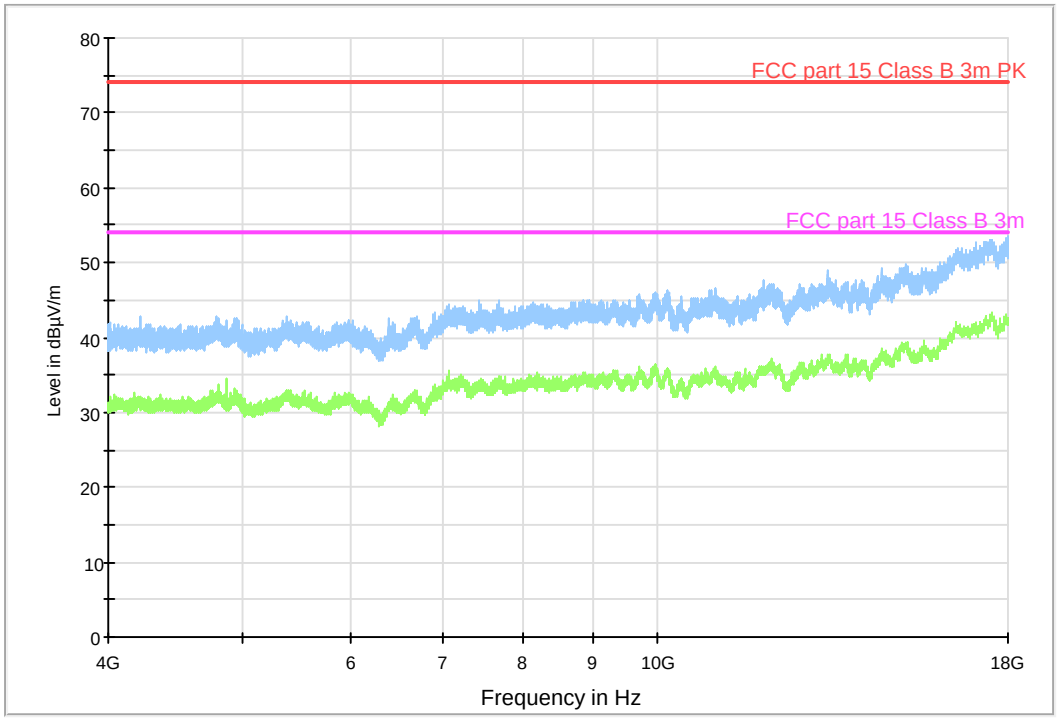
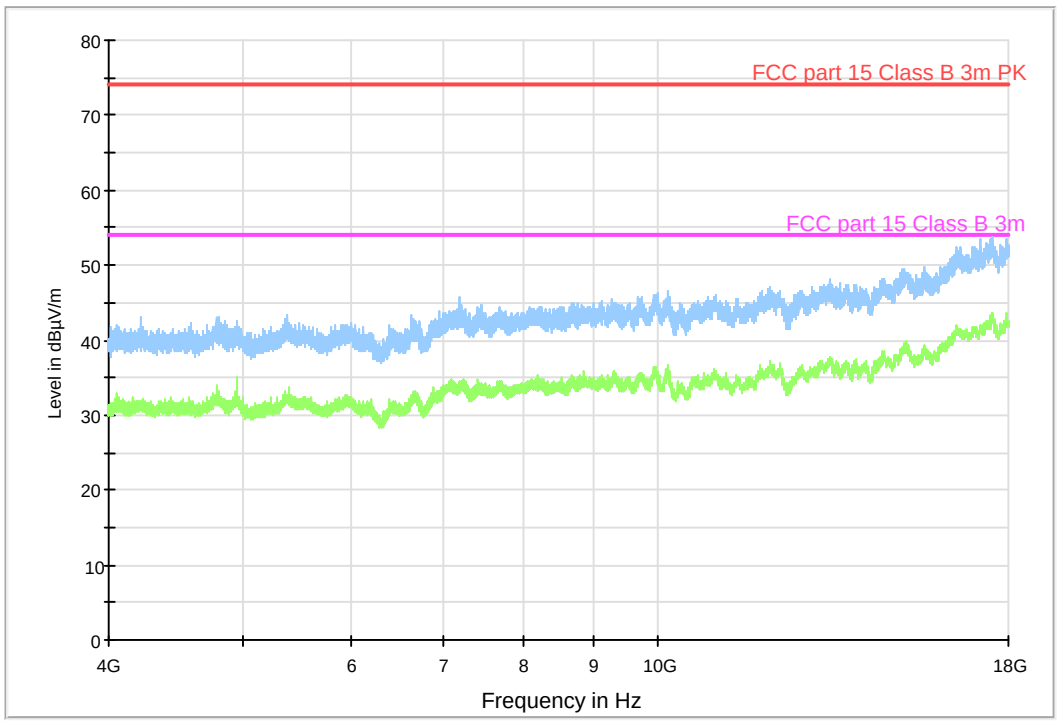


Diagram, Peak overview sweep, 4 – 18 GHz at 3 m distance. TX middle channel, EUT orientation Z.



Diagram, Peak overview sweep, 4 – 18 GHz at 3 m distance. TX high channel, EUT orientation Z.

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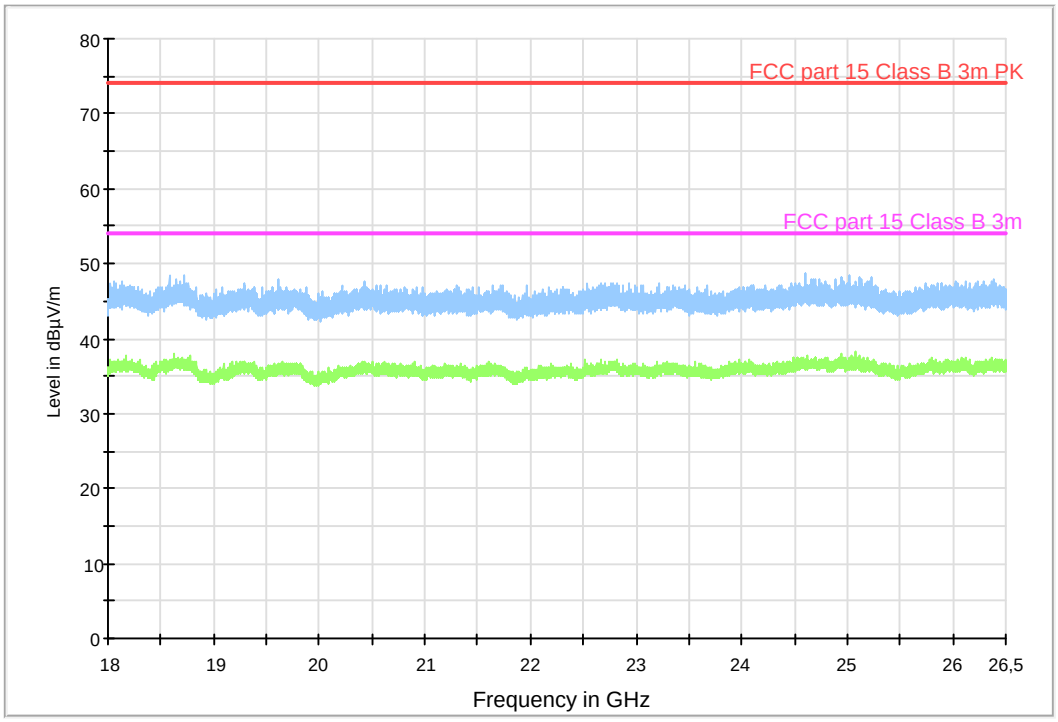
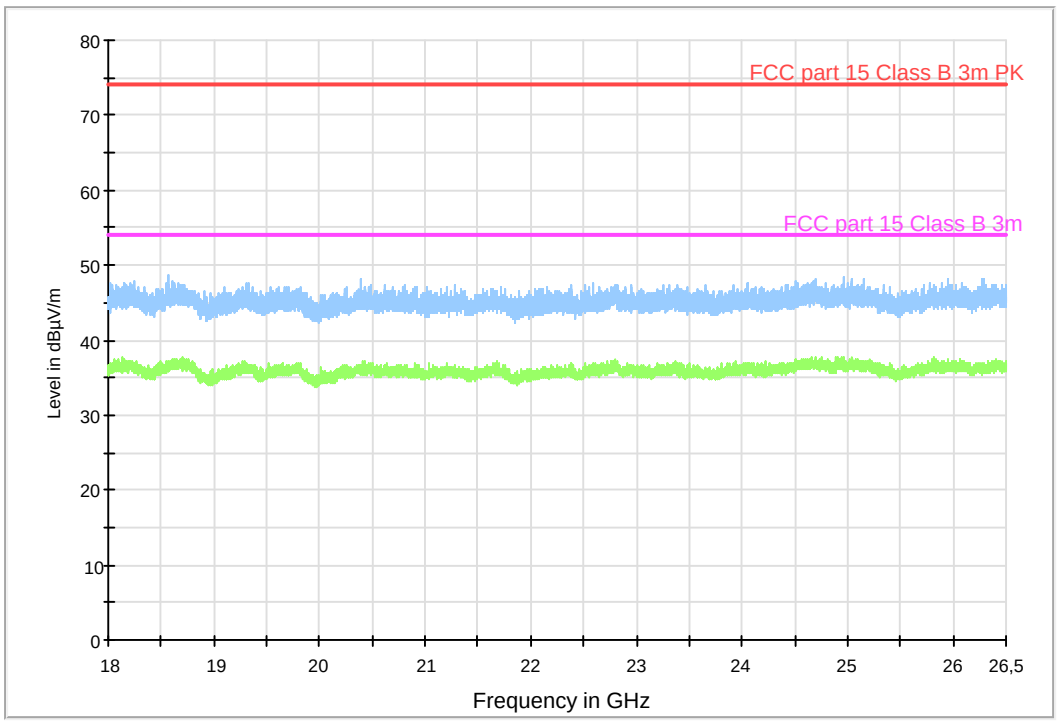


Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. TX low channel, EUT orientation X.



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

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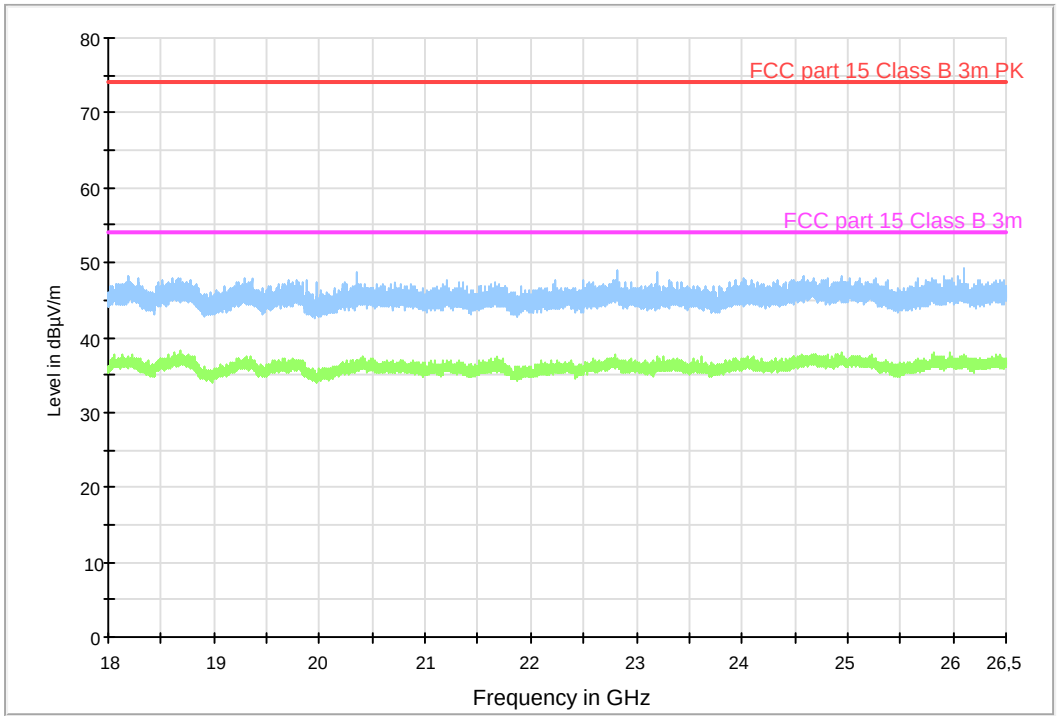
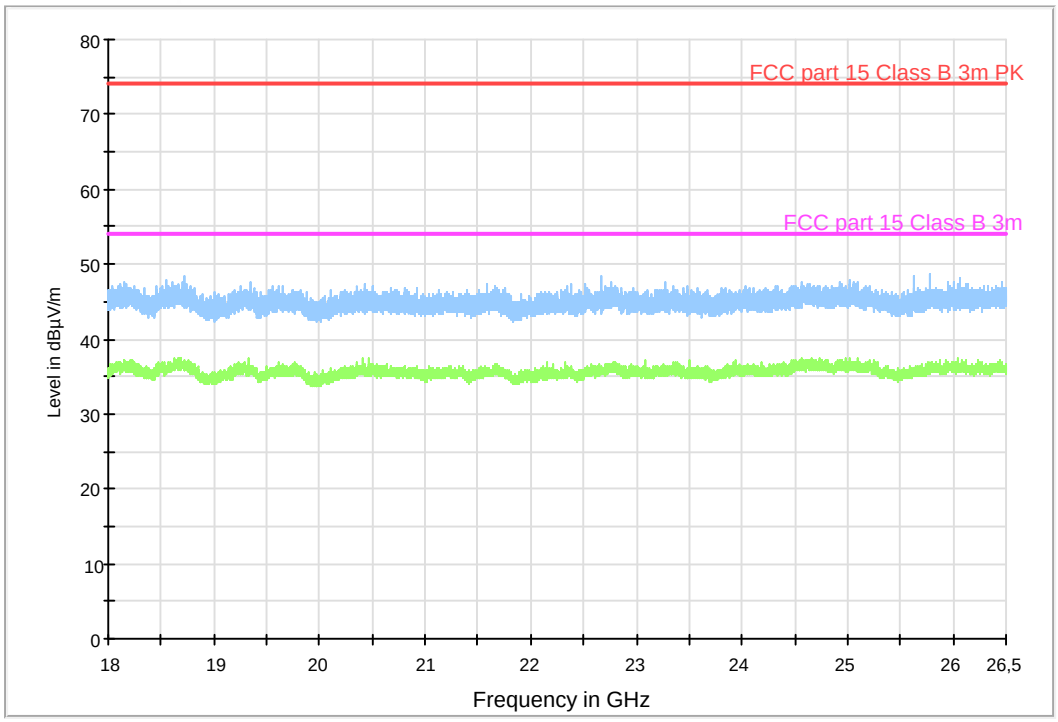


Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. TX low channel, EUT orientation Z.



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

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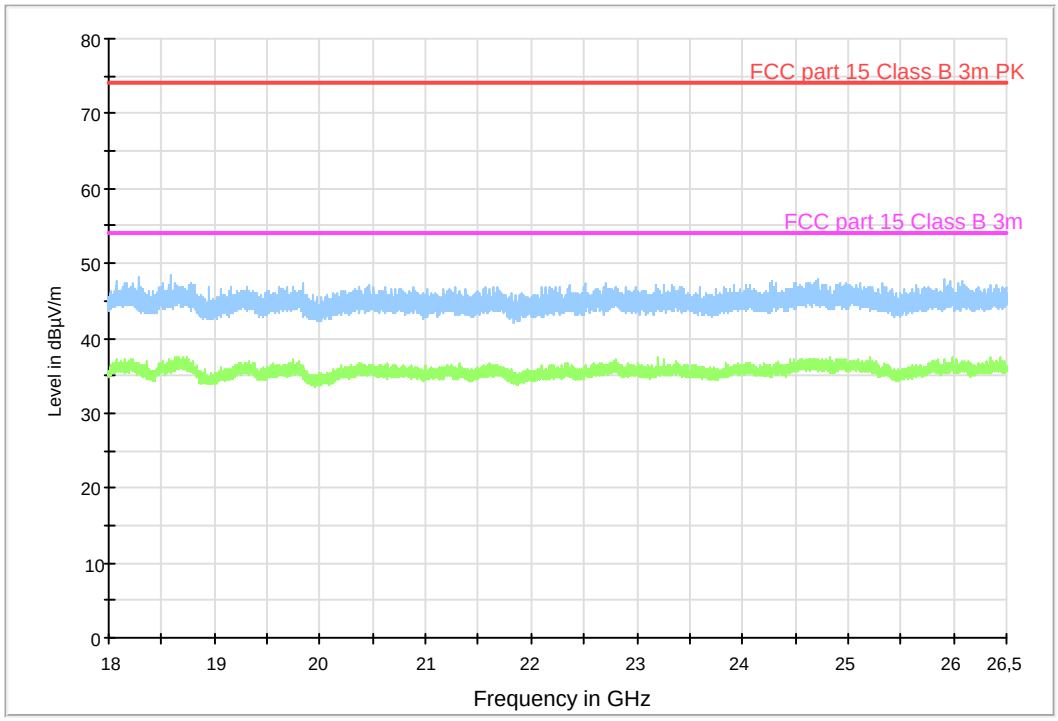

Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. TX high channel, EUT orientation Z.

Measurement results

No emissions are found above noise floor or closer than 20 dB from limit. Margin to noise floor is at least 10 dB.

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

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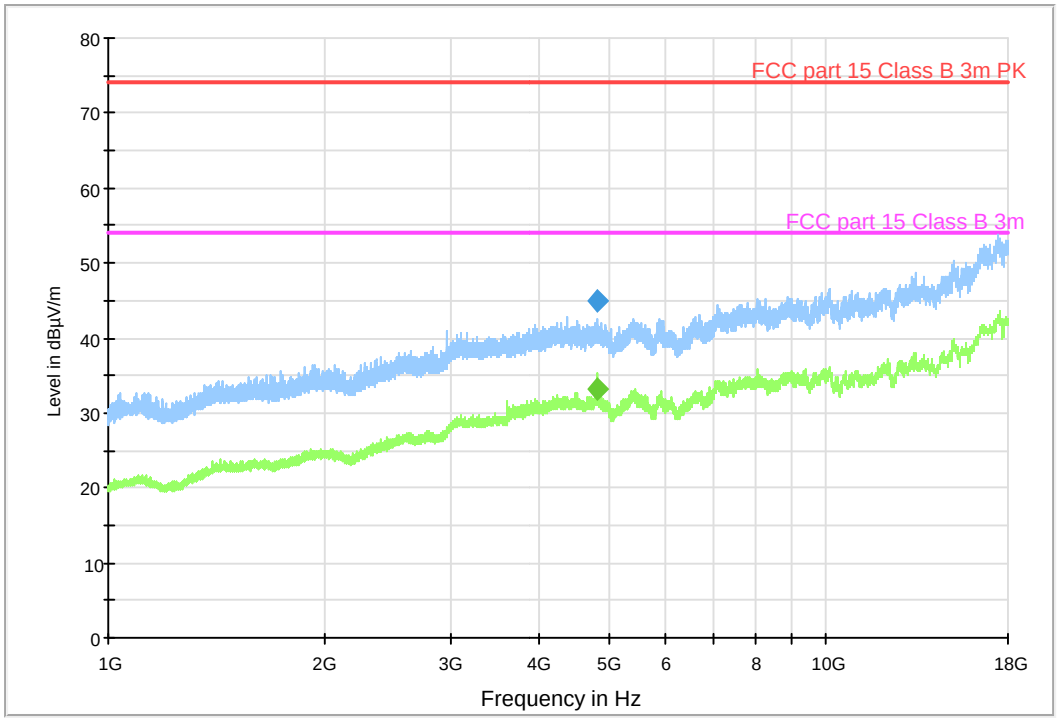
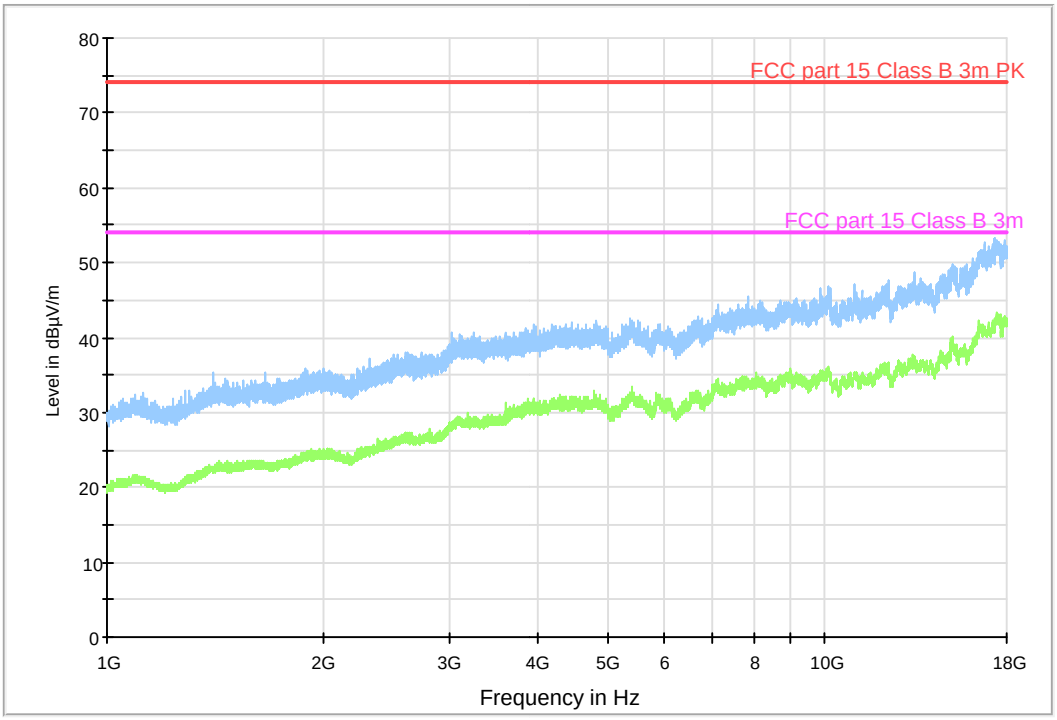
6.7 Test results 1 GHz – 26 GHz, RX



Diagram, Peak overview sweep, 1 – 18 GHz at 3 m distance. RX low channel, EUT orientation Z.



Diagram, Peak overview sweep, 1 – 18 GHz at 3 m distance. RX middle channel, EUT orientation Z.

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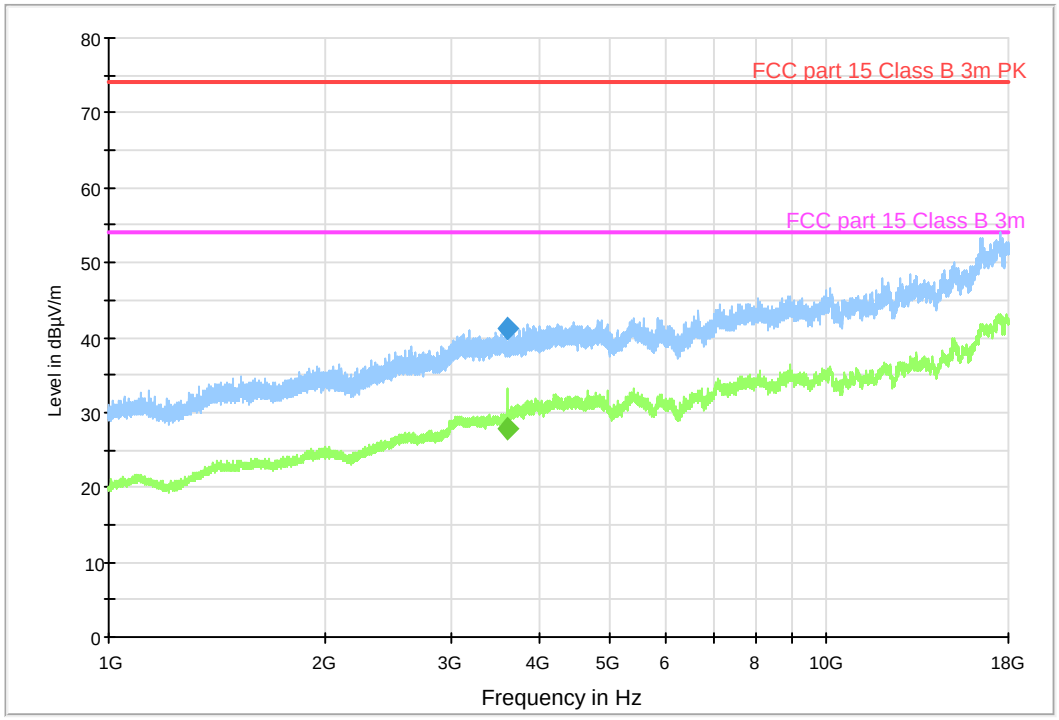
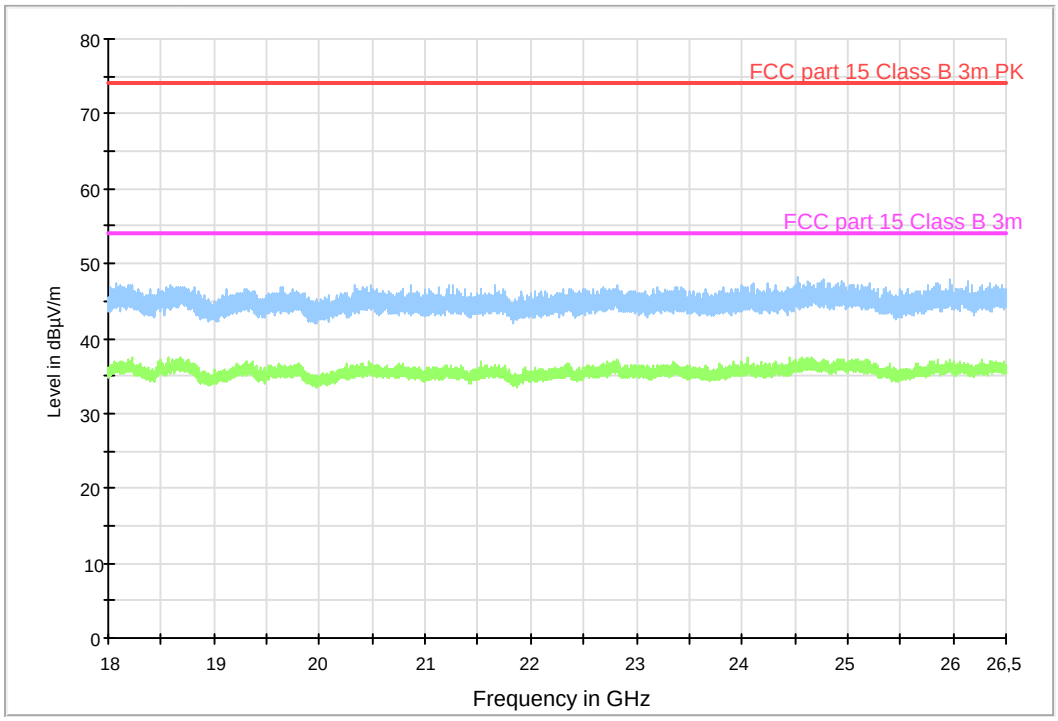


Diagram, Peak overview sweep, 1 – 18 GHz at 3 m distance. RX high channel, EUT orientation Z.



Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. RX low channel, EUT orientation Z.

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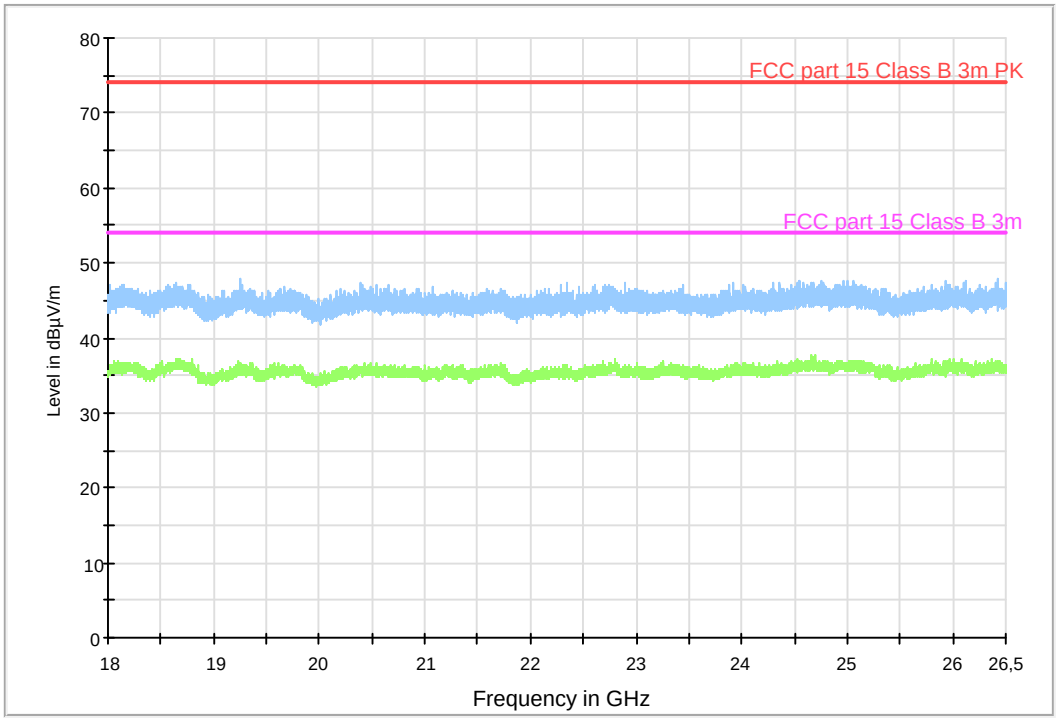
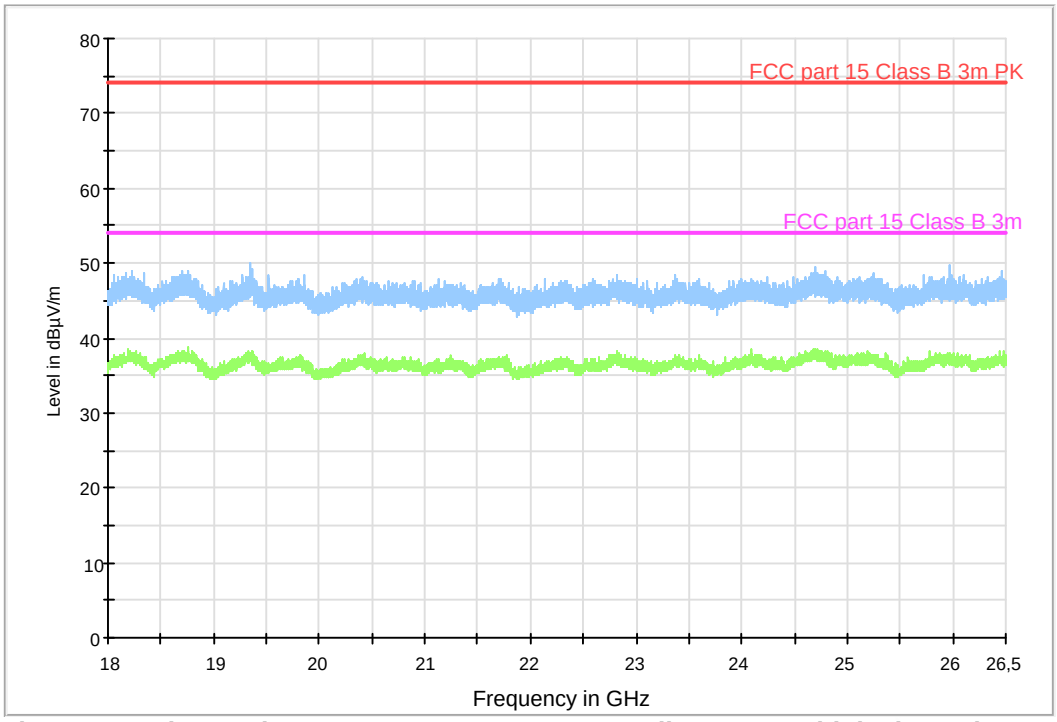


Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. RX middle channel, EUT orientation Z.



Diagram, Peak overview sweep, 18 – 26 GHz at 3 m distance. RX high channel, EUT orientation Z.

Measurement results

No emissions are found above noise floor or closer than 20 dB from limit. Margin to noise floor is at least 10 dB.

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

7 OCCUPIED 6 DB BANDWIDTH

Date of test:	2015-10-08	**Test location:**	Wireless Center
EUT Serial:	1215390431	**Ambient temp:**	20 °C
Tested by:	Kajsa From	**Relative humidity:**	31 %
Test result:	Pass	**Margin:**	203 kHz

7.1 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 and attenuator. Delta marker was used to determine the 6 dB bandwidth.

7.2 Test conditions

Detector	Peak
Trace	Max hold
RBW	100 kHz
VBW	300 kHz
Span	2 – 3 MHz

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

7.3 Requirement

Reference: CFR 47 §15.247(a)(2). RSS-247 5.2(1)

The minimum 6 dB bandwidth shall be at least 500 kHz.

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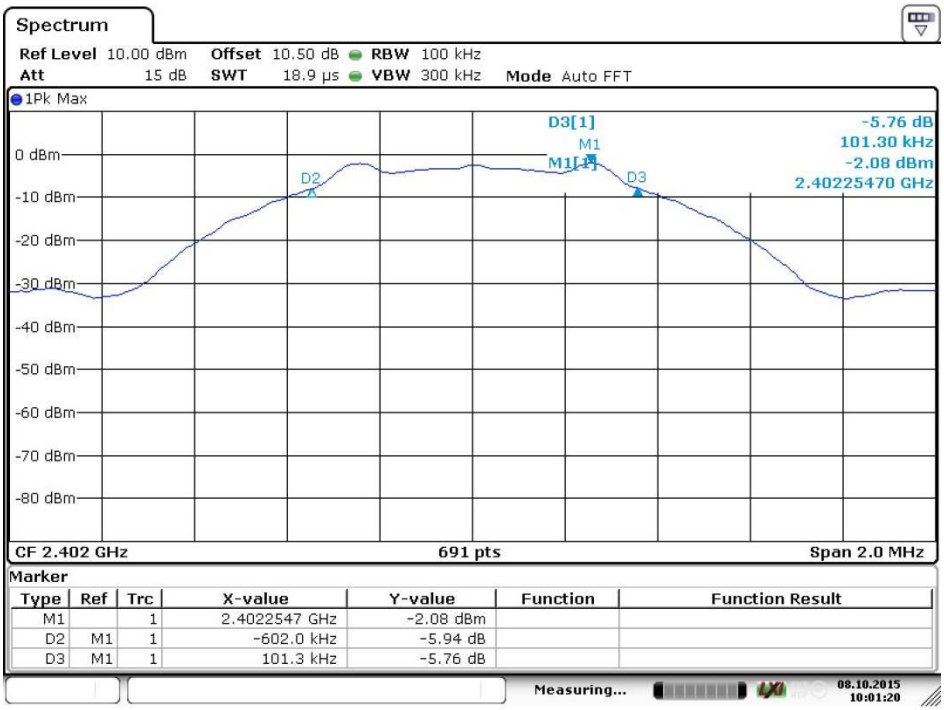
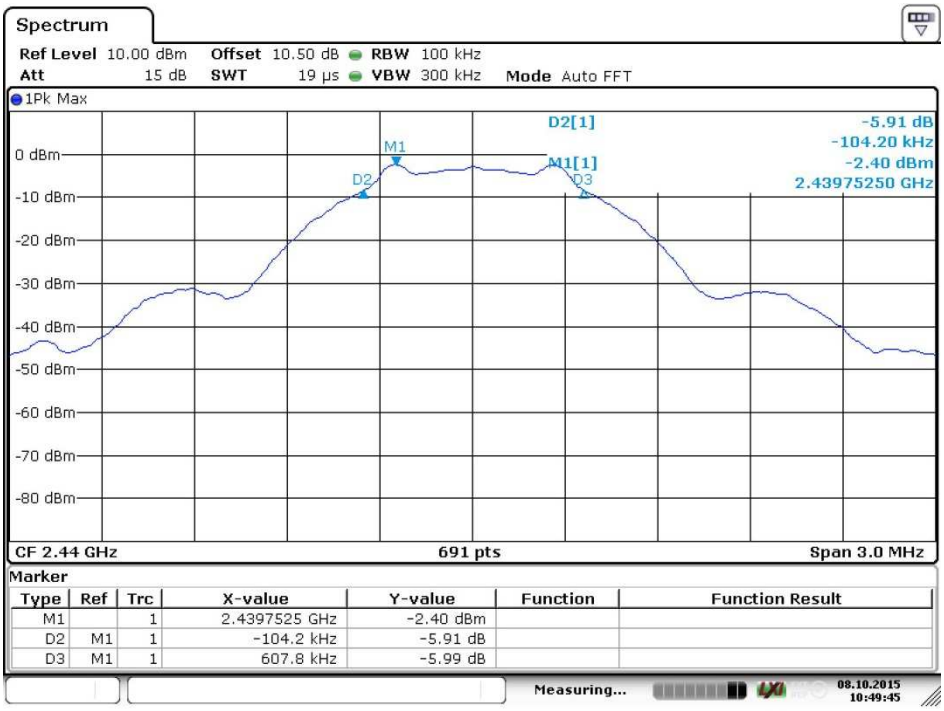
7.4 Test results



Date: 8.OCT.2015 10:01:20

Screenshot: Occupied 6 dB bandwidth Measurement, low channel



Date: 8.OCT.2015 10:49:45

Screenshot: Occupied 6 dB bandwidth Measurement, middle channel

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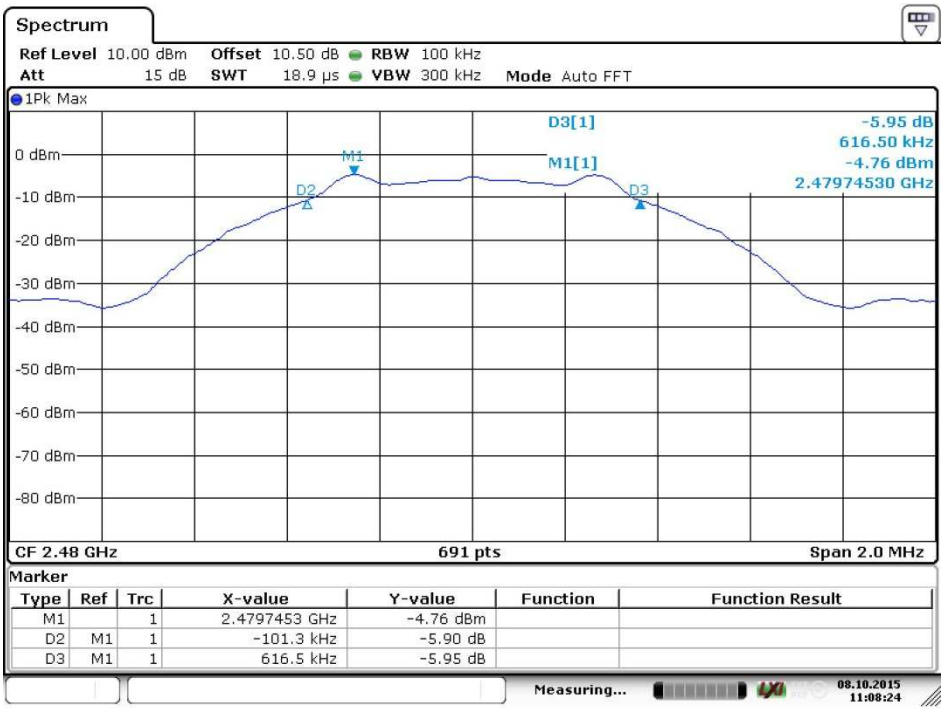

Date: 8.OCT.2015 11:08:25

Screenshot: Occupied 6 dB bandwidth Measurement, high channel

Test result

Channel [MHz]	6 dB BW [kHz]
2402	703
2440	712
2480	718

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8 99 % BANDWIDTH

Date of test:	2015-10-08	**Test location:**	Wireless Center
EUT Serial:	1215390431	**Ambient temp:**	20 °C
Tested by:	Kajsa From	**Relative humidity:**	31 %
Test result:	Pass	**Margin:**	--

8.1 Test set-up and test procedure.

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

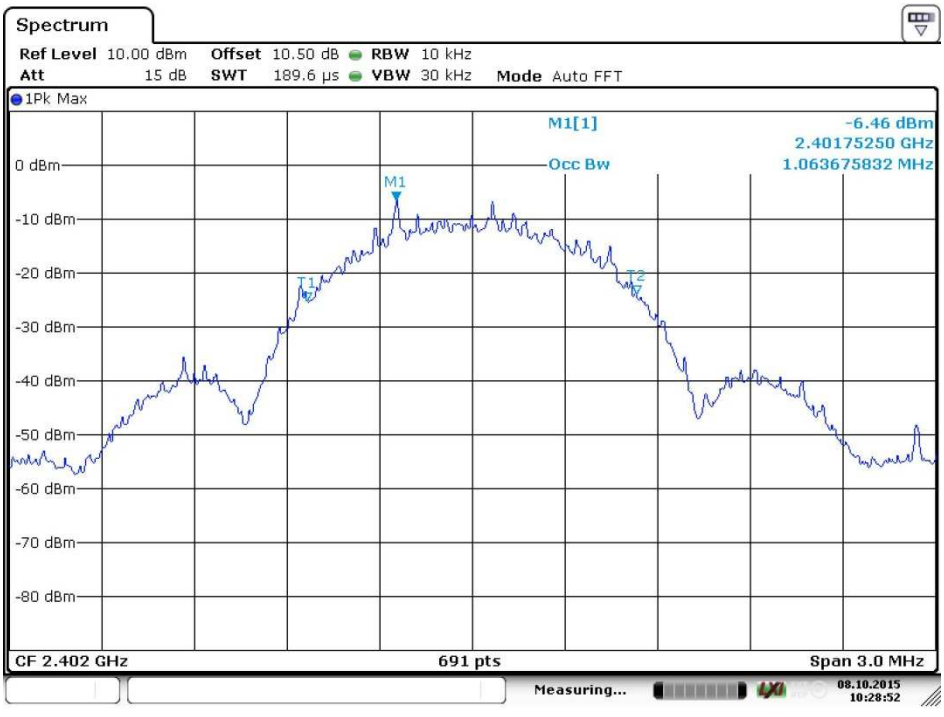
The EUT was connected to spectrum analyser via rf-cable and attenuator. Spectrum analyser with occupied bandwidth measurement function is used to determine the occupied bandwidth.

8.2 Test conditions

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

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

8.3 Test results



Date: 8.OCT.2015 10:28:52

Screenshot: 99 % bandwidth Measurement, low channel

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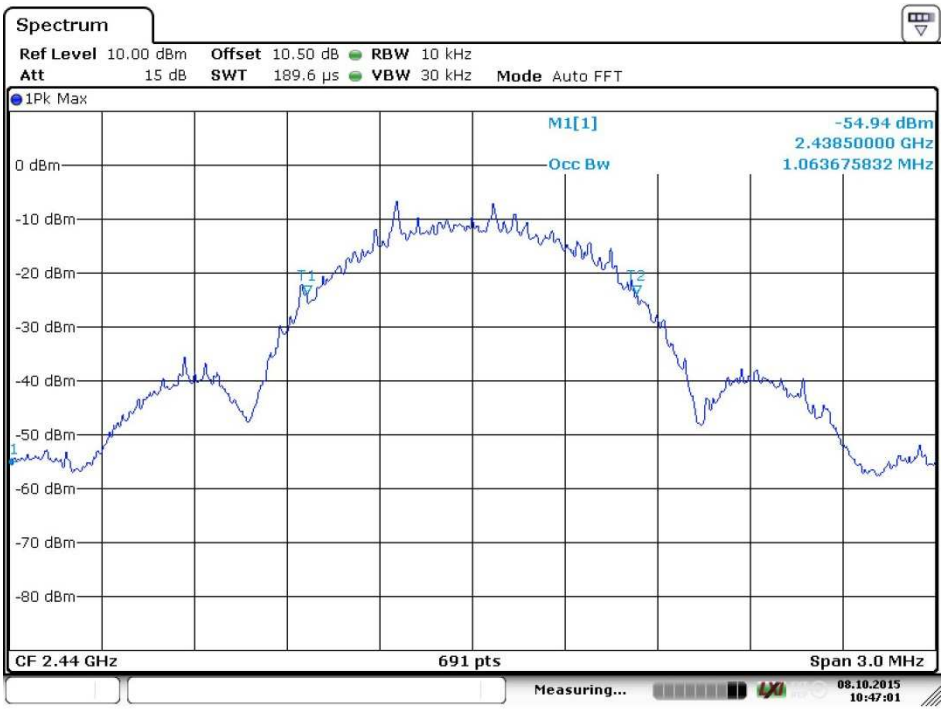
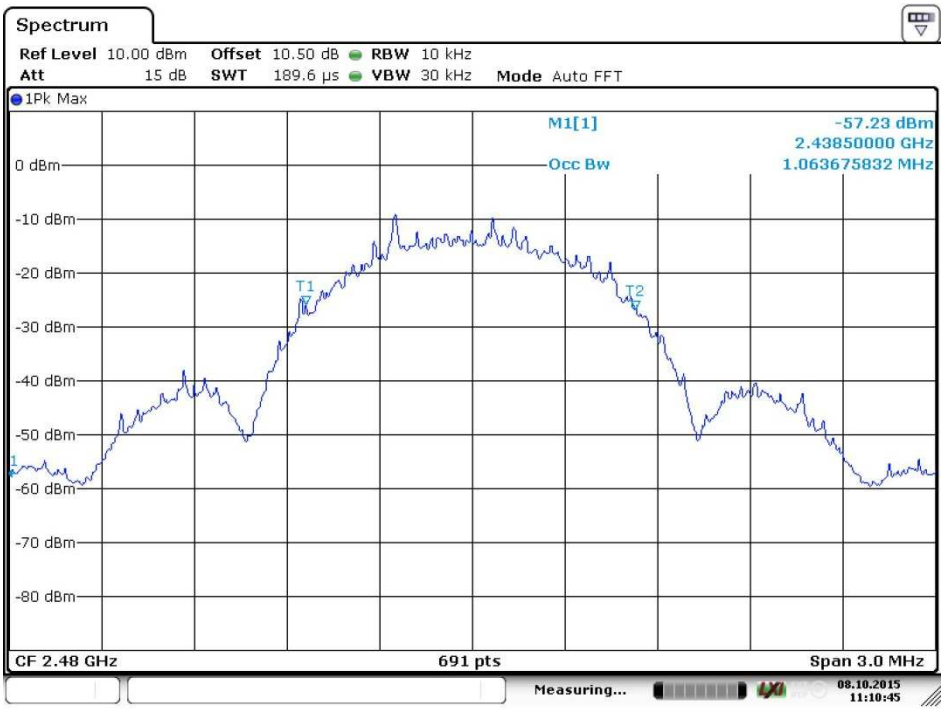


Date: 8.OCT.2015 10:47:00

Screenshot: 99 % bandwidth Measurement, middle channel



Date: 8.OCT.2015 11:10:45

Screenshot: 99 % bandwidth Measurement, high channel

Test result

Channel [MHz]	99 % BW [MHz]
2402	1.06
2440	1.06
2480	1.06

9 MAXIMUM PEAK CONDUCTED OUTPUT POWER

Date of test:	2015-10-08	**Test location:**	Wireless Center
EUT Serial:	1215390431	**Ambient temp:**	20 °C
Tested by:	Kajsa From	**Relative humidity:**	31 %
Test result:	Pass	**Margin:**	34.6 dB

9.1 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 and attenuator. Marker was used to detect peak power.

9.2 Test conditions

Detector Peak
Trace: Max hold
RBW: ≥ OBW
VBW: ≥ 3 x RBW
Span: ≥ 3 x OBW

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

9.3 Requirements

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

For DTSs employing digital modulation techniques operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W.

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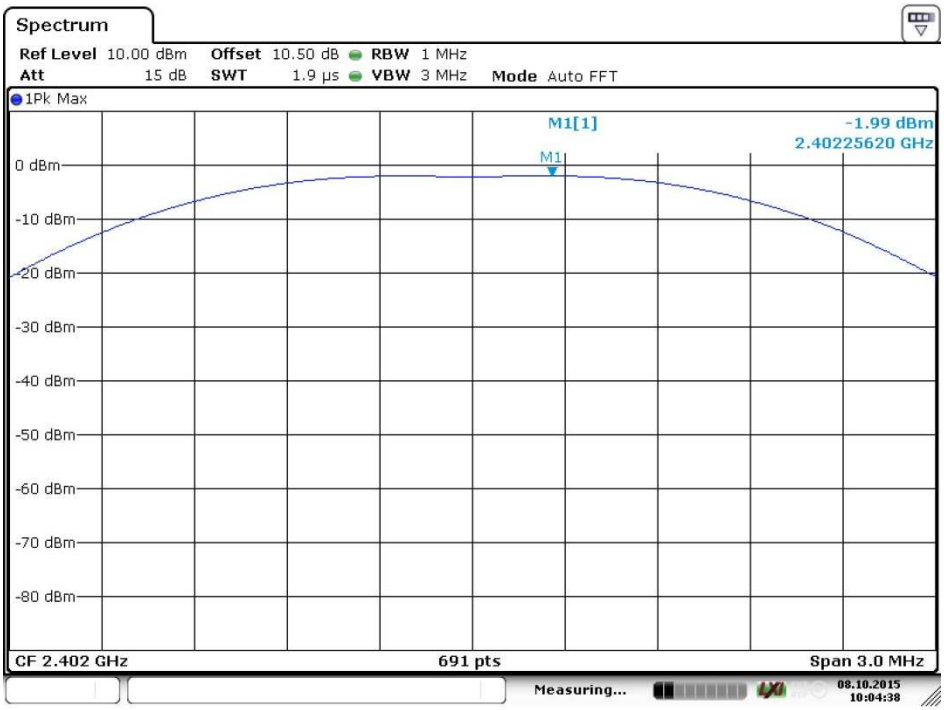
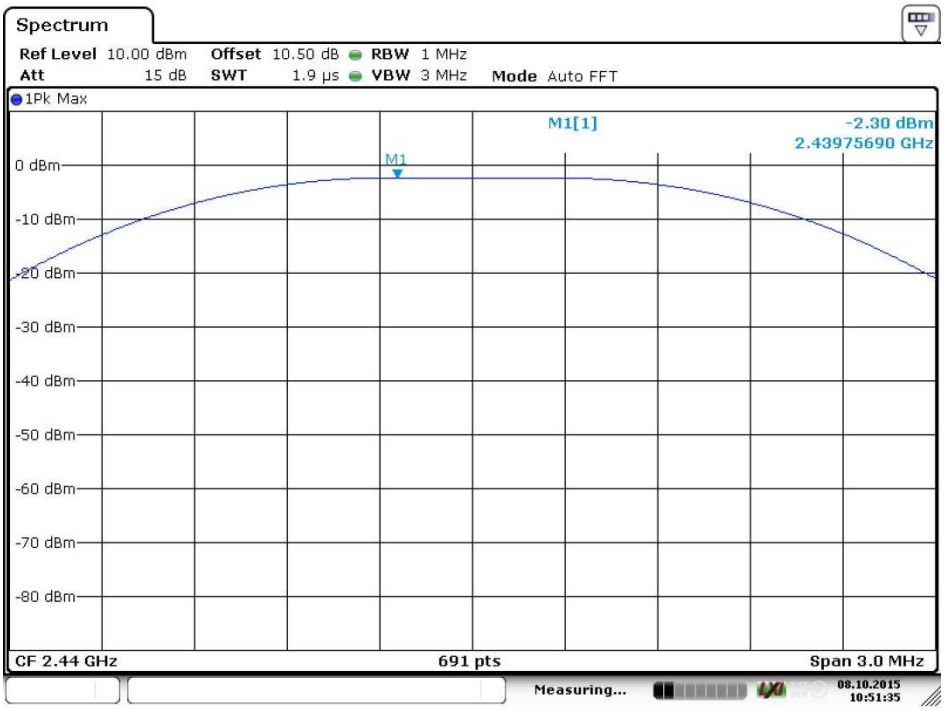
9.4 Test results



Date: 8.OCT.2015 10:04:38

Screenshot: Output power, low channel



Date: 8.OCT.2015 10:51:36

Screenshot: Output power, middle channel

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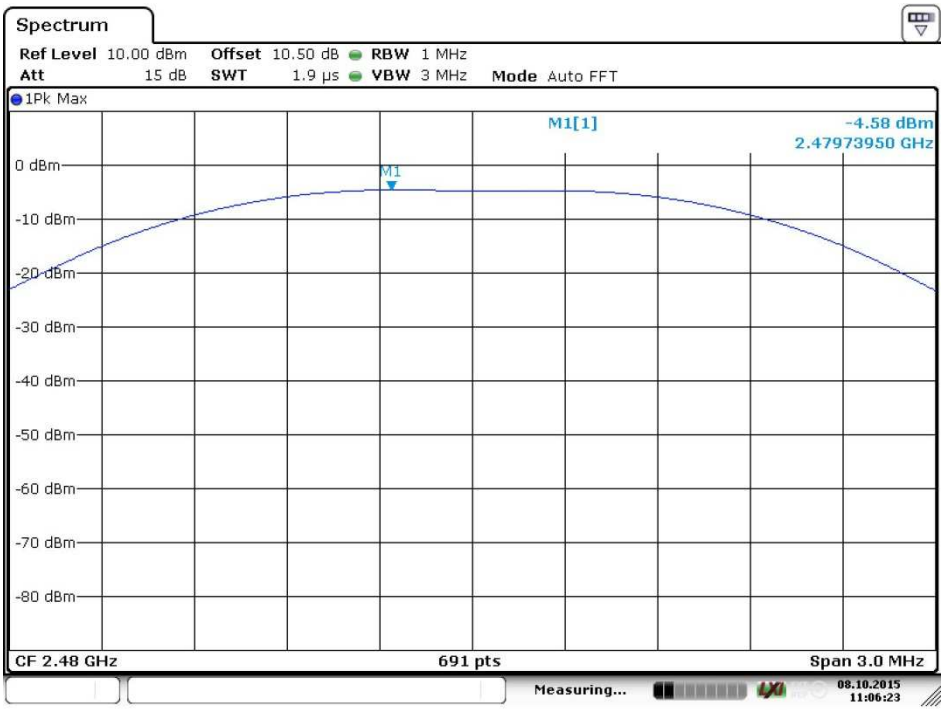

Date: 8.OCT.2015 11:06:23

Screenshot: Output power, high channel

Test result

Channel [MHz]	Output power [dBm]
2402	-2.0
2440	-2.3
2480	-4.6

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10 POWER SPECTRAL DENSITY

Date of test:	2015-10-08	**Test location:**	Wireless Center
EUT Serial:	1215390431	**Ambient temp:**	20 °C
Tested by:	Kajsa From	**Relative humidity:**	31 %
Test result:	Pass	**Margin:**	20.1 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 and attenuator. Marker was used to detect peak power spectral density.

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.

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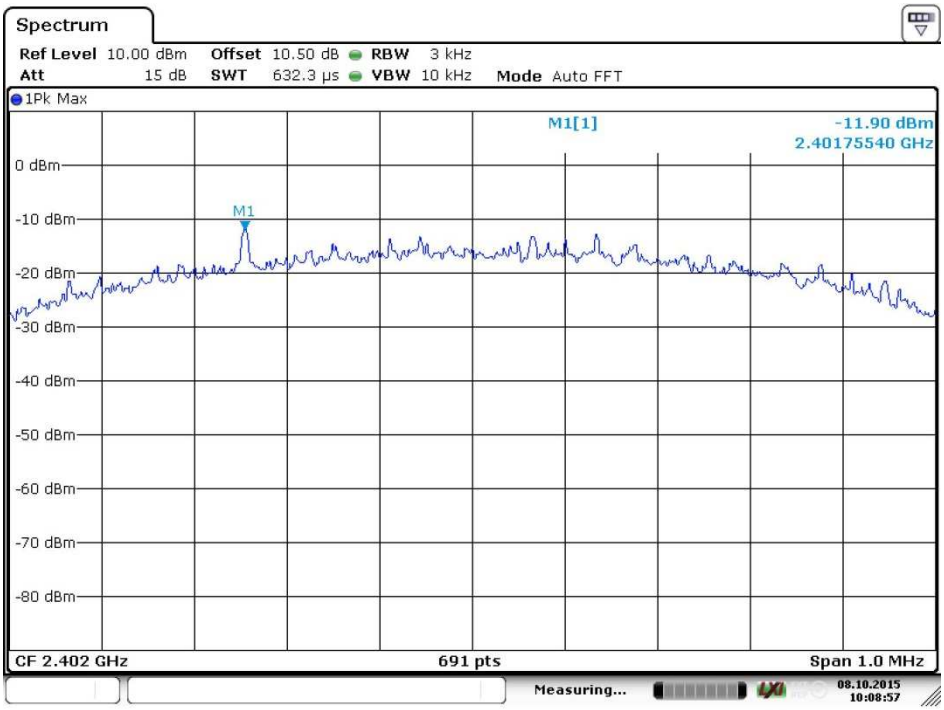
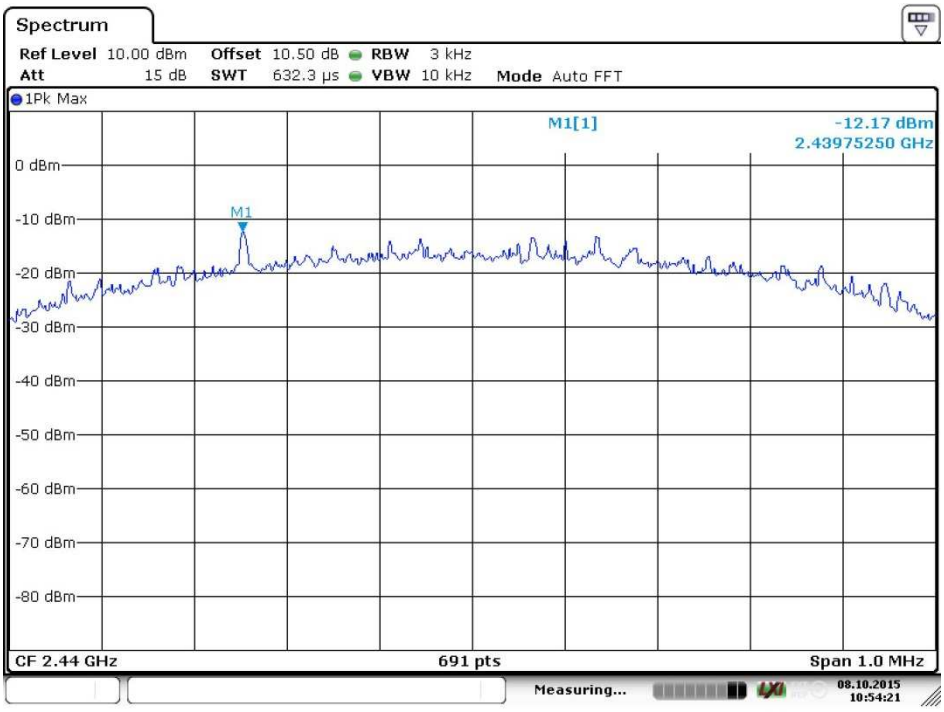
10.4 Test results



Date: 8.OCT.2015 10:08:57

Screenshot: Peak power spectral density, low channel



Date: 8.OCT.2015 10:54:21

Screenshot: Peak power spectral density, middle channel

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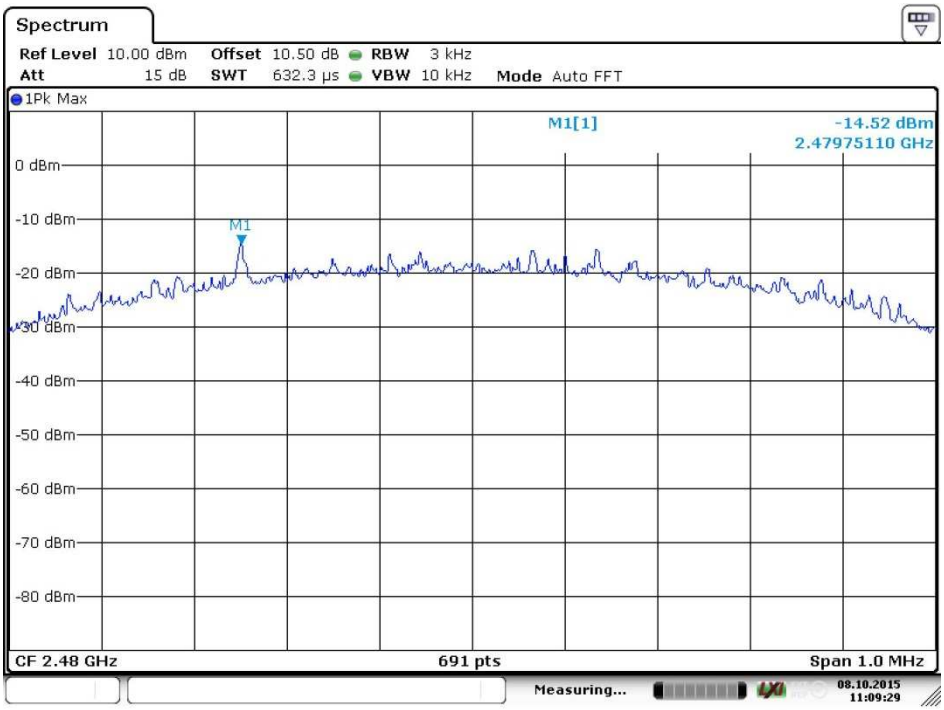

Date: 8.OCT.2015 11:09:29

Screenshot: Peak power spectral density, high channel

Test result

Channel [MHz]	PSD [dBm/3kHz]
2402	-11.9
2440	-12.2
2480	-14.5

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11 TRANSMITTER DUTY CYCLE FOR PULSED TRANSMISSIONS

Date of test:	2015-10-08	**Test location:**	Wireless Center
EUT Serial:	1215390431	**Ambient temp:**	20 °C
Tested by:	Kajsa From	**Relative humidity:**	31 %
Test result:	Pass	**Margin:**	--

11.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10.section 7.5

Spectrum analyser is used to determine the transmitter duty cycle.

11.2 Test conditions

Detector: Peak
RBW 3 MHz
VBW 3 MHz
Span 0 Hz
Sweep time 1 ms/100 ms

11.3 Requirement

CFR 47 15.35(c) and RSS-GEN section 6.10

11.4 Test results

The EUT is transmitting 120 µs pulses every 626 µs, giving 160 pulses during 100 ms.
T_{on} = 160 x 0.120 = 19.2 ms
Duty cycle is calculated T_{on} / 100 ms = 0.192
Peak to average correction factor = 20 LOG (Duty cycle) = **-14.3**

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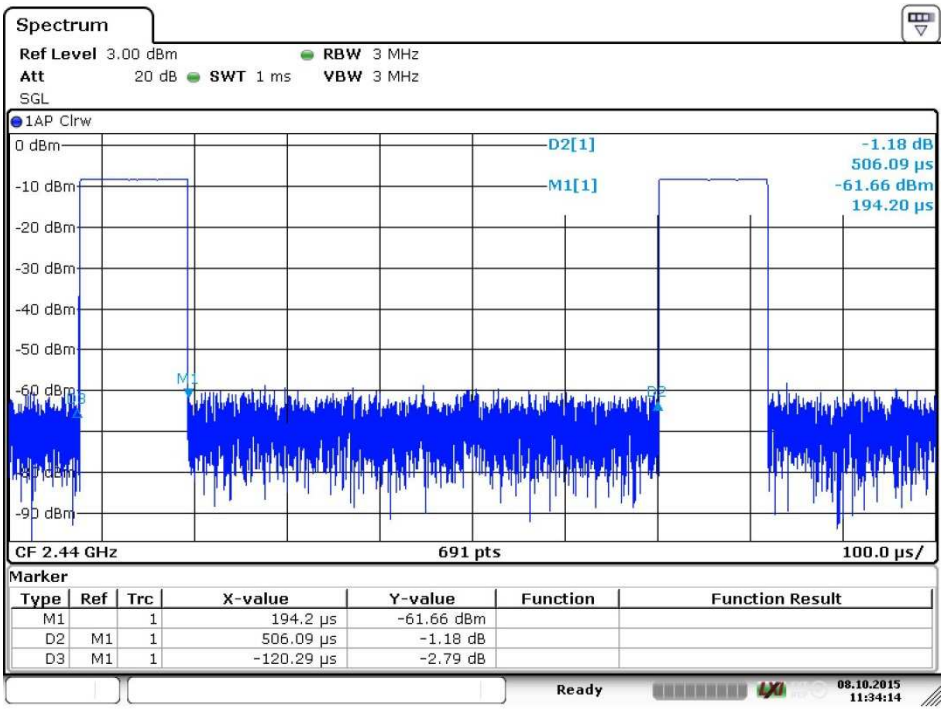
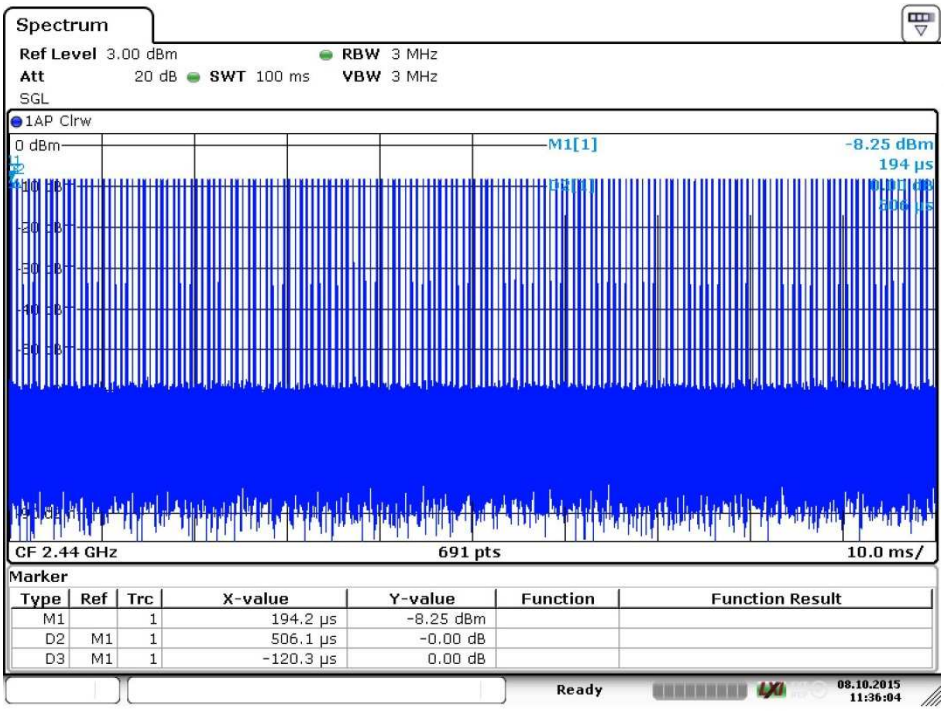


Date: 8.OCT.2015 11:34:14

Screenshot: 1 ms measurement



Date: 8.OCT.2015 11:36:05

Screen shot: 100 ms measurement

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12 TEST EQUIPMENT

Stora Hallen

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32	--	--	--
Receiver	Rohde & Schwarz	ESIB8	12866	2015-07	1 year
Receiver	Rohde & Schwarz	ESU40	13178	2015-07	1 year
BiLog antenna	Chase	CBL 6111A	971	2015-07	3 years
Horn antenna	Rohde & Schwarz	HF907	31245	2013-11	3 years
Horn antenna + pre amplifier	BONN	BLMA 1826-5A	31247	2014-01	3 years
Preamplifier	BONN	BLMA 0118-M	31246	2015-07	1 year
Power supply pre amplifier	Semko	--	7993	2015-07	1 year
BR filter	K&L Microwave	6N45-2450/T100-0/0	12389	2015-07	1 year
HP filter	K&L Microwave	4410-X4500/18000-0/0	5133	2015-07	1 year
Humidity and temperature transmitter	Vaisala	HMI41	8087	2015-03	1 year
RF-cable	Huber+Suhner	--	9506 9957 32710 39033 40036 9749 39049 39078	2015-07	1 year

Wireless Center

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Signal analyzer	Rohde & Schwarz	FSV30	32594	2015-07	1 year
Signal generator:	Rohde & Schwarz	SMB100A	32592	2015-07	1 year

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13 MEASUREMENT UNCERTAINTY

Continuous conducted disturbances with AMN in the frequency range 9 kHz to 30 MHz ± 3.6 dB

Measurement uncertainty for radiated disturbance

Uncertainty for the frequency range 30 to 1000 MHz at 3 m	± 5.1 dB
Uncertainty for the frequency range 30 to 1000 MHz at 10 m	± 5.0 dB
Uncertainty for the frequency range 1.0 to 18 GHz at 3 m	± 4.7 dB
Uncertainty for the frequency range 18 to 26 GHz at 3 m	± 4.8 dB
Uncertainty for the frequency range 26 to 40 GHz at 3 m	± 5.7 dB

Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2011.
The measurement uncertainty is given with a confidence of 95 %.

14 TEST SET UP AND EUT PHOTOS

Test set up photos are in separate document 1516281STO-002, Annex 1.
EUT photos are in separate document 1516281STO-002, Annex 2.

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